

CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES
OF WILD FAUNA AND FLORA



Thirty-first meeting of the Animals Committee
Geneva (Switzerland), 13-17 July 2020

RESPONSES TO NOTIFICATION TO THE PARTIES NO. 2020/034
ON WEST AFRICAN VULTURES

The attached information document has been submitted by the Secretariat in relation to agenda item 20.¹ It contains the responses to Notification to the Parties No. 2020/034 which requested Parties to submit relevant information as per Decision 18.188 on *West African vultures*.

¹ *The geographical designations employed in this document do not imply the expression of any opinion whatsoever on the part of the CITES Secretariat (or the United Nations Environment Programme) concerning the legal status of any country, territory, or area, or concerning the delimitation of its frontiers or boundaries. The responsibility for the contents of the document rests exclusively with its author.*



ព្រះរាជាណាចក្រកម្ពុជា
Kingdom of Cambodia
ជាតិ សាសនា ព្រះមហាក្សត្រ
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CAMBODIA

ក្រសួងកសិកម្ម រុក្ខាប្រមាញ់ និងនេសាទ
Ministry of Agriculture, Forestry and Fisheries
សមត្ថកិច្ចគ្រប់គ្រងអាយតេសកម្ពុជា
CITES Management Authority of Cambodia

No: 049/20 CMAC

Phnom Penh. 25 May 2020..

Ms. Ivonne Higuero
Secretary-General
CITES Secretariat, International Environment House,
Chemin des Anémones, CH-1219 Châtelaine,
Geneva, Switzerland

Subject: West African Vultures (*Acciptridae .spp*)

Dear Ms. Ivonne,

Reference is made to the CITES Secretariat Notification to the Parties No. 2020/034, dated 22 April 2020, the CITES Management Authority of Cambodia herewith submits its response to the concerning associated with West African Vultures (*Acciptridae .spp*) that required under Decisions 18.186 to 18.192 agreed by the Conference of Parties.

Egyptian vultures (*Neophron percnopterus*), white-headed vulture (*Trigonoceps occipitalis*), hooded vultures (*Necrosyrtes monachus*), white-black vulture (*Gyps africanus*), Ruppell's vulture (*Gyps rueppelli*), and lapped-faced vulture (*Torgos tracheliotos*), all these six vulture species are native to the West Africa; However, their native to distribution ranges are not found in Cambodia. In addition, these six African vulture species are not native to Cambodia. The country does not have information concerning trade in and conservation of these species. Therefore, Cambodia could not provide any relevant information that can response to the notification issued pursuant to this Decision 18.188.

Please accept our warmest thanks for your cooperation and assurance of our highest regards.

Sincerely yours,



Prof. NAO THUOK, PhD
Secretary of State
Chairman CITES Management Authority of Cambodia
Ministry of Agriculture, Forestry and Fisheries

CC:

- Cabinet of the Minister
- Forestry Administration
- Cambodia CITES Secretariat
- File

CONCERNING:**West African vultures (Accipitridae spp)**

In response to CITES notification 2020/34, Senegal submits recent information which have be brought to our attention by BirdLife International, the IUCN SSC Vulture Specialist Group and the Vulture Conservation Foundation on threats to Hooded vultures (*Necrosyrtes monachus*) of which Senegal is a range State. These threats are reported in accordance with decision 18.188 (c) and are linked to belief-based use of these vultures in Guinea-Bissau with demand from neighbouring countries such as Senegal driving cross-border trade.

- 1.0 **In Guinea-Bissau, the confirmed** number of Hooded vulture deaths from events occurring in February and March 2020 is approximately 1,603, which is almost 5% of the national population. However, it will never be possible to determine exact numbers, as only a very limited area has been covered during searches, and many carcasses have probably been missed or rapidly disposed of (incinerated or buried) by the local population once discovered. Therefore, we fear that there could be many hundreds more deaths from ongoing events as well as from earlier unaccounted incidents, most likely exceeding 2,000 deaths in total.
- 2.0 **Vulture deaths** have been concentrated in the Eastern Sectors of the country, namely Bambadinca, Bafatá and Gabú. Lower vulture mortality has also been reported in various other sectors of the country, including the Bijagós archipelago.
- 3.0 **Recent information** received from initial urgent in-country response efforts indicates that similar events (as many as five) began in Guinea-Bissau towards the end of 2019 and are continuing, with a report of 120 further vulture deaths in Gabú during the second week of March 2020.
- 4.0 **The cause** of this mass mortality has been confirmed as deliberate poisoning using carbamate-based (specifically methiocarb) agricultural pesticides placed onto baits e.g. chunks of meat to kill vultures. Evidence suggests that these deliberate poisonings have been driven by belief-based use of vulture body parts (ritual use) with demand related to the country's political instability. Belief-based use, in particular possession of vulture heads (or other body parts) is thought to bring good fortune or even special powers: almost 200 have been found without their heads. Additionally, there have been reports that high demand for vulture body parts from neighbouring countries such as Senegal (and potentially other countries further afield) may be driving cross-border trade.
- 5.0 **All vulture species that occur in Guinea-Bissau are globally threatened:** The country has one of the largest global populations of Critically Endangered Hooded Vulture (*Necrosyrtes monachus*) (22% of the estimated global population), locally known as jugudé, which has been the most affected species in the current mass mortality event and occurs only in Africa. Although this species may appear abundant in Guinea-Bissau and other parts of West Africa, the severity of their decline across the continent shows it to be a highly vulnerable species. This level of mortality has even greater significance because it is occurring during the vulture breeding season in this region, meaning that mortality of adult birds could also result in mortality of chicks. An incident such as this could have a catastrophic impact on the conservation status of this vulture species. Similar incidents outside of urban areas will likely also impact other species that are not commensal with human populations.

6.0 **Urgent measures in-country** are being supported by BirdLife International, the IUCN SSC Vulture Specialist Group and the Vulture Conservation Foundation to gain a clear understanding of the current situation in Guinea-Bissau and offer international support to bring the mortality to a swift end.

Senegal supports the emergency measures implemented by these organizations including the national emergency response action plan launched in close collaboration with in-situ field teams established for this purpose (including government departments, institutions, NGOs and local experts) with the following objectives in mind:

- **Collect and document information** on the events that led to the mass mortality of vultures in the main affected regions: Gabú, Bafatá and Bambadinca.
- **Collect further vulture carcasses** from future incidences, establish a pre-arranged and agreed system for post-mortem examination and sample analyses at a suitable facility to facilitate a more rapid response. Should suitable facilities and capacity not be available to do this in-country, permits to move carcasses/samples to such facilities outside of the country be expedited.
- Aggregate, confirm and complete all **accounting of vulture mortalities** in all possible detail, including dates, locations and other affected species.
- **Map the areas where vultures were found dead** in order to produce a map of the location and number of deaths on each date.

7.0 Recommendations to the Animals Committee

Senegal urges the Animals Committee to:

- 1) mandate the CITES Secretariat to issue a notification to inform CITES Parties of these concerning developments ;
- 2) urge range States and other Parties to adopt necessary national measures to strengthen the protection of vultures and to closely monitor the impact of trade in vultures for belief-based use including by:
 - Ensuring that relevant ministries and regional governments move with haste to stop the systematic extermination of vultures and where needed use **litigation and the court process**.
 - Supporting the development of a **national alert network** to quickly detect future vulture deaths and improve reaction speed; **setting up a response protocol** and creating a chain of actions, with clear actors and responsibilities, to respond more effectively to future poisoning events.
 - Initiating a **wide-scale awareness campaign** at regional and national level on the importance of vultures and other biodiversity and the inherent dangers of using poisons to kill them and other wildlife.
 - Ramping up efforts to **collaborate with neighbouring countries** to confirm and document any **international trade** in vulture carcasses or body parts, and **similar persecution**, to understand the extent of the problem and determine appropriate responses
 - Setting up national plans for the conservation of vulture populations based on the [Multi-species Action Plan to Conserve African-Eurasian Vultures, and identify national and international partners for its implementation](#) and identifying national and international partners for their implementation.

- Reporting on progress made in addressing the current mass vulture killings to the CITES Animals Committee and the Secretariats of relevant conventions (CITES, CMS, CBD) to facilitate the development of a rapid international response to the current crisis.



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DEMOGRÁFICO

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Response to CITES Notification 2020/034 - West African Vultures*

Egyptian Vulture

Of the 6 species mentioned in the Notification there is one that is present as breeder in the European Union, this is the Egyptian Vulture (EV) (*Neophron percnopterus*). It is a migratory species that breeds in Europe and spends winter south of the Sahara desert, particularly in West Africa and the Sahel.

The most relevant population of EV in the EU is present in Spain, where the results of the latest national census of 2019 are now available, with an estimate of 1,490-1,567 pairs. The survey was coordinated by the Spanish Ornithological Society (SEO BirdLife). This updated census reflects that the population of the species in the country is stable on a general level and the significant declines faced at the end of the last century and the beginning of this one halted. However, population trends vary depending on the area.

The EV has two subspecies in Spain; the peninsular subspecies (*percnopterus*) is currently listed in the Spanish Catalogue of Threatened Species as Vulnerable, and the Canary Islands subspecies (*majorensis*) as Endangered. Spain is home to the largest European population of EV and is a global stronghold for the species.

A positive fact is the recovery and new colonization of the species in the northeast of the Iberian Peninsula, starting with the northern mountain ranges of the Comunidad Valenciana and Cataluña. There are also positive trends in the Canary Islands, where thanks to active conservation the species is now out of the brink of extinction. In the Balearic Islands (Menorca), hundreds of dangerous electricity poles have been retrofitted, and the threat of poisoning declined. In the border between Portugal and Spain, a LIFE project (RUPIS) focussing on the Duero canyons is working to strengthen the population by reducing mortality and increasing breeding success.

Overall the general trend in Spain is slightly positive respect to the previous national census of 2008, with 38 new confirmed territories. In order to consolidate this trend, conservation policies must be established to counteract the abandonment of the countryside. Furthermore, it is urgent to tackle the impacts of infrastructures such as wind farms and power lines. And address the problem of poisoning.

In the wintering areas in Africa there are some isolated initiatives. For example, the campaign "Save the Egyptian Vulture from Extinction" was spread in the form of six advert boards installed in Nigeria. Although still large numbers are wintering in the Sahel zone, the species became a rare visitor to Nigeria because of the massive persecution and demand of vulture parts for traditional rituals and believed-based uses. As a result, all vultures are now almost extinct from



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Nigeria. The initiative is part of the project “Egyptian Vulture New LIFE”, which aims at informing the public about the main threats EV faces along its flyway. It is essential to call on people to stop killing of vultures, desist from use in belief-based practices and halt sales of their parts.

Vulture poisoning in West Africa

Poisoning is by far the largest threat to vultures in West Africa. A major poisoning event of Hooded Vultures (HV) in Guinea Bissau took place in late Feb 2020. Although it appeared to be a poison-bait incident, it has become clear that it involves multiple poisoning events, and probably with a belief-based use motivation (at least 200 HV have been found with heads removed).

A total of 1,166 dead HV since February 2020 has been recorded. Deaths have been concentrated in the eastern part of the country with lower mortality events in various other sectors. Information indicates that dead vultures had also been reported on at least 5 other occasions since September 2019, which are not included in the total, and the incidents have continued more recently with 120 casualties during the second week of March 2020.

A major team effort led by ODZH (Organização para a Defesa e Desenvolvimento das Zonas Húmidas na Guiné-Bissau), the IBAP (Instituto da Biodiversidade e das Áreas Protegidas), with support of FAO, has been done to swiftly address this incident. BirdLife have provided resources for follow-up and samples have been transported to Portugal for analyses.

Further evidence is emerging of high demand for vulture body parts from neighbouring countries is driving cross-border trade. There are also reports of high in-country demand for vulture heads for belief-based use in relation to the current internal political disputes.

Reasons for HV declines in Sierra Leone are thought to include the cutting down of big silk-cotton trees, along with high voltage power lines, and dwindling food sources. In Nigeria, the Nigerian Conservation Foundation (NCF) is working directly with traditional healers to reduce the pressure on belief-base use of vultures and illegal wildlife killing.

In Niger, members of parliament unanimously adopted in 2019 a bill to punish offenses relating to the trade in endangered fauna and flora. At the end of 2019, the Sahara Conservation Fund (SCF) started an environmental educational programme with schools in Niger, focusing on awareness-raising for vultures and other species in the country.

It is essential that CITES Parties in the region firmly address the issue of poisoning and the associated illegal trade of vultures and their parts, both nationally and internationally. A combination of education, legal measures and enforcement will be needed to stop this mortality, and good coordination of all the actors involved.

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It is strongly recommended to implement the CMS Multi-species Action Plan to conserve African-Eurasian Vultures (Vulture MsAP) and its associated Strategic Implementation Plan (2020–2023), which contains detailed recommendations on West African Vultures. Cooperation of CITES and CMS should be enhanced in this respect.

*This note is based on reports from SEO BirdLife, the Vulture Conservation Foundation (VCF) and the Vulture Study Group (VSG)

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**JNCC Report
No. 412**

**Survey of the occurrence and relative abundance of raptors
in Guinea subject to international trade**

**Guy Rondeau, Mohammed Moussa Condeé, Bernard Ahon,
Ousmane Diallo & Daniel Pouakouyou**

2008

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ISSN 0963 8091

ISBN 978-1-86107-601-4 (Version française)

ISBN 978-1-86107-600-7 (English version)



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This report should be cited as:

Rondeau, G, Condeé, M M, Ahon, B, Diallo, O & Pouakouyou, D. 2008.
Survey of the occurrence and relative abundance of raptors in Guinea subject to
international trade
JNCC report No.412

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1. Executive summary

In the last ten years, Guinea has emerged as a significant exporter of live wild birds to the United Kingdom and the European Community. This trade has involved a significant number of birds of prey. Due to concerns over the sustainability of this trade, some of these species have been subject to import suspensions into the European Community under regulations implementing the Convention on International Trade in Endangered Species (CITES).

This project was initiated by the CITES Authorities in the UK, in collaboration with the relevant authorities in Guinea, and aimed to provide a shared and improved understanding of the current status and distribution in Guinea of diurnal and nocturnal raptors on which to base assessments of the sustainability of any trade.

Counts of raptors were undertaken by driving road transects, supplemented by spot counts, transects on foot and nocturnal surveys, as a rapid but rigorous and reproducible survey technique which would provide information on distribution and relative abundance of birds of prey in Guinea. Information was gathered opportunistically on other bird species seen and which may also be subject to trade.

Some 3,635km of road transect were covered, over 27 days, distributed across the natural regions of Guinea and covering a representative range of habitats (forest and savanna) and including rural, urban and protected areas. These road counts were supplemented by 21km of pedestrian transects in forested areas and 6 nocturnal surveys. In all, some 47 species of diurnal raptor (equivalent to 76% of the raptor species known to occur in west Africa) and 2,792 individual raptors were recorded along with seven species of owl (31 individuals). The numbers of diurnal raptors included six species of vulture and 12 Palearctic migrants. The four most abundant species recorded were hooded vulture *Necrosyrtes monachus*, black kite *Milvus migrans*, white-backed vulture *Gyps africanus* and grasshopper buzzard *Butastur rufipennis*. The survey recorded the first known observations of Eurasian griffon vulture *Gyps fulvus*, saker falcon *Falco cherrug* and red-chested owlet *Glaucidium tephronotum* from Guinea. No African grey parrots *Psittacus erithacus*, bustards or hornbills were observed at all.

More species of raptor were recorded from rural areas (43 spp.) than any other category but this area had the lowest overall abundance index (62.3 individuals/100km); this land use type covered most of the survey route. By contrast, urban areas had the lowest species diversity (11 spp.) but the greatest abundance index (168.4 ind./100km), indicating that these areas supported significant numbers of a few species of large raptor. Notable amongst these urban raptors are the hooded vulture and black kite. Protected areas had moderate species richness (30 spp.) and abundance (78.8 ind./100km) but the highest number of species per transect. Three species, Cassin's hawk eagle *Spizaetus africanus*, crowned eagle *Stephanoaetus coronatus* and African hobby *Falco cuvierii*, were recorded only from protected areas. By contrast, not a single vulture was recorded in protected areas.

When analysed by natural region, the Haute Guinée was the richest natural region with 37 species recorded but in moderate abundance; it was also the richest region for

number of vulture species and for Palearctic migrants. La Moyenne Guinée was relatively rich in species (33 spp.) and with an index of abundance greater than the survey average. It was also the region where vultures were most abundant (74.4 ind./100km). La Guinée Forestière was relatively poor in species (28) and had the lowest abundance index (43.3 ind./100km). La Guinée Maritime recorded only 15 species but had the greatest abundance index for raptors (128.3 ind./100km) with hooded vultures being the most abundant individual species.

The results were compared with those from two other recent surveys in the region which used similar methodology. Whilst number of species and indices of abundance varied, there was generally a broad correspondence between the surveys. Whilst one survey recorded 49 species of raptor and the other 40 species, compared with 47 in Guinea by this survey, the other surveys covered significantly greater distances than this study, indicating the relative richness of Guinea for raptors. Notable from this study were the healthy vulture populations still found in the Fouta Djallon highlands of Guinea, in contrast to the pattern of decline for vultures and other large raptors over most of west Africa.

2. Introduction

In the last ten years Guinea has emerged as a significant exporter of live wild birds to the United Kingdom (UK) and the European Community, both in terms of volume and in the range of species traded (Burnett and McLardy, in prep.). This is despite the avifauna of Guinea being comparatively poorly known and large areas of the country having yet to be surveyed (Robertson 2001). Consequently concern has been expressed by some Parties to CITES, particularly those in the European Community (EC), regarding the impacts of such trade.

This project was initiated in response to these growing concerns and in recognition of the importance that Guinea places on the continuing trade in its natural resources and the shared desire for any such trade to be sustainable. It was also recognised that Guinea has limited capacity to adequately regulate this trade. The project aimed to assist the CITES Authorities of both the European Community and those of Guinea to share a common and improved understanding of the current status in Guinea of those birds found in trade and for which quantitative information on their status and distribution is currently lacking (and so an assessment of sustainability is not currently possible). The project focused on diurnal raptors because this was a group of birds which were appearing more regularly in trade, for which the UK was one of the primary destinations in the EC (Burnett and McLardy, in prep.) and which, because of their typically low densities and productivity, may be more vulnerable to the impacts of harvest for trade than other groups of birds. Moreover, increasing numbers of these species were subject to import suspensions into the EC because of the absence of data to support reliable assessments of sustainability.

Additionally, at the request of representatives from the Department for Water and Forest (DNEF - Direction Nationale des Eaux et Forêts) in Guinea, the project included an element of capacity building in raptor identification and simple survey techniques for those Guinean CITES and veterinary officials responsible for enforcing wildlife laws.

