Status Survey and Conservation Action Plan for the Black Crowned Crane *Balearica pavonina*

Emmanuel Williams, Richard Beilfuss, and Tim Dodman

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Executive Summary

The Black Crowned Crane *Balearica pavonina,* a resident of the Sahel and Sudan Savannah regions of Africa, is of global conservation concern. Historically, the Black Crowned Crane was abundant and widely distributed across at least 27 countries but during the past thirty years the species has been decreasing across much of its range. In 1999, ICF and Wetlands International launched a comprehensive programme to assess the status of Black Crowned Cranes and develop concrete plans for the conservation of the species. In 2000-2001, the first-ever, range-wide surveys of the species were co-ordinated among 187 target sites in 20 African nations. We used a combination of ground surveys, aerial surveys, and questionnaires to assess population size, distribution and habitats of the species, and threats to its survival.

The total population estimate of 42,000 Black Crowned Cranes is significantly lower than the most recent (1994) estimate of 65,500-77,500. The West African population *B. p. pavonina*, of approximately 14,500 birds, is in overall decline, but appears to be stable in freshwater wetlands of the Casamance and Guinea Bissau and in the Chad Basin. The Eastern African population *B. p. ceciliae* (~27,500 birds) is also declining, but remains relatively common in southern Sudan. The Black Crowned Crane population has fragmented into at least 38 distinct sub-populations or *Crane Areas*, including 27 for *B. p. pavonina*, with large gaps between many sub-populations that were once nearly contiguous. Black Crowned Crane habitats include seasonally flooded wetlands, lake edges, and large floodplains, with less dependence on agricultural fields than has been reported for the Grey Crowned Crane *B. regulorum*. The principal threats facing Black Crowned Cranes include the conversion and over-exploitation of wetlands, egg removal and nest disturbance, and the live crane trade and domestication. Drought and desertification are also important threats, especially in combination with other factors.

We provide recommendations for the future conservation of Black Crowned Cranes and their wetland habitats at a species and sub-species level. We recommend launching public awareness programmes for the Black Crowned Crane as a flagship species for wetland conservation, initiating case studies to find solutions to significant threats, developing integrated management programmes for critical wetlands and catchments, advocating for designation of key sites as Wetlands of International Importance, transferring the Black Crowned Crane from CITES Appendix II to Appendix I, strengthening the network and working group to promote further research, monitoring and exchange of information, and convening an international, range-wide workshop to plan future conservation measures.

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Acknowledgements

In 1999, the International Crane Foundation and Wetlands International launched the *Black Crowned Crane Programme* to identify key areas where effective projects can be established for the conservation of Black Crowned Cranes and their habitats. Through this programme, a network of Black Crowned Crane conservationists was established across twenty-one nations in West, Central, and East Africa. A co-ordinated survey, using a combination of ground surveys, aerial surveys, questionnaires, interviews, and reliable past records and reports, was conducted across the entire range of the Black Crowned Crane to assess the population size, distribution, and habitats of the species, and the threats to its survival. In August 2000, key participants met at the 10th Pan-African Ornithological Congress in Uganda to discuss survey results and review a draft of this Black Crowned Crane Action Plan.

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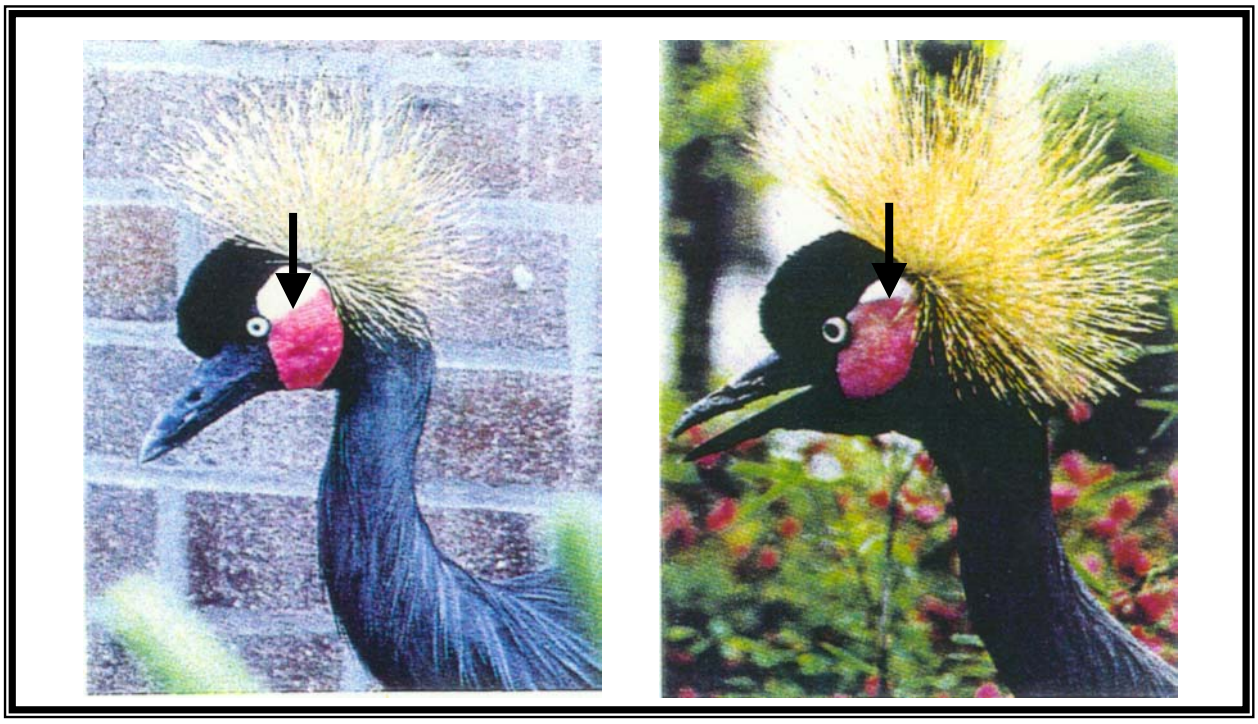
Section 1 Introduction

The Black Crowned Crane *Balearica pavonina,* a resident of the Sahel and Sudan Savannah regions of Africa, is of global conservation concern. Black Crowned Cranes range from the Senegal basin and Guinea-Bissau drainage in West Africa to the western Ethiopian Highlands and Southwest Rift Valley in East Africa. The West African Crowned Crane *B. p. pavonina* occupies the western part of this range, from the Senegal to Chad. The Sudan Crowned Crane *B. p. ceciliae* occurs in eastern Africa with its largest concentration in Sudan (Walkinshaw 1964, 1973; Johnsgaard 1983). The two sub-species are distinguished primarily by differences in the coloration of their cheek patches (Plate 1). In *B.p. pavonina*, the lower half of the cheek patch is red; in *B.p. ceciliae,* the red extends into the upper half of the cheek patch (Johnsgard 1983, S. Haeffner p*ers. comm.).*

Plate 1. Visual differences between sub-species of Black Crowned Cranes, B.p. pavonina (left) and B.p. ceciliae (right).



The Black Crowned Crane is a denizen of many of the major wetland systems of the Sahelian region, including the delta of the Senegal river, the inland delta of the Niger River in Mali, the Waza River at Lake Chad in Cameroon, and the extensive Sudd wetlands in southern Sudan (Treca 1996). Black Crowned Cranes use both wet and dry open habitats, but prefer a mixture of shallow wetlands and grasslands (especially seasonally flooded lowlands in the Sahelian savannahs). They can be considered both year-round residents and local migrants, flocking together during the dry (non-breeding) season and moving from large permanent wetlands to smaller temporary wetlands formed during the rainy season. Although they are non-migratory, daily and seasonal movements may in some areas range up to several dozen kilometres (Meine and Archibald 1996).

Historically, the Black Crowned Crane was abundant and widely distributed across its range (Walkinshaw 1964). The species is thought to have occurred in at least 27 countries, with *B.p. pavoninia* ranging across 22 countries in West and Central Africa, and *B.p. ceciliae* occurring in eight

East African countries (Meine and Archibald 1996). During the past thirty years, however, the species has been decreasing across much of its range and the population is now fragmented into eight or more isolated populations (Urban 1988; Meine and Archibald 1996). *B.p. pavonina* has declined so dramatically over the past twenty-five years that it is now threatened with extirpation across much of its range (Fry 1987; Urban 1988). In Nigeria, where it was once common and is still the national bird, the population plummeted from more than 15,000 birds in the early 1970s to no more than a few individuals today (Fry 1987; Mustafa and Durbunde 1992). The status of *B. p. ceciliae* is also of concern due to the ongoing civil war in southern Sudan and potential drainage of the Sudd wetlands; only limited surveys have been possible since the early 1980s (Wilson 1982; Mefit-Babtie Srl 1983).

The rapid decrease in the population of *B.p. pavonina* and the lack of knowledge about the status of *B. p. ceciliae* has stimulated conservation efforts on behalf of the species in recent years. The species is classified as Vulnerable under the revised IUCN Red List Categories (IUCN 1994). *B. p. pavonina* is classified Endangered, and *B. p. ceciliae* Vulnerable (Table 1). International trade in the species is regulated under the Convention on International Trade in Endangered Species (CITIES) Appendix II. Black Crowned Cranes are legally protected in most countries where they occur, and their habitats are protected within several National Parks and other wildlife management areas across their range. A few of these protected areas, including Waza National Park in Northern Cameroon and Djoudj National Park in Senegal, may still support viable populations of breeding cranes (Scholte 1996; Treca and Ndiaye 1996). However, cranes in these areas do not occur exclusively within the protected areas but rather utilise a variety of habitats around the parks, including agricultural lands.

Table 1. Black Crowned Crane conservation status

Population	Conservation Status	IUCN 1994 Red List Criteria
B. pavonina	Vulnerable	A1c, A1d, A2c & A2d
B. p. pavonina	Endangered	A1& A1d
B. p. ceciliae	Vulnerable	A1c, A1d, A2c & A2d

In 1992, Nigeria hosted the International Conference on the Black Crowned Crane and its Wetland Habitats, and the Black Crowned Crane Working Group was established. This Working Group re-convened at the African Crane and Wetland Training Workshop, held by the International Crane Foundation (ICF) in Botswana in 1993, to discuss strategies for protecting the species. Despite these initiatives, however, there was no range-wide information on the population size or distribution of the species and very few ecological studies. Very little was known about specific causes of species' decline anywhere in its range. Without accurate information on the conservation status of the species, scientists were unable to launch effective programs for the conservation and recovery of the species.

In response to this need, ICF and Wetlands International undertook a comprehensive programme to assess the status of Black Crowned Cranes in Africa and develop concrete plans for the conservation of the species across its range. In 2000-2001, the first-ever, range-wide surveys of the species were co-ordinated among 20 African nations. The surveys used a combination of ground surveys, aerial surveys, questionnaires, interviews, and reliable past records and reports to assess the population size, distribution, and habitats of the species, and the threats to its survival.

The following sections describe the *methodology* used for implementing the status survey and analysing the survey data, provide the *survey results and discussions* including data on population numbers and trends, distribution, habitat requirements, protection status, threats, and local attitudes concerning the cranes, and suggest *recommendations* for further action on a species and sub-species level.

Section 2 Methodology

2.1 Survey implementation

2.1.1 Survey participants

In December 1999, a full-time Black Crowned Crane Programme Co-ordinator was hired to manage the project under the auspices of ICF and Wetlands International. The Co-ordinator was based at the Wetlands International West Africa Program Office in Dakar, Senegal.

Survey participants included members of the African Waterbird Census (AfWC) network of Wetlands International, the ICF crane working group network in Africa, the Foundation Working Group International Waterbird and Wetland Research (WIWO), the National Hunting and Wildlife Office of France (ONCFS), and many other organisations and individuals. Letters of inquiry were sent to various organisations and individuals across Africa to encourage widespread participation in the status survey. All organisations and individuals expressing interest in the status survey received questionnaires, and many participated in the field surveys (see below).

2.1.2 Survey Sites Targeted

A total of 226 sites were targeted for surveys. These included all sites known to currently or recently harbour Black Crowned Cranes, as well as sites where cranes were thought to have historically occurred and sites never previously surveyed that would likely support cranes. Survey sites were identified from the AfWC database, previous reports and publications, and personal communication with survey participants (Annex 1).

2.1.3 Survey Sites Covered

Over the two-year survey period, a total of 187 of 226 target sites were covered by field surveys or questionnaires. The survey sites covered 20 African nations across the full range of the species. During 2000, 125 of the 226 targeted sites were covered. In 2001, 59 additional target sites were covered and 13 of the 2000 sites were repeated. Most of the target sites not covered by field surveys were considered to be of minor importance for Black Crowned Cranes, based on previous reports. However, there were some key sites not covered by the 2000-2001 surveys due to insufficient funds, field materials, local contacts, experienced counters, or other logistical reasons, and these remain as gaps in our knowledge until further surveys are commissioned (Annex 2).

2.1.4 Field Survey

Field surveys were undertaken from January to April 2000 at 83 of the 125 sites. The field surveys were conducted in 13 African nations. From January to April 2001, field surveys were conducted at 72 sites in 9 nations. The field surveys were integrated where possible into the annual AfWC that normally takes place between mid-January and March. The surveys were primarily mainly carried out on foot, by car along roads, and by boat in some river channels. Aerial surveys were conducted in the Lake Chad area, Lake Fitri, Chari River, Ndjamena, and Plaine du Logone in Chad, the Inner Niger Delta in Mali, and in Parc National du Diawling, Lac d'Aleg, and Gâat Mahamouda in Mauritania. The aerial surveys in Maurtiania were repeated in 2001, and additional aerial surveys were conducted at Ndiael in the Senegal River basin. Results from the field surveys were recorded on the sub-regional AfWC forms (Annex 3) and sent to the Co-ordinator, where they were collated and analysed.

2.1.5 Questionnaire Survey

To supplement and expand on the field surveys, a questionnaire was sent out to each national

AfWCCo-ordinator, members of partner organisations, and experts from across Africa and Europe. The questionnaire, *The Status and Distribution of Black Crowned Cranes in Africa* (Annex 4), was used to collect information on distribution, population size, status and movements, diets, breeding activity, threats, local attitudes, and legal protection concerning Black Crowned Cranes, as well as any information about ongoing crane conservation projects or education programs or development activities affecting cranes and their habitats. Fifty-five of the approximately 100 questionnaires distributed were returned, covering 87 of the 216 target sites. Forty-six of the questionnaire survey sites were also covered by field surveys. Questionnaires were completed for 20 of the 22 nations within the known range of the Black Crowned Crane (Central African Republic and D.R. Congo did not participate). For some sites with very small but well-known populations of Black Crowned Cranes (based on recent observations), questionnaires were filled out in place of fieldwork during the 2000 surveys.

Most of the questionnaires were completed with strong local input. The survey team in Benin, for example, listed the names of 47 interviewees and their respective villages that were consulted to complete the questionnaire (Annex 5). In Sudan, interviews were conducted with 180 local citizens near the field survey sites to complete the questionnaire.

2.2 Survey data analysis

2.2.1 Population estimation

Data for estimating the population of Black Crowned Cranes across the total range of the species and each sub-species, for each national population, and for sub-populations were compiled from the field surveys, questionnaires, past reports, and personal communication from experts. Direct counts from the field surveys were used to the extent possible (when the individual site coverage was 100% or the percentage of the total population covered by the surveys could be accurately gauged), or were supplemented with data from questionnaires, reports, and personal communication (when site coverage was incomplete). When multiple data sources were used, these sources were compared and combined into a single best estimate for each population parameter, with a rough range for the population estimate also given, using careful guidelines. These guidelines are described below.

To estimate the species, sub-species, and sub-population levels, information provided in the questionnaires were compared and combined with the 2000-2001 field counts as follows:

- if data from both the questionnaires and field studies were similar, the data were used directly in the estimate;
- if data from the questionnaires differed significantly from field survey data for the same survey period, data from field surveys were used preferentially over data from the questionnaires (especially if questionnaire data was based on historical count information)--however, both data sources were cross-checked with supplementary observations and other relevant information where possible to determine which source was more reliable;
- if data from the questionnaires were used directly for sites that were not surveyed in the field--the date and season of the past survey for which the questionnaire population estimates were derived were carefully evaluated to determine if numbers based on previous surveys were still relevant for the current survey; and
- trends stated in the questionnaire (*Declining*, *Stable*, *Increasing,* or *Unknown*) were used directly as an index of trends in the population unless there were sufficient conflicting information from other sources to warrant a different result.

We also compared and combined previous count records from the AfWC database and other reports with the 2000-2001 field counts as follows:

- sites for which recent count records exists, but were not covered in the 2000-2001 surveys, were included in the population estimates;
- historical count records were categorised as recent (1995-1999), past (1990-1994), and old (pre-1990), with priority given to the most recent counts;
- when 2000-2001 field survey data differed significantly from recent historical data, estimates were cross-checked with other sources to determine which data source was more reliable;
- sites for which there were no count records but for which the species is known to occur were included in the population estimates; and
- historical count records were traced, where possible, to their original sources before any attempted usage in the population estimate.

Sub-populations of Black Crowned Cranes were assessed in terms of specified ecological units (e.g., deltas, river basins, catchments, or other wetland complexes), herein referred to as *Crane Areas*, that were determined by the programme staff (Table 2). Sub-populations of cranes are assumed to remain within their respective Crane Areas on at least a seasonal basis. Local daily movements are expected to occur among survey sites within the Crane Areas, but not among Crane Areas. Seasonal migration may occur outside of the Crane Areas. The Crane Areas enable a closer examination of changes in the status and distribution of Black Crowned Cranes and the location-specific threats to their survival, and provide a focal point for future conservation measures. Because the Crane Areas are based on ecological rather than political units, many extend beyond national boundaries and highlight the need for international cooperation in monitoring and conservation. For example, the Lower Senegal River Basin Crane Area covers northern Senegal and southwestern Mauritania and the Lake Chad Basin Crane Area covers parts of Niger, Nigeria, Cameroon, and Chad.

Within each Crane Area, sub-population estimates are derived from:

- direct counts and estimates recorded during the 2000-2001 field and questionnaire surveys;
- historical counts and information;
- fluctuations in the number of individuals counted over the years;
- the frequency of recent population estimates;
- the period (season) during which the counts were conducted and the patterns of movement or migration--based on the assumption that waterbird populations usually peak after the breeding period and tend to be stable towards the end of the non-breeding period (Rose and Scott, 1997), numbers used in estimating the population were all from non-breeding period or dry season (January – April) counts or estimates;
- the percentage of each site covered during the surveys--numbers or estimates recorded for sites with adequate coverage (75 – 100% of the total area surveyed) during the 2000-2001 surveys were used directly in providing estimates for Crane Areas; and
- reliable input from people living within the Crane Areas.

Reasonable or best guess estimates were provided for Crane Areas for which there were no counts records during the survey. Site estimates were first produced within the defined Crane Areas and then extrapolated to the whole Crane Area. Estimates for each Crane Area were summed to produce an overall estimate of the Black Crowned Crane populations in Africa.

Potential (Shadow) Ramsar sites at different levels/scales were identified for the species based on the 1% criterion of the Convention on Wetlands of International Importance.

Table 2. Description and location of Crane Areas supporting Black Crowned Crane sub-populations

Crane Areas	Description	Location
1. Lower Senegal River Basin	Seasonally flooded areas along the Senegal River (including Djoudj and Diawling National Park, Ndiael, and ZIC de Djeuss) and nearby Aleg and Guier Lakes down to Louga	Northern Senegal and Southwestern Mauritania.
2. Bafing Valley	Lowland areas around the Bafing River System (including Parc National du Bafing)	Southwestern Mali.
3. Lower Gambia River	Seasonally flooded and irrigated lands along the banks of the Gambia River from the Western to Central River Division (e.g. Dankunkwu, Bambali, Balangar)	West to Central Gambia.
4. Upper Gambia River	Seasonal floodplains and gallery forest along the banks of the Gambia River, east of The Gambia (including Niokolokoba NP and Koundara)	Southeastern Senegal and Northwestern Guinea.
5. Casamance River	Seasonally cultivated land along the banks of the Casamance River and Baila and Soungrougrou tributaries (e.g., Bignona, Kolda, Ziguinchor)	Southwestern Senegal.
6. Guinea-Bissau Drainage	Lowland areas inundated by the Mansoa and Corubal rivers near the Atlantic coast (e.g., Lake Cufur/Catió, Lake Cufada Babadinca, and Port Enxudé)	Guinea-Bissau.
7. Northwest Guinea	Freshwater swamp and rice cultivated areas in the upper west of Guinea (e.g., Iles Tristao-Kadiene).	Northwestern Guinea.
8. Gâat Mahamouda	Seasonally and temporary flooded freshwater area near Nema	Southeastern Mauritania.
9. Inner Niger Delta	Large floodplain area of the Niger River between Tombouctou and Bamako in the Mopti region.	Central Mali.
10. Mid Niger River Basin	Low-lying plains around the Niger River from Gao to Parc National du W	Southeastern Mali and Southwestern Niger.

11. Niger-Sokoto System	Isolated floodplain areas along the Sokoto and lower Niger rivers (e.g, Maru)	Northwestern Nigeria.
12. Mare d'Oursi	Permanent freshwater lake in the Réserve Partielle du Sahel	Northeastern Burkina Faso
13. North Côte d'Ivoire	Wetlands on the highlands of the northern savannah regions (e.g., Odienne, Korhogo, and Parc National de la Comoé)	Northern Côte d'Ivoire
14. Southern Upper Volta	Seasonally inundated riverine floodplains, formed by the Nazinon and other tributaries of the White and Black Volta rivers in Ghana (including Parc National du Kaboré Tambi and Lac Bagré)	Southern Burkina Faso and Northern Ghana.
15. Lower Volta	Floodplains and swamps of the Black and White Volta Rivers	Northern Ghana.
16. Oti-Pendjari Basin	Floodplains of the Oti and Pendjari Rivers (including Parc National du W, P. N. de la Pendjari, P. N. d'Arly, Réserve de Pama, Lac Kompienga, Mandouri, and P. N. de la Kéran)	Northwestern Benin, Southeastern Burkina Faso, Northern Togo and Northeastern Ghana.
17. Tahoua : Ader	Wetlands of the Sahel savannah in the region of Ader (e.g., Tahoua and Abalak)	Northwestern Niger.
18. Zinder : Damerougou-Damagaram	Wetlands in the south Sahel savannah zone of Niger (e.g., Matmeye and. Magaria)	Southern Niger.
19. Diffa: Mandaram-Manga	Seasonally flooded swamps and marsh lands	Southeastern Niger
20. Upper Benue River	Floodplains associated with the Upper Benue River system (e.g., Gombe, Jalingo, Tungo, and Lagdo)	Eastern Nigeria and Northwestern Cameroon.
21. Lake Chad	Natural lake and associated seasonally flooded marshes (including Lower/Bas Logone/Chari River, Chingurme-Duguma / Lake Chad National Park in Nigeria)	Southeastern Niger, Northeastern Nigeria, Northern Cameroon and Southwestern Chad

22. Waza-Logone Floodplains	Extensive floodplain, permanent swamp land, and seasonally inundated areas on the Cameroon side of the Logone and Wazi Rivers (including Parc National du Waza)	Northern Cameroon
23. Valley du Logone Bongor – N'Djamena	Seasonal floodplains, swamps, and lake areas of the Logone River along the border between Cameroon and Chad up to the confluence with the Chari River at N'Djamena (including the Mayo Kebbi)	Southwestern Chad
24. Chari River Floodplain	Floodplain areas of the River Chari from the northern highlands of the Central African Republic to Lake Chad (including Parc National de Manda)	Southern Chad and Northern Central African Republic
25. Lac Fitri	Freshwater lake and associated permanent swampy areas.	Southcentral Chad
26. Bahr Aouk–Salamat Floodplains	Seasonally inundated plains (including Parc National de Zakouma, Bahr Salamat Faunal Reserve, and Lake Iro) from waters derived from southern Sudan (Bahr Aouk, Bahr Azoum/Wadi Azum) and the northeastern parts of The Central African Republic.	Southeastern Chad
27. Northeast Central African Republic	Floodplains of rivers rising from the Massif des Bongo and flowing towards Chad (including Parc National de St. Floris, Parc National André Felix)	Northeastern Central African Republic
28. Southern Darfur	An area of scattered hills and mountains especially on the western parts, seasonal streams and an extensive drainage network of the Bahr el Arab (Lake Kundi, Radom National Park, Am Dafogg)	Southwestern Sudan
29. Western Darfur	Swampy areas in the central part of Western Darfur (Tesi Swamp), predominantly drained by the Wadi Azum which collects more than 80% of the run-off	Western Sudan
30. Southern Kordofan	Perennial lakes in the southern parts of Kordofan (Lake Keilak Lake Abyed)	Central Sudan

31. Western Kordofan	Seasonally flooded swamps originating from the Bahr el Arab (Dambloia)	Southcentral Sudan
32. Dinder Floodplain	Seasonally flooded plains of the Dinder Rivers flowing from the Ethiopian Highlands (including Dinder National Park)	Northeastern Sudan
33. Sudd Wetlands	Extensive floodplains drained by the White Nile (e.g., Bahr el Jebel, Bahr el Zeraf), Bahr el Ghazal, and Sobat rivers	Southern Sudan and Southwestern Ethiopia.
34. Albert Nile	Floodplains along the upper reaches of the Albert-Equatoria Nile (e.g., Arua Town and Rhino Camp)	Northwestern Uganda.
35. Lake Tana	Natural lake on the Northern Ethiopian highlands (source of the Atbara, Dinder, and Blue Nile)	Northwestern Ethiopia
36. Finchar Dam/Reservoir	Artificial water storage built on the waters of the Blue Nile	Westcentral Ethiopia
37. Gambella National Park	Extensive floodplains and permanent swamp areas between the Gilo and Baro rivers along the border with Sudan	Western Ethiopia
38. Southwest Rift Valley	Series of lakes occurring south of Addis and fed by tributaries of the Blue Nile (e.g., Lake Akaki, L. Koka, L. Ziway, Abijata-Shalla Lakes National Park, L. Awasa, Omo River: Mago National Parks, and L. Turkana/ Stefanie)	Southern Ethiopia, Southeastern Sudan, and Northeastern Kenya.