The primary emphasis for the study was on those raptors known, from initial synthesis of CITES trade data, to comprise the major proportion of exports from Guinea to the EC and for which comprehensive information on their status and distribution is currently inadequate. This absence of information prevents a confident assessment of sustainability (or a 'non-detriment finding'), which is required by CITES before exports should be permitted.

2.1 Aims and objectives

The aim of this study was, in close collaboration with the Guinean Authorities, to collect information on the status and distribution of the main raptor species in international trade to inform management decisions and underpin management plans for the sustainable use and conservation of the species. The project also aimed to build the capacity of the CITES Authorities of Guinea in the implementation of CITES and enforcement of the relevant wildlife laws, providing them with the information and the basic tools they require to manage the trade, and enhance their ability to set sustainable quotas, based on the best available evidence.

Moreover, the project would also assist the Joint Nature Conservation Committee (JNCC; also the UK CITES Scientific Authority for fauna), the Department for Environment, Food and Rural Affairs (Defra; also UK CITES Management Authority), and other EC CITES Authorities to determine whether the current or anticipated levels of trade from Guinea pose a threat to species or the extent of the territory occupied by them (as required under the EC CITES Regulationsⁱ).

The project also aimed to make a contribution to the understanding of the ornithology of the region which is relatively poorly known when compared to other parts of Africa (Robertson 2001) and so contribute to any agreement on African-Eurasian migratory raptors that may be concluded under the Convention on Migratory Species (Goriup and Tucker 2005).

Although, the current project concentrated on collecting information on diurnal raptors and owls, information was also gathered opportunistically on other birds encountered during surveys which may also be in trade from Guinea, notably bustards (Otididae), hornbills (Bucerotidae) and African grey parrots (*Psittacus erithacus*).

Specific objectives included:

- i. to undertake a survey of raptors in Guinea by rapid but rigorous and reproducible survey techniques in order to provide information on their distribution and relative abundance;
- ii. to opportunistically gather information on other bird species encountered during surveys and which may also be in international trade;
- iii. to supplement this survey information with a review of available literature and of patterns, levels and organisation of trade from and through Guinea;
- iv. to build the capacity of the CITES and other relevant authorities of Guinea to improve their regulation of the live bird trade through training in the care, handling and identification of bird species subject to trade and in field survey techniques;
- v. to provide recommendations concerning future management of raptors in Guinea, especially with regard to whether existing levels of trade are sustainable or not and what measures might need to be implemented to ensure future sustainable exploitation (such as quotas for capture and export and future monitoring).

This report addresses objectives i) & ii) above. It presents the results of a field survey of raptors in Guinea which took place during February and March 2006. This survey aimed to carry out an exhaustive survey of Guinean raptors in order to determine their distribution and, most of all, their conservation status. The report documents the field team, the survey dates and itinerary, the methods used, the habitat types selected for the analysis and the zones of study. In terms of results, the report presents the observations of diurnal and nocturnal raptors by habitat types and by natural regions

ⁱ Council Regulation (EC) No. 338/97 on the protection of species of wild fauna and flora by regulating trade therein and Commission Regulation (EC) No. 865/2006 laying down detailed rules concerning the implementation of Council regulation (EC) No. 338/97 on the protection of species of wild fauna and flora by regulating trade therein.

(provinces) of Guinea. Comparisons are also made with other similar studies recently carried out in the sub-region.

Companion publications (Rondeau *et al.* in prep. a and b), provide an overview of patterns of trade, capacity building efforts, distribution and status of raptors, and recommendations for sustainable harvests.

In this report, the term ‘raptors’ signifies birds of prey, both diurnal and nocturnal, hence *Pandionidae*, *Accipitridae*, *Sagittariidae* and *Falconidae* for diurnal raptors and *Tytonidae* and *Strigidae* for nocturnal raptors.

3. Methodology

3.1 Members of the survey team

The project was managed overall by Daniel Pouakouyou of Fauna & Flora International. The survey team itself comprised the following individuals:

- | | |
|------------------------|--|
| - Guy Rondeau | Survey team leader, Afrique Nature International |
| - Mohamed Moussa Condé | Ornithologist, Guinée Ecologie |
| - Bernard Ahon | Ornithologist, SOS-Forêts (Ivory-Coast) |
| - Ousmane Diallo | Wildlife specialist, DNEF |
| - Sadio Sow | Driver, Guinée Ecologie. |

It should be noted that the core team (the first three specialists mentioned above) comprises the same members who carried out a survey of west African raptors in Niger, Burkina Faso, Togo, Ghana, Mali, Guinea, Senegal and Gambia in 2005 (Rondeau, Condé and Ahon, in prep. c). That survey was carried out using the same methodology as used in this survey, although this survey is more intensive. The fact that these surveys have been carried out by the same people greatly increases the reliability of comparisons of results between regions referred to later.

3.2 Dates of the survey

The team leader arrived in Guinea on 9 February 2006. Thursday and Friday 9 and 10 February were spent in meetings in order to inform the interested parties of the objectives of this part of the study and the development of the survey. This period of time was also used to carry out the different administrative steps needed (obtaining permits, mission orders, etc.).

The collection and purchase of field material (equipment, food, etc.) was carried out on Saturday and Sunday 11 and 12 February when the vehicle was also repaired. Given that the documents relating to the mission were not signed by the Minister until Monday afternoon, the team only left Conakry (the starting point of the survey) on Tuesday 14 February 2006.

The survey was carried out from 14 February to 18 March 2006 inclusive. The timeline of the survey is presented in Annex 1. Halfway through the survey, a progress report was sent to the FFI Programme Manager on 10 March 2006.

The period between 19 - 23 March 2006 was used for the return of equipment and survey material to DNEF as well as for the preliminary analysis of survey data. These few days were also used in order to meet the different government departments and other parties interested in this study to present a summary of the work. The debriefing meeting to the ministerial authorities took place at the DNEF on the 23 and the team leader left Conakry on 24 March 2006.

3.3 Survey route and itinerary

Given that the survey aimed to sample the whole national territory, an itinerary was planned in order to create the best coverage and to avoid, as much as possible, return journeys on the same route. The reality on the ground required, from time to time, some modification to the planned itinerary and difficult and dubious routes (e.g. broken down ferries or damaged roads) were avoided in order to increase the chances of reproducing exactly this route for comparisons in the future.

The itinerary (described in Annex 1) aimed to cover all the natural regions and prefectures of the country. It was also designed to cross the main protected areas of Guinea while attempting to spend a third of the time dedicated to the survey on forest zones (Guinée Forestière and Guinée Maritime) and two-thirds in savanna areas (Haute Guinée and Moyenne Guinée).

Considering that the team had the opportunity to camp for the night in the field, the length of transects was not dictated by the need to find a town for overnight accommodation. This allowed for some flexibility and a better control over the rhythm of the survey as well as the quality of the observations made.

It should be noted that the route taken has also been designed so that it can be integrated into the pan-African protocol for the monitoring of vulture populations being developed by the bird of prey working group of the Endangered Wildlife Trustⁱⁱ.

3.4 Survey methods

Although the primary aim of the study was to determine the conservation status in Guinea of raptors entering international trade, this survey was designed to cover all the raptors (mainly diurnal, but also nocturnal) found in Guinea. In fact, it is possible (as seen with vultures) that a species of raptor not currently being exported might eventually become the target of a substantial demand from foreign markets. Therefore, it was important that this survey allows the establishment of baseline data for all raptors, including those species not currently targeted for the commercial trade.

For the identification of birds of prey in the field, specialised ornithological guides on raptors (Clark 1999; Ferguson-Lees and Christie 2001; Kemp and Kemp 1998) and those on the birds of west Africa (Borrow and Demey 2001) were used. For scientific names, and French and English common names, the checklist of the African Bird Club (Lack 2004) was used.

Each team member was equipped with a pair of binoculars (10x magnification) and the team had two telescopes (Swarovski 20-60x) at its disposal. For the listening and playback stations, recording equipment was also at the team's disposal. Wherever possible, for documentation and training purposes, and to confirm the identification of "difficult" birds, raptors were photographed (Nikon D70 and VR-Nikkor 80-400 mm).

ⁱⁱ http://www.ewt.org.za/workgroups_overview.aspx?group=raptor&page=overview

It should be noted that the survey was carried out during the dry season in order to record migratory Palearctic raptors.

3.4.1 Diurnal raptors

The major part of the survey work was carried out by road count sampling (Johnson 1978; Fuller and Mosher 1981; Bibby *et al.* 2000) in order to determine relative abundance of each species of raptor and to enable comparisons with similar data, old and recent, originating from the sub-region. For diurnal raptors, this is the most appropriate survey method.

The counts, carried out from a vehicle following a planned route (which are treated as transects), generate indices of abundance which vary according to the behaviour and appearance of each species, the type of habitat, the speed of the vehicle, the temperature, the time of day, the season and the number and experience of the observers. Nevertheless, this type of survey allows observers to cover large areas and to record significant data on species with a low density (which is the case for most raptors). The random samplings carried out over large distances in similar habitats tend to maximise the chances of detecting the majority of species present and to reduce the impact of the variables mentioned above.

Thus, a circuit was designed in order to allow the best use of existing roads at the national level and to cover as much of the territory as possible. This circuit was also established in order to ensure that the protocol could eventually be repeated in future to enable comparisons of changes in indices of abundance over time.

As mentioned above, the survey was carried out with the same observers who undertook, using the same methodology, the regional survey of 2005 (Rondeau *et al.* in prep. c). The team leader had also been involved in part of the similar survey of raptors in Burkina Faso, Mali and Niger using the protocol of Thiollay (Thiollay 2000). Thus, this approach allowed the reduction of one variable which might have occurred if other observers had been used.

According to the method used, any birds seen perched or flying on each side of the road were counted. The observers meticulously searched for raptors while the vehicle was moving at approximately 50km/h (more slowly in protected areas or in towns). Numerous stops were made in order to identify difficult or distant birds as well as to scan the horizon in search of birds of prey. Given that vultures were being given more particular attention (being the object of a significant trade), the methodology was slightly adapted in order to start later in the morning to give time for these large raptors to take to the wing and to be more readily observed. Thus, the observations started daily at 0800 hours and finished at 1730 hours.

Nevertheless, this method is not applicable in closed environments (forests) where the visibility is reduced. Thus, in these environments, transects of 3 to 4 km length were made on foot in order to survey species present and to attempt, in a qualitative manner, to evaluate their density. However, it should be mentioned that fewer pedestrian transects were needed than expected because a significant part of the forest zones where these foot transects were planned are now so degraded and open (due to excessive clearing for food or cash crops) that it was possible to carry out the survey using road count sampling. This situation is particularly striking in Guinée Forestière,

which has almost totally lost its forest character. It is also the same in Guinée Maritime where forests are non-existent apart from mangroves which are not commonly used by raptors and which subsequently received little attention in this survey (see later description of study sites).

As part of this study, sightings of the pied crow *Corvus albus* were also recorded in the same way as diurnal raptors because of the interaction, through competition for food, between the two species (Thiollay 1978). During the analysis of the results, the data originating from survey of this corvid was not taken into consideration, but this baseline information exists (Annex 5) and could eventually be used when needed. Moreover, during the road counts, particular attention was also given to record opportunistically other 'large' birds, such as the African grey parrot *Psittacus erithacus timneh*, hornbills and bustards, but the survey was not designed with these species in mind.

The geographical coordinates of the pedestrian transects, as well as other pertinent observations (e.g. nest sites, roost sites etc.) were recorded using Geographical Positioning System (GPS).

3.4.2 Nocturnal raptors

For owls, nocturnal surveys were carried out by using listening and playback stations. Although these nocturnal surveys were carried out when feasible, in practice, it often proved difficult to carry out the nocturnal outings after a long day on the road carrying out the diurnal survey – the team members being busy with the other tasks at the camp including trying to understand and capture the daily data. Besides this, the driver was often too tired after a long day's work and it was not desirable to make him work during the night for fear of exhaustion the following day on the road, a situation which could have put the team at risk. Thus, the nocturnal surveys were only undertaken when the camping period was extended (in a protected area, for example) and when no road counts had to be carried out the next day.

3.5 Habitat types

The road counts cross a diversity of habitats, which are grouped according to the following three broad categories, namely rural areas, protected areas and towns.

'Rural areas' indicate areas under human utilisation, such as agriculture and livestock husbandry but also including small settlements (see under towns below). Rural areas often predominated in the vicinity of survey roads and these zones were often significantly degraded and converted to agriculture (intensive and extensive) and livestock husbandry.

'Protected areas' are national parks, fauna reserves and classified forests, which benefit from a degree of protection and where human activities are, normally, absent or limited. In Guinea, protected areas are relatively small and are often in a poor state of conservation. In fact, in many cases, it is difficult to recognise that they are protected areas considering the number of villages and encampments, along with their associated activities, found within them. As part of this study, only the following protected areas were surveyed:

- Partial fauna reserve of Kankan;
- Classified forest of Pic de Fon;
- Classified forest of Bossou and the peripheral zone of the Biosphere reserve of Nimba Mountains;
- Classified forest of Ziama;
- National Park of Haut Niger (Mafou sector);
- National Park of Niokolo-Badiar.

‘Towns’ are urban areas crossed by the survey route and which have a minimum road length of two kilometres. Villages, large encampments and some small sub-prefectures which were not of this length are not considered as towns and data from them are directly included in the “rural area” category.

3.6 Data analysis

Due to the fact that the different transects were of unequal lengths, and in order to compare indices of abundance between habitats, the natural regions and other regional data, the survey data have been aggregated, for each transect or group of transects, by 100 km lengths and indices expressed, accordingly, as the number of individuals of a species per 100 km.

In addition, the observations recorded by the road counts have also been recorded on a grid of squares defined by one degree each of longitude and latitude and named according to the nomenclature used in official maps folio in Guinea (Anon. 1992). This process enables a visual synthesis of the survey data, on the national scale, which will be helpful in determining the conservation status of exported species (Rondeau *et al.* in prep. b).

The descriptive statistical analyses have been carried out using XLSTAT 2006/Excel.

3.7 Study zones

It was originally planned that the data from the road counts would eventually be broken down according to the main biomes found in Guinea, notably by forest and savanna. However, the forest zones are now very degraded in Guinea, even in Guinée Forestière (and also in Guinée Maritime), which created enormous problems in the interpretation of the results. For example, should an observation be considered as originating from the forest domain when the area where it was made, though in a so-called forest zone, displayed a savanna-like profile? Moreover, for the Moyenne Guinée it is difficult to separate the biomes found in the Massif du Fouta Djallon, with its relief, its plateaux and its highly degraded soil (due to severe deforestation, high erosion etc.).

Therefore, it was decided to express the data on the basis of occurrence in natural regions. Indeed, with respect to the comparing the conservation status of raptors targeted for trade with the zones of capture, it seems that this arrangement of results was both more practical and more relevant to the reality of the trade in raptors.

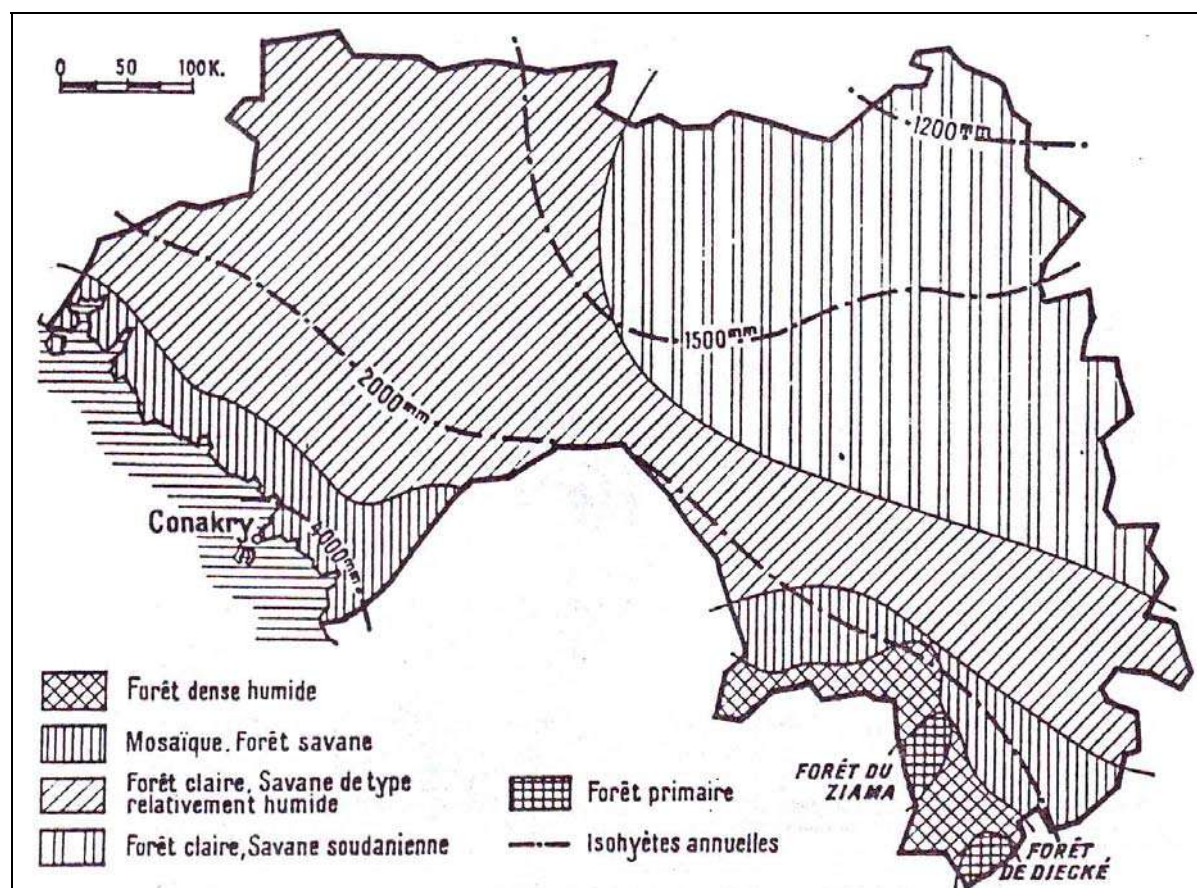


Figure 1. Main vegetation and rainfall areas of the Republic of Guinea (Suret-Canale 1970).

(*Forêt dense humide* – dense humid forest; *Mosaïque. Forêt savane* – forest and savanna mosaic; *Forêt claire. Savane de type relativement humide* – open forest and relatively humid savanna; *Forêt claire, savane soudanienne* – open forest, Sudanese savanna; *Forêt primaire* – primary forest; *isohyets annuelles* – annual isohyets.)