2.2.2 Distribution analysis

The range distribution of Black Crowned Crane was based on the findings of 2000-2001 field surveys and questionnaires, and appropriate historical records. Crane locations were plotted as the mid-point for each survey site. Different size circles/dots were used to represent different population size ranges on the distribution map.

Crane Areas, as discussed above, were determined and demarcated on a computerised map (see below) as follows:

- a detailed geographic/regional (hydrological) map of West, Central and East Africa was photocopied on a transparency sheet;
- the map transparency was projected and traced onto a flip-chart;

- the sites in which the species has been recorded or perceived to occur over the past decade were indicated by dots and rough boundary loops (where possible) on the flip-chart;
- the sites were then grouped into Crane Areas depending on the clustering and spread of the dots and boundary loops;
- larger loops were then drawn around each cluster and widely separated sites to demarcate Crane Areas; and
- each cluster of sites making up a Crane Area was named after a major relief feature (e.g., river basins, deltas, or floodplain areas) characteristic of the area or region of occurrence, or after major wetlands in the sub-region.

2.2.3 Assessment of factors affecting Black Crowned Crane status

Black Crowned Crane habitats, food sources, protection status, and local attitudes were assessed during the questionnaire surveys on a site-by-site basis. The relative percentage of each factor was determined (e.g., the number of sites where Black Crowned Cranes were observed feeding on small grain crops or the number of sites protected as national parks, divided by the total number of sites reported). Threats to Black Crowned Cranes, and to each sub-species, were assessed in terms of the Crane Areas. For each Crane Areas, observers considered which threats were likely occurring. The relative percentage of the Crane Areas for which a given threat was recorded was determined (e.g., conversion of wetlands was reported as a threat in 78% of all Crane Areas). The results of recently commissioned studies on the impact of crane trade in Mali and Nigeria are also summarized.

Section 3 Survey results and discussion

3.1 Black Crowned Crane population status

Table 3 shows the total estimated population of the Black Crowned Crane at the species and sub-species level. The overall population estimate of 42,000 Black Crowned Cranes is lower than the 65,500 to 77,500 estimated in 1994 (Urban 1996). This difference is mainly due to a substantial revision in the estimated population of the Sudan Crowned Crane. Urban (1988, 1996) estimated the population of *B. p. ceciliae* at 55,000-60,000, based on the large number of cranes observed during aerial surveys conducted over southern Sudan during 1979-1981 (Mefit-Babtie Srl 1983). Recent surveys in Sudan suggest that *B. p. ceciliae* is still common south of a belt extending from Western Darfur state to the western parts of South Kordufan state, but numbers appear to be declining everywhere compared to the 1970s (Ali 2000). We provide a conservative estimate for the overall population assuming that crane numbers in some of the inaccessible regions of southern Sudan (especially the core Sudd swamps) are similarly declining, given that the region has been plagued by civil war and drought.

Table 3. Population status and trend at the species and sub-species level, based on status surveys during 2000-2001.

Population	Estimate	Trend
B. pavonina	~42,000	Declining
B. p. pavonina	~14,500	Declining, though stable in Casamance and Chad Basin
B. p. ceciliae	~27,500	Declining, but relatively common in southern Sudan. Population could be up significantly higher if large numbers still occur in Sudd swamps.

The *B.p. pavonina* population estimate of 14,500 falls within the range of 11,500 – 17,500 given by Urban (1996), but is lower than the previous Urban (1985) estimate of 15,000-20,000 *B.p. pavonina.* Earlier population reports from various portions of the *B.p. pavonina* range suggest much higher numbers prior to the 1970s (e.g., Walkinshaw 1964; Fry 1981). The rapid decline in *B.p. pavonina* on a range-wide basis was first reported by Fry (1987), based on feedback from ornithologists working in Nigeria and elsewhere in the West Africa. No effort was made to systematically survey the entire region, however, so it is uncertain whether the dramatic declines reported, especially from Nigeria, were counter-balanced by population increases elsewhere. The present range-wide surveys confirm that a significant decline in the total *B.p. pavonina* population has occurred over the past thirty years, although the present rate of decline is uncertain and numbers appear to be stable or increasing in some areas. The dramatic decline of Black Crowned Cranes across Nigeria, for example, may be due in part to emigration of some birds to Chad (where higher numbers are now reported) but there is no clear evidence to substantiate whether this shift has occurred.

Tables 4 and 5 give general population estimates for *B.p. pavonina* and *B.p. ceciliae*, respectively, in each range country, comparing compilations by Urban (1988), Urban (1996), and Meine and Archibald (1996) with the findings of the 2000-2001 surveys. Some of the national trends are striking. The population of *B.p. pavonina* in Mali appears to be crashing rapidly. Urban (1988) reported that Black Crowned Cranes have been declining since the late 1970s, and may have previously numbered in the 10,000s with the Inner Niger Delta as a major breeding ground for the species[1]. Researchers in the

[1] Urban (1988) reports that students at the School of Training for Wildlife Specialisits, Garoua, Cameroon estimated 50,000 cranes along the Niger River in Mali during the early 1970s (or possibly earlier). The students also estimated the Black Crowned Cranes numbered 1400-1500 in Burkina Faso and more than 2400 in Togo. The reliability of these estimates is unknown, but gives some indication that Black Crowned Cranes numbers were significantly higher in many areas throughout the region.

Inner Niger Delta currently suggest a local population of only about 100 birds, and note that there are now more cranes in captivity than in the wild (Kone and Fofana 2001). J.M Thiollay (quoted in Urban 1988) suggests that crane numbers in Burkina Faso and Niger were substantially higher prior to the 1970s than they are today. Conversely, population estimates from Chad and Guinea-Bissau now significantly exceed historical estimates. Urban (1988) suggested that *B.p. pavonina* did not occur in Guinea-Bissau, for example, but recent surveys suggest a population of at least 1500 birds in lowland areas inundated by the Mansoa and Corubal rivers near the Atlantic coast. As discussed above, the population of *B.p. ceciliae* in Sudan—the global stronghold for the species—appears to be undergoing a significant decline but further surveys are needed to confirm this trend.

The results of the field surveys and questionnaires for Black Crowned Cranes at each survey site are shown in Table 6. A total of 187 sites in 20 African nations were covered by the field and questionnaire surveys during 2000-2001. During intensive surveys in 2000, 125 sites in 19 African in 2000 were covered. A total of 7,044 Black Crowned Cranes were directly counted during the comprehensive 2000 field surveys, including 3,937 individuals of *B.p. pavonina* and 3,107 individuals of *B.p. ceciliae*. These data were supplemented by population estimates from 101 additional sites provided on the questionnaire (42) and previous surveys (59). Gap-filling surveys in 2001 covered an additional 72 sites in 9 nations. No survey results were received from Guinea-Bissau during 2000-2001, but recent surveys for the AfWC indicate a substantial sub-population. An overall estimate of 500 *B.p. pavonina* for Central African Republic, based on previous surveys, was provided by Scholte et al. (2000). No estimate was available from Congo, but reports of 500 Black Crowned Cranes in Odzala National Park and additional large flocks at Mt. Fouari and Coukouati Game Reserves during the early 1980s (Urban 1987) suggest that northern DR Congo may harbour several important crane sites for *B.p. ceciliae.*

The “declining” and “disappearing” trends recorded for many of the *B.p. pavonina* target sites concur with recent reports that the species is declining across much of its historical range. The “unknown” trends reported from Chad, Ghana, Guinea, Eritrea, and Ethiopia, coupled with a lack of recent information from Central African Republic and DR Congo, however, suggest that we have limited knowledge about the species in several key areas, and the possibility remains that some of the decline in *B.p. pavonina* can be explained by regional population shifts. Some trends are difficult to discern because of annual fluctuations in numbers. Numbers of Black Crowned Cranes in the Waza-Logone floodplain of Cameroon are reported to be “oscillating” around 2500-3000 individuals from year-to-year, with exact numbers depending on the movement of birds throughout the Lake Chad basin. Holmes (1972) observed approximately 10,000 Black Crowned Cranes near Waza National Park in February 1972, however, suggesting a long-term decline in the area. Zekveld and Elissen (1997) suggest that there is currently suitable habitat at Waza for about 8000 Black Crowned Cranes, much of it unutilized.

Estimated sub-populations of Black Crowned Cranes for each Crane Area are given in Table 7. Thirty-eight Crane Areas are designated, covering a total of 20 range states (Map 1). Ten of the Crane Areas cover transboundary (international) territories. Crane Area numbers 1–27 cover the range of *B.p. pavonina* and numbers 28–38 cover the range of *B.p. ceciliae.* Black Crowned Crane sub-population strongholds (greater than 1,000 individuals) include the Crane Areas for the Casamance River (Senegal), Guinea-Bissau drainage, Waza-Logone Floodplains (Cameroon), Lac Fitri and Bahr-Aouk Salamat Floodplains (Chad), Lake Tana (Ethiopia), and the Southern Darfur, Western Darfur, Western Kordufan, Southern Kordufan, Dinder Floodplains, and Sudd Wetlands (Sudan). Several Crane Areas, including Northwest Guinea, Northern Côte d’Ivoire, and Finchar Reservoir in Ethiopia, are seasonal sites that did not support any cranes during the survey period. Data from the Crane Areas cannot be compared to previous years due to lack of coverage at this scale during previous surveys, although some population estimates from individual sites within the Crane Areas can be compared.

Table 4. Comparison of previous population estimates for *B.p. pavonina* by Urban (1985), Urban (1994), and Meine and Archibald (1996) with 2000-2001 survey results.

Country	1985	1994	1996	2000-2001
Benin	50 ?	50 ?	<1000	>20
Burkina Faso	100 ?	100 ?	<1000	>10
Cameroon	2000	2000-3500	>1000	>3000
Central African Republic	Several 100s to several 1000s	Several 100s	<1000	~500
Chad	Few 1000s*	3500-5000	>1000	>5500
Congo	600-700	0 ?	?	?
Cote d'Ivoire	-	Vagrant	<1000	None ?
D.R. Congo	-	-	-	??
Equatorial Guinea	-	-	?	None ?
Gabon	-	-	<1000	None ?
Gambia	?	100	<1000	>100
Ghana	50	50	<1000	>20
Guinea	-	-	?	<25
Guinea-Bissau	0 ?	?	?	>1500
Liberia	-	-	?	None ?
Mali	7000-8000	3000-5000	>1000	>600
Mauritania	200	200	<1000	>525
Niger	Several 100s	<1000	<1000	>300
Nigeria	Few 100s	<100	<1000	>20
Senegal	1000	1000-2000	>1000	>1900
Sierra Leone	-	-	Extirpated	None ?
Togo	50	50	<1000	>110
Source:	Urban 1988	Urban 1996	Meine and Archibald 1996	This report

Table 5. Comparison of previous population estimates for *B.p. ceciliae* by Urban (1985), Urban (1994), and Meine and Archibald (1996) with 2000-2001 survey results.

Country	1985 (Urban 1988)	1994 (Urban 1994)	1996 (Meine and Archibald 1996)	2000-2001 surveys
Chad	?	?	-	?
D.R. Congo	-	-	-	?
Egypt	-	Vagrant ?	<1000	None ?
Eritrea	-	-	<1000	?
Ethiopia	Few 1000s	Few 1000s	>1000	>2500
Kenya	Few 100s	100s	<1000	<10
Sudan	50,000	50,000	>1000	>25000
Uganda	500	500	<1000	<50
Source	Urban 1988	Urban 1996	Meine and Archibald 1996	This report

Table 6. Actual counts, questionnaire population estimates, and general population trends for each survey site, recorded during 2000-2001.

Country	Sites Covered	Year	Count	Estimate	Trends
Benin	PN de la Pendjari	2000	21	>20	Declining
		2001	25		
Burkina Faso	Barrage de Bagré	2000	0		Unknown
	Kopienga Lake	2000	0		Unknown
	Mare aux Hippopotames	2000	0		Unknown
	Pama Game Reserve	2000	0		Unknown
	PN d'Arly	2000	3		Unknown
	PN du W	2000	0		Unknown
Cameroon	Lac Tchad-Qs 87, 89, 93, 94, 96, 100, 101	2000	0		Unknown
	Waza-Logone Floodplain	2000	1348	~3000	Oscillating
		2001	1502		
	Lac Maga	2001	5		Unknown
	Fleuve Logone Pousse Takele	2001	2		Unknown
	Zilim1	2001	68		Unknown
	River Chari Parc National Kala Maloue	2001	112		Unknown
	Guidago	2001	2		Unknown
	Sara Sara	2001	65		Unknown
	Place (Zina)	2001	9		Unknown
	Zina to Somalya Mare	2001	2		Unknown
	Long De La Natinale Kousseri - Maltane	2001	23		Unknown
	Kalto	2001	2		Unknown
	Maltam-Waza, Zikake-Ndiauinka	2001	6		Unknown
	Lorane Marera	2001	1		Unknown
	Sifna	2001	6		Unknown
	Douing	2001	202		Unknown
	Tchoukfou	2001	13		Unknown
	Holom to Nekodeni	2001	8		Unknown
	Daguan	2001	12		Unknown
	Zoung	2001	11		Unknown
	Tchede	2001	4		Unknown
	Gongi – Alawen	2001	28		Unknown
	Douing – Graha	2001	13		Unknown
	Maskalay	2001	6		Unknown
	Bas-Chari (South Lac Tchad)	2000	0		Unknown
Chad	Au abords du fleuve Logone	2000	10	> 20	Unknown
	Logone floodplain north-east Katoa	2000	66		Unknown
	Logone floodplain of Arekolo	2000	4		Unknown
	Bas Chari	2000	8		Unknown
		2001	8		
	Casiers rizicoles de Bongor	2000		> 50	Unknown
	Fleuve Chari(amont de Njamena)	2000	56		Unknown
	Lac Fitri	2000	441		Unknown
	Lac Tchad-Qs 46, 47, 60, 70, 72, 79, 80	2000	298		Unknown
	Mare de Katoa	2000	10		Unknown
	Mare Dogoya-Yamatcha (Holom)	2000	4	> 50	Unknown
	Depression of Rah	2000	3	> 56	Unknown
	Mare Kiamé Télémé (Bongor)	2000	2	> 19	Unknown

Chad (cont.)	Mare Lifi-Baki (Bongor)	2000	29	> 120	Unknown
	Mare Mana-Toura (Bongor)	2000	3	~28	Unknown
	N'Djamena :Massaguet-Bisney	2000	22		Unknown
	Mare Toufgounou Marsay	2000	3	10 - 50	Unknown
	Mare /Depression of Metene	2000	3		Unknown
	Plaine/Vallée Logone (Bongor-Ndjamena	2000	393		Unknown
	Katoa Toufgounou	2001	7		Unknown
	Gozeldebib	2001	3		Unknown
	Rizelbouta	2001	3		Unknown
	Cote Gauche – Route Dougina	2001	6		Unknown
	Boudalwali	2001	3		Unknown
	Depression Nord Est Katoa	2001	4		Unknown
	Rah (Katoa)	2001	25		Unknown
	Plaine D`Inandation Katoa Nord Est	2001	4		Unknown
	Mering (Mare Temporaire)	2001	1		Unknown
	Katoa Sud Ouest	2001	51		Unknown
	Gozeldzbib (Mare Mougran)	2001	3		Unknown
Côte d'Ivoire	Région d'Odienne	2000	0	?	Disappearing
Gambia	Allahein River shores	2000		2-3	Declining
	Balangar (near Kaur)	2000		20 - 30	Declining
	Bambali Swamp	2000	50	50 - 100	Increasing
	Dankunkwu rice field	2000	8	10 - 50	Declining
	Kajalat Island	2000		10 - 50	Declining
	Kaur	2000	2		Declining
	Near Kiang West NP	2000		<5	Declining
	Pakali Ba	2000	14		Declining
	Pirang	2000	4		Declining
	Samba Soto Swamp	2000	2	10 - 50	Increasing
	Scan-Gambia Shrimp	2000		< 10	Declining
	Sotokoi rice field	2000		< 10	Declining
	Tendaba	2000	6		Declining
	Penyai Swamp	2001	2		Unknown
	Danlcuncu Swamp	2001	5		Unknown
	Medina Njugari Swamp	2001	3		Unknown
Ghana	Volta Basin	2000		< 10	Declining
Guinea	Boffa?	2000	0	?	Unknown
	Boke?	2000	0	?	Unknown
	Gaoual?	2000	0	?	Unknown
	Koundara	2000	0	?	Unknown
Guinea-Bissau	Mansoa and coastal region	2001	700	1500-2000	Unknown
Mali	Cercle de Djenné: Djenné Senessa	2000	2		Declining
	Cercle de Djenné : Diera	2000	2		Declining
	Cercle de Djenné : Sekoula	2000	6		Declining
	Cercle de Djenné : Goumitogo Mare	2000	10		Declining
	Cercle de Djenné : Magam Sabatokoni	2000	4		Declining
	Cercle de Djenné : Guiera (Souan)	2000	2		Declining
	Delta Interieure du fleuve Niger / Mopti	2000	50	50	Declining
		2001	14		
	Diountou (Koubi)	2000		60	Declining
	Focoloré :Mare Bilade	2000		50 - 100	Declining

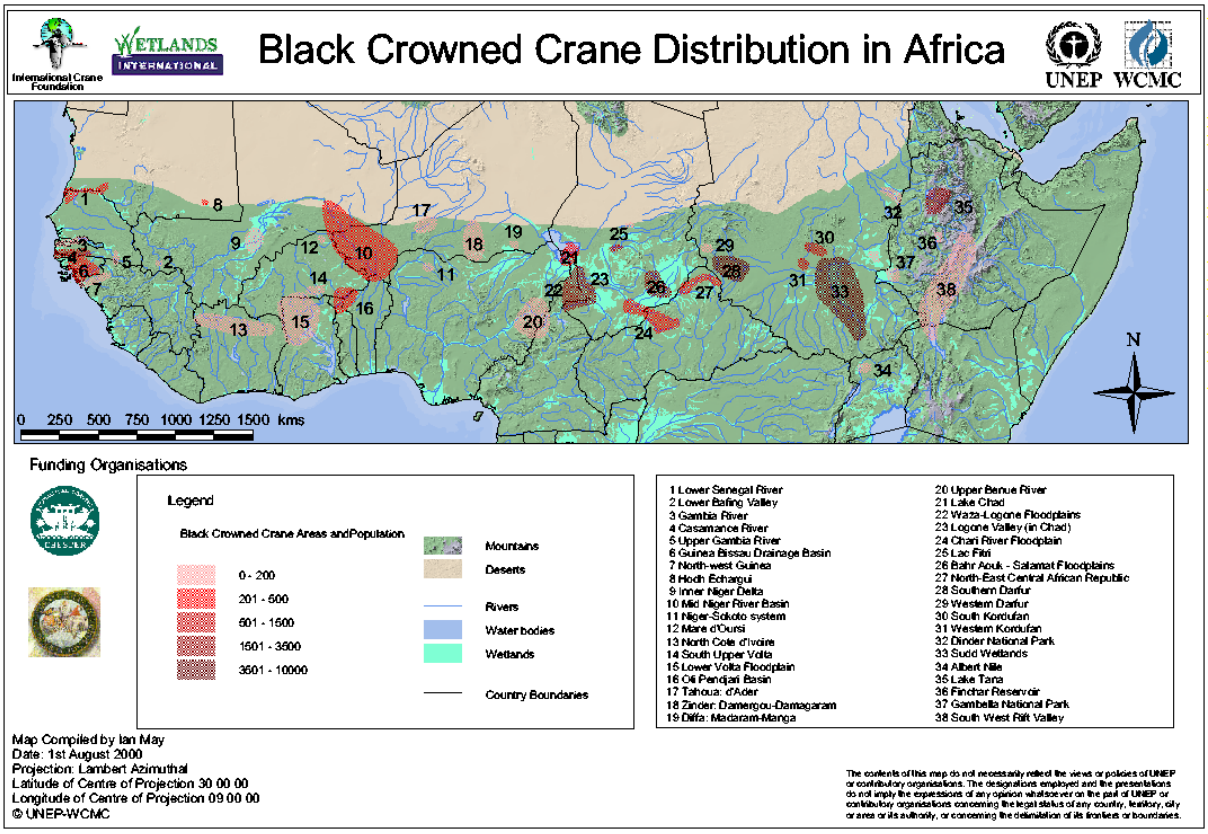
Mali (cont.)	Focoloré: Mare Nouré Oumalou	2000		50 - 100	Declining
	Focoloré: Mare Tidda Leida	2000		50 - 100	Declining
	Sibo Niala	2000		~365	Increasing
	Senou (along Niger River)	2000	18		Unknown
Mauritania	Gâat Mahamouda	2000	260	100 - 500	Increasing
	Lac d'Aleg	2000	4		Unknown
	Parc National du Diawling	2000	267	100 - 500	Increasing
	Mare Endoreliques Du Brakna	2001	4		Unknown
Niger	Abalak: Chimzazoren	2000	6		Unknown
	Abalak: Mare de Tabalak	2000	9	100	Unknown
	Arlit-Akokan	2000	0		Unknown
	Diomona	2000	0		Unknown
		2001	1		
	Kpennuya/Kpeniago	2000	0		Unknown
	La Tapoa Pékinga	2000	0		Unknown
	Liboré	2000	0		Unknown
	Namga	2000	0		Unknown
		2001	10		
	N'Doungo	2000	0		Unknown
	Périmètre de Saga	2000	0		Unknown
	Sébéri	2000	0		Unknown
	Tahoua: Mare de Tabalak	2000	6		Disappearing
		2001	38		
	Tahoua: Mare de Dossey	2000	0		Disappearing
	Tahoua: Mare de Kao II	2001	2		Unknown
	Tillabery: Dortoir de Tillabery	2000	2		Disappearing
		2001	4		
	Tillabery: Kokorou	2000	5	100 - 500	Increasing
		2001	57		
	Tillabery: Mare de Kero	2000	3		Disappearing
		2001	14		
	Tillabery: Ossolo	2000	5		Disappearing
		2001	2		
	Tillabery : PN du W	2000	0		Decreasing
		2001	40		
	Tillabery : Youmba	2000	3		Disappearing
	Tillabery: Mare de Tara	2001	2		Disappearing
	Tillabery: Diambala	2001	2		Unknown
	Tillabery: Zamakoira	2001	24		Unknown
Nigeria	Bal Oasis	2000		3	Declining
	Chad Basin N. P: Chingurume-Duguma	2000	0	1	Disappearing
	Gombe	2000		1	Disappearing
	Jalingo	2000		12	Declining
	Maru	2000		4	Declining
Senegal	Delta du fleuve Senegal	2000		100 – 500	Declining
	Fleuve Casamance : Soungrougrou	2000	512	500 – 1000	Increasing
	Kolda :Diendé	2000	265		Increasing
	Kolda:Bonconto (Vélingara) Mares	2000	10		Increasing
	Departement de Kolda	2001	10		

Senegal (cont.)	Ndiael	2000	0		Declining
	Niokolokoba	2000	4		Declining
	Parc National Oiseaux du Djoudj	2000	132		Declining
		2001	110		
	Departement de Bignona	2001	340		Unknown
	Departement de Ziguinchor	2001	85		Unknown
	Departement de Sedhiou	2001	430		Unknown
	Departement d' Oussouye	2001	50		Unknown
	ZIC de Djeuss	2000	0		Declining
Togo	Oti	2000		10 – 50	Declining
	Parc National de la Kéran	2000		50 – 100	Declining
	Valée Oti-Mandouri	2000		50 – 100	Declining
Eritrea	Asmara	2000	0	0	Unknown
Ethiopia	Akaki Lakes	2000	0		Unknown
	Abijatta-Shalla Lakes NP	2000	0		Unknown
	Bahir Dar Zuria	2000	10		Unknown
	Barbu Gaya Wetland	2000	2		Unknown
	Boyo Wetland	2000	1		Unknown
	Cheleleka Wetland	2000	0		Unknown
	Enfraz Wetland	2000	25		Unknown
	Koka Dam	2000	0		Unknown
	Lake Awassa	2000	20	10 - 50	Unknown
	Lake Ziway	2000	2		Unknown
	Shesher-Wallala Wetland	2000	320	100 - 500	Unknown
	Tikur Wuha Marsh	2000	2		Unknown
	Wagetera Marsh	2000	177	100 - 500	Unknown
	Yiganda Wetland	2000	250	100 - 500	Unknown
Kenya	Lake Turkana	2000		< 10	Unknown
Sudan	Western Kordufan State:Dambloia	2000	106	100s	Declining
	W. Kordufan State:Kelling Swamps	2000	1778	> 1000	Declining
	Southern Kordufan State:Lake Keilak	2000	29		Declining
	Southern Darfur State:Radom NP	2000	22		Declining
	S. Darfur State: Lake Kundi	2000	355	< 1000	Declining
	S. Darfur State: U/Am-Dafogg			100 - 500	Declining
	Western Darfur State:Tesi Swamp	2000	8		Declining
	Blue Nile State: Dinder NP			< 10	Declining

Table 7. Estimated Black Crowned Crane population for each Crane Area.