The Republic of Guinea covers an area of 245,875 km². It is bordered to the west by Guinea-Bissau and the Atlantic Ocean, to the north by Senegal and Mali, to the east by the Ivory Coast and to the south by Sierra Leone and Liberia (République de Guinée 2006). Figure 1 presents the country's main vegetation and rainfall areas. Guinea is sub-divided into four natural regions (la Haute Guinée, la Guinée Forestière, la Moyenne Guinée and la Guinée Maritime; see Figure 4), each are distinct and internally homogenous due to the contrasts in climate, mountain barriers and the orientation of relief, which together gives each region particular characteristics of climate, soils and vegetation (République de Guinée 2006).

The following descriptions are derived from Barry (2004), Centre d'Échange de Guinée (2005) and République de Guinée, (2006).

3.7.1 La Haute Guinée

Covering an area of 96,700 km² (39% of the Guinean territory), the Haute Guinée is morphologically and climatically part of a very extensive geographical unit. It is a region of savanna and plateaux located between 200 and 400m in altitude. The river

Niger and its tributaries have carved terraced humid plains. Due to its climate, the Haute Guinée is the most arid region of the country. Precipitation varies between 1,200 and 1,800 mm per year. Average temperatures are relatively high during most of the year with maximum temperatures sometimes exceeding 40°C in March-April. Main crops, such as mountain rice *Oryza* sp., cassava *Manihot esculenta*, peanuts *Arachis hypogaea* and cotton *Gossypium hirsutum*, are cultivated during the rainy season. The vegetation is predominantly of dwarf gallery forest. Dry dense forest or open forest of *Guibourtia copallifera* and of *Isoberlinia doka* covers 8.3% of the region, but this forest is highly degraded or has disappeared entirely, creating considerable problems of soil erosion. Relic forests, where *Pterocarpus erinaceus*, *Daniellia oliveri*, *Afzelia africana* are also found, are highly threatened by agricultural encroachment and by the intensity of fires. Rearing of cattle and small ruminants is important in the north of the region.

3.7.2 La Guinée Forestière

La Guinée Forestière, with a surface area of 49,500 km² (20% of Guinea), owes its name to the humid forest, which formerly covered the major part of its territory. Its climate is of the sub-equatorial type with abundant and almost regular rainfall throughout the year. The average annual rainfall varies between 1,800 and 2,300 mm. The temperature varies around an average of 25° C throughout the year. This region is the realm of food crops and cash crops (coffee *Coffea* sp., tea *Camellia sinensis*, cocoa *Neobroma cacao*, oil palm *Elaeis guineensis*, rubber *Hevea brasiliensis* etc.) and is an important zone for timber exportation. Except for the classified forests of Ziama and of Diécké, the forest is now found in fragments of ancient forested massifs, inaccessible islets in the mountainous zone (i.e. Nimba Mountains) and gallery forest along some rivers where the main species are: *Lophira alata*, *Terminalia* sp., *Piptadenia africana*, *Khaya grandifolia*, *Entandophragma utilis*, *Tarrieta utilis*, *Triplochitum scleroxylon*, *Mansoniea altissima*, *Guarea cedrata*, *Nauclea diderichii*, *Heriteria utilis*, *Lovoa trichiloides* and *Parinari excelsa*. The north of the Guinée Forestière (prefectures of Beyla, Kissidougou and Guéckédou) is no longer a forested region but is a region of ‘de-forested’ or ‘post-forest’ savanna of the grassy and shrubby type.

3.7.3 La Moyenne Guinée

La Moyenne Guinée, or Fouta Djallon, is a region of mountains and plateaux covering 63,600 km² of the Guinean territory, equal to 26% of the country’s surface area. The numerous watercourses which arise in the area make this region the reservoir of west Africa. These watercourses are enclosed in valleys bordered with narrow plains. The tropical climate is modified into a mountain microclimate. The precipitation is much less abundant. It is a zone of pasture, of citrus fruits and vegetable patches. La Moyenne Guinée comprises in the centre and to the north the high plateaux of the massif of Fouta Djallon, where the altitude varies between 600 and 1,500m and, to the northwest, of the low plains of the Gaoual and Koundara regions. The annual rainfall varies between 1,500 and 2,000 mm. Soils are mostly very degraded. The main crops are fonio *Digitaria* spp., maize *Zea mays*, cassava, peanuts, rice and vegetables. Pocket of forests only cover 13% of the region, equalling 800,000 ha of dense dry forest and 50,000 ha of fragments of dense mesophile forest, relics of ancient dense high altitude forest. Forested massifs do not really exist anymore outside the last

remaining small classified forests. Elsewhere, the vegetation is essentially thickets and galleries along deeply embanked rivers. Lowland savanna can also be found where *Erythrophleum guineensis*, *Erythrina senegalensis* and *Parkia biglobosa* can be encountered. The northwest of this zone (plains of Gaoual – Koundara) is composed of relic forests of *Kaya senegalensis* and *Cola cordifolia*, and contains the greatest number of cattle due to its humid pastures in valleys.

3.7.4 La Guinée Maritime

Situated in the west of the country, la Guinée Maritime is 150 km wide and spreads along the Atlantic Ocean for approximately 300 km of coastal lands. It covers 15% of the total surface area (36,200 km²) and comprises a coastal swampy zone behind which spreads a plain slowly rising until the foot of the hills of Moyenne Guinée. The average rainfall is everywhere greater than 1,800 mm, reaching 3,000 mm in Conakry. Temperatures are constantly high during the year. The region is watered by numerous rivers, which drain from the large cultivable plains to the coast. Mangrove and swamp rice, cassava and oil palm are the main food crops in the coastal zone, but rice, maize, fonio, cassava and vegetables are grown in the piedmont plain. The degradation of forest cover, as a result of the expansion of agricultural lands and the exploitation of firewood for Conakry, is highly accentuated in this region. Currently, forests only cover approximately 8% of the surface area. In addition to these forests, relics of the 50,000 ha of dense mesophile forest and the 250,000 ha of mangrove should be included. This mesophile forest is characterised by impenetrable thickets and shrubs with species such as *Elaeis guineensis*; raffia species also occur such as *Raphia giganteca*, *R. sudanica*, *R. gracilis* and as well as woody lianas such as *Calamus* sp. Mangrove vegetation is essentially composed of *Rhizophora racemosa*, *Rhizophora mangle*, *Avicennia nitida*, *Sesuvium portulacastrum*, *Phyloxerus vermicularis*, *Paspalum vaginatum* and *Laguncularia* sp. Xerophile savanna of *Lophira lanceolata*, *Elaeis guineensis*, *Anisophylla lauriana* can also be found.

4. Survey results

4.1 Itinerary

The map in Figure 2 illustrates, in yellow, the roads used for counts during this survey; the itinerary is described in detail in Annex 1. Moreover, the red lines indicate the routes which were used as part of the broader regional survey (Rondeau *et al.* in prep. c) carried out during the same season in 2005. The observations made on these sections, which complete the national coverage, will contribute to the analysis of this study (Rondeau *et al.* in prep. b).

In order to ensure that Palearctic raptors and intra-African migratory species were properly surveyed before the migration period, the survey began in the natural region of Haute Guinée (Figure 4). Afterwards, by using a circuit in the shape of an ‘8’, the natural regions of Guinée Forestière, as well as Moyenne Guinée and Guinée Maritime were covered.

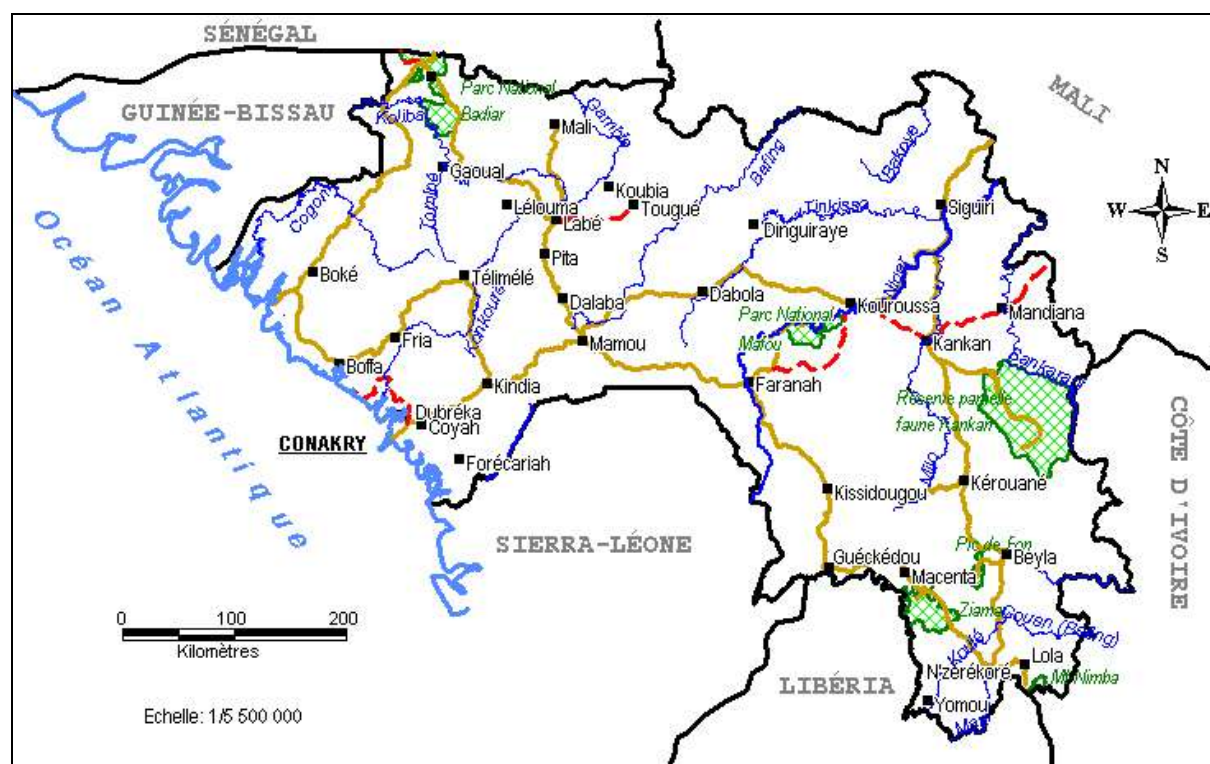


Figure 2. Survey itinerary – routes used for road transects in this study are marked in yellow; the red lines represent the circuit undertaken as part of the regional raptor survey in 2005 – Rondeau *et al.* (in prep. c).

Thus, nearly the entire national territory of Guinea was sampled by this survey, namely 23 (67%) out of the 34 grid squares covering the country (Figure 3). Out of the entire 33 prefectures of the country, only the prefectures of Dinguiraye and of Tougué (central-north) were not surveyed due to the fact that the Kalinko ferry had broken down and that roads further ahead were in very bad state. Indeed, to cover these zones would have required a very big detour – and a return the same way –

which was judged not to be practical due to time constraints and that the sectors in the north of the country were also, generally, well covered by the other sections of the survey. In any case, the prefecture of Tougué was covered as part of the 2005 survey, in the same season and with the same observers (Rondeau *et al.* in prep. c).

It should be noted that the map and the itinerary (Annex 1) do not indicate where the nocturnal surveys were undertaken; this information is provided in the section on nocturnal raptors (section 4.2.3). The location of pedestrian transects (in protected areas) is described later in this section.

In each area, in order to demonstrate that the different sections of the circuit had been effectively surveyed, the mission order was signed by the appropriate authorities (Annex 2). Moreover, Annex 3 gives a detailed list of the people encountered during the preparation and implementation of the survey.

Table 1 presents the broad habitats covered during the survey and the percentage they represent in relation to the whole circuit. It should be noted that protected areas only form 5% of the total distance travelled (179 km), which is relatively small. However, this broadly corresponds to the percentage land cover of the country's protected areas (some 6%). It should also be noted that all the main protected areas of the country were visited and it would have been difficult to do more at this level due to the fact that the road network in most parks and reserves is very limited. On the other hand, taking into consideration that the survey had covered nearly the entire country, a large number of "towns" were crossed, which explains why 13% of the effort carried out for the survey was deployed in human conurbations. The rural area, with 82% of the total circuit (2,987 km), represents the habitat that was best covered as part of the survey. It is also the most widespread habitat in Guinea.

Table 1. Road count transects broken down by broad habitat types

Habitat types	Transects achieved (km)	Survey %
Rural area	2,987	82
Protected areas	179	5
Towns	469	13
Total (survey)	3,635	100
Outside of the survey	1613	(31)
<i>Total</i>	<i>5,248</i>	

Thus, a total of 3,635 km of road counts were covered for the study, with a daily average of 135 km (the average length of transect, when crossing a homogenous area in one general direction, was 158 km). However, it should be noted that with the inevitable "back and forth" journeys (cul-de-sacs) and the backward and forward journeys in the main towns (refuelling, vehicle repairs, lodging, etc.), and by including the distance of 296 km needed to joint the starting point of the survey, some 1,613 km were added to the meter, which brings the total to 5,248 km covered for this

work (and therefore, a daily average of 194 km). This additional 1,613 km corresponded to 31% of the total distance covered for this study.

Table 2 presents the survey effort by the natural regions of Guinea. With 40% of the distance covered by transects, Haute Guinée is the natural region where the survey lingered the most. Yet, this effort perfectly corresponds to the territorial coverage of this region on a national level (39%). This is the same for Guinée Forestière, Moyenne Guinée and Guinée Maritime, which have been respectively covered at a rate of 22, 24 and 14% of the deployed effort.

Table 2. Road count transects broken down according to natural regions

Natural regions	Transects covered (km)	Percentage of survey effort	Proportion of national territory (%)*
Haute Guinée	1,446	40	39
Guinée Forestière	818	22	20
Moyenne Guinée	862	24	26
Guinée Maritime	509	14	15
<i>Total</i>	<i>3,635</i>	<i>100</i>	<i>100</i>

*According to Barry (2004).

Although the survey, in terms of data analysis, had not been planned on the basis of the ecosystems (theoretically) found in Guinea, the efforts deployed reflected the ratio mentioned in the terms of reference, namely 1/3 of effort for forested areas and 2/3 for savanna (Guinean savannah and Sudanese savannah, including the ecosystems of the mountainous regions of Moyenne Guinée).

As part of this survey, six nocturnal outings (without counting the occasions where nocturnal birds of prey were seen in a fortuitous manner) were carried out in order to survey owls found in the national territory. For practical reasons, linked to the fact that the camps were set up in national parks for more than one night, four of these outings were carried out in protected areas, the other two in rural areas. Two of these observations were carried out in forested areas, although the other four were done in savannah ecosystems.

Moreover, 21 kilometres of pedestrian transects were carried out in the following protected areas: Pic de Fon, Bossou/Nimba, Zياما, Haut Niger and Niokolo-Badiar, notably in areas where visibility was limited (due to the vegetation) or in zones not accessible by vehicle. In Zياما and Pic de Fon, fixed stations were operated during several hours on summits and ridges in order to observe raptors, notably those species making their daily displays over the canopy of forest trees. Furthermore, the observations carried out at Pic de Fon, where the visit was synchronised with the start of the migration of Palearctic species, aimed to determine if this series of mountains (with the Nimba mountains), comprising the north-south axis of the Guinean highlands, was exploited by migrant raptors.

4.2 Survey data

4.2.1 Overall results

Table 3 presents an overview of the numbers of species recorded during the survey. The list of raptors – diurnal and nocturnal – that may be found within the region overall is given in Annex 4. The raw data recorded from road count transects carried out during the survey are presented in Annex 5.

Table 3. Summary of species seen during the survey

Item	Number	Comments
Total number of species of diurnal raptors observed	47	
Individuals of diurnal raptors observed	2,792	Including 19 diurnal raptors not identified
Vulture species	6	
Species of Palearctic diurnal raptors	12	
Species of nocturnal raptors recorded	7	
Individuals of nocturnal raptors observed	31	Including one nocturnal raptor not identified
Individuals of Pied Crow <i>Corvus albus</i> observed	545	
Individuals of other large birds (African grey parrot, hornbills, bustards)	0	

4.2.2 Diurnal raptors

Out of the 62 diurnal species known to occur in west Africa (Borrow and Demey 2001), we have identified, during the 27 survey days, 47 species in the entire Guinean territory, equivalent to 76% of the regional species' complement. This is a very high proportion of the potential total considering that, for comparison, as part of the west-African survey carried out in 2005 in eight countries of the sub-region, only 40 diurnal species were observed (Rondeau *et al.* in prep. c).

It is possible that this high number of species observed might be correlated to the high diversity of ecosystems in Guinea. However, it is also possible that this could be due to the fact that this survey has been carried out in a more intensive manner, at a slower pace and over a longer period of time than the regional survey of 2005, with 27 days (3,635 km) versus 24 days (5,760 km) respectively (Rondeau *et al.* in prep. c). In any case, this survey demonstrates the high richness of diurnal raptors in Guinea, which may also partly explain why Guinea is an important centre for the trade and export of raptors.

Table 4. Diurnal raptors grouped by abundance categories.

Abundance class of species surveyed	Scientific names
<u>Abundant species</u> (4) (sighted at least fifty times) (in decreasing order of abundance)	<i>Necrosyrtes monachus</i> <i>Milvus migrans</i> <i>Gyps africanus</i> <i>Butastur rufipennis</i>
<u>Common species</u> (9) (sighted between fifteen and fifty times) (in taxonomic order)	<i>Elanus caeruleus</i> <i>Gyps rueppellii</i> <i>Polyboroides typus</i> <i>Circus aeruginosus</i> <i>Melierax metabates</i> <i>Accipiter badius</i> <i>Kaupifalco monogrammicus</i> <i>Buteo auguralis</i> <i>Falco biarmicus</i>
<u>Uncommon species</u> (12) (sighted between five and fifteen times) (in taxonomic order)	<i>Gypohierax angolensis</i> <i>Trionoceph occipitalis</i> <i>Circaetus beaudouini</i> <i>Circaetus cinereus</i> <i>Circaetus cinerascens</i> <i>Terathopius ecaudatus</i> <i>Accipiter ovampensis</i> <i>Aquila wahlbergi</i> <i>Hieraaetus spilogaster</i> <i>Hieraaetus pennatus</i> <i>Falco tinnunculus</i> <i>Falco ardosiaecus</i>
<u>Scarce species</u> (14) (sighted between two and five times) (in taxonomic order)	<i>Pandion haliaetus</i> <i>Aviceda cuculoides</i> <i>Pernis apivorus</i> <i>Haliaeetus vocifer</i> <i>Gyps fulvus</i> *** <i>Circus pygargus</i> <i>Micronisus gabar</i> <i>Accipiter melanoleucus</i> <i>Aquila rapax</i> <i>Lophaelus occipitalis</i> <i>Stephanoaetus coronatus</i> <i>Falco alopex</i> <i>Falco subbuteo</i> <i>Falco cuvierii</i>
<u>Rare species</u> (8) (sighted once) (in taxonomic order)	<i>Accipiter tachiro</i> <i>Accipiter erythropus</i> <i>Buteo rufinus</i> ** <i>Spizaetus africanus</i> * <i>Falco chicquera</i> <i>Falco vespertinus</i> ** <i>Falco cherrug</i> *** <i>Falco peregrinus</i>

* Species difficult to observe

** Very rare species

*** Exceptional or vagrant species

Table 4 presents diurnal species grouped by abundance categories enabling the 13 most abundant and common species to be identified along with those of less frequent occurrence. Discussion concerning these species will follow in subsequent sections, including analysis by habitat types and by natural regions. However, it should be

noted that some very rare or vagrant species have been observed during this survey, notably the Eurasian griffon vulture *Gyps fulvus*, the long-legged buzzard *Buteo rufinus*, the western red-footed falcon *Falco vespertinus* and the saker falcon *Falco cherrug*. The observations of Eurasian griffon vulture and saker falcon are, to the best of our knowledge, the first records for Guinea.