No.	Crane Areas	Number of Individuals
	B. p. pavonina	
1	Lower Senegal River Basin	400
2	Bafing Valley	10
3	Lower Gambia River	100
4	Upper Gambia River	25
5	Casamance River	1500
6	Guinea-Bissau Drainage	1500
7	Northwest Guinea	0
8	Hodh Echargui	300
9	Inner Niger Delta	100
10	Mid Niger River Basin	500
11	Lower Niger River Basin/Niger-Sokoto System	10
12	Mare d'Oursi	10
13	Northern Côte d'Ivoire	0
14	South Upper Volta	10
15	Lower Volta Floodplains	10
16	Oti-Pendjari Basin	300
17	Tahoua :Ader	200
18	Zinder :Damergou-Damagaram	50
19	Diffa :Mandaram-Manga	50
20	Upper Benue River Floodplain	25
21	Lake Chad Marshes	500
22	Waza-Logone Floodplain	3000
23	Valley du Logone System/Bongor-N'Djamena	500
24	Chari Floodplain (south of Bongor)	500
25	Lac Fitri	1000
26	Bahr Aouk – Salamat Floodplains*	3500
27	Northeast Central African Republic	300
	Total	14,400
	B. p. ceciliae	
28	Southern Darfur	10000
29	Western Darfur	1000
30	Southern Kordofan	2000
31	Western Kordofan	1000
32	Dinder Floodplains	1000
33	Sudd Wetlands	10000
34	Albert Nile	50
35	Lake Tana	2500
36	Finchar Dam/Reservoir	0
37	Gambella National Park	10
38	Southwest Rift Valley	100
	Total	27,660

* Sub-species/population occurring in this area needs confirmation



Map 1. Distribution of the Crane Areas.

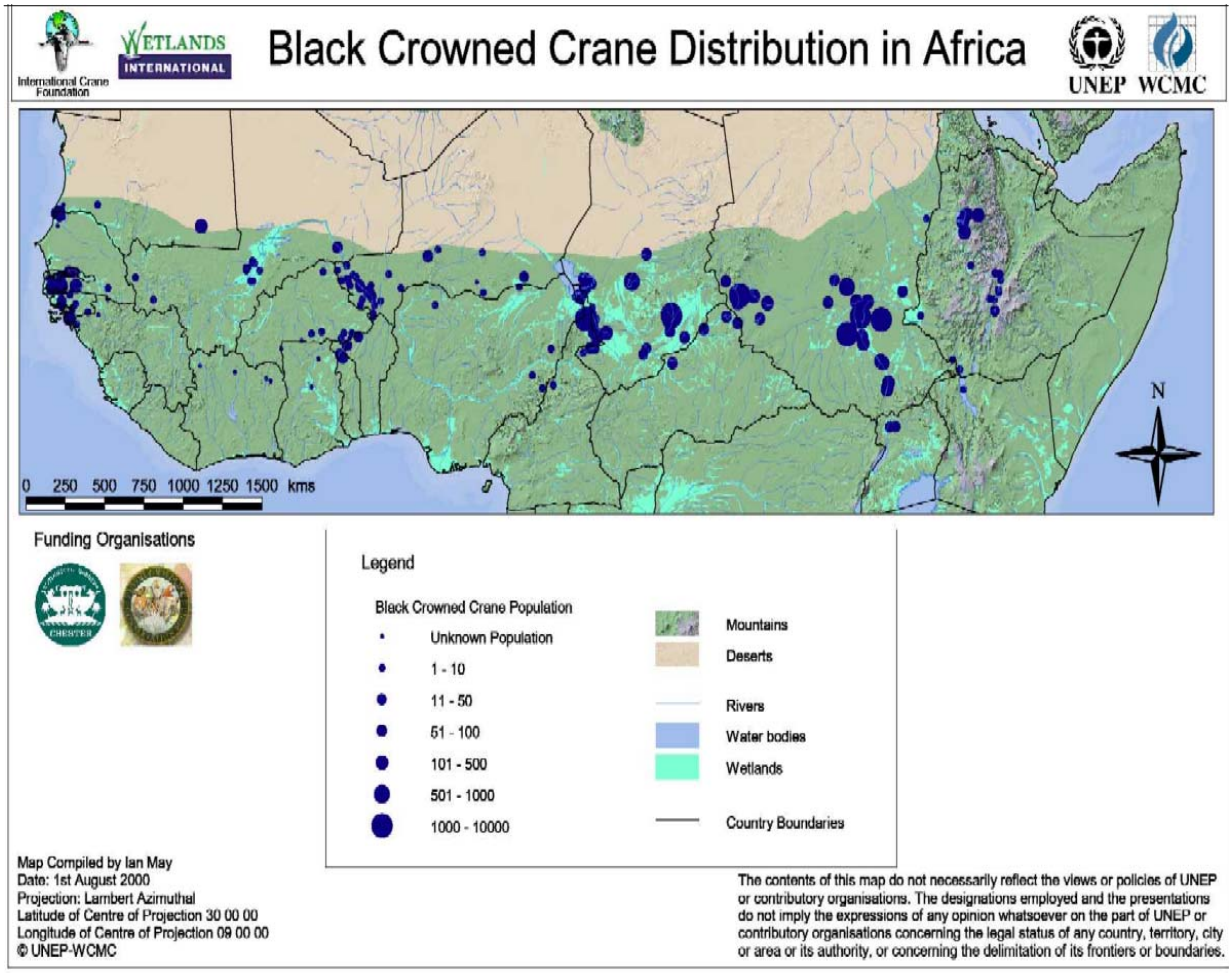
3.2 Black Crowned Crane distribution and seasonal movements

The Black Crowned Crane is distributed across the Sahel and Sudan Savanna region of Africa from Senegal and Guinea-Bissau on the Atlantic coast east to the upper Nile River basin in Sudan and Ethiopia (Map 2). Survey results confirm that the range of *B.p. pavonina,* once nearly contiguous across West Africa, has been severely fragmented with large gaps between many of the sub-populations (Map 1). Most Black Crowned Cranes are now clustered in a few regions, most notably the Senegal River Delta of Senegal and Mauritania, the coastal region from southern Senegal to Guinea-Bissau River, the Inner Niger Delta of Mali, the Sahelian zone of southwestern Niger, southeastern Mali, eastern Burkina Faso, and far northern Togo and Benin, the Chad River basin of Chad and Cameroon, and Lac Fitri and the Bahr-Aouk Salamat floodplains of Chad. Black Crowned Cranes have become rare or extirpated from several countries and regions where they formerly occurred in substantial numbers. Black Crowned Cranes are no longer known by young people in several places where they were once common, such as around Pendjari National Park in northern Benin. The surveys also suggest that there has been some reduction in the range of *B.p. ceciliae,* but further surveys are needed to verify this change.

Previous distribution maps generally show the dividing line between the two sub-species as occurring somewhere in central or eastern Chad (e.g., Fry 1981; Meine and Archibald 1996). The exact location of dividing line has yet to be firmly established, but is most likely east of Lac Fitri in central Chad. Newby (1979) states that *B.p pavonina* occurs in the Ouadi Rime area (ca. 18° 40'E), nesting in tall

trees. The two subspecies appear similar but can be distinguished at close range by differences in the coloration of their cheek patches (Plate 1).

The survey suggests that Black Crowned Cranes can be considered year-round residents in most of the Crane Areas, although local seasonal migration occurs between a few of the Crane Areas. In Northern Côte d'Ivoire, Lower Volta Floodplains, and Upper Benue the species was only recorded as occurring only during the dry season. Black Crowned Cranes flock—often in large numbers—during the dry (non-breeding) season and move from large permanent wetlands to smaller temporary wetlands during the rainy season. Daily and seasonal movements between feeding and roosting areas are thought to be extensive (perhaps up to several dozen km), but there has been little research on this aspect of their life history (Urban 1981). Table 8 shows the seasonal distribution of Black Crowned Cranes for each of the Crane Areas.



Map 2. Distribution of Black Crowned Cranes.

Table 8. Seasonal occurrence of Black Crowned Crane by Crane Area

No.	Crane Area	Site	Season of occurrence
1	Lower Senegal River Basin	Parc National d'Oiseaux du Djoudj	Wet and Dry
		Parc National du Diawling	Wet and Dry
2	Lower Bafing Valley	-	-
3	Lower Gambia River	Bambali Swamp	Wet and Dry
		Sotokoi rice field	Wet and Dry
		Kajakat island	Wet and Dry
		Dankunkwu rice field	Wet and Dry
		Samba Soto Swamp	Wet and Dry
		Scan-Gambia Shrimp	Wet and Dry
		Pirang (border area)	Wet and Dry
4	Upper Gambia River	Parc National du Niokolokoba	Dry and ?Wet
		Koundara	Dry
5	Casamance River		Wet and Dry
6	Guinea-Bissau Drainage	-	Dry and ?Wet
7	Northwest Guinea	-	-
8	Hodh Echargui	Gâat Mahamouda	Dry and ?Wet
9	Inner Niger Delta	Cercle de Djenné :Djenné Senessa	Dry
		Cercle de Djenné :Diera	Dry
		Cercle de Djenné :Sekoula	Dry
		Cercle de Djenné :Mare Gomitogo	Dry
		Diountou (Koubi)	Dry
		Sibo Niala	Wet and Dry
		Focoloré :Mare Bilade	Dry
		Focoloré :Mare Tidda Leida	Dry
		Focoloré :Mare Naouré Oumalou	Dry
		Focoloré :Mare Mini Mana	Dry
10	Mid Niger River Basin	Kokorou	Wet and Dry
11	Lower Niger River Basin	-	-
12	Mare d'Oursi	-	Dry and ?Wet
13	North Côte d'Ivoire	Odienné	Dry
14	Lower Volta Floodplains	-	Dry
15	South Upper Volta	-	-
16	Oti – Pendjari Basin	Fleuve Oti	Wet and Dry
		Valée Oti-Mandouri	Wet and Dry
		Parc National de la Kéran	Wet and Dry
17	Tahoua: Ader	-	Dry and ?Wet
18	Zinder: Damergou-Damagaram	-	Wet and ?Dry
19	Diffa: Mandaram	-	Wet
20	Upper Benue River	Jalingo	Dry
21	Lake Chad	Bal Oasis	Dry
		Bulatura Oasis	Wet and Dry
		Chingurme-Duguma	Wet and Dry

22	Waza-Logone Floodplains	Plaine du Logone	Wet and Dry
		Parc National du Waza	Wet and Dry
23	Valley du Logone (in Chad)	-	-
24	Chari River Floodplain	-	-
25	Lac Fitri	-	Dry and ?Wet
26	Bahr Aouk - Salamat	-	Dry and ?Wet
27	NE Central African Republic	-	-
28	Southern Darfur	Lake Kundi	Wet and Dry
		Radom National Park	Wet and Dry
		Am Dafog	Wet and Dry
		Kelling Wetlands	Wet and Dry
29	Western Darfur	Tesi Swamp	Wet and Dry
30	Southern Kordofan	Lake Keilak	Wet and Dry
		Lake Abyed	Wet and Dry
31	Western Kordofan	Dambloia	Wet and Dry
32	Dinder Floodplains	Dinder National Park	Dry and Wet
33	Sudd Wetlands	-	Wet and Dry
34	Albert Nile	-	Dry
35	Lake Tana	-	Dry and ?Wet
36	Finchar Reservoir	-	Dry and ?Wet
37	Gambella National Park	-	Dry and ?Wet
38	Southwest Rift Valley	-	Dry and ?Wet

? = unconfirmed

3.3 Black Crowned Crane breeding ecology and distribution

Twenty-seven breeding sites were recorded for the species in 15 of the 38 Crane Areas. The breeding period was reported for 27 sites, corresponding to the wet or rainy season (Table 9). Several distinct breeding areas are known within the Inner Niger Delta and Mid-Niger Basin Crane Areas. The lack of known breeding sites from 60% of the Crane Areas reflects a major gap in our knowledge.

Table 10 provides an estimate of the overall distribution status of the Black Crowned Crane by Crane Area, using various published sources to supplement the survey data. Black Crowned Cranes have confirmed resident breeding status in twenty-two Crane Areas, unconfirmed resident breeder status in five Crane Areas, non-resident visitor status in six Crane Areas, and unknown distribution status in five Crane Areas.

Walkinshaw (1973) and Johnsgard (1983) described the breeding ecology of Black Crowned Cranes. The species builds circular platform nests out of grasses and sedges within or along the edges of densely vegetated wetlands, often surrounded by shallow water. The average clutch size is about 2.5 eggs/nest. The incubation period is 28-31 days. The fledging period is 60-100 days. Black Crowned Cranes normally nest only once each year. Urban et al in Wilkinson (1993) noted that their productivity is low with an average of one youngster reared by each breeding pair annually. They are monogamous and territorial in the wild, defending an area of 0.5 to 1.0 sq km. Black Crowned Cranes are considered seasonal breeders nesting within May to December in West Africa, and from July to January in East Africa. Main breeding period for the species is July to September. Soon after the chicks hatch, the

Table 9. Breeding sites and periods recorded for Black Crowned Crane by Crane Area

No.	Crane Area	Breeding site	Breeding period
1	Lower Senegal River Basin	Parc National Oiseaux du Djoudj	August - December
-		Parc National du Diawling	August
2	Lower Bafing Valley	-	-
3	Lower Gambia River	River Gambia	Early Wet Season
4	Upper Gambia River	Parc National du Niokolokoba	Wet Season
5	Casamance River	Bignona	July - August
6	Guinea-Bissau Drainage	-	-
7	Northwest Guinea	-	-
8	Gâat Mahamouda	-	-
9	Inner Niger Delta	Diountou	Wet Season/Highwater
-		Sibo Niala	September
-		Mare Bilade	-
-		Mare Tidda Leida	-
-		Délta Intérieure du fleuve Niger	Flooding/Highwater
10	Mid Niger River Basin	Tillabery:Kokorou	May – June
-		Tillabery:Kero	May - June
-		Tahoua:Dossey	May - June
-		Tahoua:Tabalak	May - June
11	Lower Niger River Basin	-	-
12	Mare d'Oursi	-	-
13	North Côte d'Ivoire	-	-
14	Lower Volta River Floodplains	-	-
15	South Upper Volta	-	-
16	Oti – Pendjari Basin	Parc National de la Pendjari	Wet Season
17	Tahoua: Ader	-	-
18	Zinder: Damergou-Damagaram	-	-
19	Diffa: Mandaram-Manga	Goudoumaria	Wet Season
20	Upper Benue River	-	-
21	Lake Chad	-	-
22	Waza-Logone Floodplains	Parc National du Waza	August - September
-		Mare de Katoa	August – September
23	Valley du Logone (in Chad)	Mare Lifi-Baki (Bongor)	July – September
24	Chari River Floodplain	-	-
25	Lac Fitri	-	July - September
26	Bahr Aouk - Salamat Floodplains	-	-
27	Northeast Central African Republic	-	-
28	Southern Darfur	Lake Kundi	July - September
-		Radom National Park	July - September
-		Kelling Swamps	July - September
29	Western Darfur	Tesi Swamp	July - September
30	Southern Kordofan	Lake Keilak	July - September
31	Western Kordofan	Damloia	July - September
32	Blue Nile-Dinder Floodplains	-	-
33	Sudd Wetlands	-	-
34	Albert Nile	-	-

35	Lake Tana	Yiganda Wetand	Before January
	-	Kurt Bahir Wetland	Before January
36	Finchar Reservoir	-	-
37	Gambella National Park	-	-
38	Southwest Rift Valley	-	-

Table 10. Distribution Status of the Black Crowned Crane by Crane Area

No.	Crane Areas	Distribution Status
1	Lower Senegal River Basin/River Delta	R
2	Lower Bafing Valley	Unknown
3	Lower Gambia River	R
4	Upper Gambia River	R
5	Casamance River	R
6	Guinea-Bissau Drainage	R
7	Northwest Guinea	N
8	Hodh Echargui	Unknown
9	Inner Niger Delta (DIN)	R
10	Mid Niger River Basin	R
11	Lower Niger River Basin	N
12	Mare d'Oursi	Unknown
13	North Côte d'Ivoire	N
14	South Upper Volta	R
15	Lower Volta Floodplains	N
16	Oti – Pendjari Basin	R
17	Tahoua : Ader	R
18	Zinder :Damergou-Damagaram	R
19	Diffa :Mandaram	R
20	Upper Benue River	N
21	Lake Chad	R
22	Waza-Logone Floodplains	R
23	Valley du Logone (in Chad)	R
24	Chari River Floodplain	R
25	Lac Fitri	R
26	Bahr Aouk-Salamat	R
27	Northeast Central African Republic	Unknown
28	Southern Darfur	R
29	Western Darfur	R
30	Southern Kordofan	R
31	Western Kordofan	R
32	Dinder Floodplains	R
33	Sudd Wetlands	R
34	Albert Nile	Unknown
35	Lake Tana	R
36	Finchar Reservoir	N
37	Gambella National Park	R
38	Southwest Rift Valley	R

R = Resident Status = Wet season or year-round occurrence with breeding record
r = Resident Status = Wet season or year-round occurrence with unavailable breeding record
N = Non-resident Status = Dry season or year-round occurrence without breeding record

cranes move into nearby open upland/grassland areas where they forage on insects and the fresh tips of plants.

Recent observations of specific Black Crowned Crane breeding behaviour were recorded from Djoudj National Park of Senegal (*pers. obs.*) and Waza-Logone NP in Cameroon (Zekveld and Elissen 1997). The breeding period of the species falls within the rainy season, from July–August/September. Plants used to construct the nest include *Sporobulus sp* and *Cyperus sp.* Both parents guard the nest. The female incubates the egg with head erect or above the nest to watch for predators. When the female leaves the nest to forage, the male often guards the nest by perching on a nearby tree so as to signal an alarm call if any threats are perceived. Both the female and male assist with feeding the chicks. The nesting behaviour of the Black Crowned Crane is thought to be similar to that of the Spur-winged goose *Plectopterus gambensis* and the Egyptian goose *Alopochen aegyptiacus* (Ndegar *pers. comm.*).

3.4 Black Crowned Crane habitats and feeding ecology

Principle Black Crowned Crane habitats recorded during the survey include seasonally flooded wetlands (47%), edges of water bodies (29%), and large floodplains (12%) (Figure 1). Agricultural fields (6%) and dry savanna (5%) were reported to a lesser degree. This concurs with Meine and Archibald (1996), who reported that Black Crowned Cranes use both wet and dry open habitats, but prefer freshwater marshes, wetter grasslands, and the edges of water bodies. Previous studies suggest that *B.p. pavonina* prefer a mixture of shallow wetlands and grasslands, especially flooded lowlands in the Sahelian savannahs during the rainy season (Walkinshaw 1964). They also forage and nest along river banks, in rice and wet crop fields, and even in abandoned fields and other dry lands, although always close to wetlands. *B.p. ceciliae* typically inhabit larger freshwater marshes, wet meadows and fields, and open areas of emergent vegetation along the margins of ponds, lakes, and rivers. These landscapes often include acacias and other trees, in which the cranes will roost. During the dry season, they forage in upland areas, frequently near herds of domestic livestock where invertebrates occur in greater abundance (Meine & Archibald, 1996).

The habitat data suggest that the Black Crowned Crane, unlike the Grey Crowned Crane (*B. regulorum*) in Eastern and Southern Africa (P. Mundy *pers. comm.*), may not be a significant agricultural pest. Furthermore, conflicts between farmers and Black Crowned Cranes due to crop depredation were not reported by local communities during the questionnaire surveys. However, data collected on Black Crowned Crane diet items during the survey indicate that small grain crops (45%) are the most important food source (Figure 2). Further research is needed to determine the degree to which cranes feed on waste grain in agricultural fields, rather than seedlings of freshly planted crops. Small plants (25%), small invertebrates (18%), and small vertebrates (12%) were also indicated as primary food sources in the omnivorous diet of the Black Crowned Crane.

Figure 1. Black Crowned Crane habitats.

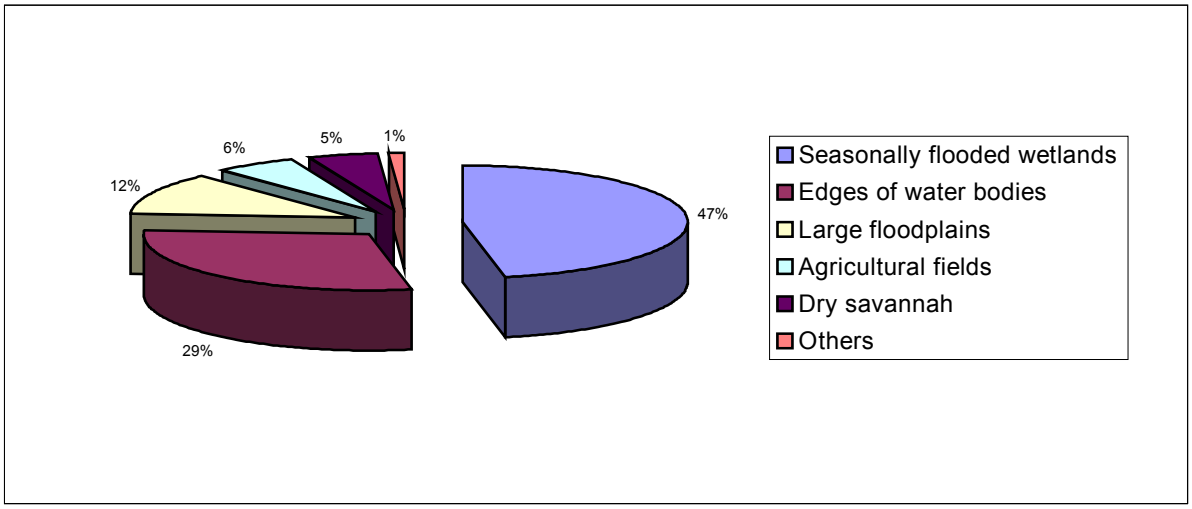
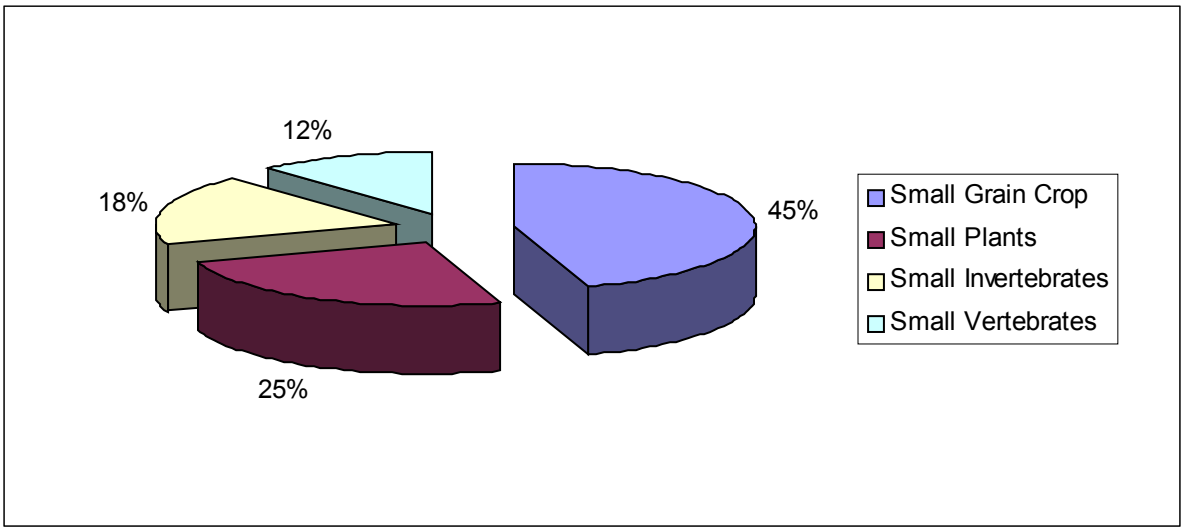


Figure 2. Food sources recorded at Black Crowned Cranes survey sites.



3.5 Black Crowned Crane protection status

Forty-eight (21%) out of the 226 sites supporting Black Crowned Cranes have some degree of official protection (Figure 3). Protected habitats include National Parks (12%), Ramsar Sites (4%), Reserves (4%), and locally protected sites (1%). The remaining 79% of sites are reported as unprotected. The habitats of *B.p. pavonina* (41%) are better protected than those of *B.p. ceciliae* (*17%*) (Figures 4 and 5).

Based on the 1% criterion of the Convention on Wetlands of International Importance (Ramsar), 25 sites and 22 Crane Areas were identified as candidates for Ramsar Site designation. In West Africa, 15 sites and 15 Crane Areas support at least 1% criterion of the *B.p. pavonina* population. Ten sites and 7 Crane Areas support at least 1% of the *B.p. ceciliae* population. However, only four of the candidate sites are currently designated as Ramsar Sites. A complete list of potential (Shadow) Ramsar sites is provided in Table 11.

Figure 3. Protection status of known Black Crowned Crane sites.

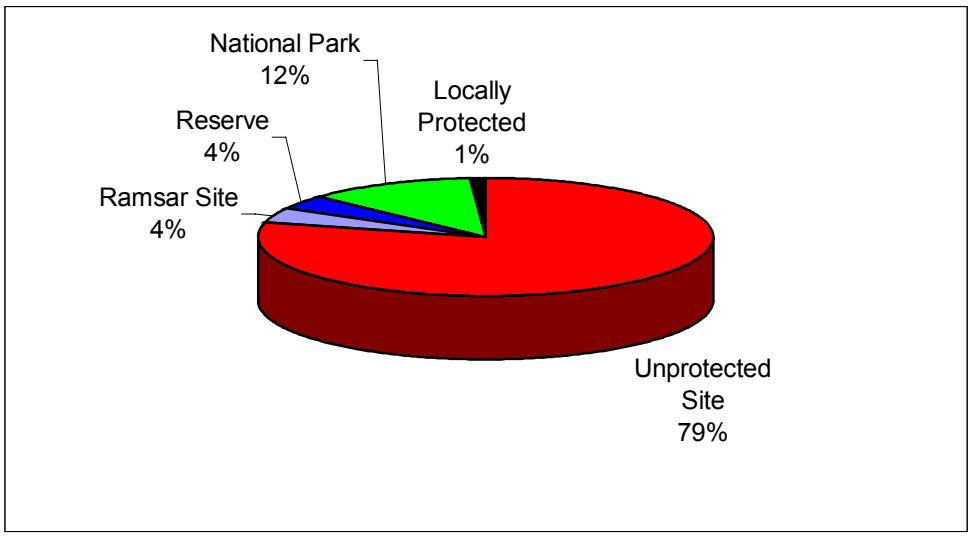


Figure 4. Protection status of *B.p. ceciliae* sites.

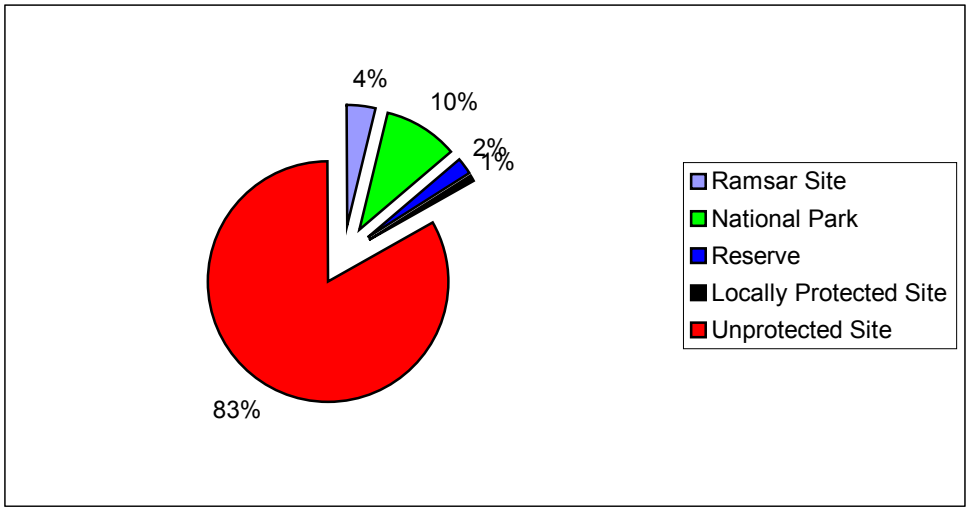


Figure 5. Protection status of *B.p. ceciliae* sites.

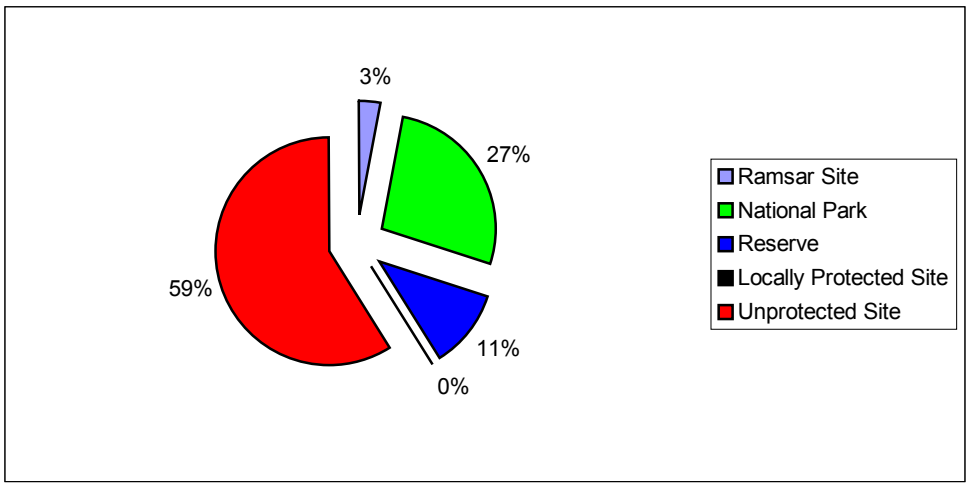


Table 11. Potential Ramsar sites identified based on the 1% criterion (1% of the sub-populations of *B. p. pavonina* is taken here as 100 individuals and that of *B. p. ceciliae* as 250 individuals)

Potential Ramsar Sites at the site level	Potential Ramsar sites at the Crane Area level
Sédhiou:Soungrougrou	Lower Senegal River Delta
Kolda	Gambia River
Gâat Mahamouda	Casamance River
Mandouri	Guinea-Bissau Drainage
Parc National de la Kéran	Hodh Echargui
Abalak : Mare de Tabalak	Inner Niger Delta
Logone Floodplain (in Cameroon)	Mid Niger River Basin
Waza	Oti-Pendjari Basin
Waza Camp	Tahoua :d'Ader
Casiers rizicoles de Bongor	Lake Chad
Chari River upstream N'Djamena	Waza-Logone Floodplains
Chari River downstream of N'Djamena	Valley du Logone (in Chad)
Lake Kundi	Chari Floodplain
A/Um Dafogg	Lac Fitri
Kelling Wetlands	Northeast Central African Republic
Lake Abyed	Southern Darfur
Dambloia	Western Darfur
Sudd Wetlands	Southern Kordufan
Sheshar Wellala Marshes	Western Kordufan
Wagetera Marsh	Dinder Floodplains
Yiganda Wetland	The Sudd
	Lake Tana

Note: Diawling National Park, Djoudj National Park, Lagoa de Cufur (Catió), and Lac Fitri, each of which meets the 1% criterion for *B. p. pavonina*, are already designated Ramsar Sites.

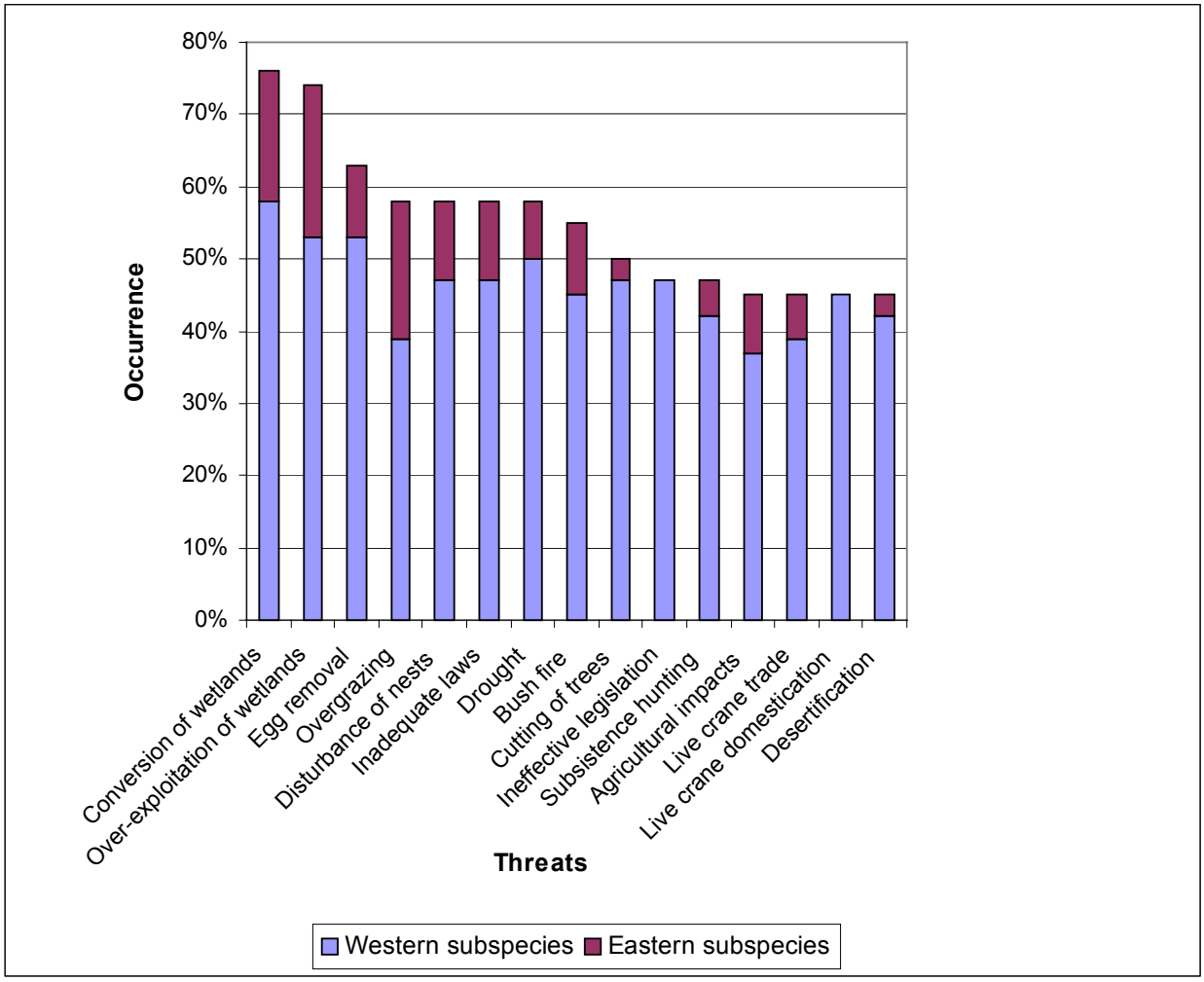
3.6 Threats to Black Crowned Cranes

Black Crowned Cranes and their habitats face serious threats across their range (Figure 6). According to our questionnaire informants, the principal threats facing the Black Crowned Crane are the conversion of wetlands (affecting 77% of all Crane Areas) and over-exploitation of wetlands (74%). Other forms of wetland degradation, including overgrazing (58%) and agricultural drainage (46%) are also important threats, as are the cutting of roost trees (50%). Direct threats to Black Crowned Cranes include egg removal (63%), disturbance of nests (58%), bush fires (55%), subsistence hunting (48%), and live crane trade (46%) and domestication (46%). Drought (58%) and desertification (45%) are also considered important threats. Inadequate laws (58%) and ineffective legislation (48%) threaten Black Crowned Cranes and have important bearing on many of the other above-mentioned factors. Taken collectively, it is clear that Black Crowned Cranes are threatened by many different factors in each Crane Area. The cumulative impact of these threats, such as over-exploitation of wetland habitats and direct disturbance of nest sites, are severe in many areas.

Reported threats to Black Crowned Cranes differ significantly among the sub-species. More than 15 different threats affect at least 50% of all Crane Areas for *B.p. pavonina* (Figure 7). By contrast, only 4 different threats are reported to affect the majority of the Crane Areas for *B.p. ceciliae* (Figure 8). Live crane trade and domestication are considered serious threats in West Africa (affecting more than 60% of all crane sites), but are not considered important in East Africa. Overgrazing is a particularly important threat in East Africa (65%). The direct poisoning of cranes to reduce crop depradation was

also reported from East Africa. Warfare and political instability affects nations across the range of the Black Crowned Crane, particularly *B.p. ceciliae* in southern Sudan.

Figure 6. The fifteen most frequently recorded threats to Black Crowned Cranes.



In the last two decades, wetlands and grasslands across the Sahel and Sudan Savannah regions, but especially in West Africa, have been devastated by natural forces and by the intensification of human land use (Tréca 1996). Drought and increased human pressures (especially overgrazing and destruction of tree cover) are widely considered to have contributed to the southward expansion of the Sahara Desert (Claude et al. 1991). Many seasonal and permanent wetlands (even those within protected areas) have been lost to desertification. At the same time, dramatic increases in human population have placed increased pressure on forest, range, and wetland resources (again, most severely in the west). In many areas, traditional forms of resource use have broken down, while intensified agricultural and industrial activities and large-scale development projects have been undertaken (Daddy and Ayeni 1996). The environmental consequences, as they pertain to the Black Crowned Crane, are numerous and interrelated.

Drought and population growth have forced people to migrate to relatively moist, less populated regions (in Burkina Faso, Nigeria, and Chad, for example) containing prime crane habitat. More recently droughts have hit Sudan, Ethiopia and Kenya. Wetlands have deteriorated as a result of overgrazing and erosion in adjacent lands, pollution, and heavy use of agricultural chemicals (Mustafa 1996,

Scholte 1996). In many areas of the western range, for example, the Senegal delta, the Niger delta, the lower Bafing, the Gambia river, and northern Côte d'Ivore roost trees (*Acacia nilotica*) have disappeared as a result of human demand for fuel and building material.

Figure 7. The fifteen most frequently recorded threats to *B.p. pavonina.*

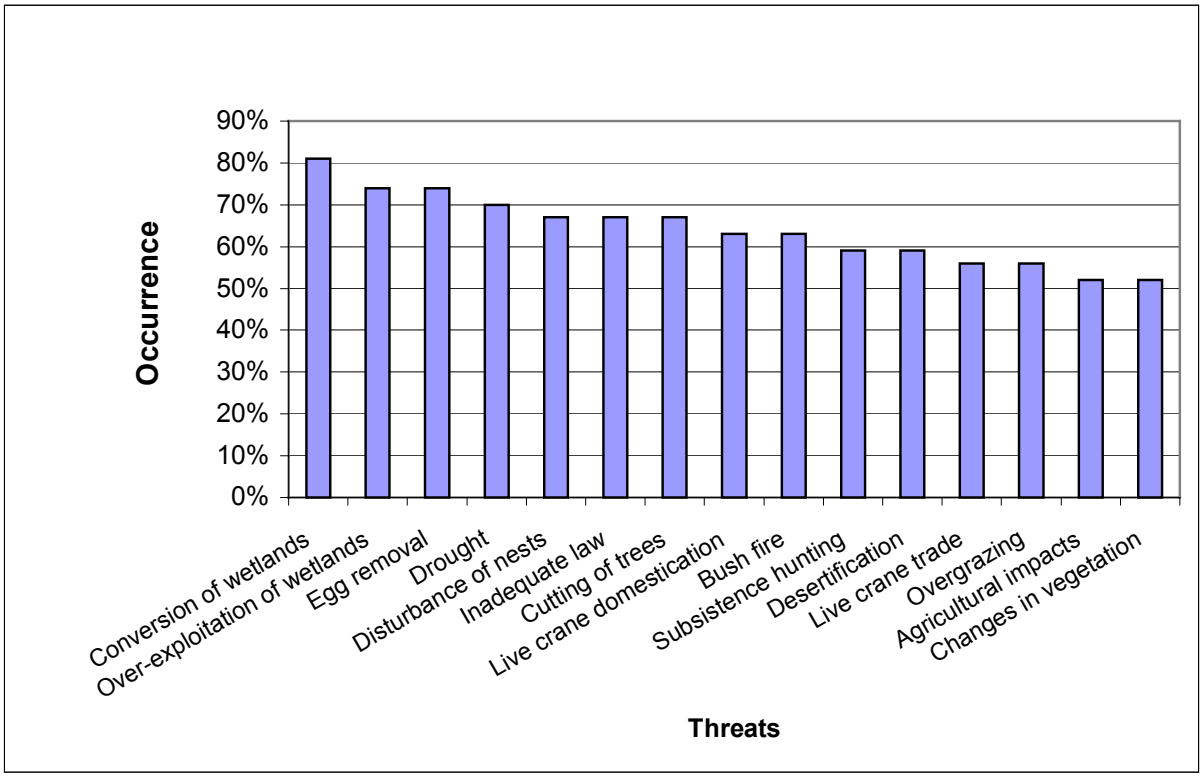
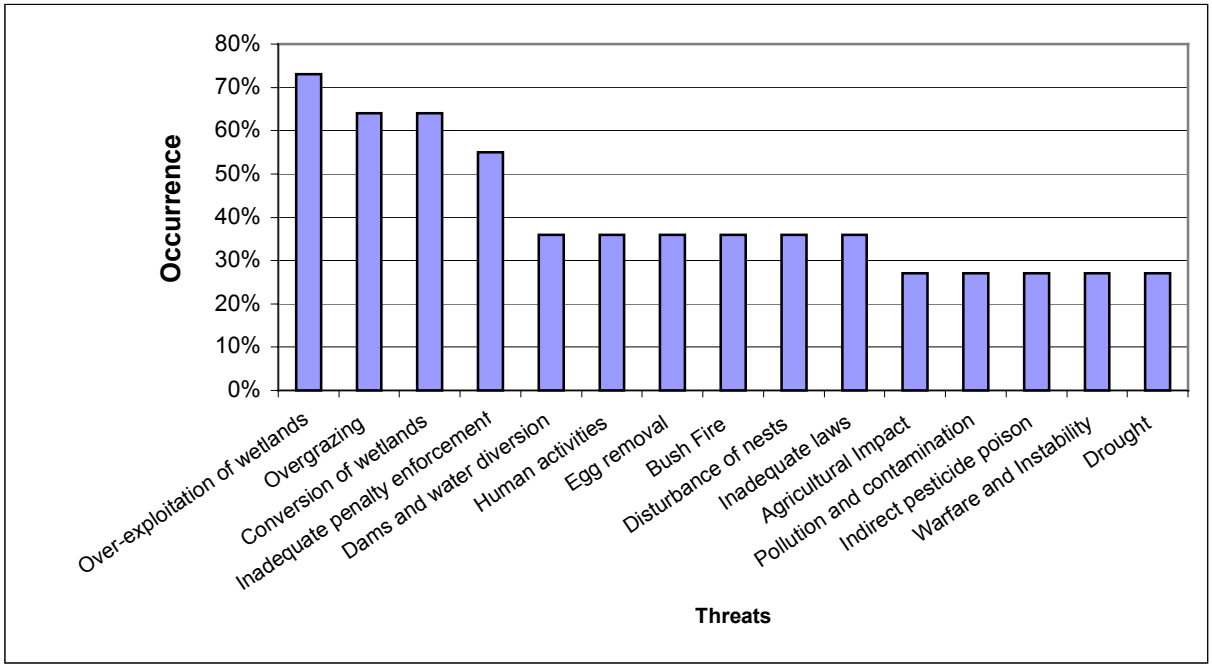


Figure 8. The fifteen most frequently recorded threats to *B.p. ceciliae.*



Wetlands have been drained to expand agricultural production (of, for example, rice in Senegal and Mauritania) and to provide water for large irrigation projects. Drainage and irrigation schemes have had a significant impact in Nigeria (in, for example, the Hadejia and the Chad basin), other parts of West Africa (Fry 1987, P. Hall *pers. comm*.) and along the Nile river system in Sudan.

Dam construction has been a major thrust of national and international development programs, especially in Cameroon, Nigeria, Senegal and Sudan. Impounded waters behind large dams may flood wetlands formerly used as nesting habitat by cranes. Downstream, the reduced inflow and resultant changes in flooding cycles desiccate riparian wetlands and allow floodplains to be converted to cropland (Boyi and Polet 1996; Olofin 1996). Scholte *et al.* (2000) examined the impact of large dams on Black Crowned Cranes in Waza National Park, and the potential benefits of floodplain rehabilitation.

Intensification of agricultural systems has increased the level of pesticide use and incidence of indiscriminate pesticide application. In particular, aerial spraying of pesticides has been heavily employed in the effort to control locusts, aphids, and other insect pests, as well as rodents and flocks of Black-faced Dioch (*Quelea quelea*) and Golden Sparrows (*Passer luteus*). This may directly impact cranes through the ingestion of poisoned food items, and indirectly through reduction of the food base (Mustafa and Durbunde 1992, Tréca 1996). In Senegal, however, Black Crowned Cranes often use harvested (dry) rice fields for feeding and resting when humans are not nearby. Treca notes that "the expansin of rice fields is not always a threat for Black Crowned Cranes, as long as some wetlands [are] left nearby."

Although these factors are especially pressing in West Africa, many also affect Black Crowned Cranes in the central and eastern portions of its range. In Sudan, the major threats to crane habitat include overgrazing and mismanagement of livestock, agricultural expansion in the Sudd wetlands, the planned Jonglei Canal in the Sudd, and oil exploration in and near the wetlands (Eljack 1996). In addition, ongoing civil war in the region has left national parks and other reserved areas unprotected, prevented the implementation of conservation plans, and hindered international assistance efforts (Ojok 1996).

In some areas, Black Crowned Cranes are hunted for meat, as a source of traditional medicine, or captured and sold for live trade. Hunting traditions vary widely within the species' range. In some areas, the eating of cranes is taboo, for example, in the Casamance region of Senegal and in parts of Burkina Faso. In Sudan, the species is not normally hunted and is not considered edible (Eljack 1996), but it has been hunted during times of war-induced famine. In Nigeria, Chad, and other countries, crane hunting still occurs when the opportunity arises, but cranes no longer occur in sufficient numbers to sustain the practice in many areas. Live-trapping poses the most significant threat. Black Crowned Cranes are trapped and sold to local, regional, and international markets for considerable profit. Many local traditions encourage domestication of cranes within West Africa, and there is considerable demand for the birds in North Africa, the Middle East, and Europe. In 1992, Black Crowned Cranes were listed in CITES Appendix 2, so that official licenses are required for international trade (Wilkinson 1993). However, there is strong evidence that international trade continues to deplete the species population in the wild.

Two recent surveys commissioned by the Black Crowned Crane Program in Mali and Nigeria illustrate the magnitude and severity of this problem. A study in the Inner Niger Delta of Mali, covering three wetland sub-districts in Mopti where cranes are know to breed (Mopti, Tenenkou, and Youwarou) and the markets of Bamako district, reveal that market trading of Black Crowned Cranes is having a tremendous impact on the species (Kone and Fofana 2001). Key findings include:

- there are now more cranes in captivity than in the wild in this region, and the species is close to becoming locally extirpated;

- captive cranes rarely, if ever, reproduce;
- cranes in captivity are acquired either by purchase, capture, or as gifts--they are acquired as chicks in wetland areas where they reproduce and as adult birds in urban locations;
- people who capture cranes have several years of experience and are skilled at capture techniques, although crane capture is generally not their main occupation;
- cranes are domesticated mainly for their socio-cultural value because they symbolize high social status, wealth, happiness, power, and protection from evil spirits, and are also used as timekeepers (cranes are purported to chant at the top of every hour) and guiardians;
- live cranes are the most expensive birds in the market and crane exportation is an important source of income for captors/hunters, buyers, sellers, and exporters, with each group profiting from the transactions;
- dead cranes can be profitably sold, as body parts are used to cure several different diseases; and
- persons involved in crane exploitation, including the small percentage that know the species is endangered and that unregulated trade is prohibited, are not willing to give up their activity.

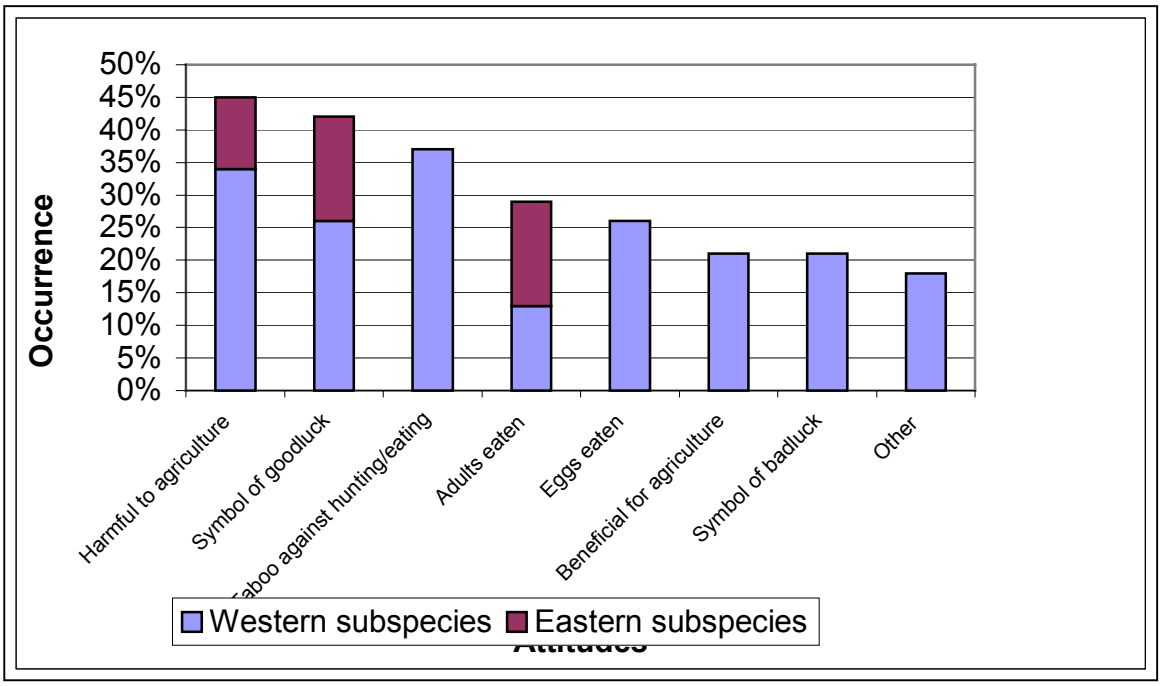
In Nigeria, where Black Crowned Cranes are on the verge of extirpation, there is still a market for live birds and for body parts. Boyi (2001) undertook a survey of Black Crowned Cranes trade in 28 villages of northern Nigeria, distributing more than 1200 questionnaires. He observed eleven captured birds for sale or export in Kano, a major trade route for cranes in northern Nigeria. A trader in the Kano market could expect to make a profit of around 15,000 naira (US $150) from one bird. Birds are exported from Kano as far as the Middle East, including Saudi Arabia, Qatar, and Oman. Parts of dead Black Crowned Cranes, notably the head and feathers, are used in traditional healing.

Beyond these direct threats, Black Crowned Cranes are also affected throughout their range by ineffective law enforcement, insufficient penalties for illegal activities, inadequate policies and legislation to protect key habitats, and a lack of educational programs emphasizing the importance of wetlands. Finally, there is a basic lack of detailed information on, and little ongoing research concerning, the Black Crowned Crane and its habitat.