It is also surprising that the red-necked falcon *Falco chicquera* was only observed once during the survey although it is a species regularly exported by bird catchers from Conakry and it is a species which should normally have been observed more frequently in the north of the country.

Table 5 presents the 15 “missing” species, namely those species which might have been expected to have been observed in the zones and in the period covered by the survey. Of course, if the survey duration had been extended, it might have been possible to see some of these missing species, but it also remains possible that these species are not all necessarily present in Guinea, at least not during the dry season in which this survey, as well as the others done in the sub-region, was carried out. Moreover, out of these 15 “missing” species, eight, therefore more than half, are migrant species (intra-African or Palearctic).

Table 5. Species not observed during the survey but which are known from the region.

Species grouped by biomes and other categories	Scientific names (in taxonomic order)
Species difficult to observe (1)	<i>Macheiramphus alcinus</i>
Forest species (3)	<i>Dryotriorchis spectabilis</i> <i>Urotriorchis macrourus</i> <i>Hieraaetus ayresii</i>
Species of the Sudanese savannah (3)	<i>Torgos tracheliotus</i> <i>Circus macrourus</i> <i>Polemaetus bellicosus</i>
Species of the Sahel regions (4)	<i>Chelictinia riocourii</i> <i>Neophron percnopterus</i> <i>Circaetus gallicus</i> <i>Sagittarius serpentarius</i>
Exceptional or vagrant Palearctic species (4)	<i>Buteo buteo</i> <i>Aquila nipalensis</i> <i>Falco naumanni</i> <i>Falco peregrinoides</i>

The bat hawk *Macheiramphus alcinus* is a crepuscular / nocturnal species which can be difficult to observe using the current survey methods where observations ended at 1730 hours. Forest species are also often difficult to observe, especially for the first two (the Congo serpent eagle *Dryotriorchis spectabilis* and the long-tailed hawk *Urotriorchis macrourus*), particularly with the survey methodology. The effort deployed through the pedestrian transects and during the observations on ridges in forested zones did not result in any records of them. It is more than possible that the

near total disappearance of dense forests in Guinea is not favourable to the presence of these strictly forest-dependent species. However, it should be noted that an adult of the Ayres' hawk eagle *Hieraaetus ayresii* was observed several weeks before the start of the survey in the suburbs outside Conakry.

The species of the Sudanese savanna group could normally, by the methodology used, have been observed during the survey, notably in Haute Guinée and in the Koundara plains and, particularly, in the partial fauna reserve of Kankan and in the national parks of Haut Niger and Niokolo-Badiar. The species of the Sahel group are raptors which are generally observed more to the north in the sub-region. There is little chance of seeing them in Guinea, even in the extreme north of the country and it is not surprising that they have not been recorded.

This is also the case for the other four raptors in the 'exceptional' or vagrant group of Palearctic species. Their observation, as for other rare or vagrant species, is very much subject to chance in the sub-region; their presence does not add much to the overall assessment of a country's raptors. However, the fact that they were not recorded remains an important fact, especially when noting that some of these species are sometimes 'offered' by bird traders operating in Conakry.

4.2.3 Nocturnal raptors

Table 6 summarises the observations on nocturnal raptors carried out during the survey. As explained above, listening stations operated as part of this work do not allow any index of abundance (e.g. sightings per kilometre or other) to be estimated. They simply allow the establishment of a list of recorded species and it cannot be claimed to be an exhaustive list of all the species present in the areas surveyed.

However, it should be noted that seven species have been observed, with some 31 individuals counted. Out of these seven species, only the red-chested owlet *Glaucidium tephronotum* was observed uniquely in the forest biome. In fact, this is an interesting observation (from the classified forest of Ziaman) because this species had not previously been observed in Guinea (it is nevertheless known in the forests located on the other side of the border in Liberia). The white-faced scops owl *Otus leucotis*, the African scops owl *Otus senegalensis* and the Pel's fishing-owl *Scotopelia peli* were only observed in the savanna biome. The barn owl *Tyto alba* and the wood owl *Stix woodfordii*, were recorded equally in forest areas as much as in savanna. It should be noted that Pel's fishing-owl was recorded in the only place where this species is known in Guinea (namely Haut Niger National Park).

With respect to the marsh owl *Asio capensis*, it is useful to note that an individual was found in a bird catcher's aviary in Conakry even though this species is not normally found in Guinea. However, the study carried out on the trade in raptors has demonstrated that this species is regularly exported from Conakry.

Table 6. Nocturnal raptors recorded during the survey.

Date	Sites	Habitat	Environment	Species	Numbers
14.02.2006	Conakry (at a bird traders)	RA	S	<i>Asio capensis</i>	1
15.02.2006	Bissikirim Camp	RA	S	<i>Otus senegalensis</i>	3
25.02.2006	CF Pic de Fon	PA	F	<i>Unidentified sp.</i>	1
28.02.2006	CF Ziama	PA	F	<i>Glaucidium tephronotum</i>	2
				<i>Strix woodfordii</i>	2
04.03.2006	Faranah	T	S	<i>Tyto alba</i>	1
05.03.2006	NP Haut Niger	PA	S	<i>Otus senegalensis</i>	3
				<i>Scotopelia peli</i>	1
				<i>Unidentified sp.</i>	1
06.03.2006	NP Haut Niger	PA	S	<i>Otus senegalensis</i>	2
				<i>Otus leucotis</i>	1
				<i>Strix woodfordii</i>	1
13.03.2006	NP Badiar	PA	S	<i>Otus senegalensis</i>	6
				<i>Otus leucotis</i>	3
				<i>Strix woodfordii</i>	1
13.03.2006	Koundara	T	S	<i>Otus senegalensis</i>	1
16.02.2006	Kamsar	T	F	<i>Tyto alba</i>	1

RA: Rural area

F: Forest

PA: Protected area

S: Savannah

T: Town

4.2.4 Other large birds

In spite of the opportunity taken during the surveys to take note of any African grey parrots *Psittacus erithacus timneh* which might be encountered, not a single individual was observed, either during the road counts or during the foot surveys. It is also remarkable to note that neither were any hornbills (terrestrial or arboreal) or any bustards observed during the field surveys.

4.3 Distribution by habitat types

4.3.1 Overall distribution

Table 7 presents the survey data by broad habitat type (rural area, protected areas and towns). It should be noted that, for the entire survey, the average number of species per transect is 11 ± 1.4 (s.d) with an average index of abundance of 76.8 individuals/100km.

Table 7. Survey data of diurnal raptors according to habitat types.

Habitat type	No. of individuals	No. of species	Average no. of species / transect	Overall abundance index (individuals / 100 km)	Five main species observed
Rural area	1 861 (67 %)	43	5.8 ± 0.5	62.3	<i>Necrosyrtes monachus</i> <i>Milvus migrans</i> <i>Gyps africanus</i> <i>Butastur rufipennis</i> <i>Kaupifalco monogrammicus</i>
Protected areas	141 (5 %)	30	13.8 ± 0.9	78.8	<i>Milvus migrans</i> <i>Buteo auguralis</i> <i>Polyboroides typus</i> <i>Accipiter badius</i> <i>Hieraaetus spilogaster</i>
Towns	790 (28 %)	11	1.5 ± 0.2	168.4	<i>Necrosyrtes monachus</i> <i>Milvus migrans</i> <i>Gyps africanus</i> <i>Accipiter badius</i> <i>Gyps rueppellii</i>
Total	2 792	47	(11.0 ± 1.4)	76.8	<i>Necrosyrtes monachus</i> <i>Milvus migrans</i> <i>Gyps africanus</i> <i>Butastur rufipennis</i> <i>K. monogrammicus</i>

4.3.2 Rural areas

A total of 43 species has been observed in the rural areas of Guinea, in all natural regions combined. This makes it the richest habitat of the survey area, but this is probably due to the fact that the survey was mainly concentrated in this environment. Not surprisingly therefore, the five main species recorded in this type of habitat are those found in the same order for the survey overall (Table 7). These are mainly species associated with human establishments (hooded vulture *Necrosyrtes monachus* and the black kite *Milvus migrans*) and also, to some extent, the white-backed vulture *Gyps africanus* and raptors visiting, in this season, the savanna lands prepared for agriculture and husbandry using fire.

Despite this large number of species, relatively few individuals were counted in rural areas: only 67% of individual raptors were recorded for 82% of effort (measured in terms of kilometres). Also, the average number of species per transect and the index of overall abundance are lower compared to that found in the entire survey (5.8 ± 0.5 and 62.3 ind./100 km respectively), which could indicate a lower productivity in the rural areas.

4.3.3 Protected areas

A total of 30 species was observed in the country's protected areas, in all natural areas combined. It should be noted that no vultures were observed in any of the protected areas visited.

It is, nevertheless, noteworthy that the five main species recorded in the protected areas, except for the black kite, are different from the main species observed in the rural areas (and for the survey overall). Of all species found in the protected areas, only three (Cassin's hawk eagle *Spizaetus africanus*, crowned eagle *Stephanoaetus coronatus* and African hobby *Falco cuvierii*) were exclusive to protected areas and were not observed elsewhere. Nevertheless, this is very few considering that the protected areas, in principle, are composed of undisturbed ecosystems (and, also, that these three species were, in fact, observed only once or twice during the survey).

Despite a relatively low number of species, the average number of species per transect is high (13.8 ± 0.9), which indicates that the environment is rich and it is possible that a larger number of species would have been recorded in the protected areas if it had been possible to increase the survey effort within this environment. Moreover, the overall abundance index is higher (78.8 ind./100 km) compared to the average of the survey overall. However, the percentage of the number of individuals counted (5%) corresponds to the percentage of the effort expended in this type of habitat during the survey.

4.3.4 Towns

A total of 11 species has been observed in towns during the survey, all of which had also been recorded in rural areas. However, some five species observed in towns had not been observed in the protected areas. They are the black-shouldered kite *Elanus caeruleus* as well as the four regularly occurring vulture species. In this respect, it is interesting to once again emphasise that all species of vultures had been observed in the towns and none in protected areas.

It should be noted that the three main species recorded in towns are the same, and in the same order, as those observed in rural areas (and, indeed, for the survey overall). The shikra *Accipiter badius* and Rüppell's vulture *Gyps rueppellii* comprise the remainder of the main species observed in towns (4th and 5th rank). However, it should be noted that the Rüppell's vulture remains more abundant in rural areas than in towns (1.4 vs. 0.9 ind./100 km).

Given the low number of species found in towns, it is not surprising that the average number of species per transect in this habitat type is very low (1.5 ± 0.2). On the other hand, the overall abundance index for towns is the highest (78.8 ind./100 km) of the survey area. Also, the percentage of the number of individuals counted (28%) exceeds the effort committed during the survey in this type of habitat (13%). Thus, it is possible to conclude that towns support relatively few species of raptor, which is not surprising considering the "homogeneity" of the habitat, but they nevertheless sustain large numbers of birds of prey. Notable amongst these are large raptors, such as the hooded vulture (133.7 ind./100 km), whose presence is almost certainly due to the large quantity of food available in these urban environments.

4.4 Geographical distribution of raptors

Annex 6 presents the road count data re-organised in grid squares of one degree longitude and latitude and grouped according to the natural regions of Guinea.

Figure 3 illustrates the survey data by grid of one degree longitude/latitude. Based on this grid, some 34 squares cover, entirely or partially, the territory of the Republic of Guinea. As part of the survey work, some 23 squares have been covered. This reorganisation of the data by grid square enables one to better visualise the survey results at the geographical level and will enable the publication of distribution maps (Rondeau *et al.* in prep. b). Moreover, the reorganisation of data according to this grid will allow correlations between raptor distribution and areas exploited by the bird traders based on information collected during a study of the trading networks carried out in December 2005 (Rondeau *et al.* in prep. a).

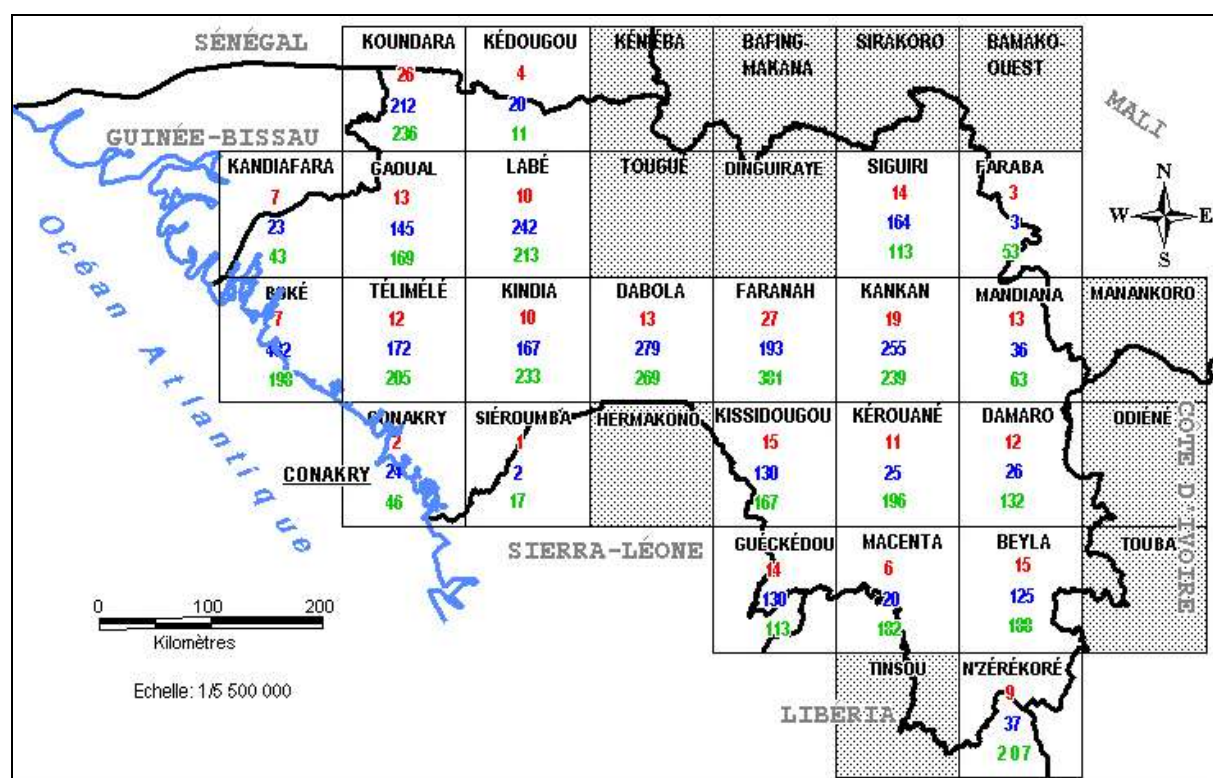


Figure 3. Summary data of the occurrence of diurnal raptors in Guinea by grid squares of one degree longitude/latitude (in red: the number of species; in blue: the number of individuals; in green: the kilometres). Shaded squares were not sampled by the survey.

Due to the configuration of the grid and the road network, some squares have only been partially tackled whilst others have had better coverage. Due to this uneven coverage, the data are better analysed by natural region (see below).

However, it should be noted that some squares contain a high number of species, such as the squares of Faranah (27) and of Koundara (26). This situation is certainly due to the presence of significant protected areas in these sectors (National Parks of Haut

Niger and of Niokola-Badiar respectively). On the other hand, the survey has demonstrated that the squares of Macenta (6), Boké (7) and N'Zérékoré (8) apparently possess very low numbers of species. Incidentally, they are the most forested regions of the survey area.

4.5 Distribution by natural regions

Table 8 and Figure 4 present the survey data broken down by natural regions (see Annex 6 for raw data). It was explained above (Table 2) that the survey effort for each natural region corresponds broadly to the proportion of the country occupied by each region, thus enabling valid comparisons between regions.

4.5.1 La Haute Guinée

With 37 species, this region is, in terms of raptors, the richest natural region of Guinea. This finding is particularly interesting given that this region seems, at first sight, to be rather homogenous and very disturbed (by cultivation of cotton and livestock husbandry, for example). It is also the region harbouring, in the season of the survey, the largest number of Palearctic species (eight species). In fact, the average number of species per transect (14.0 ± 2.3) is the highest of the entire survey area. However, the overall abundance index (68.4 ind./100km) is lower than the one for the entire survey.

With six species recorded, la Haute Guinée is also the richest region in terms of vultures (with the Eurasian griffon vulture observed twice in this region).

4.5.2 La Guinée Forestière

With 28 species recorded, the survey has demonstrated that this natural region is relatively poor in terms of species richness of raptors. It is the same in terms of the average number of species per transect (10.0 ± 1.9), which is quite surprising considering the large homogeneity of the environments found in this natural region (and of the forest tracts still present in the south of this area). It is also the natural region with the lowest overall abundance index (43.8 ind./100 km) of the survey area.

On the other hand, a high number (seven) of Palearctic species occurred in Guinée Forestière in the survey period, a situation which was particularly notable during the observations carried out in the Guinean highlands (Pic de Fon).

It is interesting to note that Guinée Forestière and Haute Guinée share four of the five main species observed (and in the same rank), which might indicate that these regions do not differ substantially in terms of their exploitation by the most abundant raptors.

Table 8. Occurrence of diurnal raptors in Guinea by natural regions.