3.7 Local attitudes about Black Crowned Cranes

Various local attitudes about Black Crowned Cranes were recorded during the survey. Black Crowned Cranes are perceived in a variety of ways, both positive and negative. Positive attitudes recorded about Black Crowned Cranes include “symbol of good luck” (42%), “taboo against hunting/eating” (38%), and “beneficial to agriculture” (21%) (Figure 9). Negative attitudes recorded include “harmful to agriculture” (45%), “adults eaten” (28%), and “eggs eaten” (26%). These attitudes present a mixed message about Black Crowned Crane awareness and conservation across their range. Ironically, some of the attitudes that appear to be beneficial for the conservation of Black Crowned Cranes may actually be contributing to their decline. Around the area of Niokolokoba National Park, for example, *B.p. pavonina* has been seriously affected by hunting for their feathers, which are used in a ritualised traditional dance. Also, a greater variety of attitudes were recorded from West Africa than East Africa. Clearly, efforts to protect Black Crowned Cranes and their habitats must be based on a firm understanding of local attitudes at each project site.

Figure 9. Frequently reported local attitudes about Black Crowned Cranes.



4 Recommended Conservation Actions

This section provides recommendations for the future conservation of Black Crowned Cranes and the wetland ecosystems that serve, in part, as crane habitat. We provide recommendations for the species as a whole, and for each sub-species. Although we do not address recommendations on a national or site-specific basis, our suggested actions are drawn in part from the input of national survey coordinators and local survey participants in each of the range countries of the Black Crowned Crane.

4.1 Recommended range-wide actions for Black Crowned Cranes

4.1.1 Launch public awareness programs for the Black Crowned Crane as a flagship species for wetland conservation

Black Crowned Cranes are associated with most of the major wetland systems of the Sahel and Sudan Savannah regions of Africa (section 3.2). Black Crowned Cranes are also well known across their range at a national level (e.g., the national bird of Nigeria), and steeped in the traditions and dances of many local cultures. As such, Black Crowned Cranes may serve as an effective flagship species for the conservation of wetlands and the many lesser-known species that similar depend on healthy wetlands. Awareness programs should highlight the vulnerable status of Black Crowned Cranes, and the importance of conserving wetlands for the long-term survival of the species. Awareness materials and programmes should be developed on a national basis for key decision-makers and resource managers, and on a site-specific basis, reflecting local attitudes and threats to the species and its habitats (sections 3.6-3.7).

4.1.2 Initiate case studies to find solutions to key threats facing Black Crowned Crane

To gain further understanding about some of the most critical threats facing Black Crowned Cranes and their wetland homes, case study projects are recommended. Significant threats to Black Crowned Crane wetland habitats identified during the survey project include the conversion of wetlands to agricultural fields, the over-exploitation of wetland resources, overgrazing, agricultural dams and drainage, and cutting of roost trees, as well as drought and desertification (section 3.6). Direct threats to Black Crowned Cranes include egg removal, disturbance of nest sites, bush fires, subsistence hunting, and live crane trade and domestication. Inadequate laws and ineffective legislation were also identified as important threats. Case studies should be developed to investigate some of these threats in detail, and to develop a strong foundation for a sound recovery program for the species and its habitats.

Some potential case studies are described below, although many others are possible:

- An investigation of the factors affecting crane breeding success and movements in areas where former floodplain habitats have been converted to agricultural production. In areas of intensive agricultural development, Black Crowned Cranes may be affected directly by loss of wetland nest sites and roost trees and by human disturbance, and indirectly by poisoning from agricultural chemicals (Treca 1996). The impact of these activities on the breeding ecology of Black Crowned Cranes is widely recognized but poorly known (section 3.6). Potential sites include the Hadejia-Nguru system in Nigeria where large-scale agricultural schemes have been developed below large dams (Olofin 1996) and the vast Inner Niger Delta in Mali. Sidibé, Boubout, and Ndiaye (2002) conducted a preliminary investigation of reproduction and movements in the Senegal River Delta, where Black Crowned Cranes are threatened by the conversion of floodplain habitat for rice production, and follow-up research is recommended.

- An awareness and conservation program to address the root factors behind the live crane trade in West Africa. The magnitude of the crane trade in Mali and Nigeria suggest that it could be one of the most important factors contributing to the decline of Black Crowned Cranes in the region (section 3.6). The program should focus on community-based conservation projects that will help reduce trade, including launching an education and public awareness campaign based in the local languages and traditions of each target area where trade is occurring and on a national level; translating relevant laws and regulations into local languages; and liberating captive cranes by compensating locals who hold them captive or providing alternative economic opportunities. The program should build on recent efforts in the Inner Niger Delta (Kone and Fofana 2001) and northern Nigeria (Boyi 2001).

- An investigation of a site supporting a viable and stable population of Black Crowned Cranes. This site could be contrasted with other case study sites where Black Crowned Cranes are declining, to determine how threats to the species vary among sites and to examine the threats to the long-term viability of the sub-population. Important case study sites include the Waza-Logone/Chari Floodplain in Cameroon, the Casamance River floodpains of Senegal, the coastal wetlands of Guinea-Bissau, and the Bahr Aouk – Salamat Floodplains of Chad, which are home to the largest remaining sub-populations of West African Crowned Cranes.

Case study projects may be facilitated through partnerships with ongoing conservation projects at study sites. If appropriate, some of the case study topics may be combined at single project site.

4.1.3 Develop integrated management programs for critical wetlands and catchments that support Black Crowned Cranes

A number of river and other wetland systems (closely approximated by the Crane Areas) are of special importance to sub-populations of the Black Crowned Cranes. Many of these sites transcend national frontiers. These wetland systems and complexes are under increasing demand from growing human population and development pressures. The Black Crowned Crane can, and in many cases have, provided a focus for conservation programs in these areas. However, the challenge of maintaining the biological diversity, hydrological functions, and ecological processes of these wetland systems, and of sustainably managing the economic resources they provide, is larger-scale and longer-term undertaking. For this reason, crane and wetland conservationists in these areas will need to join with other conservationists, scientists, local communities, administrators, officials, and other supporting individuals and organizations to craft integrated conservation programs. In a few cases, the preparation of such programs may already be underway; for many others, they are yet to be initiated (Meine and Archibald, 1996). More recently, a sustainable management plan for the Sahel region of Africa was published by IUCN.

River and wetland complexes that are of overall importance to the future well being of Black Crowned Cranes include the Senegambia basin; the Niger Basin; and the Chad Basin for *B.p. pavonina* and the river floodplains, lake marshes and swamps in Southern Darfur, Southern Kordufan, LakeTana and the Sudd for *B.p. ceciliae.*

Watershed-scale planning is no less important for the smaller river and wetland complexes in these regions. Crane and wetland conservationists should work with other conservation and development planners to promote coordinated policies and actions that will benefit cranes, other elements of bio-diversity, and the local communities in these areas (Meine and Archibald, 1996).

4.1.4 Advocate designation of Black Crowned Crane sites as wetlands of international importance and implementation of the convention on wetlands

In the long run, the fate of the Black Crowned Crane rests largely upon actions taken to protect, maintain, and restore healthy wetlands that serve as breeding grounds (section 3.6). A key step in assuring a viable future for the Black Crowned Crane and other wetland-dependent species is the designation and implementation of the Convention on Wetlands (the Ramsar Convention). Especially important are provisions requiring signatory countries to designate their own Wetlands of International Importance (Ramsar sites) based on specific criteria and to consider wetland conservation in natural resource planning, and to promote wetland conservation through establishment of protected areas. The obligations outlined in the Convention provide an important foundation upon which detailed Black Crowned Crane conservation strategies can be developed at the national and regional levels (Meine and Archibald, 1996). The globally threatened species criteria (2) should be the primary justification for designating Black Crowned Crane sites as wetlands of international importance regardless of their concentration in these areas. Where possible, efforts should also be geared towards designating Crane Areas supporting 1% of the each sub-species population as Ramsar sites (section 3.5). Table 12 shows the range states that have signed the Ramsar Convention (as of 25 August 2000).

4.1.5 Transfer the Black Crowned Crane from CITES Appendix II to Appendix I

Another major threat to Black Crowned Cranes, particularly in West Africa, is the live crane trade (section 3.6). Scientists must revisit and re-submit a proposal for transferring the Black Crowned Crane from CITES Appendix II to Appendix I. This should be endorsed and ratified by all range states that are members of CITES.

4.1.6 Strengthen the Black Crowned Crane network and working group to promote further research, monitoring, and exchange of information

The Black Crowned Crane network and working group needs financial and logistical support to carry out research and monitoring, and exchange information through scientific studies, newsletters, meetings, and electronic media. Strengthening the network and working group is a high overall priority, including the establishment of a Black Crowned Crane conservation coordinator. The long-term effectiveness of the network depends on training opportunities to better understand and monitor Black Crowned Cranes and wetland ecology.

4.1.7 Convene international and range-wide workshops to plan future conservation measures for the Black Crowned Crane

International workshops are vital platforms for bringing together different ideas, sharing knowledge, planning and endorsing priority conservation measures. This is no less important for efforts geared towards conserving the Black Crowned Crane. At least one international or one range-wide workshops should be organized each year to maintain project momentum and plan future conservation measures for the Black Crowned Crane. These meetings can be held in combination with other international venues such as the PAOC, Wetlands International meetings, or International Crane Foundation workshops.

Table 12. Black Crowned Crane range nations that have designated Wetlands of International Importance under the Ramsar Convention (as of 25 August 2000). Ramsar sites supporting Black Crowned Crane populations are indicated with an asterisk (*).

Range State/Country	Date of Designation	Site	Area (ha)
Burkina Faso	27/06/90	La Mare d'Oursi*	45000
	27/06/90	La Mare aux Hippopotames*	19200
	27/06/90	Parc National du W*	235000
Côte d'Ivoire	27/02/96	Parc National d'Azagny	19400
The Gambia	16/09/96	Baobolon Wetland Reserve	20000
Ghana	22/02/88	Owabi	7260
	14/08/92	Muni Lagoon	8670
	14/08/92	Densu delta	4620
	14/08/92	Sakumo lagoon	1340
	14/08/92	Songor lagoon	28740
Guinea	18/11/92	Ile Alcatraz	1
	18/11/92	Iles Tristao*	85000
	18/11/92	Rio Kapatchez*	20000
	18/11/92	Rio Pongo	30000
	18/11/92	Konkouré	90000
	23/06/93	Ile Blanche	10
Guinea-Bissau	14/05/90	Lagoa de Cufada*	39098
Mali	25/05/87	Walado/Lac Debo*	103100
	25/05/87	Séri	40000
	25/05/87	Lac Horo	18900
Niger	30/04/87	Parc National du « W »*	220000
Nigeria	?/ ?/00	Hadejia-Nguru	?
Senegal	11/07/77	Parc National du Djoudj*	16000
	11/07/77	Bassin du Ndiaël*	10000
	03/04/84	Delta du Saloum	73000
	29/09/86	Geumbeul	720
Tchad	13/06/90	Lac Fitri*	195000
Togo	04/07/95	Parc National de la Kéran*	163400
	04/07/95	Reserve de Faune de Togodo	31000
Kenya	05/06/90	Lake Nakuru	18800
	10/04/95	Lake Naivasha	30000

4.2 Recommendation actions for Black Crowned Crane sub-species

4.2.1 Conservation action for B.p. pavonina

Countries Included

Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Congo, Cote d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Mali, Mauritania, Niger, Nigeria, Senegal, Togo, and possibly D.R. Congo.

International Agreements and Cooperation

1. Transfer the Black Crowned Crane from CITES Appendix II to Appendix I.
2. Initiate cross-border projects involving banding, monitoring, research, and protection of *B.p. pavonina*.

Legal and Cultural Protection

1. Adopt stronger wetland protection policies and legislation at the province and national level throughout the range of *B.p. pavonina.*
2. Strengthen enforcement of existing laws prohibiting hunting and live-trapping of cranes, and protecting cranes within designated protected areas.
3. Review and, where needed, strengthen existing laws and penalties to enhance the conservation status of *B.p. pavonina* at the national level. Especially important are laws to bring trade under control.
4. Strengthen requirements for environmental impact assessments in the planning of development projects affecting wetlands and crane habitat in general.

Protected Areas

1. Strengthen administration of existing protected areas that are important for West African Crowned Cranes.
2. Designate new protected areas (especially key breeding areas) to ensure the survival of the Black Crowned Crane in West Africa. In areas where the species has been extirpated, identify remaining habitat that may again support cranes. Key areas for consideration should include: the Lake Chad basin (especially the Chingurme Duguma sector of Nigeria's Chad Basin National Park); the Senegal River basin (Senegal and Mauritania); and the Hadejia-Nguru wetlands (northern Nigeria).
3. Develop special buffer zone programs for landowners and villages near protected areas to strengthen management programs and to harmonize conservation and development goals.
4. Provide financial and political support for cooperative international efforts to strengthen existing protected areas in the Lake Chad basin (especially Cameroon's Waza National Park) and to integrate habitat protection and sustainable resource management in the region.

Habitat Restoration and Management

1. Develop community-based wetland conservation and management projects in areas where Black Crowned Cranes are found. Such projects can often involve local NGOs and should entail crane monitoring, research, education, and habitat restoration and programs.
2. Prepare national-level wetland inventories as a first step toward developing restoration and management plans. Some countries have already taken steps to do so, and support should be given to further implementation projects.
3. Develop and implement integrated land use and conservation programs for critical wetland complexes within the region, including the Lower Senegal River Delta (Senegal and Mauritania), the Senegambia basin (Senegal and Gambia), the Inner Niger Delta (Mali), and Lake Chad Basin

(Niger, Nigeria, Cameroon and Chad). In some cases, such plans have already been outlined and should be further developed.
4. Develop and implement plans for the restoration of degraded wetlands and adjacent uplands.

Surveys/Censuses/Monitoring

1. Coordinate surveying and monitoring program to determine the current status, distribution, size, and trends of the *B.p. pavonina* population within each 5-10 year period.
2. Promote regular coverage of all Black Crowned Crane Sites during the January and July AfWC activities. Emphasis should be placed on surveys to identify more breeding sites.
3. Organize surveys to verify the cranes status in Central African Republic and D.R. Congo, and the furthest eastern extent of *B.p. pavonina* in Chad.
4. Develop specific monitoring program for important concentration and breeding sites for the *B.p. pavonina.*
5. Through the Black Crowned Crane Programme, coordinated by the International Crane Foundation and the Wetlands International West Africa Office in Senegal, provide technical and financial support for coordinating surveys, censuses and monitoring programs for *B.p. pavonina*, and disseminating results.

Research

1. Conduct field studies of various aspects of Black Crowned Crane biology in the region, especially population density, limiting factors, demographics, nesting success, productivity, habitat characteristics, feeding habits, local and seasonal movements, and behaviour.
2. Conduct basic ecological studies of the cranes habitats in areas supporting important concentration and breeding of *B.p. pavonina*.
3. Support research on the development of sustainable land use practices appropriate for the wetland-upland complexes of the Sahel Savannah. This should include research on restoration of degraded wetlands.
4. Undertake studies of the status and environmental characteristics of specific protected areas and other critical habitats.
5. Determine more precisely, through satellite telemetry, banding, and simultaneous monitoring programs, the local migration route and seasonal distribution of *B.p. pavonina*.

Education and Training

1. Develop community-based conservation education and awareness programs involving *B.p. pavonina* and their wetland/savannah habitats.
2. Develop targeted education programs aimed at crane trappers and dealers, policy makers, resource managers, students, and other groups. These programs should provide information on the status of West Africa's cranes and wetlands, the impact of crane trade, and sustainable land use practices and economic opportunities.
3. Provide opportunities for professional training in crane censusing and monitoring techniques, ecological research, wetland management and restoration, and conservation education.
4. Promote the Black Crowned Crane as a flagship species for wetland conservation in countries across its western range (West to Central Africa).

Captive Propagation and Reintroduction

1. Assess the need for a release program to re-establish the Black Crowned Crane in areas where it has been extirpated. This assessment should, however, stress the need to ensure protection and sound management of habitat before any releases are undertaken.
2. Expand training opportunities in crane husbandry, propagation, and reintroduction techniques.

4.2.2 Conservation action for B.p. ceciliae

Countries Included

DR Congo, Ethiopia, Kenya, Sudan, Uganda, and possibly Chad.

International Agreements and Cooperation

1. Transfer the Black Crowned Crane from CITES Appendix II to Appendix I.
2. Build cross-border links among scientists and conservationists in eastern Chad, Sudan, and Ethiopia for monitoring the *B.p. ceciliae*.

Legal and Cultural Protection

1. Place strict controls on the export of *B.p. ceciliae* from the region.
2. Strengthen national laws to protect cranes, especially through increased penalties for trapping, hunting, capture, and illegal possession.
3. Adopt stronger laws to protect wetlands against over-exploitation, to prevent indiscriminate use of pesticides, to require environmental impact assessments in the planning of development projects, and to discourage encroachment upon and conversion of key crane habitats.

Protected Areas

1. Strengthen administration and enforcement in existing protected areas that are important for *B.p. ceciliae.*
2. Designate already identified key breeding areas and areas where large concentrations of *B.p. ceciliae* are known to occur as protected areas.
3. Develop special buffer zone programs for landowners and villages near protected areas to strengthen management programs and to harmonize conservation and development goals.

Habitat Protection and Management

1. Prepare national-level inventories of wetlands as a first step in developing national-level crane and wetland conservation plans in the region. Some countries have already taken steps to do so, and support should be given to further implementation projects.
2. Develop coordinated land use and conservation programs for critical wetlands within the region, especially the Sudd wetlands and other breeding areas outside of designated protected areas.
3. Assess the need for protective measures in key habitats.
4. Require environmental impact assessments for all large-scale development schemes affecting crane habitats.

Community Conservation Programs

1. Work with community-based NGOs to develop crane monitoring, research, education, and habitat restoration programs.
2. Develop and implement community-based conservation programs that combine wetland protection, restoration, and management activities with local economic development opportunities.

Surveys/Censuses/Monitoring

1. Coordinate surveying and monitoring program to verify the current status, distribution, size, and trends of the *B.p. ceciliae* population within each 5-10 year period.
2. Conduct local crane counts in the region. Non-governmental organizations can and should play a key role in organizing and coordinating these counts.
3. Use survey results to monitor habitats of the *B.p. ceciliae*.

4. Encourage and support require regular participation of range countries, especially Sudan, in the January and July AfWC activities with the aim of increasing coverage of sites that are known for the Sudan Crowned Crane.
5. Establish a long-term population monitoring program for known habitats in the Ethiopian Highlands and Rift valley.
6. Stimulate local interest in the population through crane counts and other educational programs involving cranes and their habitats.
7. Through the Black Crowned Crane Programme, coordinated by the International Crane Foundation and the Wetlands International West Africa Office in Senegal, provide technical and financial support for coordinating surveys, censuses and monitoring programs for *B.p. ceciliae*, and disseminating results.

Research

1. Conduct basic ecological studies of habitat requirements. Information from these studies should be used to identify critical habitat, especially breeding habitat, for these species.
2. Conduct banding studies to understand local and seasonal movements and the demographics of the *B.p. ceciliae* population, especially along the border areas of Sudan with Chad, Central African Republic, Uganda, Ethiopia, and Kenya.
3. Conduct basic studies of the *B.p. ceciliae* population density, nesting densities, nesting success, recruitment rates, feeding habits, and behaviour.
4. Conduct focused research on factors (including human activities) affecting productivity in different parts of the region.
5. Assess the extent and impact of the capture, sale, and export of the Sudan Crowned Crane.
6. Develop sustainable land use practices appropriate for the wetland-upland complexes of the Sudan Savannah region and for the wetlands in the region as a whole.
7. Initiate a research program to gather basic information on the biology, ecology, and conservation needs of the population. Studies should focus on the distribution, population status, habitat requirements and availability, wetland ecology, the life history of breeding and non-breeding cranes.
8. Initiate a banding program to collect information on habitat requirements, population dynamics, seasonal movements, and movements of non-breeding adults and juveniles.

Education and Training

1. As a component of community-based conservation programs, develop crane counts and other education and awareness programs involving *B.p. ceciliae* and wetlands.
2. Provide professional training opportunities for crane researchers, wetland conservationists, and protected area managers in crane censusing and monitoring techniques, ecological research, wetland management and restoration, and conservation.
3. Integrate public education efforts into all local crane research and conservation projects.
4. Develop special programs aimed at groups critical to the conservation of *B.p. ceciliae*, especially teachers, rural landowners, and those who are involved in the capturing of cranes for trade.

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Annexes

Annex 1. List of target survey sites, Crane Areas, and countries targeted
Annex 2. Field survey sites, questionnaire survey sites, and key sites not surveyed in 2000-2001
Annex 3. Sub-regional African Waterbird Census forms for West, Central, and East Africa
Annex 4. Status and Distribution of Black Crowned Cranes in Africa – Questionnaire 2000
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Annex 1
List of target survey sites, Crane Areas, and countries targeted

No.	Sites	Crane Areas (and Countries)
1	Bassin du Ndiael	Lower Senegal River Basin/Delta (Senegal-Mauritania)
2	lac d'Aleg	
3	Parc National du Diawling	
4	Parc National Oiseaux du Djoudj	
5	ZIC de Djeuss	
6	Lac Guiers	
7	Louga	
8	Réserve de Faune/PN du Bafing	Lower Bafing Valley (Mali)
9	Allahein River Shores	Gambia River (Gambia)
10	Upper Badibu:Bambali Swamp	
11	Balangar	
12	Niamina:Dankunkwu rice field	
13	Jahkaly	
14	Niani:Kajalat Island	
15	Kaur	
16	Kiang West National Park	
17	Pakali Ba	
18	Pirang	
19	Upper Badibu:Samba Soto Swamp	
20	Pirang:Scan-Gambia Shrimp	
21	Niamina:Sotokoi rice field	
22	Tendaba	
23	Bignona	Casamance River (Senegal)
24	Sédhiou:Soungrougrou	
25	Kolda:Diendé, Bonconto/Vélingara	
26	Ziguinchor	
27	Koundara	Upper Gambia River (Senegal-Guinea)
28	Parc National du Niokolokoba	
29	Bolonha de Sta Helenda (Bambadinca)	Guinea-Bissau Drainage (Guinea Bissau)
30	Bula	
31	Farim	
32	N. E. Safim	
33	Lagoa de Cufada	
34	Lagoa de Cufur (Catió)	
35	Mansoa	
36	Porto de Enxudé	
37	Ile de Tristao:Kadiene	North-West Guinea (Guinea)
38	Plaine du Pakis	
39	?Rio Kapatchez	
40	Gâat Mahamouda	Hodh Echargui (Mauritania)
41	Cercle de Djenné:Djenné Senessa	Inner Niger Delta/Delta Intérieur du fleuve Niger
42	Cercle de Djenné:Diera	
43	Cercle de Djenné:Sekoula	
44	Cercle de Djenné:Goumitogo Mare	
45	Cercle de Djenné:Magam Sabatokoni	
46	Cercle de Djenné:Guiera (Souan)	
47	Mopti:Sibo Niala	Cercle Ténenkou /
48	Focoloré:Mare Bilade	Commune Touguéré Koumbé

49	Focoloré:Mare Tidda Leida	
50	Focoloré:Mare Nouré Oumalo	
51	Focoloré:Mare Mini Mana	
52	Diondiori/Diountou (Koubi)	
53	Tioya	
54	Niaminiama/Niamihara	
55	Noukoutou	
56	Quadrat No. 100	
57	Quadrat No. 108	
58	Lac Walado	
59	Diaka - Diarende	
60	Gao - Labezenga (Gao - Niamey)	Mid Niger River Basin (Mali-Niger-Burkina Faso)
61	Ayorou	
62	Bac Farie	
63	Boboye	
64	Dogondoutchi	
65	Dolbel	
66	Filingué	
67	Firgoun	
68	Gongozougou	
69	Gotheye-Ayorou	
70	Goudel	
71	Kolo	
72	Kirtachi	
73	Liboré	
74	Makalondi	
75	Namari Goungou	
76	Namaro	
77	Niamey	
78	N'Dounga	
79	Rive droite	
80	Saga	
81	Saga-Kolo	
82	Say	
83	Séberi	
84	Torodi	
85	Tillabery:Diambala	
86	Tillabery:Dortoir de Tillabery	
87	Tillabery:Mare de Kero	
88	Tillabery:Kero	
89	Tillabery:Kokorou	
90	Tillabery:Ossolo	
91	Tillabery:Parc National du 'W'	
92	Tillaberi:Youmba	
93	?Yalalé	
94	Maru	Lower Niger / Niger Sokoto System (Nigeria)
95	Mare d'Oursi	Mare d'Oursi (Burkina Faso)
96	Odienné	North Côte d'Ivoire (Côte d'Ivoire)
97	Korhogo	
98	Parc National de la Comoé	
99	Lake Bagré	Southern-West Upper Volta (Burkina Faso)

100	P. N. Kaboré Tambi	
101	Nazinga Game Ranch	
102	Mares aux Hippopotames	
103	Black Volta:Lawra	Lower Volta Floodplains (Ghana)
104	White Volta:Bawku	
105	White Volta:Nasia Floodplain	
106	Black-White Volta:Mpaha	
107	Fleuve Oti	Oti-Pendjari Basin (Benin-Burkina Faso-Togo-Ghana)
108	Lac Kopienga/Kompiembiga	
109	Mandouri	
110	Parc National d'Arly	
111	Parc National de la Kéran	
112	Parc National de la Pendjari	
113	Réserve de Pama	
114	Abalak:Chimzazoren	Tahoua: d'Ader (Niger)
115	Abalak:Mare de Tabalak	
116	Tanout	Zinder:Damergou -Damagaram (Niger)
117	Matameye-Magaria	
118	Goudoumaria	Diffa: Mandaram-Manga (Niger)
119	Mainé Cheri	
120	Gombe	Upper Benue (Nigeria Cameroon)
121	Jalingo	
122	North Faro	
123	Tungo	
124	Chad Basin N.P:Chingurme-Duguma	Lake Chad (Nigeria-Niger-Chad-Cameroon)
125	Bas-Chari (Cameroon)	
126	Bas-Chari (Chad)	
127	Bal Oasis	
128	Quadrat 46 (Chad)	
129	Quadrat 47 (Chad)	
130	Quadrat 60 (Chad)	
131	Quadrat 70 (Chad)	
132	Quadrat 72 (Chad)	
133	Quadrat 79 (Chad)	
134	Quadrat 80 (Chad)	
135	Quadrat 87 (Cameroon)	
136	Quadrat 89 (Chad/Cameroon)	
137	Quadrat 93 (Cameroon)	
138	Quadrat 94 (Cameroon)	
139	Quadrat 96 (Cameroon)	
140	Quadrat 100 (Cameroon)	
141	Quadrat 101 (Cameroon)	
142	Logone floodplain (in Cameroon)	Waza-Logone Floodplains (Cameroon)
143	Lac Maga	
144	Maga amont	
145	Semry II	
146	Semry III	
147	Mares de la Plaine du Nord:Moukak	
148	Mares de la Plaine du Nord:Mandabé	
149	Mares de la Plaine du Sud:Sifna	
150	Mares de la Plaine du Sud:Bagdassi	
151	Mares de la Plaine du Sud:Zina	

152	Mares de la Plaine du Sud:Karaska	
153	Mares de la Plaine du Sud:Autres	
154	Logomatya	
155	Loromé-Mazra	
156	Kalamaloué	
157	Waza	
158	Waza Camp	
159	Mare de Katoa	Valley du Logone (Chad-Cameroon)
160	Depression of Rah	Bongor - N'Djamena /
161	Au abords du fleuve Logone (Katoa)	Région de Mayo-Bone
162	Logone floodplain north-east Katoa	Région de Canton Madiago /
163	Logone floodplain of Arekolo (N. Katoa)	Chari-Baguirmi
164	Logone floodplain (S. Katoa)	
165	Mare Dogoya-Yamatcha (Holom)	
166	Depression of Metene	
167	Toubouri	
168	Cuvette de Mbourao	
169	Lac Tikem	Région de Mayo-Kebbi
170	Mare Toufgounou (Depression) Marsay	
171	Mare Kiamé Télémé (Bongor)	
172	Mare Mana-Toura/Tura (Bongor)	
173	Mare Lifi-Baki (Bongor)	
174	Casiers rizicoles de Bongor	
175	Bongor	
176	Réserve de Faune de Binder-Léré	
177	Logone Gana	
178	Fleuve Chari(amont de N'Djamena)	Chari Floodplain (Chad-Central African Republic)
179	Fleuve Chari(en aval de N'Djamena)	
180	Massaguet-Bisney (E. N'Djamena)	
181	Parc National de Manda	
182	P. N. Bamingui-Bangoran	
183	Lac Fitri	Lac Fitri (Chad)
184	P. N. de Zakouma	Bahr Aouk-Salamat Floodplains (4 995 000ha)
185	R. F. Bahr Salmat	
186	Domaine de Chasse de l'Aouk	
187	Bahr Azoum-Wadi Azum	
188	Lac Iro	
189	Ouadi Rimé-Ouadi Achim	
190	Birao	North-East Central African Republic (Central African Republic)
191	Parc National André Félix	
192	Parc National de Saint Floris	
193	Lake Kundi	Southern Darfur (Sudan)
194	Radom National Park	
195	Am Dafogg	
196	Kelling Wetlands	
197	Tesi Swamp	Western Darfur (Sudan)
198	Azum:Amballa-Mongororo	
199	Lake Keilak	Southern Kordofan (Sudan)
200	Lake Abyed	
201	Dambloia	Western Kordofan (Sudan)
202	Dinder National Park	Dinder Floodplains (Sudan-Ethiopia)
203	Sudd	Sudd Wetlands (Sudan)

204	Arua Town	Albert Nile (Uganda)
205	Rhino Camp	
206	E/Infranz Marsh	Lake Tana (Ethiopia)
207	Kurt Bahir	
208	Bahir Dar Zuria	
209	Sheshar Wellala Marshes	
210	Wagetera Marsh	
211	Yiganda Wetland	
212	Yifag	
213	Kirigna	
214	Finchar Reservoir	Finchar Reservoir (Ethiopia)
215	Gambella National Park	Gambella National Park (Ethiopia-Sudan)
216	Boyo Swamp	South-West Rift Valley (Kenya)
217	Barbu Gaya Wetland	
218	Cheleleka Wetland	
219	Koka	
220	Lakes Abijata-Shalla N. P.	
221	Lake Akaki	
222	Lake Awasa	
223	Lake Turkana/Stefanie/Rudolph	
224	Tikur Wuha	
225	Lake Ziway	
226	Omo:Mago National Park	

Annex 2
Field survey sites, questionnaire survey sites, and key sites not surveyed in 2000-2001

Country	Sites surveyed by air or ground	Sites surveyed by questionnaire	Key Sites not surveyed
Benin	Parc National de la Pendjari	P. N. Pendjari	
Burkina Faso	Mare aux Hippopotames		
	Pama Game Reserve		
	Parc National d'Arly		
	Kompienga Lake		
	Barrage de Bagré		
	Parc National du « W »		
	Mare d'Oursi		
Cameroon	Waza-Logone	Waza-Logone	
	Lac Tchad		
Central African Republic			
Chad	Lac Tchad	Plaine du Logone : Mare de Katoa	Depression de Toubouri (1987)
	Bas Chari	Plaine du Logone : Mare Toufgounou Marsay	Cuvette de M'bourao (1987)
	Plaine du Logone:Bongor - Ndjamena	Au abords du fleuve Logone	Mayo Kebbi :Lac Tikem (1987)
	Au abords du fleuve Logone	Plaine du Logone : Mare Kiamé Télém(Bongor)	?? Parc National de Manda
	Fleuve Chari (amont de Njamena)	Plaine du Logone : Mare Lifi-Baki (Bongor)	
	Lac Fitri	Plaine du Logone : Mare Mana-Toura (Bongor)	
	N'Djamena:Massaguet -Bisney	Plaine du Logone : Mare Dogoya-Yamatcha (Holom)	
	Plaine du Logone : Mare de Katoa	Plaine du Logone : Casiers rizicoles de Bongor	
	Plaine du Logone : Mare Toufgounou Marsay		
	Au abords du fleuve Logone		
	Plaine du Logone : Mare Kiamé Télém(Bongor)		
	Plaine du Logone : Mare Lifi-Baki (Bongor)		
	Plaine du Logone : Mare Mana-Toura (Bongor)		
	Plaine du Logone : Mare Dogoya-Yamatcha (Holom)		
	Plaine du Logone : Casiers rizicoles de Bongor		
	Parc National de Zakouma		
Côte d'Ivoire		Région of d'Odienne (1985)	?? Parc National de la Comoé
Gambia	Dankunkwu rice field	Dankunkwu rice field	
	Bambali Swamp	Bambali Swamp	
	Pirang	Tendaba (1999)	
	Samba Soto Swamp	Kaur (1999)	
		Balangar (1995)	
		Pirang	
		Samba Soto Swamp	
		Sotokoi rice field (?)	
		Kajalat Island (?)	
		Scan-Gambia Shrimp (?)	
		Pakali Ba (1995)	
		Allahein River shores (1995)	
		Kiang West National Park (1995)	
Ghana		Volta Basin (1990/9)	
		White Volta: Bawku (?)	
		White Volta:Nasia (?)	
		Black Volta:Lawra (?)	
		Black/White Volta:Mpaha (1999)	
Guinea		Koundara (?)	
		Kadiene (199?)	
Guinea Bissau			Lago de Cufur/Catió (1997)

Mali	Délta Intérieur du fleuve Niger	Délta Intérieur du fleuve Niger	Fleuve Niger:Gao -Labezenga (1984)
	Cercle de Djenné: Djenné Senessa	Cercle de Djenné: Djenné Senessa	?? Réserve de Faune du Bafing (1996)
	Diountou (Koubi)	Diountou (Koubi)	
		Mopti :Sibo Niala (1999)	
		Cercle de Djenné: Diera (1990)	
		Cercle de Djenné:Sekoula (1997)	
		Goumitogo Mare (1997)	
		Focoloré:Mare Bilade (1996)	
		Focoloré:Mare Tidda Leida (1996)	
		Focoloré:Mare Nouré Oumalou (1996)	
		Focoloré:Mare Mini Mana (1996)	
Mauritania	Parc National du Diawling	Parc National du Diawling	
	Lac d'Aleg	Gâat Mahamouda	
	Gâat Mahamouda		
Niger	Fleuve:Tillabery: Mare de Kero	Fleuve Niger: Tillabery: Mare de Kero	Fleuve Niger: Ayorou (1995)
	Fleuve Niger:Tillabery: Kokorou	Fleuve Niger: Tillabery: Kokorou	Département de Zinder (Damergou/Damagaram)
	Fleuve Niger:Tillabery: Ossolo	Tillabery: Ossolo	Département de Diffa (Mandaram/Manga)
	Fleuve Niger :Tillabery: Dortoir de Tillabery	Fleuve Niger : Tillabery: Dortoir de Tillabery	
	Flueve Niger : Parc National du W	Fleuve Niger : Parc National du W	
	Fleuve Niger : La Tapoa Pékinga	Tillabery : Youmba	
	Fleuve Niger:Tillabery : Youmba	Tahoua :Dossey	
	Abalak: Chimzazoren	Tahoua: Tabalak	
	Abalak: Mare de Tabalak		
	Tahoua :Dossey		
	Tahoua: Tabalak		
	Diomona		
	Namga		
	Kpennuya/Kpeniago		
	Fleuve Niger :N'Dounga		
	Fleuve Niger :Sébéri		
	Fleuve Niger/Rive gauche : Périmètre de Saga		
	Fleuve Niger:Liboré/N'Doungo		
Nigeria	Hadejia – Nguru Wetlands (including Dagona National Park)	Chad Basin N. P. Chingurume – Duguma (1998)	Upper Benue System (1996)
		Chad Bassin N. P: Bula Tura Oasis (?1996)	
		Chad Basin N. P: Kujila Oasis (?1996)	
		Bama :Mboro (1996)	
		Gulumba : Kutila (1996)	
		Hadejia - Nguru Wetlands (including Dagona N. P)	
		Bal Oasis (1990)	
Senegal	Parc National Oiseaux du Djoudj	Delta du fleuve Senegal	Louga/Ferlo (1987)
	ZIC de Djeuss	Parc National Oiseaux du Djoudj	
	Bassin du Ndiael	ZIC de Djeuss	
	Lac de Guier-Vallée de Ferlo	Bassin du Ndiael	
	Fleuve Casamance	Fleuve Casamance	
	Kolda	Kolda	
	Parc National du Niokolokoba		
Togo		Oti (?1990)	
		Valée Oti -Mandouri(?1990)	
		Parc National de la Kéran (?1990)	
Eritrea	Asmara	Asmara?	
Ethiopia	Akaki Lakes	Lake Awassa	
	Abijatta-Shalla Lakes National Park	Kurt Bahir	Kirigna (1999)
	Lake Awassa	Shesher-Wallala Wetland	
	Boyo Wetland	Wagetera Marsh	
	Barbu Gaya Wetland	Yiganda Wetland (1998/9)	
	Bahir Dar Zuria		
	Cheleleka Wetland		
	Enfraz Wetland		
	Koka Dam		
	Kurt Bahir		
	Shesher-Wallala Wetland		

	Tikur Wuha Marsh		
	Wagetera Marsh		
	Lake Ziway		
Kenya		Lake Turkana (1992)	
Sudan	Western Kordufan:Dambloia	Western Kordufan:Dambloia	The Sudd
	Southern Darfur:Radom National Park	Southern Darfur:Radom National Park	
	Southern Kordufan:Lac Keilak	Southern Kordufan:Lac Keilak	
	Southern Darfur: Lake Kundi	Southern Darfur: Lake Kundi	
		Southern Darfur: Um-Dafog (?)	
	Southern Darfur:Kelling Swamps	Southern Darfur:Kelling Swamps	
	Western Darfur:Tesi Swamp	Sennar: Dinder National Park (?)	
		Western Darfur:Tesi Swamp	
Uganda		Arua Town (1998)	
		Arua Town:West Nile Golf field (1998)	
		Rhino Camp: Ewanyapa (1998)	
		Rhino Camp: Ayilo Valley (1998)	

Notes

Date of most recent survey for Black Crowned Cranes at a given site shown in brackets

Missing information is indicated with a ?

Potential sites with no or unavailable survey records are indicated with a ??

Annex 3
Sub-regional African Waterbird Census forms for West, Central, and East Africa

COMPILER'S name and address:	**AFRICAN WATERFOWL CENSUS** **CENSUS FORM** **WEST AFRICA** WETLANDS INTERNATIONAL P0 box 8060 Dakar - Yoff Senegal
DATE OF COUNT:	**COUNTRY:**
TIME OF DAY:	
NAME OF SITE:	
PROVINCE/STATE: **NEAREST LARGE TOWN:**	**SITE CODE:**
WAY OF COUNTING: Aerial ☐ on Foot ☐ Boat ☐ Mixed ☐	**HAS THE SITE BEEN COUNTED BEFORE** ? Yes ☐ No ☐ **AS PART OF A LARGER SITE**, please give details:
COVERAGE OF THE COUNT: % If less then 100%, please show covered area on added sketch-map	
CONDITION OF THE WETLAND (e.g. wet, dry**):**	
SITE STATUS, protection, disturbance:	

Total	_____	***GREBES***	*Total*	_____	***STORKS***
TACRU	_____	Little Grebe - *Tachybaptus ruficollis*	MYCIB	_____	Yellow-billed Stork - *Mycteria ibis*
PODNI	_____	Black-necked Grebe - *Podiceps nigricollis*	ANALA	_____	African Openbill Stork - *Anastomus lamelligerus*
			CICNI	_____	Black Stork - *Ciconia nigra*
Total	_____	***PELICANS***	CICAB	_____	Abdim's Stork - *Ciconia abdimii*
PELON	_____	Great White Pelican - *Pelecanus onocrotalus*	CICEP	_____	Woolly-necked Stork - *Ciconia episcopus*
PELRU	_____	Pink-backed Pelican - *Pelecanus rufescens*	CICCI	_____	White Stork - *Ciconia ciconia*
PELEC	_____	unidentified pelicans - *Pelecanus spp.*	EPHSE	_____	Saddle-billed Stork - *Ephippiorhynchus senegalensis*
			LEPCR	_____	Marabou Stork - *Leptoptilos crumeniferus*
Total	_____	***CORMORANTS & DARTER***	CICON	_____	unidentified storks - *Ciconiidae spp.*
PHACA	_____	Great Cormorant - *Phalacrocorax carbo*			
PHAAF	_____	Long-tailed Cormorant - *Phalacrocorax africanus*	*Total*	_____	***IBISES, SPOONBILLS & HAMERKOP***
PHALA	_____	unidentified cormorants - *Phalacrocorax spp.*	THRAE	_____	Sacred Ibis - *Threskiornis aethiopicus*
ANHRU	_____	African Darter - *Anhinga rufa*	HAGHA	_____	Hadada Ibis - *Bostrychia hagedash*
			PLEFA	_____	Glossy Ibis - *Plegadis falcinellus*
Total	_____	***HERONS & EGRETS***	IBISE	_____	unidentified ibises - *Threskiornithidae spp.*
ARDCI	_____	Grey Heron - *Ardea cinerea*	PLALE	_____	Eurasian Spoonbill - *Platalea leucorodia*
ARDME	_____	Black-headed Heron - *Ardea melanocephala*	PLAAL	_____	African Spoonbill - *Platalea alba*
ARDGO	_____	Goliath Heron - *Ardea goliath*	PLATA	_____	unidentified spoonbills - *Platalea spp.*
ARDPU	_____	Purple Heron - *Ardea purpurea*	SCOUM	_____	Hamerkop - *Scopus umbretta*
EGRAL	_____	Great White Egret - *Casmerodius albus*			
EGRAR	_____	Black Heron - *Egretta ardesiaca*	*Total*	_____	***FLAMINGOS***

EGRIN	_____	Intermediate Egret - *Mesophyx intermedia*
EGRGU	_____	Western Reef Egret - *Egretta gularis*
EGRGA	_____	Little Egret - *Egretta garzetta*
BUBIB	_____	Cattle Egret - *Bubulcus ibis*
EGRET	_____	unidentified egrets - *Egretta/Bubulcus spp.*
ARDRA	_____	Squacco Heron - *Ardeola ralloides*
BUTST	_____	Green-backed Heron - *Butorides striatus*
NYCNY	_____	Black-crowned Night-heron - *Nycticorax nycticorax*
IXOMI	_____	Little Bittern - *Ixobrychus minutus*
IXOST	_____	African Dwarf Bittern - *Ixobrychus sturmii*
ARDEI	_____	unidentified Ardeidae - *Ardeidae spp.*
Total	_____	***GEESE & DUCKS***
DENBI	_____	Fulvous Whistling Duck - *Dendrocygna bicolor*
DENVI	_____	White-faced Whistling Duck - *Dendrocygna viduata*
PLEGA	_____	Spur-winged Goose - *Plectropterus gambensis*
SARME	_____	Knob-billed Duck - *Sarkidiornis melanotos*
ALOAE	_____	Egyptian Goose - *Alopochen aegyptiacus*
NETAU	_____	African Pygmy Goose - *Nettapus auritus*
ANAPE	_____	Wigeon - *Anas penelope*
ANACR	_____	Green-winged Teal - *Anas crecca*
ANAAC	_____	Northern Pintail - *Anas acuta*
ANAHO	_____	Hottentot Teal - *Anas hottentota*
ANAQU	_____	Garganey - *Anas querquedula*
ANACL	_____	Northern Shoveler - *Anas clypeata*
AYTFE	_____	Pochard - *Aythya ferina*
AYTNY	_____	Ferruginous Duck - *Aythya nyroca*
AYTFU	_____	Tufted Duck - *Aythya fuligula*
DUCKS	_____	unidentified ducks - *Anatinae spp.*
Total	_____	***RAILS, GALLINULES & COOTS***
PORFL	_____	Black Crake - *Amaurornis flavirostra*
GALCH	_____	Moorhen - *Gallinula chloropus*
GALAN	_____	Lesser Moorhen - *Gallinula angulata*
GALAL	_____	Allen's Gallinule - *Porphyrio alleni*
PORPO	_____	Purple Swamphen - *Porphyrio porphyrio*
FULAT	_____	Common Coot - *Fulica atra*
RAILS	_____	Unidentified rallids - *Rallidae spp.*
Total	_____	***WADERS/SHOREBIRDS***
ROSBE	_____	Painted Snipe - *Rostratula benghalensis*
HAEOS	_____	Eurasian Oystercatcher - *Haematopus ostralegus*
HIMHI	_____	Black-winged Stilt - *Himantopus himantopus*
RECAV	_____	Pied Avocet - *Recurvirostra avosetta*
BURSE	_____	Senegal Thick-knee - *Burhinus senegalensis*
BURCA	_____	Spotted Dikkop - *Burhinus capensis*
PLUAE	_____	Egyptian Plover - *Pluvianus aegyptius*
RHICH	_____	Violet-tipped Courser - *Rhinoptilus chalcopterus*
CURCU	_____	Cream-coloured Courser - *Cursorius cursor*
CURTE	_____	Temminck's Courser - *Cursorius temminckii*
GLAPR	_____	Common Pratincole - *Glareola pratincola*
VANCR	_____	Long-toed Lapwing - *Vanellus crassirostris*
VANSP	_____	Spur-winged Plover - *Vanellus spinosus*
VANTE	_____	Black-headed Plover - *Vanellus tectus*
VANAL	_____	White-headed Lapwing - *Vanellus albiceps*
VANLU	_____	Senegal Plover - *Vanellus lugubris*

PHORO	_____	Greater Flamingo - *Phoenicopterus ruber roseus*
PHOMI	_____	Lesser Flamingo - *Phoenicopterus minor*
PHOEN	_____	unidentified flamingos - *Phoenicopteridae spp.*
		CRANES
BALPA	_____	Black Crowned Crane - *Balearica pavonina*
Total	_____	***FINFOOT & JACANAS***
PODSE	_____	African Finfoot - *Podica senegalensis*
MICCA	_____	Lesser Jacana - *Microparra capensis*
ACTAF	_____	African Jacana - *Actophilornis africana*
TRIST	_____	Marsh Sandpiper - *Tringa stagnatilis*
TRINE	_____	Greenshank - *Tringa nebularia*
TRIOC	_____	Green Sandpiper - *Tringa ochropus*
TRIGL	_____	Wood Sandpiper - *Tringa glareola*
XENCI	_____	Terek Sandpiper - *Tringa cinereus*
ACTHY	_____	Common Sandpiper - *Tringa hypoleucos*
TRING	_____	unidentified Tringa sandpipers - *Tringa spp.*
AREIN	_____	Ruddy Turnstone - *Arenaria interpres*
GALMD	_____	Great Snipe - *Gallinago media*
GALGA	_____	Common Snipe - *Gallinago gallinago*
GALIN	_____	unidentified snipes - *Gallinago spp.*
CALCA	_____	Red Knot - *Calidris canutus*
CALAA	_____	Sanderling - *Calidris alba*
CALMI	_____	Little Stint - *Calidris minuta*
CALTE	_____	Temminck's Stint - *Calidris temminckii*
CALAL	_____	Dunlin - *Calidris alpina*
CALFE	_____	Curlew Sandpiper - *Calidris ferruginea*
CALID	_____	unidentified Calidris sandpipers - *Calidris spp.*
PHIPU	_____	Ruff - *Philomachus pugnax*
WADER	_____	unidentified waders - *Charadrii spp.*
Total	_____	***GULLS, TERNS & SKIMMER***
LARAU	_____	Audouin's Gull - *Larus audouinii*
LARCS	_____	Yellow-legged Herring Gull - *Larus cachinnans*
LARFU	_____	Lesser Black-backed Gull - *Larus fuscus*
LARCI	_____	Grey-headed Gull - *Larus cirrocephalus*
LARRI	_____	Black-headed Gull - *Larus ridibundus*
LARGE	_____	Slender-billed Gull - *Larus genei*
LARUS	_____	unidentified gulls - *Larus spp.*
CHLHY	_____	Whiskered Tern - *Chlidonias hybridus*
CHLLE	_____	White-winged Black Tern - *Chlidonias leucopterus*
CHLNI	_____	Black Tern - *Chlidonias niger*
CHLID	_____	unidentified marsh terns - *Chlidonias spp.*
GELNI	_____	Gull-billed Tern - *Gelochelidon nilotica*
STECA	_____	Caspian Tern - *Sterna caspia*
STEHI	_____	Common Tern - *Sterna hirundo*
STEDO	_____	Roseate Tern - *Sterna dougallii*
STEAL	_____	Little Tern - *Sterna albifrons*
STEMA	_____	Royal Tern - *Sterna maxima*
STEBE	_____	Lesser Crested-Tern - *Sterna bengalensis*
STESA	_____	Sandwich Tern - *Sterna sandvicensis*
STERN	_____	unidentified Sterna terns - *Sterna spp.*
RYNFL	_____	African Skimmer - *Rynchops flavirostris*

VANSE	_____	Senegal Wattled Plover - *Vanellus senegallus*	*Total*	_____	***BIRDS OF PREY***
PLUVI	_____	Plover spp. - *Vanellus spp.*	PANHA	_____	Osprey - *Pandion haliaetus*
PLUSQ	_____	Grey Plover - *Pluvialis squatarola*	HALVO	_____	African Fish Eagle - *Haliaeetus vocifer*
CHAHI	_____	Common Ringed Plover - *Charadrius hiaticula*	CIRAE	_____	Marsh Harrier - *Circus aeruginosus*
CHADU	_____	Little Ringed Plover - *Charadrius dubius*	CIRMA	_____	Pallid Harrier - *Circus macrourus*
CHAPE	_____	Kittlitz's Sandplover - *Charadrius pecuarius*	CIRPY	_____	Montagu's Harrier - *Circus pygargus*
CHAFO	_____	Forbes's Plover - *Charadrius forbesi*	CIRCU	_____	unidentified harriers - *Circus spp.*
CHAAL	_____	Kentish Plover - *Charadrius alexandrinus*	ASICA	_____	Marsh Owl - *Asio capensis*
CHAMA	_____	White-fronted Sandplover - *Charadrius marginatus*			
CHARA	_____	unidentified Charadrius plovers - *Charadrius spp.*	*Total*	_____	***ADDITIONAL SPECIES***
LIMLI	_____	Black-tailed Godwit - *Limosa limosa*		_____	_____
LIMLA	_____	Bar-tailed Godwit - *Limosa lapponica*		_____	_____
NUMPH	_____	Whimbrel - *Numenius phaeopus*		_____	_____
NUMAR	_____	Eurasian Curlew - *Numenius arquata*		_____	_____
TRIER	_____	Spotted Redshank - *Tringa erythropus*		_____	_____
TRITO	_____	Redshank - *Tringa totanus*	**TOTALS:**	_____	**BIRDS of _____ SPECIES**

Please return this form to your National Coordinator or Wetlands International

COMPILATEUR, nom et adresse:	**DENOMBREMENTS D'OISEAUX D'EAU EN AFRIQUE** **FORMULAIRE DE COMPTAGE** **AFRIQUE CENTRALE**

WETLANDS INTERNATIONAL
B.P. 8060
Dakar - Yoff
Sénégal

DATE DU COMPTAGE:	**PAYS:**
HEURE:	
NOM DU SITE:	
PROVINCE/REGION: **GRANDE VILLE LA PLUS PROCHE:**	**CODE DU SITE:**
COMPTAGE REALISE: par Avion☐ à Pied ☐ par Bateau ☐ Mixte ☐	**LE SITE A-T-IL DEJA FAIT L'OBJET D'UN COMPTAGE**? Oui ☐Non ☐ **EN TANT QUE PARTIE D'UNE PLUS GRANDE ZONE**, détailler s.v.p:
COUVERTURE DU COMPTAGE: % Si < 100%, indiquer s.v.p. la surface couverte sur une carte schématisée.	
ETAT DE LA ZONE HUMIDE (p.e. sèche, inondée):	
STATUT DU SITE, protection, dérangement:	