Natural region	No. of species	Average no. of species / transect	Overall abundance index (ind. / 100 km)	Five main species observed
Haute Guinée	37	14.0 ± 2.3	68.4	<i>Milvus migrans</i> <i>Necrosyrtes monachus</i> <i>Gyps africanus</i> <i>Butastur rufipennis</i> <i>Buteo auguralis</i>
Guinée Forestière	28	10.0 ± 1.9	43.8	<i>Milvus migrans</i> <i>Necrosyrtes monachus</i> <i>Gyps africanus</i> <i>Polyboroides typus</i> <i>Buteo auguralis</i>
Moyenne Guinée	33	12.6 ± 3.3	91.6	<i>Necrosyrtes monachus</i> <i>Gyps africanus</i> <i>Milvus migrans</i> <i>Gyps rueppellii</i> <i>Polyboroides typus</i>
Guinée Maritime	15	5.8 ± 1.8	128.3	<i>Necrosyrtes monachus</i> <i>Milvus migrans</i> <i>Gyps africanus</i> <i>Kaupifalco monogrammicus</i> <i>Accipiter badius</i>

4.5.3 La Moyenne Guinée

Moyenne Guinée, with 33 species recorded, is a relatively rich region. Moreover, both the average number of species per transect (12.6 ± 3.3) and the overall abundance index (91.6 ind./100 km) is higher than the survey average.

Five species of vultures were recorded – it is, in fact, the natural region with the highest index of abundance for vultures (74.4 ind./100 km), with 61.5 ind./100km for the hooded vulture. It should be noted that the two most abundant species of this natural region are the hooded vulture and the white-backed vulture (9.4 ind./100 km) with Rüppell's vulture in fourth position.

Moreover, six Palearctic species were recorded in Moyenne Guinée.

4.5.4 La Guinée Maritime

With only 15 species recorded, it is the least rich natural region for raptors in Guinea. Also, the average number of species per transect (5.8 ± 1.8) is, by far, the lowest of the survey. Moreover, only one Palearctic species was recorded.

On the other hand, the Guinée Maritime is the region possessing the highest overall abundance index (128.3 ind./100km) for the entire survey area. As for the Moyenne Guinée, the hooded vulture is the most abundant species of this natural region (with an abundance index of 77.7 ind./100km). In fact, it is the region where this vulture is the most abundant as, indeed, is the pied crow (with an abundance index of 32.6 ind./100km).

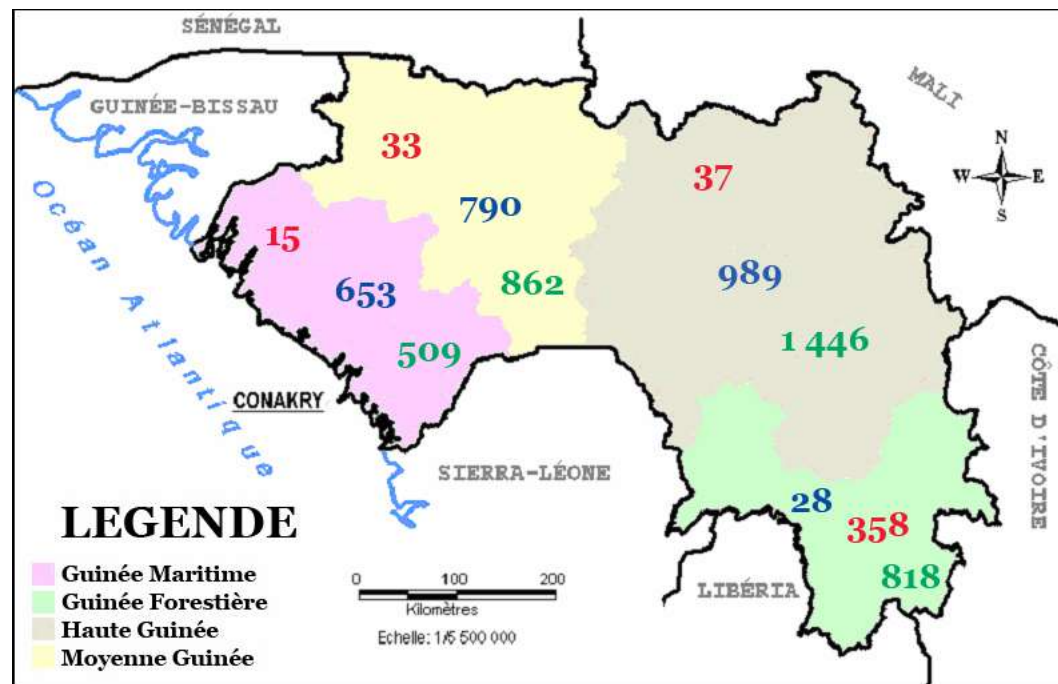


Figure 4. Survey results broken down according to the natural regions (red: the number of species; blue: the number of individuals; green: the distance covered in kilometres).

5. Comparisons with data from other regional surveys

It is possible to compare the results of this survey with two other similar studies carried out recently in the sub-region. They are the surveys carried out in 2003-2004 by Dr Jean-Marc Thiollay (Thiollay 2006) in Burkina Faso, Mali and Niger (8,165 km) and the study funded by the Critical Ecosystem Partnership Fund (hereafter referred to as the 'CEPF' survey) carried out in 2005 across the sub-region (Niger, Burkina Faso, Togo, Ghana, Mali, Guinea, Gambia and Senegal / 5,760 km) by the same team who carried out this survey (Rondeau *et al.* in prep. c). However, it is important to note that Thiollay's protocol was carried out in the Sudanese and Sahel savanna at more northerly latitudes, and in drier conditions, than this survey. Accordingly, for comparison, only the data of Thiollay (2006) originating from the Sudanese savanna have been used. However, the results of the Thiollay's survey do not differentiate between rural areas and towns, data from these two areas being combined. This needs to be considered when analysing the results.

The CEPF study was carried out in conditions closer to the ones in this survey, although it also covered the southern part of the Thiollay's circuit. Here data from towns were dealt with in the same way as in this work. It should also be noted that the CEPF survey also covered a significant part of Guinea (Figure 2). Indeed, the data from the CEPF study relating to Guinea will be exploited for the drafting of the status and conservation assessment (Rondeau *et al.* in prep. b), as will the results of Rondeau and Thiollay (2004) regarding the decline of west African vultures.

Table 9 presents the main results of the different surveys carried out recently in the sub-region. Some 47 species have been recorded from this current survey in Guinea. This is greater than the 40 species recorded by the CEPF survey but less than the 49 recorded by Thiollay (2006). It should be noted that the last study had been carried out over several years (1969-1973 and 2003-2004), during repeated field campaigns and over a very large area (comprising three countries and more than 8,000 km of transects), which must surely have contributed to the higher number of species observed. Thus, in this context, the total of 47 species observed during this work, over only 27 days and 3,635 km, confirms the very high richness of raptors in Guinea.

It is interesting to note that the four most abundant species from the current and CEPF surveys are the same and in the same rank. The differences with Thiollay's surveys (three species the same out of five) probably originate from the fact that the latter study had been carried out more in the Sahel regions (also including the interior delta of the river Niger).

The overall abundance indices found by this and by surveys by Thiollay (2006) are very close; this is also the case for the average number of species per transects. However, the equivalent values recorded from the CEPF study were significantly lower; it is possible that this is due to the fact that the CEPF survey was carried out later in the year, towards the end of the rainy season.

Table 9. Comparison of data originating from three different raptor surveys carried out in the sub-region, broken down by broad habitat types (source of survey data: ‘Guinea’ - this survey; ‘Thiollay’ - Thiollay 2006; ‘CEPF’ - Rondeau *et al.* in prep. c).

Habitat type	Survey	No. of species	Average no. of spp. / transect	Overall index of abundance I. (ind. / 100km)	Five main species observed
Rural Areas	Guinea	43	5.8 ± 0.5	62.3	<i>Necrosyrtes monachus</i> <i>Milvus migrans</i> <i>Gyps africanus</i> <i>Butastur rufipennis</i> <i>Kaupifalco monogrammicus</i>
	Thiollay	24	8.5 ± 0.5	88.7	<i>Necrosyrtes monachus</i> <i>Milvus migrans</i> <i>Falco tinnunculus</i> <i>Circus aeruginosus</i> <i>Gyps rueppellii</i>
	CEPF	35	10.2 ± 1.6	28.3	<i>Necrosyrtes monachus</i> <i>Milvus migrans</i> <i>Butastur rufipennis</i> <i>Gyps africanus</i> <i>Elanus caeruleus</i>
Protected areas	Guinea	30	13.8 ± 0.9	78.8	<i>Milvus migrans</i> <i>Buteo auguralis</i> <i>Polyboroides typus</i> <i>Accipiter badius</i> <i>Hieraaetus spilogaster</i>
	Thiollay	32	22.0 ± 1.8	98.4	<i>Gyps africanus</i> <i>Necrosyrtes monachus</i> <i>Terathopius ecaudatus</i> <i>Butastur rufipennis</i> <i>Accipiter badius</i>
	CEPF	26	9.2 ± 2.6	41.0	<i>Gyps africanus</i> <i>Necrosyrtes monachus</i> <i>Terathopius ecaudatus</i> <i>Milvus migrans</i> <i>Gyps rueppellii</i>
Towns	Guinea	11	1.5 ± 0.2	168.4	<i>Necrosyrtes monachus</i> <i>Milvus migrans</i> <i>Gyps africanus</i> <i>Accipiter badius</i> <i>Gyps rueppellii</i>
	Thiollay	-	-	-	-
	CEPF	11	1.0 ± 0.2	165.4	<i>Necrosyrtes monachus</i> <i>Milvus migrans</i> <i>Gyps africanus</i> <i>Elanus caeruleus</i> <i>Gyps rueppellii</i>
Total	Guinea	47	11.0 ± 1.4	76.8	<i>Necrosyrtes monachus</i> <i>Milvus migrans</i> <i>Gyps africanus</i> <i>Butastur rufipennis</i> <i>K. monogrammicus</i>
	Thiollay	49	19.7 ± 0.6	88.7	<i>Necrosyrtes monachus</i> <i>Milvus migrans</i> <i>Falco tinnunculus</i> <i>Circus aeruginosus</i> <i>Gyps africanus</i>
	CEPF	40	3.2 ± 0.5	39.0	<i>Necrosyrtes monachus</i> <i>Milvus migrans</i> <i>Gyps africanus</i> <i>Butastur rufipennis</i> <i>Gyps rueppellii</i>

In terms of rural areas, the high number of species observed (43) by this study should be noted, compared to 35 and 24 species by the CEPF and Thiollay's surveys respectively, though it is difficult to find any reason to account for this difference. It should also be noted that, except for the first two most abundant species (hooded vulture and black kite), the main species observed are not always exactly the same between surveys. The overall abundance index found for this survey (62.3) is between those recorded by the surveys of Thiollay (88.7) and CEPF (28.3), likewise for the average number of species per transect. However, it should not be forgotten that Thiollay's survey amalgamated the data from towns with those from rural areas thus distorting the results. It is thus possible that the overall abundance indices of these two protocols would be closer without this distortion.

Indeed, comparison between the different surveys shows a big variability in recorded parameters from rural areas, which is perhaps not surprising given the large diversity of ecosystems and practices of land use found in this "habitat".

For the protected areas, it should be noted that this study and those of Thiollay and CEPF, record similar numbers of species (respectively 30, 32 and 26). However, it should be noted that in Thiollay's survey, the number of species recorded in protected areas was higher than in the rural areas. However, this was not the case for the Guinea and CEPF studies. Even accounting for the fact that no vulture species were recorded in protected areas by this study, it is difficult to explain this difference, which may be due to the fact that protected areas in Guinea are relatively small and in a poor state of conservation.

Most of the overall indices of abundance for protected areas are broadly similar though the abundance index for the CEPF study is lower. The Thiollay and CEPF studies shared the same three most abundant species but these differed from the current study. These differences might be explained by the fact that the current project surveyed more protected areas in the forest biome. Although the average number of species recorded is similar between this study and that of the CEPF, both are low compared with the results from Thiollay's survey.

With respect to towns, it is interesting to note that this study and CEPF's record the same number of species (Thiollay does not present any data for this habitat) and four out of the five most abundant species are also the same and in the same rank. Furthermore, the average number of species observed and the overall abundance indices are also very similar. Thus, it appears that urban areas in Guinea, and more widely in west Africa, offer conditions which are broadly similar for those raptors exploiting these environments.

6. Conclusions

This survey has achieved one of the main objectives of this project, namely to provide a shared and improved understanding of the distribution and relative abundance in Guinea of diurnal and nocturnal raptors on which assessments of the sustainability of any trade can be based. As a result, the Guinean authorities responsible for the management of the wildlife, whom before the accomplishment of this work had only marginal and incomplete data on raptors (diurnal and nocturnal), are now in possession of reliable, recent and authoritative information on this important group of birds. Such intense and prolonged surveys of raptors are rare in a regional context.

Some 3,635km of road transect has been covered, over 27 days, distributed across the natural regions of Guinea and covering a representative range of habitats (forest and savanna) and including rural, urban and protected areas. These road counts were supplemented by 21km of pedestrian transects in forested areas and 6 nocturnal surveys. In all, some 47 species of diurnal raptor and 2,792 individual raptors were recorded along with 7 species of owl (31 individuals). This survey has demonstrated, and confirmed that the Republic of Guinea is particularly rich in terms of raptors. Alone, it hosts 76% of all the species of bird of prey which it is normally possible to find in west Africa – an exceptional situation. This richness could explain, in part, why Guinea is one of the main centres of trade in raptors from the African continent.

This survey contributes to a more complete status and conservation assessment on the raptors of Guinea (Rondeau *et al.* in prep. b) which will form the basic tool to allow those responsible for managing wildlife to take the best possible informed decisions regarding the exploitation and conservation of this important resource. The information gathered begins to provide the basic information necessary to underpin for raptors the non-detriment findings which are a fundamental requirement of CITES before the export of any species under the Convention is permitted. The absence of any sightings at all of the African grey parrot (*Psittacus erithacus*) is also significant in a CITES context, this species has been heavily traded and is currently the subject of measures under CITES review of significant trade.

Thanks to the other two similar studies (Rondeau *et al.* in prep. c; Thiollay 2006) carried out recently in the region, it has been possible to compare and to validate the results of this survey. These comparisons have also drawn attention to the poor state of protected areas in Guinea for raptors, a situation emphasised by the fact that not a single vulture was recorded in them during the survey.

With respect to vultures, the survey has also confirmed that healthy vulture populations are still present in parts of Guinea, notably in Fouta Djallon and in its extensions. In the context of the widespread, general decline of vultures in west Africa (Rondeau and Thiollay 2004), the confirmation of this relic enclave highlights the crucial regional importance of Guinea for the conservation of west African vultures. In part as a result of this survey, the Republic of Guinea established, in November 2006, a specially protected area (extending to 450,000 ha) for vultures in the Massif du Fouta Djallon (Birdlife International, 2007), one of the rare parts of the sub-region where a relic population of vultures still exists. Such a vulture sanctuary will

constitute a cornerstone of conservation efforts aiming, through education and protection, at avoiding the regional extinction of vultures in West Africa.

Importantly, the results of the survey provide a baseline against which future trends can be assessed. The survey method (and related transects) was designed to be easily replicated. It is, indeed, important that regular follow up surveys be carried out (say every five years) on the same circuit in order to monitor population trends in raptors in relation to the pressures exerted on them and the conservation measures undertaken for their protection. It is also important that such repeat surveys contribute to wider monitoring programmes, such as the pan-African protocol for monitoring vultures. Finally, the survey also provides information relevant to negotiations for a potential agreement on migratory African-Eurasian raptors under the Convention on Migratory Species (Goriup and Tucker, 2005).

7. Acknowledgements

The research conducted for this project was commissioned jointly by the Joint Nature Conservation Committee (JNCC; also the UK CITES Scientific Authority for animals) & the Department of the Environment, Food and Rural Affairs (Defra; also the UK CITES Management Authority) but does not necessarily reflect the views of either. Alison Littlewood and Vin Fleming of JNCC initiated the idea for this study and were also responsible for editing the English version of the final report. Wendy Byrnes translated the report from English to French.

We would like to thank Jamison Sutter, formerly of FFI, for his important and initial contribution to the project design.

We would like to sincerely thank the Guinean authorities for their unwavering support brought as part of this work. The support from the government services and official authorities has always been exemplary. It is thanks to their help that this work could be achieved as planned, especially during the difficult period of general strike at the end of February 2006. We also would like to thank the personnel of the National Department for Water & Forests (DNEF), and particularly Mme Christine Sagno, for her complete support to this study. We also thank all the other authorities (administration, military etc.) we met during this survey and who, without slackening, have hugely facilitated the task in the field.

Moreover, we wish to thank the staff of Camp Ganga 2 of Rio Tinto in Simandou for their hospitality and their logistical support to the survey in Pic de Fon. Also, we would like to thank M. Philip Laprade of Ultragold and the Clapasson family, conservator of Diwasi safari, for their hospitality.

Mr. John McManus, Ambassador of the United Kingdom to the Republic of Guinea, is also thanked for his support to this study.

Finally, we would not want to forget the different colleagues of the national parks and classified forests visited who have also supported us in our work and also underline the exemplary contribution and devotion of M. Ousmane Diallo, DNEF's wildlife specialist, who has accompanied us and hugely facilitated this work all along this mission.

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Annex 1. Details of the survey itinerary

DATE	DEPART	INTERMEDIATE TOWNS	END
14/02/06	Conakry		Boria *
15/02/06	Boria	Timbo - Dabola – Bissikirim	Campement Bissikirim *
16/02/06	Campement Bissikirim	Kouroussa - Carrefour Yiridi	Campement Norassoba *
17/02/06	Campement Norassoba	Carrefour Niandankoro – Siguiri	Campement frontière *
18/02/06	Campement frontière	Kourémalé - Carrefour Niandankoro	Kankan
19/02/06	Kankan		Réserve de faune de Kankan *
20/02/06	Réserve de faune de Kankan	Kossa	Réserve de faune de Kankan *
21/02/06	Réserve de faune de Kankan		Kankan
23/02/06	Kankan	Tintioulén – Kérouané	Banankoro
24/02/06	Banankoro	Kérouané – Beyla	Rio Tinto *
25/02/06	Rio Tinto (Simandou)	Pic de Fon	Rio Tinto *
26/02/06	Rio Tinto	Carrefour Beyla - FC Béro	N'Zérékoré
27/02/06	N'Zérékoré	Lola - Boussou- Boussou (Monts Nimba)	N'Zérékoré
28/02/06	N'Zérékoré	Sérédou	FC Ziam *
01/03/06	FC Ziam		Macenta
02/03/06	Macenta	Guéckédou	Kissidougou
03/03/06	Kissidougou	Banian – Tiro	Faranah
05/03/06	Faranah	Sidakoro (Base-vie) PN Haut Niger	Somoria (PN Haut Niger) *
06/03/06	Somoria (PN Haut Niger)	PK 36 (PN Haut Niger)	Somoria (PN Haut Niger) *
07/03/06	Somoria (PN Haut Niger)	Faranah – Marela – Ourékaba – Soyah	Mamou
08/03/06	Mamou	Dalaba – Pita	Labé
11/03/06	Labé	Yambéring	Mali
12/03/06	Labé	Tianguél Bôri – Kounsitél	Koundara
13/03/06	Koundara		PN Niokolo-Badiar
14/03/06	Koundara	Sambaïlo – Saraboïdo	Koumbia
15/03/06	Koumbia	Wendou – Boké	Kamsar
18/03/06	Kamsar	Boffa – Fria – Sokolo – Kambaya - Kindia	Kouria

* Bivouacs

Annex 2. Orders of the study mission (signed by the authorities in the regions visited)

REPUBLIQUE DE GUINEE
Travail – Justice – Solidarité

MINISTRE DE L'AGRICULTURE
DE L'ELEVAGE DES EAUX ET FORETS

N° 0034 /MAEEF/CAB/DNEF

ORDRE DE MISSION

Il est ordonné à : DIALLO Ousmane, Guy RONDEAU, Moussa CONDE, AHON Bernard

De Nationalité : Guinéenne - Canadienne - Ivoirienne

Profession ou Fonction : Cadre/DNEF - Consultant - Ornithologue Guinée écologie,
Ornithologue

De se rendre à : dans les 4 régions naturelles du pays

Objet de la Mission : Inventaire de la présence et de l'abondance des rapaces
de Guinée soumis à un commerce international

Moyen de Transport : TOTOTA Land Cruiser RC 5947 H

Conduit par : Bobob SOW


Date de Départ : 13/02/2006

Date de Retour : Fin de mission

Les Autorités Civiles et Militaires des Préfectures traversées sont priées de lui faciliter l'accomplissement de la présente mission

Conakry, le 13 FEV 2006 2006

P/ LE MINISTRE P.O
LE CHEF DE CABINET
SYLLA Abdoulaye Chérif






Vu à l'arrivée
Macenta, le 3-03-06
le Préfet



EdT / Mamadouba Simon Samara

Visa au départ de
Sidakou le 7/03/2006
le Conservateur des
Forêts

Uu à l'arrivée
au Parc Badiar
13.03.2006



Tromma Pahari

Vu à l'arrivée à
Lissidugne le 02/03/1966
et au départ de Kiriung
le 03/03/1966
Le chef de section

03-1966
H. Elie Tarkandian



Vu à l'arrivée
Sida Koro le 5/03/2006



Brachina *Camara*
Conservateur

Vu à Lambée
Label 1608 2006



vu à l'assise
et au départ Beke
le 15 Mars 2006



Vu a l'arrivée à Mali'
11/03/06 et au départ
Mali' 3/04/06



Le Chef de section E/F
Thierry Amouroux Bellet

Vu à Harriumi et au
départ de Wend-MBour
le 15 Mars 2006.
Le Sous-Préfet.



Soumah
du
à l'arrivée

et au départ
Fria, b
18/03/2006

 *Signature* P.D.R.E.
M. Moussa Dioubé Lou

Abbeurrahmane diallo - ~~6/19~~
Abou Bakar Camara
Chargé de la faune

Annex 3. List of people met during the preparation and implementation of the survey

Conakry

Name	Function
KOUROUMA Sagno Christine	Directrice Nationale des Eaux et Forêts
YANSANE Mohamed	Directeur National Adjoint E/Forêts
McMANUS John	Hon. Ambassador of the United Kingdom, Guinea
OUATTARA I. Mamadou	Coordinateur International de la Commission de l'Union Africaine, Conakry
SOW Yacine	Coordinateur du Prog. de Conserv. du Massif du Fouta Djallon
SQUARE Mamadou Kaba	Assistant du représentant FAO Conakry
CAMARA Aminata BARRY	Coordinatrice Nationale du PACV (Programme d'Appui Collec.Villageoises)
BARRY Mamadou Tahirou	Programme Intégrée de Gestion des Ecosystèmes point focal PACV
DIALLO Saliou	Coordinateur Guinée Écologie
CAMARA Marie	Directrice de Laboratoire Centrale Diagnostic Direction Nationale de l'Elevage
DIA Mamadou	Chef Section Chasse et Aires protégées
TRAORE Mohamed Lankan	Chef de Division Economie et Législation forestière
DIAKHABI Mamadou	Conseiller Juridique, Ministère de l'Agriculture Elevage des Eaux et Forêts
ROUILLE Didier	Conseiller Technique, Direction Nationale de l'Elevage

During the course of the surveys

Name	Function
TRAORE Mamadou	Chef Section des Eaux et Forêts Mamou
LAPRADE Louis Philippe	Directeur, Ultragold, Norassoba/ Siguiri
SQUARE Mamadou	Ingénieur Géologue de Norassoba/ Siguiri
KEITA Diankan	Commissaire de Police/ Koré Malé à Siguiri
KOUROUMA Souleymane	Chef Section des Eaux et Forêts de Kankan
SIDIBE Satenin	Chef de Bureau Adjoint des Douanes de Koré Malé à Siguiri
CLAPASON Albert	Conservateur Parc Diwasi, Réserve de faune Kankan
BARRY Ousmane	DPDRE par Intérim Kérouane
CAMARA Aboubacar	Sous-préfet de Banakoro/ Kérouane
BERINDEI Petre	Chargé de la logistique, Rio Tinto (Pic de Fon, Simandou), Beyla
CHANT Robin	Géologue, Rio Tinto (Pic de Fon, Simandou) Beyla
GOUMY Mamadou	Guide surveillant du Centre de Recherche Environnemental de Bossou Lola
CONDE Iba	Directeur Adjoint de Centre de Recherche Environnemental de Bossou Lola
SAKHO Djémory	Secrétaire Scien. du Centre de Recherche Environnemental de Bossou Lola
DIALLO Mamadou Nadhel	Directeur Général du Centre Forestier de N'Zérékoré (PGRR/CFZ)
WERNER Grimmeimanne	GFA, Conseiller Technique Principal du Centre Forestier de N'Zérékoré
CONDE Papa Cécé	Chef de Division Biodiversité du Centre Forestier de N'Zérékoré
PETIT Jean Marie	Directeur Général Forêt Forte N'Zérékoré
TOUPOU Mamadou	Chef Section des Eaux et Forêts de Macenta
CAMARA Mamadouba Simon	Préfet de Macenta
SYLLA Malick	Oiseleur Macenta
KOUDOUNO Elie Fara	Chef Section des Eaux et Forêts de Kissidougou
SOUHAH Mohamed Malick	Secrétaire Général des Affaires Administrative et Financière de Kissidougou
MAGASSOUBA Bakary	Chef de Projet AGIR PNHN Faranah
CAMARA Ibrahima	Conservateur PNHN Faranah
DIALLO Th. Amadou	Conservateur Adjoint, PNHN
CONDE Maoudou	Chef Section des Eaux et Forêts de Faranah
SYLLA Manga	Secrétaire Général, Institut de Sciences Agronomique et Vétérinaires, Faranah
DIALLO Sara	Directeur Général, Institut de Sciences Agronomique et Vétérinaires, Faranah
ANIVA Zoumanigui	Section des Eaux et Forêts de Kankan
GBAMOU Mamadou	Section des Eaux et Forêts de Kankan
SIDIBE Laye	Oiseleur Conakry
SYLLA Ali	Ramasseur Faranah
BAH Aliou	"Capteur" Faranah

DIALLO Ibrahima	“Capteur” Faranah
CAMARA Amadou	“Capteur” Faranah
BERETE Moussa	“Capteur” Faranah
BAH Mamadou Maladho	“Capteur” Faranah
TOURE N’Fanly	“Capteur” Faranah
MALAGHO Mamadou	“Capteur” Faranah
SANGARA Youssouf	“Capteur” Faranah
OULARE Adama	“Capteur” Faranah
TOURE Demba	“Capteur” Faranah
DOUMBOUYA Kemo	Oiseleur Kériouané
CAMARA Moussa	DPDRE, Labé
KEITA Kerfalla	Chef Section des Eaux et Forêts, Labé
DIALLO Samba Diao	1 ^{er} Chargé des Forêts, Labé
TOUNKARA Ousmane	Chargé des Faunes, Labé
DIAKITE Mamadou	Projet PRADEL, Labé
DIALLO Ousmane	Chef de Projet Aire protégée transfrontalière Guinée – Mali
BAH ElHadj Th. Abdourahmane	Notable, 1 ^{er} Imam, Labé
BADROU Elhadj Th.	2 ^{ème} Imam, Labé
BALDE Th. Amadou	Chef Section des Eaux et Forêts, Mali
TOLNO Sâa Emanuel Tongui	Chargé de la Faune, Mali
KAMANO Pierre Kabine	Surveillant de Faune, PN Niokolo-Badiar
SAKOVogui Koïkoï	Surveillant de Faune, PN Niokolo-Badiar
CAMARA Facély	Surveillant de Faune, PN Niokolo-Badiar
BAH Th. Madhou	Surveillant de Faune, PN Niokolo-Badiar
MANET Dilène	Guide, PN Niokolo-Badiar
SOW Mamadou Diouldé	DPDRE, Koundara
SOW Ousmane	Chef Section Adjoint Eaux et Forêts, Koundara
BALDE Alpha Oumar	Chargé de Faunes, Koundara
DIALLO Abdourahmane	Chargé Badiar Sud, Koundara
CAMARA Abdourahmane	Chef Section des Eaux et Forêts, Gaoual
DIALLO Abdourahmane	Sous-préfet Wendou M’Borou, Gaoual
MANET Manga	Président CRD – Wendou M’Borou, Gaoual
KANTE Dansa	Gouverneur de Région, Boké
SOUMAH Mamadouba	Chef Section Eaux et Forêts, Boké

Annex 4. Scientific, English and French names of the diurnal and nocturnal raptors of west Africa

Species	English	French
<u>Diurnal raptors</u>		
<i>Pandion haliaetus</i>	Osprey	Balbuzard pêcheur
<i>Aviceda cuculoides</i>	African Cuckoo Hawk	Baza coucou
<i>Pernis apivorus</i>	European Honey Buzzard	Bondrée apivore
<i>Macheiramphus alcinus</i>	Bat Hawk	Milan des chauves-souris
<i>Elanus caeruleus</i>	Black-shouldered Kite	Élanion blanc
<i>Chelictinia riocourii</i>	Swallow-tailed Kite	Élanion naucier
<i>Milvus migrans</i>	Black Kite	Milan noir
<i>Haliaeetus vocifer</i>	African Fish-Eagle	Pygargue vocifer
<i>Gypohierax angolensis</i>	Palm-nut Vulture	Palmiste africain
<i>Neophron percnopterus</i>	Egyptian Vulture	Vautour percnoptère
<i>Necrosyrtes monachus</i>	Hooded Vulture	Vautour charognard
<i>Gyps africanus</i>	White-backed Vulture	Vautour africain
<i>Gyps rueppellii</i>	Rüppell's Vulture	Vautour de Rüppell
<i>Gyps fulvus</i>	Eurasian Griffon Vulture	Vautour fauve
<i>Torgos tracheliotus</i>	Lappet-faced Vulture	Vautour oricou
<i>Trigonoceps occipitalis</i>	White-headed Vulture	Vautour à tête blanche
<i>Circaetus gallicus</i>	Short-toed Eagle	Circaète Jean-le-Blanc
<i>Circaetus beaudouini</i>	Beaudouin's Snake Eagle	Circaète de Beaudouin
<i>Circaetus cinereus</i>	Brown Snake Eagle	Circaète brun
<i>Circaetus cinerascens</i>	Western Banded Snake Eagle	Circaète cendré
<i>Terathopius ecaudatus</i>	Bateleur	Bateleur des savanes
<i>Dryotriorchis spectabilis</i>	Congo Serpent Eagle	Serpentaire du Congo
<i>Polyboroides typus</i>	African Gymnogone	Gymnogène d'Afrique
<i>Circus macrourus</i>	Pallid Harrier	Busard pâle
<i>Circus pygargus</i>	Montagu's Harrier	Busard cendré
<i>Circus aeruginosus</i>	Eurasian Marsh Harrier	Busard des roseaux
<i>Micronisus gabar</i>	Gabar Goshawk	Autour gabar
<i>Melierax metabates</i>	Dark Chanting Goshawk	Autour sombre
<i>Accipiter tachiro</i>	African Goshawk	Autour tachiro
<i>Accipiter badius</i>	Shikra	Épervier shikra
<i>Accipiter erythropus</i>	Western Little Sparrowhawk	Épervier de Hartlaub
<i>Accipiter ovampensis</i>	Ovambo Sparrowhawk	Épervier de l'Ovampo
<i>Accipiter melanoleucus</i>	Black Goshawk	Autour noir
<i>Urotriorchis macrourus</i>	Long-tailed Hawk	Autour à longue queue
<i>Butastur rufipennis</i>	Grasshopper Buzzard	Busautour des sauterelles
<i>Kaupifalco monogrammicus</i>	Lizard Buzzard	Autour unibande
<i>Buteo auguralis</i>	Red-necked Buzzard	Buse d'Afrique
<i>Buteo buteo</i>	Steppe Buzzard	Buse variable
<i>Buteo rufinus</i>	Long-legged Buzzard	Buse féroce
<i>Aquila rapax</i>	Tawny Eagle	Aigle ravisseur
<i>Aquila nipalensis</i>	Steppe Eagle	Aigle des steppes
<i>Aquila wahlbergi</i>	Wahlberg's Eagle	Aigle de Wahlberg
<i>Aquila chrysaetos</i> *	Golden Eagle	Aigle royal
<i>Aquila verreauxii</i> *	Verreaux's Eagle	Aigle de Verreaux
<i>Hieraaetus spilogaster</i>	African Hawk Eagle	Aigle fascié
<i>Hieraaetus pennatus</i>	Booted Eagle	Aigle botté

<i>Hieraaetus ayresii</i>	Ayres' Hawk Eagle	Aigle d'Ayres
<i>Lophaetus occipitalis</i>	Long-crested Eagle	Aigle huppard
<i>Spizaetus africanus</i>	Cassin's Hawk Eagle	Aigle de Cassin
<i>Stephanoaetus coronatus</i>	Crowned Eagle	Aigle couronné
<i>Polemaetus bellicosus</i>	Martial Eagle	Aigle martial
<i>Sagittarius serpentarius</i>	Secretary Bird	Messenger sagittaire
<i>Falco naumanni</i>	Lesser Kestrel	Faucon crécerellette
<i>Falco tinnunculus</i>	Common Kestrel	Faucon crécerelle
<i>Falco alopex</i>	Fox Kestrel	Crécerelle renard
<i>Falco ardosiaceus</i>	Grey Kestrel	Faucon ardoisé
<i>Falco chicquera</i>	Red-necked Falcon	Faucon chicquera
<i>Falco vespertinus</i>	Western Red-footed Falcon	Faucon kobez
<i>Falco eleonora</i> *	Eleonora's Falcon	Faucon d'Éléonore
<i>Falco subbuteo</i>	European Hobby	Faucon hobereau
<i>Falco cuvierii</i>	African Hobby	Hobereau africain
<i>Falco biarmicus</i>	Lanner Falcon	Faucon lanier
<i>Falco cherrug</i>	Saker Falcon	Faucon sacre
<i>Falco peregrinus</i>	Peregrine Falcon	Faucon pèlerin
<i>Falco pelegrinoides</i>	Barbary Falcon	Faucon de Barbarie
<u>Owls</u>		
<i>Tyto alba</i>	Barn Owl	Effraie des clochers
<i>Otus icterorhynchus</i>	Sandy Scops Owl	Petit-duc à bec jaune
<i>Otus scops</i>	European Scops Owl	Petit-duc scops
<i>Otus senegalensis</i>	African Scops Owl	Petit-duc africain
<i>Otus leucotis</i>	White-faced Scops Owl	Petit-duc à face blanche
<i>Jubula lettii</i>	Maned Owl	Duc à crinière
<i>Bubo (bubo) ascalaphus</i>	Desert Eagle Owl	Grand-duc du désert
<i>Bubo africanus</i>	Spotted Eagle-Owl	Grand-duc africain
<i>Bubo poensis</i>	Fraser's Eagle-Owl	Grand-duc à aigrettes
<i>Bubo shelleyi</i>	Shelley's Eagle-Owl	Grand-duc de Shelley
<i>Bubo lacteus</i>	Verreaux's Eagle-Owl	Grand-duc de Verreaux
<i>Bubo leucostictus</i>	Akun Eagle-Owl	Grand-duc tacheté
<i>Scotopelia peli</i>	Pel's Fishing-Owl	Chouette-pêcheuse de Pel
<i>Scotopelia ussheri</i>	Rufous Fishing-Owl	Chouette-pêcheuse rousse
<i>Glaucidium perlatum</i>	Pearl-spotted Owlet	Chevêchette perlée
<i>Glaucidium tephronotum</i>	Red-chested Owlet	Chevêchette à pieds jaunes
<i>Glaucidium capense</i>	Barred Owlet	Chevêchette du Cap
<i>Athene noctua</i>	Little Owl	Chevêche d'Athéna
<i>Strix woodfordii</i>	Wood Owl	Chouette africaine
<i>Asio flammeus</i>	Short-eared Owl	Hibou des marais
<i>Asio capensis</i>	Marsh Owl	Hibou du Cap

(*) Species considered not to occur in Guinea.