Total	_____	***GREBES***	*Total*	_____	***CIGOGNES***
TACRU	_____	Grèbe castagneux - *Tachybaptus ruficollis*	MYCIB	_____	Tantale ibis - *Mycteria ibis*
			ANALA	_____	Bec-ouvert africain - *Anastomus lamelligerus*
Total	_____	***PELICANS***	CICAB	_____	Cigogne d'Abdim - *Ciconia abdimii*
PELON	_____	Pélican blanc - *Pelecanus onocrotalus*	CICEP	_____	Cigogne épiscopale - *Ciconia episcopus*
PELRU	_____	Pélican roussâtre - *Pelecanus rufescens*	CICCI	_____	Cigogne blanche - *Ciconia ciconia*
PELEC	_____	Pélicans non ident. - *Pelecanus spp.*	EPHSE	_____	Jabiru du Sénégal - *Ephippiorhynchus senegalensis*
			LEPCR	_____	Marabout d'Afrique - *Leptoptilos crumeniferus*
Total	_____	***CORMORANS & ANHINGA***			
PHACA	_____	Grand Cormoran - *Phalacrocorax carbo*	*Total*	_____	***IBIS & SPATULES***
PHAAF	_____	Cormoran africain - *Phalacrocorax africanus*	THRAE	_____	Ibis sacré - *Threskiornis aethiopicus*
PHACS	_____	Cormoran du Cap - *Phalacrocorax capensis*	HAGHA	_____	Ibis hagedash - *Bostrychia hagedash*
PHALA	_____	Cormorans non ident. - *Phalacrocorax spp.*	LAMRA	_____	Ibis vermiculé - *Bostrychia rara*
ANHRU	_____	Anhinga roux - *Anhinga rufa*	LAMOL	_____	Ibis olive - *Bostrychia olivacea*
			IBISE	_____	Ibis non ident. - *Threskiornithidae spp.*
Total	_____	***HERONS & AIGRETTES***	PLAAL	_____	Spatule d'Afrique - *Platalea alba*
ARDCI	_____	Héron cendré - *Ardea cinerea*			
ARDME	_____	Héron mélanocéphale - *Ardea melanocephala*	*Total*	_____	***OMBRETTE & BEC-en-SABOT***
ARDGO	_____	Héron goliath - *Ardea goliath*	SCOUM	_____	Ombrette du Sénégal - *Scopus umbretta*
ARDPU	_____	Héron pourpré - *Ardea purpurea*	BALRX	_____	Bec-en-sabot du Nil - *Balaeniceps rex*
EGRAL	_____	Grande Aigrette - *Casmerodius albus*			
EGRAR	_____	Aigrette ardoisée - *Egretta ardesiaca*	*Total*	_____	***FLAMANTS***
EGRIN	_____	Aigrette intermédiaire - *Mesophyx intermedia*	PHOMI	_____	Flamant nain - *Phoenicopterus minor*
EGRGU	_____	Aigrette à gorge blanche - *Egretta gularis*	PHOEN	_____	Flamants non ident. - *Phoenicopteridae spp.*
EGRGA	_____	Aigrette garzette - *Egretta garzetta*			
BUBIB	_____	Héron gardeboeuf - *Bubulcus ibis*			***GRUE***
EGRET	_____	Aigrette/Gardeboeuf non ident. - *Egretta/Bub. spp.*	BUGCA	_____	Grue caronculée - *Grus carunculatus*

ARDRA	_____	Crabier chevelu - *Ardeola ralloides*
ARDRU	_____	Héron à ventre roux - *Ardeola rufiventris*
BUTST	_____	Héron vert - *Butorides striatus*
NYCNY	_____	Bihoreau gris - *Nycticorax nycticorax*
NYCLE	_____	Bihoreau à dos blanc - *Gorsachius leuconotus*
TIGLE	_____	Onoré à huppe blanche - *Tigriornis leucolophus*
IXOMI	_____	Blongios nain - *Ixobrychus minutus*
ARDEI	_____	Ardéidés non ident. - *Ardeidae spp.*

Total	_____	***OIES & CANARDS***
DENBI	_____	Dendrocygne fauve - *Dendrocygna bicolor*
DENVI	_____	Dendrocygne veuf - *Dendrocygna viduata*
PLEGA	_____	Oie de Gambie - *Plectropterus gambensis*
ALOAE	_____	Oie d'Egypte - *Alopochen aegyptiacus*
SARME	_____	Canard casqué - *Sarkidiornis melanotos*
PTEHA	_____	Canard de Hartlaub - *Pteronetta hartlaubi*
NETAU	_____	Sarcelle à oreillons - *Nettapus auritus*
ANACA	_____	Sarcelle du Cap - *Anas capensis*
ANAAC	_____	Canard pilet - *Anas acuta*
ANAQU	_____	Sarcelle d'été - *Anas querquedula*
AYTFE	_____	Fuligule milouin - *Aythya ferina*
AYTFU	_____	Fuligule morillon - *Aythya fuligula*
DUCKS	_____	Canards non ident. - *Anatinae spp.*
Total	_____	***RALES, GALLINULES & FOULQUES***
HIMHA	_____	Râle à pieds rouge - *Himantornis haematopus*
CANOC	_____	Râle à gorge gris - *Canirallus oculeus*
COTRU	_____	Râle à camail - *Sarothrura rufa*
COTPU	_____	Râle perlé - *Sarothrura pulchra*
POREG	_____	Râle de prés - *Crecopsis egregia*
GALCH	_____	Poule d'eau - *Gallinula chloropus*
GALAN	_____	Gallinule africaine - *Gallinula angulata*
GALAL	_____	Talève d'Allen - *Porphyrio alleni*
PORPO	_____	Poule sultane - *Porphyrio porphyrio*
FULAT	_____	Foulque macroule - *Fulica atra*
RAILS	_____	Rallidés non ident. - *Rallidae spp.*
Total	_____	***LIMICOLES***
ROSBE	_____	Rhynchée peinte - *Rostratula benghalensis*
HAEOS	_____	Huîtrier pie - *Haematopus ostralegus*
HIMHI	_____	Echasse blanche - *Himantopus himantopus*
RECAV	_____	Avocette élégante - *Recurvirostra avosetta*
BURVE	_____	Oedicnème vermiculé - *Burhinus vermiculatus*
RHICH	_____	Courvite à ailes violettes - *Rhinoptilus chalcopterus*
CURTE	_____	Courvite de Temminck - *Cursorius temminckii*
GLAPR	_____	Glaréole à collier - *Glareola pratincola*
GLANU	_____	Glaréole auréolée - *Glareola nuchalis*
GLACI	_____	Glaréole grise - *Glareola cinerea*
VANCR	_____	Vanneau à ailes blanches - *Vanellus crassirostris*
VANAR	_____	Vanneau armé - *Vanellus armatus*
VANSP	_____	Vanneau éperonné - *Vanellus spinosus*
VANAL	_____	Vanneau à tête blanche - *Vanellus albiceps*
VANLU	_____	Vanneau demi-deuil - *Vanellus lugubris*

BALPA	_____	Grue couronnée - *Balearica pavonina*
Total	_____	***GREBIFOULQUE & JACANAS***
PODSE	_____	Grébifoulque du Sénégal - *Podica senegalensis*
MICCA	_____	Jacana nain - *Microparra capensis*
ACTAF	_____	Jacana à poitrine dorée - *Actophilornis africana*

TRIOC	_____	Chevalier culblanc - *Tringa ochropus*
TRIGL	_____	Chevalier sylvain - *Tringa glareola*
ACTHY	_____	Chevalier guignette - *Tringa hypoleucos*
TRING	_____	Chevaliers non ident. - *Tringa spp.*
AREIN	_____	Tournepierre à collier - *Arenaria interpres*
GALMD	_____	Bécassine double - *Gallinago media*
GALGA	_____	Bécassine des marais - *Gallinago gallinago*
GALIN	_____	Bécassines non ident. - *Gallinago spp.*
CALCA	_____	Bécasseau maubèche - *Calidris canutus*
CALAA	_____	Bécasseau sanderling - *Calidris alba*
CALMI	_____	Bécasseau minute - *Calidris minuta*
CALTE	_____	Bécasseau de Temminck - *Calidris temminckii*
CALFE	_____	Bécasseau cocorli - *Calidris ferruginea*
CALID	_____	Bécasseaux non ident. - *Calidris spp.*
PHIPU	_____	Chevalier combattant - *Philomachus pugnax*
WADER	_____	Limicoles non ident. - *Charadrii spp.*
Total	_____	***GOELANDS, STERNES & BEC-EN-CISEAUX***
LARAU	_____	Goéland d'Audouin - *Larus audouinii*
LARAR	_____	Goéland argenté - *Larus argentatus*
LARCS	_____	Goëland leucophée - *Larus cachinnans*
LARFU	_____	Goéland brun - *Larus fuscus*
LARCI	_____	Mouette à tête grise - *Larus cirrocephalus*
LARRI	_____	Mouette rieuse - *Larus ridibundus*
LARGE	_____	Goéland railleur - *Larus genei*
LARUS	_____	Mouettes/Goélands non ident. - *Larus spp.*
CHLLE	_____	Guifette leucoptère - *Chlidonias leucopterus*
CHLNI	_____	Guifette noire - *Chlidonias niger*
CHLID	_____	Guifettes non ident. - *Chlidonias spp.*
STECA	_____	Sterne caspienne - *Sterna caspia*
STEHI	_____	Sterne pierregarin - *Sterna hirundo*
STEAN	_____	Sterne bridée - *Sterna anaethetus*
STEBA	_____	Sterne de baleiniers - *Sterna balaenarum*
STEAL	_____	Sterne naine - *Sterna albifrons*
STEMA	_____	Sterne royale - *Sterna maxima*
STESA	_____	Sterne caugek - *Sterna sandvicensis*
STERN	_____	Sternes non ident. - *Sterna spp.*
RYNFL	_____	Bec-en-ciseaux d'Afrique - *Rynchops flavirostris*
Total	_____	***OISEAUX DE PROIE***
PANHA	_____	Balbuzard pêcheur - *Pandion haliaetus*
HALVO	_____	Pygargue vocifer - *Haliaeetus vocifer*
CIRRA	_____	Busard grenouillard - *Circus ranivorus*
CIRAE	_____	Busard des roseaux - *Circus aeruginosus*
CIRMA	_____	Busard pâle - *Circus macrourus*

PLUVI	_____	Pluviers non ident. - *Vanellus spp.*	CIRPY	_____	Busard cendré - *Circus pygargus*
PLUFU	_____	Pluvier fauve - *Pluvialis fulva*	CIRCU	_____	Busards non ident. - *Circus spp.*
PLUSQ	_____	Pluvier argenté - *Pluvialis squatarola*			
CHAHI	_____	Grand Gravelot - *Charadrius hiaticula*	*Total*	_____	***AUTRES ESPECES***
CHADU	_____	Petit Gravelot - *Charadrius dubius*		_____	_____
CHAPE	_____	Gravelot pâtre - *Charadrius pecuarius*		_____	_____
CHAFO	_____	Gravelot de Forbes - *Charadrius forbesi*		_____	_____
CHAAL	_____	Gravelot à collier interrompu - *Char. alexandrinus*		_____	_____
CHAMA	_____	Gravelot à front blanc - *Charadrius marginatus*		_____	_____
CHARA	_____	Gravelots non ident. - *Charadrius spp.*		_____	_____
LIMLI	_____	Barge à queue noire - *Limosa limosa*		_____	_____
LIMLA	_____	Barge rousse - *Limosa lapponica*		_____	_____
NUMPH	_____	Courlis corlieu - *Numenius phaeopus*		_____	_____
NUMAR	_____	Courlis cendré - *Numenius arquata*		_____	_____
TRITO	_____	Chevalier gambette - *Tringa totanus*		_____	_____
TRIST	_____	Chevalier stagnatile - *Tringa stagnatilis*		_____	_____
TRINE	_____	Chevalier aboyeur - *Tringa nebularia*	**TOTAUX :**	_____	**INDIVIDUS de _____ ESPECES**

S.v.p. retourner ce formulaire à votre Coordinateur National ou à Wetlands International

COMPILER'S name and address:	**AFRICAN WATERFOWL CENSUS** **CENSUS FORM** **EASTERN AFRICA**
DATE OF COUNT:	**COUNTRY:**
TIME OF DAY:	
NAME OF SITE:	
PROVINCE/STATE: **NEAREST LARGE TOWN:**	**SITE CODE:**
WAY OF COUNTING: Aerial ☐ on Foot ☐ Boat ☐ Mixed ☐	**HAS THE SITE BEEN COUNTED BEFORE** ? Yes ☐ No ☐ **AS PART OF A LARGER SITE**, please give details:
COVERAGE OF THE COUNT: % If less then 100%, please show covered area on added sketch-map	
CONDITION OF THE WETLAND (e.g. wet, dry**):**	
SITE STATUS, protection, disturbance:	

WETLANDS INTERNATIONAL
PO Box 8060
Dakar - Yoff
Senegal

Total	_____	***GREBES***	*Total*	_____	***STORKS***
PODCR	_____	Great crested Grebe - *Podiceps cristatus*	MYCIB	_____	Yellow-billed Stork - *Mycteria ibis*
TACRU	_____	Little Grebe - *Tachybaptus ruficollis*	ANALA	_____	African Openbilled Stork - *Anastomus lamelligerus*
PODNI	_____	Black-necked Grebe - *Podiceps nigricollis*	CICNI	_____	Black Stork - *Ciconia nigra*
			CICAB	_____	Abdim's Stork - *Ciconia abdimii*
Total	_____	***PELICANS***	CICEP	_____	Woolly-necked Stork - *Ciconia episcopus*
PELON	_____	Great White Pelican - *Pelecanus onocrotalus*	CICCI	_____	White Stork - *Ciconia ciconia*
PELRU	_____	Pink-backed Pelican - *Pelecanus rufescens*	EPHSE	_____	Saddle-billed Stork - *Ephippiorhynchus senegalensis*
PELEC	_____	unidentified pelicans - *Pelecanus spp.*	LEPCR	_____	Marabou Stork - *Leptoptilos crumeniferus*
			STORK	_____	unidentified storks - *Ciconiidae spp.*
Total	_____	***CORMORANTS & DARTER***			
PHACA	_____	Great Cormorant - *Phalacrocorax carbo*	*Total*	_____	***IBISES, SPOONBILLS, HAMERKOP & SHOEBILL***
PHAAF	_____	Long-tailed Cormorant - *Phalacrocorax africanus*	THRAE	_____	Sacred Ibis - *Threskiornis aethiopicus*
PHALA	_____	unidentified cormorants - *Phalacrocorax spp.*	HAGHA	_____	Hadada Ibis - *Bostrychia hagedash*
ANHRU	_____	African Darter - *Anhinga rufa*	?	_____	Wattled Ibis - *Bostrychia carunculata*
			PLEFA	_____	Glossy Ibis - *Plegadis falcinellus*
Total	_____	***HERONS & EGRETS***	PLALE	_____	Eurasian Spoonbill - *Platalea leucorodia*
ARDCI	_____	Grey Heron - *Ardea cinerea*	PLAAL	_____	African Spoonbill - *Platalea alba*
ARDME	_____	Black-headed Heron - *Ardea melanocephala*	SCOUM	_____	Hamerkop - *Scopus umbretta*
ARDGO	_____	Goliath Heron - *Ardea goliath*	??	_____	Shoebill - *Balaeniceps rex*
ARDPU	_____	Purple Heron - *Ardea purpurea*			
EGRAL	_____	Great Egret - *Casmerodius albus*	*Total*	_____	***FLAMINGOS***
EGRAR	_____	Black Heron - *Egretta ardesiaca*	PHORO	_____	Greater Flamingo - *Phoenicopterus ruber roseus*
EGRIN	_____	Yellow-billed Egret - *Mesophoyx intermedia*	PHOMI	_____	Lesser Flamingo - *Phoenicopterus minor*
EGRDI	_____	Dimorphic Egret - *Egretta dimorpha*	PHOEN	_____	unidentified flamingos - *Phoenicopteridae spp.*
EGRGA	_____	Little Egret - *Egretta garzetta*			
EGRGU	_____	Western Reef Egret - *Egretta gularis*	*Total*	_____	***CRANES***

BUBIB	_____	Cattle Egret - *Bubulcus ibis*
EGRET	_____	unidentified egrets - *Egretta/Bubulcus spp.*
ARDRA	_____	Squacco Heron - *Ardeola ralloides*
ARDID	_____	Madagascar Squacco Heron - *Ardeola idae*
BUTST	_____	Green-backed Heron - *Butorides striatus*
NYCNY	_____	Black-crowned Night-heron - *Nycticorax nycticorax*
IXOMI	_____	Little Bittern - *Ixobrychus minutus*
IXOST	_____	Dwarf Bittern - *Ixobrychus sturmii*
ARDEI	_____	unidentified Ardeidae - *Ardeidae spp.*
Total	_____	***GEESE & DUCKS***
DENBI	_____	Fulvous Whistling Duck - *Dendrocygna bicolor*
DENVI	_____	White-faced Whistling Duck - *Dendrocygna viduata*
THALE	_____	White-backed Duck - *Thalassornis leuconotus*
PLEGA	_____	Spur-winged Goose - *Plectropterus gambensis*
SARME	_____	Knob-billed Duck - *Sarkidiornis melanotos*
ALOAE	_____	Egyptian Goose - *Alopochen aegyptiacus*
NETAU	_____	African Pygmy Goose - *Nettapus auritus*
ANAPE	_____	Wigeon - *Anas penelope*
ANACR	_____	Common Teal - *Anas crecca*
ANACA	_____	Cape Teal - *Anas capensis*
ANAUN	_____	Yellow-billed Duck - *Anas undulata*
ANASP	_____	African Black Duck - *Anas sparsa*
ANAAC	_____	Northern Pintail - *Anas acuta*
ANAER	_____	Red-billed Teal - *Anas erythrorhynchos*
ANAHO	_____	Hottentot Teal - *Anas hottentota*
ANAQU	_____	Garganey - *Anas querquedula*
ANACL	_____	Shoveler - *Anas clypeata*
NETER	_____	Southern Pochard - *Netta erythropthalma*
OXYMA	_____	Maccoa Duck - *Oxyura maccoa*
DUCKS	_____	unidentified ducks - *Anatinae spp.*
Total	_____	***RAILS, GALLINULES & COOTS***
RALCA	_____	African Water Rail - *Rallus caerulescens*
POREG	_____	African Crake - *Crecopsis egregia*
PORFL	_____	Black Crake - *Amaurornis flavirostra*
GALCH	_____	Common Moorhen - *Gallinula chloropus*
GALAN	_____	Lesser Moorhen - *Gallinula angulata*
GALAL	_____	Alllen's Gallinule- *Porphyrio alleni*
PORPO	_____	Purple Swamphen - *Porphyrio porphyrio*
FULCR	_____	Red-knobbed Coot - *Fulica cristata*
RAILS	_____	Unidentified Rallids - *Rallidae spp.*
Total	_____	***WADERS/SHOREBIRDS***
ROSBE	_____	Painted Snipe - *Rostratula benghalensis*
DROAR	_____	Crab Plover - *Dromas ardeola*
HAEOS	_____	Eurasian Oystercatcher - *Haematopus ostralegus*
HIMHI	_____	Black-winged Stilt - *Himantopus himantopus*
RECAV	_____	Pied Avocet - *Recurvirostra avosetta*
BURSE	_____	Senegal Thick-knee - *Burhinus senegalensis*
BURVE	_____	Water Thick-knee - *Burhinus vermiculatus*
BURCA	_____	Spotted Thick-knee - *Burhinus capensis*
RHIAF	_____	Two-banded Courser - *Rhinoptilus africanus*
RHICI	_____	Heuglin's Courser - *Rhinoptilus cinctus*
RHICH	_____	Violet-tipped Courser - *Rhinoptilus chalcopterus*

?	_____	Common Crane - *Grus grus*
?	_____	Wattled Crane - *Grus carunculatus*
?	_____	DemoiselleCrane - *Grus virgo*
BALPA	_____	Black Crowned Crane - *Balearica pavonina*
BALRE	_____	Grey Crowned Crane - *Balearica regulorum*
Total	_____	***FINFOOT & JACANAS***
PODSE	_____	African Finfoot - *Podica senegalensis*
MICCA	_____	Lesser Jacana - *Microparra capensis*
ACTAF	_____	African Jacana - *Actophilornis africana*
CHAAL	_____	Kentisch Plover - *Charadrius alexandrinus*
CHAMA	_____	White-fronted Sandplover - *Charadrius marginatus*
CHAMO	_____	Lesser Sandplover - *Charadrius mongolus*
CHALE	_____	Greater Sandplover - *Charadrius leschenaultii*
CHAAS	_____	Caspian Plover - *Charadrius asiaticus*
CHARA	_____	unidentified Charadrius plovers - *Charadrius spp.*
LIMLI	_____	Black-tailed Godwit - *Limosa limosa*
LIMLA	_____	Bar-tailed Godwit - *Limosa lapponica*
NUMPH	_____	Whimbrel - *Numenius phaeopus*
NUMAR	_____	Curlew - *Numenius arquata*
TRIER	_____	Spotted Redshank - *Tringa erythropus*
TRITO	_____	Common Redshank - *Tringa totanus*
TRIST	_____	Marsh Sandpiper - *Tringa stagnatilis*
TRINE	_____	Common Greenshank - *Tringa nebularia*
TRIOC	_____	Green Sandpiper - *Tringa ochropus*
TRIGL	_____	Wood Sandpiper - *Tringa glareola*
ACTHY	_____	Common Sandpiper - *Tringa hypoleucos*
XENCI	_____	Terek Sandpiper - *Tringa cinereus*
TRING	_____	unidentified Tringa sandpipers - *Tringa spp.*
AREIN	_____	Ruddy Turnstone - *Arenaria interpres*
GALNI	_____	African Snipe - *Gallinago nigripennis*
GALMD	_____	Great Snipe - *Gallinago media*
GALGA	_____	Common Snipe - *Gallinago gallinago*
CALAA	_____	Sanderling - *Calidris alba*
CALMI	_____	Little Stint - *Calidris minuta*
CALFE	_____	Curlew Sandpiper - *Calidris ferruginea*
CALAL	_____	Dunlin - *Calidris alpina*
CALID	_____	unidentified Calidris sandpipers - *Calidris spp.*
PHIPU	_____	Ruff - *Philomachus pugnax*
WADER	_____	unidentified waders - *Charadrii spp.*
Total	_____	***GULLS, TERNS & SKIMMER***
LARFU	_____	Lesser Black-backed Gull - *Larus fuscus*
LARCI	_____	Grey-headed Gull - *Larus cirrocephalus*
LARRI	_____	Black-headed Gull - *Larus ridibundus*
LARUS	_____	unidentified gulls - *Larus spp.*
CHLHY	_____	Whiskered Tern - *Chlidonias hybridus*
CHLLE	_____	White-winged Black Tern - *Chlidonias leucopterus*
CHLID	_____	unidentified marsh terns - *Chlidonias spp.*
GELNI	_____	Gull-billed Tern - *Gelochelidon nilotica*
STECA	_____	Caspian Tern - *Sterna caspia*
STEHI	_____	Common Tern - *Sterna hirundo*
STEFU	_____	Sooty Tern - *Sterna fuscata*
STEAL	_____	Little Tern - *Sterna albifrons*
STEBE	_____	Lesser Crested Tern - *Sterna bengalensis*

CURTE	_____	Temminck's Courser - *Cursorius temminckii*
GLAPR	_____	Collared Pratincole - *Glareola pratincola*
GLANU	_____	Rock Pratincole - *Glareola nuchalis*
VANCR	_____	Long-toed Lapwing - *Vanellus crassirostris*
VANAR	_____	Blacksmith Plover - *Vanellus armatus*
VANSP	_____	Spur-winged Plover - *Vanellus spinosus*
VANTE	_____	Black-headed Plover - *Vanellus tectus*
VANLU	_____	Senegal Plover - *Vanellus lugubris*
VANME	_____	Black-winged Plover - *Vanellus melanopterus*
VANCO	_____	Crowned Lapwing - *Vanellus coronatus*
VANSE	_____	African Wattled Plover - *Vanellus senegallus*
PLUVI	_____	unidentified plover spp. - *Vanellus spp.*
PLUSQ	_____	Grey Plover - *Pluvialis squatarola*
CHAHI	_____	Ringed Plover - *Charadrius hiaticula*
CHADU	_____	Little Ringed Plover - *Charadrius dubius*
CHAPE	_____	Kittlitz's Sandplover - *Charadrius pecuarius*
CHATR	_____	Three-banded Plover - *Charadrius tricollaris*

STERN	_____	unidentified Sterna terns - *Sterna spp.*
RYNFL	_____	African Skimmer - *Rhynchops flavirostris*
Total	_____	***BIRDS OF PREY***
PANHA	_____	Osprey - *Pandion haliaetus*
HALVO	_____	African Fish Eagle - *Haliaeetus vocifer*
CIRAE	_____	Eurasian Marsh Harrier - *Circus aeruginossus*
CIRRA	_____	African Marsh Harrier - *Circus ranivorus*
CIRMA	_____	Pallid Harrier - *Circus macrourus*
CIRPY	_____	Montagu's Harrier - *Circus pygargus*
Total	_____	***ADDITIONAL SPECIES***
	_____	_____
	_____	_____
	_____	_____
	_____	_____
TOTALS:	_____	**BIRDS of _____ SPECIES**

Please return this form to your National Co-ordinator or Wetlands International

Annex 4
Status and Distribution of Black Crowned Cranes in Africa – Questionnaire 2000

SAMPLE QUESTIONNAIRE-ENGLISH

International Crane Foundation
E-11376 Shady Lane Road,
P. O. Box 477
Baraboo,Wisconsin (53913-0447), USA
Tel: 608-356-9462 x 131
Fax: 608-356-9465
cranes@savingcranes.com

Wetlands International
407 Cité Djily Mbaye
B. P. 8060
Dakar-Yoff, Senegal
Tel: 221-820-6478
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wetlands@telecomplus.sn

THE STATUS AND DISTRIBUTION OF BLACK CROWNED CRANES IN AFRICA

The International Crane Foundation and Wetlands International have launched a new project to determine the status and distribution of Black Crowned Cranes (*Balearica pavonina*). Once widespread across the Sahel and Sudan Savanna regions of Africa, Black Crowned Cranes have been in dramatic decline across much of their range over the past twenty-five years. Little is known about the extent or cause of this decline. In early 2000, we are encouraging survey participants in nineteen Africa nations to assess the population size, distribution, habitats, and specific threats to Black Crowned Cranes in their countries. The survey will be conducted primarily through the annual African Waterbird Census. Survey coordinators from each of the key countries where Black Crowned Cranes occur will be invited to meet at the Pan-African Ornithological Congress in (PAOC 10) September, 2000 to produce a Black Crowned Crane Action Plan.

Please fill out the following form describing the status and distribution of Black Crowned Cranes *Balearica pavonina* in your region and send it to Wetlands International Africa Office in Senegal.

Details of compliler(s)

Name:_____ Address:_____

Phone:_____ Fax:_____ e-mail:_____ Date_____

Region/Country reported: (please define your region, which may be anything from a particular site to a province, country or group of countries)_____

1. **Distribution:**

List the areas of occurrence (documented) and possible areas of occurrence (not documented) of Black Crowned Cranes in your region. Please provide specific records if available and a map if possible.

	Location	Estimated number of individuals*	Habitat type	Habitat Use	Season
1	Region / Province: Site: Area(ha/Km²):	❑ None ❑ Less than 10 ❑ 10-50 ❑ 50-100 ❑ 100-500 ❑ 500-1000 ❑ more than 1000	❑ Large floodplains ❑ Seasonally flooded wetlands ❑ Edges of water bodies ❑ Dry savannah ❑ Agricultural fields ❑ Other(specify)	❑ Breeding ❑ Feeding ❑ Roosting ❑ Other (specify)	❑ Wet season ❑ Dry season ❑ Year-round resident

2	Region / Province: Site: Area:	❑ None ❑ Less than 10 ❑ 10-50 ❑ 50-100 ❑ 100-500 ❑ 500-1000 ❑ more than 1000	❑ Large floodplains ❑ Seasonally flooded wetlands ❑ Edges of water bodies ❑ Dry savannah ❑ Agricultural fields ❑ Other(specify)	❑ Breeding ❑ Feeding ❑ Roosting ❑ Other (specify)	❑ Wet season ❑ Dry season ❑ Year-round resident
3	Region / Province: Site: Area:	❑ None ❑ Less than 10 ❑ 10-50 ❑ 50-100 ❑ 100-500 ❑ 500-1000 ❑ more than 1000	❑ Large floodplains ❑ Seasonally flooded wetlands ❑ Edges of water bodies ❑ Dry savannah ❑ Agricultural fields ❑ Other(specify)	❑ Breeding ❑ Feeding ❑ Roosting ❑ Other (specify)	❑ Wet season ❑ Dry season ❑ Year-round resident
4	Region / Province: Site: Area:	❑ None ❑ Less than 10 ❑ 10-50 ❑ 50-100 ❑ 100-500 ❑ 500-1000 ❑ more than 1000	❑ Large floodplains ❑ Seasonally flooded wetlands ❑ Edges of water bodies ❑ Dry savannah ❑ Agricultural fields ❑ Other(specify)	❑ Breeding ❑ Feeding ❑ Roosting ❑ Other (specify)	❑ Wet season ❑ Dry season ❑ Year-round resident
Other information:					

(Please use an extra sheet for additional sites)

Do Grey Crowned Cranes also occur in your region? ☐ Yes or ☐ No
If so, where and how many (approx.): -_____

2. Population size

Estimated total number of Black Crowned Cranes in your country
☐< 10, ☐ 10 - 50, ☐ 50 - 100, ☐ 100 - 500, ☐500 - 1000, etc.

Population estimate (try to give a specific figure):_____

3. Status and Movements of Black Crowned Cranes

Are the Black Crowned Cranes in your region showing any noticeable trend in number? Are they:
☐ Stable, ☐ Increasing, ☐ Declining, ☐ Unknown

Years over which trend has occurred _____

Do the cranes move away from your region at certain times of the year? ☐Yes or ☐ No

Do you have an idea of where they can be found when absent from your region or site? ☐ Yes or ☐ No

When are they present in your region? (months or season)_____

Do the cranes move locally? ☐ Yes or ☐ No
How ? ☐ Daily, ☐ Seasonally, ☐ Other:_____

Place they move to (if known) _____

Distance or direction moved (if known) _____

Do the cranes utilise trees in your region? ☐ Yes or ☐ No

If yes, what species of trees and for what purpose?_____

5. Diets of Black Crowned Cranes

Do you know what comprises the diets of Black crowned cranes in your country? ☐ Yes or ☐ No

If yes, please specify:_____

In which areas do cranes feed?_____

Do farmers in your region experience problems with cranes eating their crops? ☐ Yes or ☐ No

If yes, what type of crop(s)?_____

6. Breeding

Do you know whether Black Crowned Crane breeds in your country? ☐ Yes or ☐ No

If yes, where exactly do they breed?_____

At what time of the year do they breed? (month or season):_____

Can you estimate the number of breeding adults? (estimate):_____

Do you know of any threats affecting their breeding success?
(threats):_____

7. Threats to Black Crowned Cranes (please indicate which of the following factors are a threat to Black Crowned Cranes in your region)

HUMAN FACTOR	❑ Removal of eggs from nest
Loss and degradation of crane habitat	**Poisoning**
❑ Conversion of wetlands (e.g., agricultural drainage)	❑ Direct poisoning to protect crops
❑ Overgrazing	❑ Indirect poisoning due to use of agricultural chemicals (e.g, Quelea spraying, herb/pesticides()
❑ Over-exploitation of wetland resources	**Other human threats**
	❑ Fires for land clearing or bushmeat
❑ Changes in agricultural land use and other agricultural impacts (e.g., drainage and irrigation)	❑ Disturbance of nesting sites due to human activity(e.g road expansion and land development)
❑ Dams and water diversion	❑ Warfare and political instability
❑ Urban expansion and land development	❑ Lack of effective legislation and protection
❑ Oil exploration	❑ Constructions (e.g., roads)
❑ Cutting of roost trees	**Inadequate protection**
	❑ Inadequate laws
❑ Other changes in vegetation	❑ Inadequate enforcement or penalties
❑ Pollution and environmental contamination (e.g., pesticides, fertilizers)	**BIOLOGICAL FACTORS**
	❑ Predation by other animals
❑ Human activities in wetland areas	❑ Competition with other animals
Direct exploitation	❑ Disease
❑ Sport hunting	
❑ Subsistence hunting	**CLIMATIC AND OTHER ENVIRONMENTAL FACTORS**
	❑ Drought
❑ Live trapping for commercial trade	❑ Flooding
❑ Live trapping for domestication	❑ Desertification

8. Local attitudes to Black Crowned Cranes

❑ Considered beneficial for agriculture by eating pest species	❑ Symbol of good luck for agriculture or other aspects of village life
❑ Considered harmful to agriculture by feeding on crops	❑ Symbol of bad luck for agriculture or other aspects of village life
❑ Local taboo against hunting or eating	❑ Adults eaten
❑ Eggs taken for food	❑ Other:

9. Is there any legal protection for Black Crowned Cranes or their habitats in your region.
☐ Yes or ☐ No

If yes, please describe briefly:_____

10a. Are any projects underway in your region that may contribute to the conservation of Black Crowned Cranes or their habitats.
☐ Yes or ☐ No

If yes, please describe briefly:_____

10b. Are any projects or developments underway in your region that may contribute to the decline of Black Crowned Cranes or their habitats.
☐ Yes or ☐ No

If yes, please describe briefly:_____

11. Are any education projects underway related to Black Crowned Cranes or their habitats?
☐ Yes or ☐ No

If yes, please describe briefly:_____

12. Sources of information
☐ Field survey, ☐ Database, ☐ Publication, ☐ Personal communication, ☐ Other:

(Please use additional sheet where applicable)

Return completed forms to Wetlands International, 407 Cité Djily Mbaye, B. P. 8060, Dakar-Yoff, Senegal. Tel: + 221-820 - 6478, Fax: + 221 - 820 - 6479, E-mail: wetlands@telecopmlus.sn **or** emmanuelwilliams@hotmail.com

Deadline for reciept of completed questionnaire is 15 April, 2000.

Thank you for completing this form. This information will be used for contributing to an Action Plan for Black Crowned Cranes being developed by the International Crane Foundation & Wetlands International. All informants will receive a free copy of this plan.

Finally, please indicate whether you would like to present a paper or a poster on Black Crowned Crane, during PAOC 10, in Uganda, 3 - 8 September, 2000. ☐Yes or ☐ No

SAMPLE COMPLETED QUESTIONNAIRE-FRENCH

International Crane Foundation
E-11376 Shady Lane Road,
P. O. Box 477
Baraboo, Wisconsin (55913-0447), USA
Tel. 608-356-9462 x 131
Fax. 608-356-9465
lcf@baraboo.com

Wetlands International
407 Cité Djily Mbaye
B.P. 8060
Dakar-Yoff, Sénegal
Tel. 221-820-6478
Fax. 221-820-6479
wetlands@telecomplus.sn

SITUATION ET REPARTITION DE LA GRUE COURONNEE EN AFRIQUE

La Fondation Internationale pour la Grue couronnée et Wetlands International viennent de lancer un nouveau projet dont l'objectif est de connaître la situation et la répartition de la Grue couronnée (*Balearica pavonina*). Jadis très présente sur toute l'étendue du Sahel, mais aussi dans les savanes soudaniennes, la population des Grues couronnes a connu de fortes baisses au cours des vingt cinq dernières années.

On sait très peu de chose sur l'ampleur ou les causes de cette chute brutale. Au début de l'an 2000, les compteurs de 19 pays d'Afrique seront encouragés à procéder à l'évaluation des effectifs de Grues couronnées, de leur répartition, de leurs habitats, mais également des menaces qui leur sont propres. Ce suivi sera effectué surtout lors des dénombrements annuels d'oiseaux d'eau en Afrique. Les coordinateurs de comptage qui sont dans les pays clés où la présence de la Grue couronnée est attestée seront invités à produire un Plan d'Actions en faveur de la Grue couronnée lors du Congrès Panafricain d'Ornithologie (PAOC), qui se tiendra en septembre 2000.

Veuillez remplir le formulaire qui suit pour nous faire part de la situation et de la répartition de la Grue couronnée (*Balearica pavonina*) dans votre région et nous le retourner à l'adresse de Wetlands International, Bureau Afrique, Dakar, Sénégal.

.....

Nom et adresse complète du (ou des) compilateur (s)

Nom : ADJAPKA Boco Jacques **Adresse :** 03 B.P. 1323 Cotonou BENIN

Téléphone : (00229) 35 20 97 **Fax :** (00229) 31 03 08 **E-mail** : adjakpa@syfed.bj.refer.org **Date** 30/03/00

Région/Pays concerné : **(Veuillez spécifier la région couverte pour les besoins du dénombrement, il peut s'agir d'un site donné, d'une province, d'un pays ou d'un groupe de pays) :** Département de l'ATACORA (Parc National de la Pendjari)

1. Répartition

Donnez la liste des sites dans votre région où la présence de la Grue couronnée est attestée (références écrites à l'appui) et les sites où leur présence est probable (pas besoin de références). Produire des données précises si elles existent, ainsi qu'une carte si possible.

	Localisation	Effectif estimé *	Type d'habitat	Utilisation de l'habitat	Saison
1	**Région/ Province :** ATACORA Site : Parc National de la Pendjari Superficie (ha/km²) :	❑ Aucun ❑ Moins de 10 X 10-50 ❑ 50-100 ❑ 100-500 ❑ 500-1000 ❑ Plus de 1000	X Grande plaine d'inondation X Zones humides temporairement inondées X Les rivages des étendues d'eau X Savanes sèches ❑ Champs de culture ❑ Autres (spécifier)	X Reproduction X Nourrissage ❑ Dortoirs ❑ Autres spécifier)	X Saison des pluies X Saison sèche X Résidente permanente

2	**Région/ Province :** Site : Parc National de la Pendjari Superficie (ha/km²) :	❑ Aucun ❑ Moins de 10 ❑ 10-50 ❑ 50-100 ❑ 100-500 ❑ 500-1000 ❑ Plus de 1000	❑ Grande plaine d'inondation ❑ Zones humides temporairement inondées ❑ Les rivages des étendues d'eau ❑ Savanes sèches ❑ Champs de culture ❑ Autres (spécifier)	❑ Reproduction ❑ Nourrissage ❑ Dortoirs ❑ Autres spécifier)	❑ Saison des pluies ❑ Saison sèche ❑ Résidente permanente
3	**Région/ Province :** Site : Parc National de la Pendjari Superficie (ha/km²) :	❑ Aucun ❑ Moins de 10 ❑ 10-50 ❑ 50-100 ❑ 100-500 ❑ 500-1000 ❑ Plus de 1000	❑ **Grande plaine d'inondation** ❑ **Zones humides temporairement inondées** ❑ **Les rivages des étendues** d'eau ❑ **Savanes sèches** ❑ **Champs de culture** ❑ **Autres (spécifier)**	❑ Reproduction ❑ Nourrissage ❑ Dortoirs ❑ Autres spécifier)	❑ Saison des pluies ❑ Saison sèche ❑ Résidente permanente
4	**Région/ Province :** Site : Parc National de la Pendjari Superficie (ha/km²) :	❑ Aucun ❑ Moins de 10 ❑ 10-50 ❑ 50-100 ❑ 100-500 ❑ 500-1000 ❑ Plus de 1000	❑ **Grande plaine d'inondation** ❑ **Zones humides temporairement inondées** ❑ **Les rivages des étendues** d'eau ❑ **Savanes sèches** ❑ **Champs de culture** ❑ **Autres (spécifier)**	❑ Reproduction ❑ Nourrissage ❑ Dortoirs ❑ Autres spécifier)	❑ Saison des pluies ❑ Saison sèche ❑ Résidente permanente
Autres informations					

(Pour d'éventuels sites supplémentaires utiliser une autre feuille A4)
Avez-vous également noté la présence de la Grue Royale dans votre région ? ☐ Oui X Non

Si oui, indiquer le lieu et la quantité (approx.) :

2. Taille de l'effectif

Nombre total de Grues couronnées présentes dans votre pays

☐ <10, **X** 10-50, ☐ 50-100, ☐ 100-500, ☐ 500-1000, etc.

Estimation de l'effectif (essayez de donner un chiffre précis) :

3. Situation et mouvements des Grues couronnées

Est-ce que les Grues couronnées présentes dans votre région montrent une quelconque tendance démographique perceptible au sein de l'effectif ? Quelle est la situation ? :

☐ Stable, ☐ En augmentation, ☐ En baisse, **X** Je ne sais pas

Donnez les années pendant lesquelles la tendance a été observée : Néant

Les Grues couronnées vont-elles ailleurs pendant certaines périodes de l'année ?

☐ Oui ☐ Non **X** Je ne sais pas

Savez-vous où elles vont quand elles quittent votre région ou votre site ? ☐ Oui **X** Non
A quel moment de l'année sont-elles présentes dans votre région ? (mois ou saison) : Toute saison

Les Grues couronnées se déplacent-elles intérieurement ? **X** Oui ☐ Non

Décrivez **X** tous les jours, ☐ Saisonnièrement, ☐ Autres :

Où vont-elles (si vous le savez) : Se nourrir

Distance ou direction des déplacements (si vous le savez) : Néant

Les Grues couronnées utilisent-elles les arbres dans votre région ? **X** Oui ☐ Non

Si oui, quelles sont les espèces d'arbres utilisées et à quelles fins ? : ***Adansonia digitata, Daniellia oliveti, Kaya senegalensis***

4. Régime alimentaire de la Grue couronnée

Savez-vous quels sont les éléments qui constituent son alimentation dans votre pays ?

☐ **Oui** X **Non**

Si oui, veuillez spécifier **:**

Quelles sont les zones de nourrissage des Grues ? : Marres, rivières peu profondes, berges, plaines inondables asséchées.

Dans votre région les agriculteurs sont-ils confrontés à des problèmes de pertes de production liées à l'alimentation des Grues couronnées ? ☐ Oui **X** Non

Si oui, quelle (s) est (sont) la (les) culture (s) concernée (s) ? **: t**

5. La reproduction

Savez-vous si la Grue couronnée niche dans votre pays ? X **Oui** ☐ **Non**

Si oui, situez l'endroit avec précision **:** **Parc National de la Pendjari**

A quel moment de l'année se situe leur reproduction ? (mois ou saison) **: Saison pluvieuse**
(d'après les enquêtes)

Pouvez-vous donner une estimation de l'effectif d'adultes nicheurs ? **:**

Etes-vous au courant d'une menace quelconque sur le taux de réussite des reproductions ?
(menaces) **:** **Ramassage des œufs, capture des jeunes au nid, massacre des adultes**

6. **Menaces auxquelles est confrontée la Grue couronnée** (veuillez indiquer parmi les facteurs suivants ceux qui sont une menace pour la Grue couronnée dans votre région).

Facteurs humains	
Perte et dégradation de l'habitat de la Grue	**Empoisonnement**
❑ Conversion des zones humides (par ex. drainage à des fins agricoles)	❑ Empoisonnement direct pour protéger les cultures
❑ Surpâturage	**X** Empoisonnement indirect suite à l'utilisation de produits chimiques agricoles (par ex. la pulvérisation de Quelea, d'herbicides / pesticides)
❑ Surexploitation des ressources des zones humides	**Autres menaces anthropiques**
❑ Changements d'affectation des sols et autres impacts agricoles (par ex. drainage et irrigation)	**X** Feu de brousse pour débroussailler / gibier
❑ Barrage et déviation des cours d'eau	❑ Perturbation des sites de reproduction suite à des activités anthropiques (par ex. l'extension de routes et l'assainissement)
❑ Expansion urbaine et assainissement	❑ Guerre et instabilité politique
❑ Exploitation pétrolière	❑ Manque de législation et de protection efficace
X Abattage des arbres servant de dortoirs **Recherche de miel**	❑ Construction (de route par ex.)
❑ Autres changements dans la végétation	**Protection Inadéquate**
❑ Pollution et contamination environnementale (par ex. les pesticides, les engrais)	❑ Législation inappropriée
❑ Les activités anthropiques dans les zones humides	**X** Application ou amendes inopérante
Exploitation directe	
X Chasse sportive	**Facteurs biologiques**
X Chasse de subsistance	❑ Prédation par d'autres animaux
X Capture vivante pour la vente	❑ Compétition avec d'autres animaux
X Capture vivante pour la domestication	❑ Maladie

	Facteurs climatiques et environnementaux
	❑ Sécheresse
	❑ Inondation
	X Désertification

7. **Comportement des populations locales vis-à-vis des Grues couronnées**

❑ Considérées comme utiles à l'agriculture parce qu'elles mangent des espèces de ravageurs	X Symbole de bonne chance pour l'agriculture ou pour d'autres aspects de la vie du village
❑ Considérées comme nuisibles à l'agriculture parce qu'elles sont granivores	❑ Symbole de malchance pour l'agriculture ou pour d'autres aspects de la vie du village
❑ Tabou local (ni à chasser ni à manger)	**X** Mangent les adultes
X Œufs ramassés pour la nourriture	**X** Autres : **symbole de bonne chance pour le retour de guerre et pour le mariage**
X Enlèvement des œufs de leur nid	

8. **Existe-il une quelconque protection juridique de la Grue couronnée ou de son habitat dans votre région ?**

X **Oui** ☐ **Non**

Si oui, veuillez décrire brièvement : La Loi existe et protège intégralement la Grue couronnée

9. **A) Y a-t-il dans votre région un (ou des) projet (s) en cours susceptibles (s) de contribuer à la conservation des effectifs des grues couronnées ou de leurs habitats ?**

X **Oui** ☐ **Non**

Si oui, veuillez décrire sommairement **: Projets supervisés par le Centre National de Gestion des Ressources de Faunes (CENAGREF) pour la conservation des ressources fauniques des parcs nationaux.**

9. B) Y a-t-il dans votre région un (ou des) projet (s) ou élément nouveau en cours susceptible (s) de contribuer à la baisse de l'effectif de grues couronnées ou de leurs habitats.

X **Oui** ☐ **Non**

Si oui, veuillez décrire sommairement **: Chasse sportive, village de vacances dans les zones cynégétiques du Parc.**

10. Y a-t-il un ou plusieurs projet (s) éducatif (s) en cours sur la Grue couronnée ou ses habitats ?

X **Oui** ☐ **Non**

Si oui, veuillez décrire sommairement **: Programme d'éducation environnementale du CE.R.O.E et aussi le Magazine « LA CIGOGNE » du CE.R.O.E qui concerne tous les oiseaux d'eau dont la Grue couronnée Projet de Dénombrement et de Suivi des Grues couronnées et d'autres oiseaux d'eau du Nord Bénin.**

11. Source d'informations

X **Enquête de terrain,** X **Base de données,** X **Publication,** ☐ **Communication personnelle,** ☐ **Autre :**

(Veuillez utiliser une feuille supplémentaire si nécessaire)

Le formulaire rempli doit être renvoyé à Wetlands International, 407 Cité Djily Mbaye, B.P. 8060, Dakar-Yoff, Sénégal. E-mail : wetlands@telecomplus.sn ou emmanuelwilliams@hotmail.com
Le questionnaire rempli doit nous parvenir au plus tard le 15 avril 1999.

Nous vous remercions du temps que vous consacriez à remplir ce questionnaire. Les informations qui nous parviendrons seront utilisées pour élaborer un Plan d'Action pour la Grue couronnée sur lequel planchent l'International Crane Foundation & Wetlands International. Toutes les personnes ayant participé à la collecte d'informations recevront un exemplaire gratuit dudit plan.

Pour terminer, veuillez indiquer vos intentions lors du prochain Congrès panafricain d'ornithologie en Ouganda, 3-8 septembre 2000, si vous voulez faire une communication ou présenter un poster sur la Grue couronnée. X Oui ☐ Non

N.B. : Nous voudrions présenter une communication sur la situation de la Grue couronnée au Bénin.

Annex 5
List of persons interviewed for completion of Questionnaire For Benin

Monsieur Yacoubou ASSOUMA	Directeur Départemental des Forêts et de la Protection des Ressources Naturelles de l'Atacora
Monsieur Jafarou TIEMOKO	Directeur du Parc National de la Pendjari
Monsieur Rémy HOUEHOUNHA	Chef Zone du Parc National de la Pendjari
Monsieur Jean AÏSSAN	Chef Brigade Forestière de Dassari
Monsieur Ramanou BAH LEMANMOUN	Chef Brigade Forestière de Porga
Monsieur Agbossou SOGLOHOUN	Chef Brigade Forestière de Batia
Monsieur Issiakou LOGOMAN	Chef Station à la Radio Rurale de Tanguiéta
Monsieur Théophile KAH	Pisteur au Poste de Porga
Monsieur Jean-Baptiste KASSA	Pisteur en garde au Poste d'Arly
Monsieur André SOUWALI	Pisteur en garde au Poste d'Arly
Monsieur Achille MANOU	Pisteur en garde au Poste d'Arly
Monsieur Dieudonné KASSA	Pisteur en garde au Poste d'Arly
Monsieur Emile TANKOUAHOU	Pisteur en garde au Poste de Batia
Monsieur Christophe ADJATI	Pisteur en garde au Poste de Batia
Monsieur Dieudonné TIANDO	Pisteur en garde au Poste de Batia
Monsieur Yémtéma KONDJA	Pisteur en garde au Poste de Batia
Monsieur Valentin TANKOUAHOU	Pisteur en garde au Poste de Batia
Monsieur Christophe NATCHINGABOU	Maire de la Commune de Tanongou
Monsieur Waro MANOU	Chef du Village de Batia
Monsieur Dieudonné SAMBIENI	Village de Porga
Monsieur Martin TIANSI	Village de Porga
Monsieur Jean Bosco SAGUI	Village de Porga
Monsieur Idrissou SAMBIENI	Village de Porga
Monsieur Alidou H. KAH	Village de Porga
Monsieur Jean SAMBIENI	Village de Porga
Monsieur Christophe YOA	Village de Porga
Monsieur Paul GUIATI	Village de Porga
Monsieur Marcel SAMBIENI	Village de Porga
Monsieur Alassane KAH	Village de Porga
Monsieur Barnabé KAH	Village de Porga
Monsieur Mathias GUIATI	Village de Porga
Monsieur Jean KASSA	Village de Porga
Monsieur Houanti GNANGO	Village de Porga
Monsieur Idani KASSA	Village de Porga
Monsieur Thomas ELIDJA	Village de Batia
Monsieur Guéra BELTI	Village de Batia
Monsieur Placide YORO	Instituteur à Batia
Monsieur Dieudonné MATOHOU	Instituteur à Batia
Monsieur Nassouri BOUNDJA	Village de Tanongou
Monsiuer Félix NATCHINGABOU	Village de Tanongou
Monsiuer Etienne NATCHINGABOU	Village de Tanongou
Monsieur Chadari NATCHINGABOU	Village de Tanongou
Monsieur Anatole TANKOUANOU	Village de Tanongou
Monsiuer Anatole TIEGO	Village de Tanongou
Monsieur Yoto KASSA	Village de Dassari
Monsieur Rémy SANGUIGOUMA	Village de Dassari
Monsieur Jules LOGO	Village de Dassari