Annex 5. Raw data of numbers of raptors recorded from road counts undertaken during the survey

(DR - rural areas; V - towns; AP - protected areas; SP – unidentified raptors; ‘rang’ – rank)

	Km total	4	2	95	5	21	2	23	116	6	24	27	52	44	12	65	16	2	
	Arrivée	Timbo E	Timbo F	Dabola E	Dabola F	Bissikrima E	Bissikrima F	Bissikrima Camp	Kouroussa E	Kouroussa F	Carrefour Yiridi	Camp. Ultragold Carr.	Nlandankor	Siguiri E	Siguiri F	Camp. Frontière	Kourémali E	Kourémali F	
	Départ	Boria	Timbo E	Timbo F	Dabola E	Dabola F	Bissikrima E	Bissikrima F	Camp Pont	Kouroussa E	Kouroussa F	Carrefour Yiridi	Camp. Norassoba Carr.	Nlandankor	Siguiri E	Siguiri F	Camp. Frontière	Kourémali E	
Espèce		DR	V	DR	V	DR	V	DR	DR	V	DR	DR	DR	DR	DR	V	DR	DR	V
Pandion haliaetus														1					
Aviceda cuculoides																			
Pernis apivorus																			
Macheiramphus alcinus																			
Elanus caeruleus						3		1	5					4		2			
Chelictinia riocourii																			
Milvus migrans				22	2	3	1	13	30	4	2	8	12	52	7	1			
Haliaeetus vocifer								1											
Gypohierax angolensis				1															
Neophron percnopterus																			
Necrosyrtes monachus			20	43	59	1	5	1	7	3	3	9	16	9					
Gyps africanus				21					7			2	10	13					
Gyps rueppellii				7										7					
Gyps fulvus																			
Torgos tracheliotus																			
Trigonoceps occipitalis			1	1															
Circaetus gallicus																			
Circaetus beaudouini								1	1					1		1			
Circaetus cinereus						1											1		
Circaetus cinerascens								1											
Terathopius ecaudatus																			
Dryotriorchis spectabilis																			
Polyboroides typus																			
Circus macrourus																			
Circus pygargus									1			1							
Circus aeruginosus									1			2	5	3		1	1		
Micronisus gabar																			
Melierax metabates									1		1	1	1			1			
Accipiter tachiro																			
Accipiter badius									4				1			3	1		
Accipiter erythropus																			
Accipiter ovampensis									1							1			
Accipiter melanoleucus																			
Urotriorchis macrourus																			
Butastur rufipennis								1	6		1		10	13		4			
K. monogrammicus				4		1			3							1			
Buteo auguralis				3				2	3										
Buteo buteo																			
Buteo rufinus																			
Aquila rapax																			
Aquila nipalensis																			
Aquila wahlbergi									1										
Hieraaetus spilogaster																			
Hieraaetus pennatus								1											
Hieraaetus ayresii				1															
Lophaetus occipitalis						1													
Spizaetus africanus																			
S. coronatus																			
Polemaetus bellicosus																			
Sagittarius serpentarius																			
Falco naumanni																			
Falco tinnunculus									6				1	1		1			
Falco alopex																			
Falco ardosiaceus									2										
Falco chicquera													1						
Falco vespertinus																			
Falco subbuteo																			
Falco cuvierii																			
Falco biarmicus								2	4				2	1		1			
Falco cherrug																			
Falco peregrinus																			
Falco pelegrinoides																			
Total Espèces		0	2	9	2	6	2	10	17	2	4	6	10	11	1	11	3	0	
Total Individus		0	21	103	61	10	6	24	83	7	7	23	59	105	7	17	3	0	
Corvus albus					4			1	2	2		4	5	6					
SP												1				1			

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	Km total	79	19	75	86	125	6	38	11	105	3	36	6	58	60	54	33	5
	Arrivée	Kankan E	Kankan F	Parc Diessi	Kossa	Kérouané E	Kérouané F	Banankoro E	Banankoro F	Bayla E	Bayla F	anga Est, Rio Tinto	Pic de Fon	Ibut Zone forestière	Nzérouké E	Nzérouké F	Lola E	Lola F
	Départ	Carr. Niandankoro	Kankan E	Kankan F	Camp. Diessi	Carr. Tintoul	Kérouané E	Kérouané F	Banankoro E	Kérouané F	Bayla E	Bayla F	Pic de Fon	arr. Rio Tinto/Beybut	Zone forestière	Nzérouké E	Nzérouké F	Lola E
Espèce		DR	V	DR	AP	DR	V	DR	V	DR	V	DR	AP	DR	DR	V	DR	V
<i>Pandion haliaetus</i>													1					
<i>Aviceda cuculoides</i>																		
<i>Pernis apivorus</i>						2							1					
<i>Macheiramphus alcinus</i>																		
<i>Elanus caeruleus</i>								1										
<i>Chelictinia riocourii</i>																		
<i>Milvus migrans</i>		7	3	116	5	10		3		2		13	27	52	1	4		
<i>Haliaeetus vocifer</i>																		
<i>Gypohierax angolensis</i>					1			1					2					
<i>Neophron percnopterus</i>																		
<i>Necrosyrtes monachus</i>		2		2														
<i>Gyps africanus</i>		20																
<i>Gyps rueppellii</i>		1																
<i>Gyps fulvus</i>		14																
<i>Torgos tracheliotus</i>																		
<i>Trigonoceps occipitalis</i>																		
<i>Circaetus gallicus</i>																		
<i>Circaetus beaudouini</i>				1									1					
<i>Circaetus cinereus</i>																		
<i>Circaetus cinerascens</i>					2													
<i>Terathopus ecaudatus</i>					3													
<i>Dryotriorchis spectabilis</i>																		
<i>Polyboroides typus</i>				1	1								1					
<i>Circus macrourus</i>																		
<i>Circus pygargus</i>																		
<i>Circus aeruginosus</i>				2	1													
<i>Micronisus gabar</i>					1													
<i>Melierax metabates</i>		1		1	4	1												
<i>Accipiter tachiro</i>																		
<i>Accipiter badius</i>				3		2		2						2		2		
<i>Accipiter erythropus</i>																		
<i>Accipiter ovampensis</i>				2														
<i>Accipiter melanoleucus</i>																		
<i>Urotriorchis macrourus</i>																		
<i>Butastur rufipennis</i>		8		9	3	6		1		1		2						
<i>K. monogrammicus</i>				3	1	2				1				1	2		1	
<i>Buteo auguralis</i>				2	7			1				1	5	1	1			
<i>Buteo buteo</i>																		
<i>Buteo rufinus</i>					1													
<i>Aquila rapax</i>													1					
<i>Aquila nipalensis</i>																		
<i>Aquila wahlbergi</i>						1												
<i>Hieraaetus spilogaster</i>													3					
<i>Hieraaetus pennatus</i>				2									2					
<i>Hieraaetus ayresii</i>																		
<i>Lophaetus occipitalis</i>					2													
<i>Spizaetus africanus</i>																		
<i>S. coronatus</i>													2					
<i>Polemaetus bellicosus</i>																		
<i>Sagittarius serpentarius</i>																		
<i>Falco naumanni</i>																		
<i>Falco tinnunculus</i>													5					
<i>Falco alopex</i>																		
<i>Falco ardosiaceus</i>		1		1	1											1		
<i>Falco chicquera</i>																		
<i>Falco vespertinus</i>																		
<i>Falco subbuteo</i>													1					
<i>Falco cuvierii</i>					1													
<i>Falco biarmicus</i>		2		3	1			1							1			
<i>Falco cherrug</i>																		
<i>Falco peregrinus</i>																		
<i>Falco pelegrinoides</i>																		
Total Espèces		9	1	14	16	7	0	7	0	3	0	3	13	4	4	3	1	0
Total Individus		56	3	148	35	24	0	10	0	4	0	16	52	56	5	7	1	0
<i>Corvus albus</i>		10	40	4	2			1	2	3		2		3		4		
SP														1	1			

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	Km total	16	8	89	3	13	23	28	80	10	75	40	71	2	20	2	36	94
	Arrivée	Bossou E	Nimba	Sérédou E	Sérédou F	Ziama F	Macenta E	Macenta F	Guékédou E	Guékédou F	Kissidougou E	Kissidougou F	Banlian E	Banlian F	Tiro E	Tiro F	Faranah E	Faranah F
	Départ	Lola F	Bossou E	N'Zérékoni F	Sérédou E	Ziama E	Ziama F	Macenta E	Macenta F	Guékédou E	Guékédou F	Kissidougou E	Kissidougou F	Banlian E	Banlian F	Tiro E	Tiro F	Faranah E
Espèce		DR	DR	DR	V	AP	DR	V	DR	V	DR	V	DR	V	DR	V	DR	V
<i>Pandion haliaetus</i>																		
<i>Aviceda cuculoides</i>		1																
<i>Pernis apivorus</i>																		
<i>Macheiramphus alcinus</i>																		
<i>Elanus caeruleus</i>																		
<i>Chelictinia riocourii</i>																		
<i>Milvus migrans</i>			13	4				1	9	5	23	1	14		5	1	12	7
<i>Haliaeetus vocifer</i>																1	1	
<i>Gypohierax angolensis</i>									2									
<i>Neophron percnopterus</i>																		
<i>Necrosyrtes monachus</i>										2	5	30	8		9		3	22
<i>Gyps africanus</i>													12		1		5	
<i>Gyps rueppellii</i>																		
<i>Gyps fulvus</i>																		
<i>Torgos tracheliotus</i>																		
<i>Trigonoceps occipitalis</i>																		
<i>Circaetus gallicus</i>																		
<i>Circaetus beaudouini</i>																		
<i>Circaetus cinereus</i>																		
<i>Circaetus cinerascens</i>																		
<i>Terathopus ecaudatus</i>																		
<i>Dryotriorchis spectabilis</i>																		
<i>Polyboroides typus</i>		1		2		1			4		8						1	
<i>Circus macrourus</i>																		
<i>Circus pygargus</i>																		
<i>Circus aeruginosus</i>																	1	
<i>Micronisus gabar</i>																		1
<i>Melierax metabates</i>													1					
<i>Accipiter tachiro</i>																		
<i>Accipiter badius</i>																	1	
<i>Accipiter erythropus</i>													1					
<i>Accipiter ovampensis</i>																		
<i>Accipiter melanoleucus</i>													2					
<i>Urotriorchis macrourus</i>																		
<i>Butastur rufipennis</i>													1				4	
<i>K. monogrammicus</i>		1		1					2		2						4	
<i>Buteo auguralis</i>			1								1		1				4	
<i>Buteo buteo</i>																		
<i>Buteo rufinus</i>																		
<i>Aquila rapax</i>																		
<i>Aquila nipalensis</i>																		
<i>Aquila wahlbergi</i>											1						1	
<i>Hieraetus spilogaster</i>			1										2					
<i>Hieraetus pennatus</i>																		
<i>Hieraetus ayresii</i>																		
<i>Lophaetus occipitalis</i>																		
<i>Spizaetus africanus</i>						1												
<i>S. coronatus</i>																		
<i>Polemaetus bellicosus</i>																		
<i>Sagittarius serpentarius</i>																		
<i>Falco naumanni</i>																		
<i>Falco tinnunculus</i>																		
<i>Falco alopex</i>																		
<i>Falco ardosiaceus</i>							2	5	46	7	64	16	22					22
<i>Falco chicquera</i>																		
<i>Falco vespertinus</i>																		
<i>Falco subbuteo</i>																		
<i>Falco cuvierii</i>																		
<i>Falco biarmicus</i>		3																
<i>Falco cherrug</i>																		
<i>Falco peregrinus</i>																		
<i>Falco pelegrinoides</i>																		
Total Espèces		4	3	3	0	2	0	1	5	2	6	2	9	0	3	2	10	3
Total Individus		6	15	7	0	2	0	1	18	7	40	31	42	0	15	2	33	30
<i>Corvus albus</i>							2	5	46	7	64	16	22					22
SP				1		1												

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	Km total	48	32	36	44	2	41	3	29	2	23	2	22	3	11	31	47	5
	Arrivée	koro (Base-Vie PNBase-Vie Somoria	Matou "PK 36"	Sandénia E	Sandénia F	Marela E	Marela F	Ouré Kaba E	Ouré Kaba F	Soyat E	Soyat F	Soyah E	Soyah F	Mamou E	Mamou F	Dalaba E	Dalaba F	
	Départ	Faranah F	koro (Base-Vie PNBase-Vie Somoria	Faranah F	Sandénia E	Sandénia F	Marela E	Marela F	Ouré Kaba E	Ouré Kaba F	Soyat E	Soyat F	Soyah E	Soyah F	Mamou E	Mamou F	Dalaba E	Dalaba F
Espèce		DR	AP	AP	DR	V	DR	V	DR	V	DR	V	DR	V	DR	V	DR	V
Pandion haliaetus																		
Aviceda cuculoides				2														
Pernis apivorus																		
Macheiramphus alcinus																		
Elanus caeruleus																		
Chelictinia riocourii																		
Milvus migrans	7		4	1	1	1		1		3			1		3			
Haliaeetus vocifer			1															
Gypohierax angolensis																		
Neophron percnopterus																		
Necrosyrtes monachus						4	26	3		4		8	4	1	30	3	17	
Gyps africanus						18						1						
Gyps rueppellii												6						
Gyps fulvus																		
Torgos tracheliotus																		
Trigonoceps occipitalis																		
Circaetus gallicus																		
Circaetus beaudouini	1																	
Circaetus cinereus	1																	
Circaetus cinerascens	1	1																
Terathopius ecaudatus		1	1															
Dryotriorchis spectabilis																		
Polyboroides typus			4															
Circus macrourus															1			
Circus pygargus																		
Circus aeruginosus																		
Micronisus gabar																		
Melierax metabates																		
Accipiter tachiro																		
Accipiter badius		2	2															
Accipiter erythropus																		
Accipiter ovampensis		1	2															
Accipiter melanoleucus																		
Urotriorchis macrourus																		
Butastur rufipennis				1														
K. monogrammicus	2		1															
Buteo auguralis	1	1	1					1				1						
Buteo buteo																		
Buteo rufinus																		
Aquila rapax																		
Aquila nipalensis																		
Aquila wahlbergi																		
Hieraaetus spilogaster				2														
Hieraaetus pennatus																		
Hieraaetus ayresii																		
Lophaetus occipitalis																		
Spizaetus africanus																		
S. coronatus		1																
Polemaetus bellicosus																		
Sagittarius serpentarius																		
Falco naumanni																		
Falco tinnunculus																		
Falco alopex																		
Falco ardosiaceus																		
Falco chicquera																		
Falco vespertinus																		
Falco subbuteo																		
Falco cuvierii				2														
Falco biarmicus	2							1										
Falco cherrug																		
Falco peregrinus																		
Falco pelegrinoides																		
Total Espèces	7	6	12	1	1	3	1	4	0	2	0	4	2	2	2	1	1	
Total Individus	15	7	23	1	1	23	26	6	0	7	0	16	5	2	33	3	17	
Corvus albus	3			1													1	
SP	2		4													1		

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	Km total	49	7	30	15	66	2	36	6	154	96	8	15	6	10	2	33	4
	Arrivée	Pita E	Pita F	Labé E	Labé F	Yambei E	Yambei F	Mali E	Mali F	Kounsiel	Koundara E	Koundara F	Iaso-Vie PN Badia	Guel Badjar	Samballo E	Samballo F	Saraboldo E	Saraboldo F
	Départ	Dalaba F	Pita E	Pita F	Labé E	Labé F	Yambei E	Yambei F	Mali E	Labé F	Kounsiel	Koundara E	Koundara F	Iaso-Vie PN Badia	Koundara F	Samballo E	Samballo F	Saraboldo E
Espèce		DR	V	DR	V	DR	V	DR	V	DR	DR	V	DR	AP	DR	V	DR	V
Pandion haliaetus														1				
Aviceda cuculoides																		
Pernis apivorus																		
Macheiramphus alcinus																		
Elanus caeruleus		1		1														
Chelictinia riocourii																		
Milvus migrans				1	6	1		1	1	4		2	5	1			4	
Haliaeetus vocifer														1				
Gypohierax angolensis																		
Neophron percnopterus																		
Necrosyrtes monachus		16	9	22	29	57	12		11	55	15	24	9			2	17	27
Gyps africanus		10	2	12	1	5			8	12			4				14	
Gyps rueppellii		1		2		3		1		2		2	3				3	
Gyps fulvus																		
Torgos tracheliotus																		
Trigonoceps occipitalis		2		3		1												
Circaetus gallicus																		
Circaetus beaudouini											1		1				1	
Circaetus cinereus													1					
Circaetus cinerascens																		
Terathopius ecaudatus											1			1				
Dryotriorchis spectabilis																		
Polyboroides typus											2		1	2			5	
Circus macrourus																		
Circus pygargus																		
Circus aeruginosus														1				
Micronisus gabar				1														
Melierax metabates											1		1	1			3	
Accipiter tachiro																		
Accipiter badius				1							2	1	1	4				
Accipiter erythropus																		
Accipiter ovampensis																	1	
Accipiter melanoleucus																		
Urotriorchis macrourus																		
Butastur rufipennis										1	1		1				1	
K. monogrammicus										2	1		2	1			1	
Buteo auguralis																		
Buteo buteo																		
Buteo rufinus																		
Aquila rapax								1										
Aquila nipalensis																		
Aquila wahlbergi											2						1	
Hieraaetus spilogaster		1												3				
Hieraaetus pennatus																		
Hieraaetus ayresii																		
Lophaetus occipitalis																		
Spizaetus africanus																		
S. coronatus																		
Polemaetus bellicosus																		
Sagittarius serpentarius																		
Falco naumanni																		
Falco tinnunculus										1								
Falco alopex													2					
Falco ardosiaceus														1				
Falco chicquera																		
Falco vespertinus											1							
Falco subbuteo																	1	
Falco cuvierii																		
Falco biarmicus								1									1	
Falco cherrug								1										
Falco peregrinus																	2	
Falco pelegrinoides																		
Total Espèces		6	2	8	3	5	1	5	3	7	10	4	12	11	0	1	14	1
Total Individus		31	11	43	36	67	12	5	20	77	27	29	31	17	0	2	55	27
Corvus albus			8	2	21	1			3	3	1	20	3				2	7
SP																	2	

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	Km total	27	66	8	71	76	14	40	15	2	147	2	27	3	20	8	56	2
	Arrivée	Bac	Koumbia E	Koumbia F	Wendou	Boké E	Boké F	Kamsar E	Kamsar F	Kolabou E	Tanéné E	Tanéné F	Tormélen E	Tormélen F	Fria E	Fria F	Sokoto E	Sokoto F
	Départ	Saraboldo F	Bac	Koumbia E	Koumbia F	Wendou	Boké E	Boké F	Kamsar E	Kolabou E	Kolabou F	Tanéné E	Tanéné F	Tormélen E	Tormélen F	Fria E	Fria F	Sokoto E
Espèce		DR	DR	V	DR	DR	V	DR	V	V	DR	V	DR	V	DR	V	DR	V
Pandion haliaetus																		
Aviceda cuculoides																		
Pernis apivorus																		
Macheiramphus alcinus																		
Elanus caeruleus									1		1					2		
Chelictinia riocourii																		
Milvus migrans	2	4	1	3	3	18	35	51		44		6		3	3	7		
Haliaeetus vocifer																		
Gypohierax angolensis	1	2						1										
Neophron percnopterus																		
Necrosyrtes monachus	5	32	64	19	14	42	68	117		55		3		3	13	30	5	
Gyps africanus	1		4				3									4		
Gyps rueppellii			2													4		
Gyps fulvus																		
Torgos tracheliotus																		
Trigonoceps occipitalis																		
Circaetus gallicus																		
Circaetus beaudouini		1		1														
Circaetus cinereus	1					1												
Circaetus cinerascens				1	1													
Terathopius ecaudatus																		
Dryotriorchis spectabilis																		
Polyboroides typus		2		1	2												1	
Circus macrourus																		
Circus pygargus																		
Circus aeruginosus						1											1	
Micronisus gabar																		
Melierax metabates	1			3	3													
Accipiter tachiro					1													
Accipiter badius		1	3	1				2		1				1	1	1		
Accipiter erythropus																		
Accipiter ovampensis																		
Accipiter melanoleucus																		
Urotriorchis macrourus																		
Butastur rufipennis	1																	
K. monogrammicus	1			1	3					4		2					2	
Buteo auguralis				4													5	
Buteo buteo																		
Buteo rufinus																		
Aquila rapax																		
Aquila nipalensis																		
Aquila wahlbergi																		
Hieraetus spilogaster						2												
Hieraetus pennatus	1																	
Hieraetus ayresii																		
Lophaetus occipitalis																		
Spizaetus africanus																		
S. coronatus																		
Polemaetus bellicosus																		
Sagittarius serpentarius																		
Falco naumanni																		
Falco tinnunculus																		
Falco alopex																		
Falco ardosiaceus				1											1		1	
Falco chicquera																		
Falco vespertinus																		
Falco subbuteo																		
Falco cuvierii																		
Falco biarmicus																		
Falco cherrug																		
Falco peregrinus																		
Falco pelegrinoides																		
Total Espèces	9	6	5	10	9	2	3	5	0	5	0	3	0	4	4	10	1	
Total Individus	14	42	74	35	30	60	106	172	0	105	0	11	0	8	19	56	5	
Corvus albus		6		2		16	12	74	1	41	1				22			
SP		1								1							1	

Survey of the occurrence and relative abundance of raptors in Guinea subject to international trade

	Km total	42	2	29	2	14	2	37	11	67	3635			
	Arrivée	Kambaya E	Kambaya F	Kollet E	Kollet F	Bangouya E	Bangouya F	Kindia E	Kindia F	Kouria (FIN avant)				
	Départ	Sokolo F	Kambaya E	Kambaya F	Kollet E	Kollet F	Bangouya E	Bangouya F	Kindia E	Kindia F				
Espèce	DR	V	DR	V	DR	V	DR	V	DR	V	Total	#/100 km	Rang	
<i>Pandion haliaetus</i>											3	0,1	28	
<i>Aviceda cuculoides</i>											3	0,1	28	
<i>Pernis apivorus</i>											3	0,1	28	
<i>Macheiramphus alcinus</i>														
<i>Elanus caeruleus</i>											22	0,6	12	
<i>Chelictinia riocourii</i>														
<i>Milvus migrans</i>	2		1					4	4	16	750	20,6	2	
<i>Haliaeetus vocifer</i>											5	0,1	27	
<i>Gypohierax angolensis</i>											11	0,3	18	
<i>Neophron percnopterus</i>														
<i>Necrosyrtes monachus</i>	24	2	7	11	2			1	41	10	1232	33,9	1	
<i>Gyps africanus</i>	15		7		4			1			217	6,0	3	
<i>Gyps rueppellii</i>	2							1			47	1,3	7	
<i>Gyps fulvus</i>											14	0,4	15	
<i>Torgos tracheliotus</i>														
<i>Trigonoceps occipitalis</i>											8	0,2	20	
<i>Circaetus gallicus</i>														
<i>Circaetus beaudouini</i>											12	0,3	17	
<i>Circaetus cinereus</i>								1			6	0,2	26	
<i>Circaetus cinerascens</i>											7	0,2	22	
<i>Terathopius ecaudatus</i>											7	0,2	22	
<i>Dryotriorchis spectabilis</i>														
<i>Polyboroides typus</i>											41	1,1	9	
<i>Circus macrourus</i>														
<i>Circus pygargus</i>											2	0,1	35	
<i>Circus aeruginosus</i>											20	0,6	13	
<i>Micronisus gabar</i>											3	0,1	28	
<i>Melierax metabates</i>											26	0,7	11	
<i>Accipiter tachiro</i>											1	0,0	41	
<i>Accipiter badius</i>											45	1,2	8	
<i>Accipiter erythropus</i>											1	0,0	41	
<i>Accipiter ovampensis</i>											8	0,2	20	
<i>Accipiter melanoleucus</i>											2	0,1	35	
<i>Urotriorchis macrourus</i>														
<i>Butastur rufipennis</i>											76	2,1	4	
<i>K. monogrammicus</i>											49	1,3	5	
<i>Buteo auguralis</i>								1			48	1,3	6	
<i>Buteo buteo</i>														
<i>Buteo rufinus</i>											1	0,0	41	
<i>Aquila rapax</i>											2	0,1	35	
<i>Aquila nipalensis</i>														
<i>Aquila wahlbergi</i>											7	0,2	22	
<i>Hieraaetus spilogaster</i>											14	0,4	15	
<i>Hieraaetus pennatus</i>											7	0,2	22	
<i>Hieraaetus ayresii</i>														
<i>Lophaetus occipitalis</i>											3	0,1	28	
<i>Spizaetus africanus</i>											1	0,0	41	
<i>S. coronatus</i>											3	0,1	28	
<i>Polemaetus bellicosus</i>														
<i>Sagittarius serpentarius</i>														
<i>Falco naumanni</i>														
<i>Falco tinnunculus</i>											15	0,4	14	
<i>Falco alopex</i>											2	0,1	35	
<i>Falco ardosiaceus</i>											11	0,3	18	
<i>Falco chicquera</i>											1	0,0	41	
<i>Falco vespertinus</i>											1	0,0	41	
<i>Falco subbuteo</i>											2	0,1	35	
<i>Falco cuvierii</i>											3	0,1	28	
<i>Falco biarmicus</i>	2										28	0,8	10	
<i>Falco cherrug</i>											1	0,0	41	
<i>Falco peregrinus</i>											2	0,1	35	
<i>Falco pelegrinoides</i>														
Total Espèces	5	1	3	1	2	0	6	2	2		47			
Total Individus	45	2	15	11	6	0	9	45	26		2773			
<i>Corvus albus</i>									14	1	545			
SP			1								19			
											2792			

Annex 6. Road count data in Guinea by natural region

(raptor counts reorganised by grid squares (carreau) of one degree longitude/latitude and grouped according to the natural regions (régions naturelles); SP – unidentified raptors)

Haute Guinée

	Km total									1446		
Régions naturelles	HG	HG	HG	HG	HG	HG	HG	HG	HG			
Carreau	Dabola	Kankan	Siguiri	Yanfolila	Mandiana	Boula	Kérouané	Faranah				
Espèce	18	20	8	7	21	24	25	19		Total	#/100 km	Rang
<i>Pandion haliaetus</i>			1							1	0,1	34
<i>Aviceda cuculoides</i>								2		2	0,1	28
<i>Pernis apivorus</i>		1					1			2	0,1	28
<i>Macheiramphus alcinus</i>												
<i>Elanus caeruleus</i>	3		6				1	6		16	1,1	10
<i>Chelictinia riocourii</i>												
<i>Milvus migrans</i>	35	133	65		14	4	8	66		325	22,5	1
<i>Haliaeetus vocifer</i>								3		3	0,2	23
<i>Gypohierax angolensis</i>	1					1	1			3	0,2	23
<i>Neophron percnopterus</i>												
<i>Necrosyrtes monachus</i>	170	27	16		2			35		250	17,3	2
<i>Gyps africanus</i>	40	24	22					7		93	6,4	3
<i>Gyps rueppellii</i>	14	1	7							22	1,5	6
<i>Gyps fulvus</i>		14								14	1,0	12
<i>Torgos tracheliotus</i>												
<i>Trigonoceps occipitalis</i>	2									2	0,1	28
<i>Circaetus gallicus</i>												
<i>Circaetus beaudouini</i>			2		1			3		6	0,4	16
<i>Circaetus cinereus</i>	1		1					1		3	0,2	23
<i>Circaetus cinerascens</i>						2		3		5	0,3	18
<i>Terathopius ecaudatus</i>					1	2		2		5	0,3	18
<i>Dryotriorchis s.</i>												
<i>Polyboroides typus</i>					1	1		4		6	0,4	16
<i>Circus macrourus</i>												
<i>Circus pygargus</i>		1						1		2	0,1	28
<i>Circus aeruginosus</i>		3	10		2			1		16	1,1	10
<i>Micronisus gabar</i>						1		1		2	0,1	28
<i>Melierax metabates</i>		5		1		4	1	1		12	0,8	13
<i>Accipiter tachiro</i>												
<i>Accipiter badius</i>		3	5				4	9		21	1,5	8
<i>Accipiter erythropus</i>												
<i>Accipiter ovampensis</i>		2		1				4		7	0,5	15
<i>Accipiter melanoleucus</i>												
<i>Urotriorchis macrourus</i>												
<i>Butastur rufipennis</i>		21	21		7	3	4	8		64	4,4	4
<i>K. monogrammicus</i>	5	5	1		2	1	2	6		22	1,5	6
<i>Buteo auguralis</i>	5	2			2	5	1	8		23	1,6	5
<i>Buteo buteo</i>												
<i>Buteo rufinus</i>					1					1	0,1	34
<i>Aquila rapax</i>												
<i>Aquila nipalensis</i>												
<i>Aquila wahlbergi</i>					1		1	2		4	0,3	21
<i>Hieraaetus spilogaster</i>								2		2	0,1	28
<i>Hieraaetus pennatus</i>	1	2						1		4	0,3	21
<i>Hieraaetus ayresii</i>												
<i>Lophaeetus occipitalis</i>	1				1	1				3	0,2	23
<i>Spizaetus africanus</i>												
<i>S. coronatus</i>								1		1	0,1	34
<i>Polemaetus bellicosus</i>												
<i>Sagittarius serpentarius</i>												
<i>Falco naumanni</i>												
<i>Falco tinnunculus</i>		1	2	1				6		10	0,7	14
<i>Falco alopex</i>												
<i>Falco ardosiaceus</i>		4				1				5	0,3	18
<i>Falco chicquera</i>		1								1	0,1	34
<i>Falco vespertinus</i>												
<i>Falco subbuteo</i>												
<i>Falco cuvierii</i>					1			2		3	0,2	23
<i>Falco biarmicus</i>	1	5	5				1	8		20	1,4	9
<i>Falco cherrug</i>												
<i>Falco peregrinus</i>												
<i>Falco pelegrinoides</i>												
Total Espèces	13	19	14	3	13	12	11	27		37		
Total Individus	279	255	164	3	36	26	25	193		981		
<i>Corvus albus</i>	4	60	11		2		6	29		112	7,7	
SP		1	1					6		8	0,6	

Guinée Forestière

	Km total	188	207	182	74	167	818		
Régions naturelles	GF	GF	GF	GF	GF				
Carreau	Beyla	Nzérekoré	Macenta	Guékédou	Kissidougou				
Espèce	33	35	32	31	26		Total	#/100 km	Rang
<i>Pandion haliaetus</i>	1						1	0,1	17
<i>Aviceda cuculoides</i>		1					1	0,1	17
<i>Pernis apivorus</i>	1						1	0,1	17
<i>Macheiramphus alcinus</i>									
<i>Elanus caeruleus</i>									
<i>Chelictinia riocourii</i>									
<i>Milvus migrans</i>	93	21	9	26	38		187	22,9	1
<i>Haliaeetus vocifer</i>					1		1	0,1	17
<i>Gypohierax angolensis</i>	2		2				4	0,5	10
<i>Neophron percnopterus</i>									
<i>Necrosyrtes monachus</i>				7	50		57	7,0	2
<i>Gyps africanus</i>					18		18	2,2	3
<i>Gyps rueppellii</i>									
<i>Gyps fulvus</i>									
<i>Torgos tracheliotus</i>									
<i>Trigonoceps occipitalis</i>									
<i>Circaetus gallicus</i>									
<i>Circaetus beaudouini</i>	1						1	0,1	17
<i>Circaetus cinereus</i>									
<i>Circaetus cinerascens</i>									
<i>Terathopius ecaudatus</i>									
<i>Dryotriorchis s.</i>									
<i>Polyboroides typus</i>	1	3	5	6	3		18	2,2	3
<i>Circus macrourus</i>									
<i>Circus pygargus</i>									
<i>Circus aeruginosus</i>					1		1	0,1	17
<i>Micronisus gabar</i>									
<i>Melierax metabates</i>					1		1	0,1	17
<i>Accipiter tachiro</i>									
<i>Accipiter badius</i>		2			1		3	0,4	12
<i>Accipiter erythropus</i>					1		1	0,1	17
<i>Accipiter ovampensis</i>									
<i>Accipiter melanoleucus</i>					2		2	0,2	13
<i>Urotriorchis macrourus</i>									
<i>Butastur rufipennis</i>	3				5		8	1,0	6
<i>K. monogrammicus</i>	1	3	2	1	1		8	1,0	6
<i>Buteo auguralis</i>	8	1		1	5		15	1,8	5
<i>Buteo buteo</i>									
<i>Buteo rufinus</i>									
<i>Aquila rapax</i>	1						1	0,1	17
<i>Aquila nipalensis</i>									
<i>Aquila wahlbergi</i>					1		1	0,1	17
<i>Hieraaetus spilogaster</i>	3	1			2		6	0,7	8
<i>Hieraaetus pennatus</i>	2						2	0,2	13
<i>Hieraaetus ayresii</i>									
<i>Lophaetus occipitalis</i>									
<i>Spizaetus africanus</i>			1				1	0,1	17
<i>S. coronatus</i>	2						2	0,2	13
<i>Polemaetus bellicosus</i>									
<i>Sagittarius serpentarius</i>									
<i>Falco naumanni</i>									
<i>Falco tinnunculus</i>	5						5	0,6	9
<i>Falco alopex</i>									
<i>Falco ardosiaceus</i>		1	1				2	0,2	13
<i>Falco chicquera</i>									
<i>Falco vespertinus</i>									
<i>Falco subbuteo</i>	1						1	0,1	17
<i>Falco cuvierii</i>									
<i>Falco biarmicus</i>		4					4	0,5	10
<i>Falco cherrug</i>									
<i>Falco peregrinus</i>									
<i>Falco peregrinoides</i>									
Total Espèces	15	9	6	5	15		28		
Total Individus	125	37	20	41	130		353		
<i>Corvus albus</i>	5	4	37	57	56		159	19,4	
SP	3		2				5	0,6	

Moyenne Guinée

	Km total	233	213	11	236	169	862		
Régions naturelles	MG	MG	MG	MG	MG				
Carreau	Mamou	Labé	Mali	Koundara	Gaoual				
Espèce	17	11	2	1	12	Total	#/100 km	Rang	
<i>Pandion haliaetus</i>				1		1	0,1	24	
<i>Aviceda cuculoides</i>									
<i>Pernis apivorus</i>									
<i>Macheiramphus alcinus</i>									
<i>Elanus caeruleus</i>	1	1				2	0,2	16	
<i>Chelictinia riocourii</i>									
<i>Milvus migrans</i>	13	14	1	13	7	48	5,6	3	
<i>Haliaeetus vocifer</i>				1		1	0,1	24	
<i>Gypohierax angolensis</i>				1	2	3	0,3	14	
<i>Neophron percnopterus</i>									
<i>Necrosyrtes monachus</i>	126	178	10	111	105	530	61,5	1	
<i>Gyps africanus</i>	19	31	8	19	4	81	9,4	2	
<i>Gyps rueppellii</i>	2	9		6	2	19	2,2	4	
<i>Gyps fulvus</i>									
<i>Torgos tracheliotus</i>									
<i>Trigonoceps occipitalis</i>	2	4				6	0,7	9	
<i>Circaetus gallicus</i>									
<i>Circaetus beaudouini</i>				3	2	5	0,6	10	
<i>Circaetus cinereus</i>	1			2		3	0,3	14	
<i>Circaetus cinerascens</i>					2	2	0,2	16	
<i>Terathopus ecaudatus</i>				2		2	0,2	16	
<i>Dryotriorchis s.</i>									
<i>Polyboroides typus</i>	1			10	4	15	1,7	5	
<i>Circus macrourus</i>									
<i>Circus pygargus</i>									
<i>Circus aeruginosus</i>				1		1	0,1	24	
<i>Micronisus gabar</i>		1				1	0,1	24	
<i>Melierax metabates</i>				7	6	13	1,5	7	
<i>Accipiter tachiro</i>									
<i>Accipiter badius</i>		2		9	4	15	1,7	5	
<i>Accipiter erythropus</i>									
<i>Accipiter ovampensis</i>				1		1	0,1	24	
<i>Accipiter melanoleucus</i>									
<i>Urotriorchis macrourus</i>									
<i>Butastur rufipennis</i>				4		4	0,5	12	
<i>K. monogrammicus</i>				7	2	9	1,0	8	
<i>Buteo auguralis</i>	1				4	5	0,6	10	
<i>Buteo buteo</i>									
<i>Buteo rufinus</i>									
<i>Aquila rapax</i>		1				1	0,1	24	
<i>Aquila nipalensis</i>									
<i>Aquila wahlbergi</i>				2		2	0,2	16	
<i>Hieraaetus spilogaster</i>	1			3		4	0,5	12	
<i>Hieraaetus pennatus</i>				1		1	0,1	24	
<i>Hieraaetus ayresii</i>									
<i>Lophaetus occipitalis</i>									
<i>Spizaetus africanus</i>									
<i>S. coronatus</i>									
<i>Polemaetus bellicosus</i>									
<i>Sagittarius serpentarius</i>									
<i>Falco naumanni</i>									
<i>Falco tinnunculus</i>									
<i>Falco alopex</i>				2		2	0,2	16	
<i>Falco ardosiaceus</i>				1	1	2	0,2	16	
<i>Falco chicquera</i>									
<i>Falco vespertinus</i>				1		1	0,1	24	
<i>Falco subbuteo</i>				1		1	0,1	24	
<i>Falco cuvierii</i>									
<i>Falco biarmicus</i>		1		1		2	0,2	16	
<i>Falco cherrug</i>			1			1	0,1	24	
<i>Falco peregrinus</i>				2		2	0,2	16	
<i>Falco pelegrinoides</i>									
Total Espèces	10	10	4	26	13	33			
Total Individus	167	242	20	212	145	786			
<i>Corvus albus</i>	14	50	3	37	4	108	12,5		
SP	1	1		2		4	0,5		

Guinée Maritime

Km total	43	198	205	17	46	509			
Régions naturelles	GM	GM	GM	GM	GM				
Carreau	Dabiss	Kamsar	Fria	Friguiagbé	Conakry				
Espèce	13	15	16	28	29	Total	#/100 km	Rang	
<i>Pandion haliaetus</i>									
<i>Aviceda cuculoides</i>									
<i>Pernis apivorus</i>									
<i>Macheiramphus alcinus</i>									
<i>Elanus caeruleus</i>		2	2			4	0,8	8	
<i>Chelictinia riocourii</i>									
<i>Milvus migrans</i>	3	138	32	2	15	190	37,3	2	
<i>Haliaeetus vocifer</i>									
<i>Gypohierax angolensis</i>		1				1	0,2	14	
<i>Neophron percnopterus</i>									
<i>Necrosyrtes monachus</i>	13	282	91		9	395	77,6	1	
<i>Gyps africanus</i>		3	22			25	4,9	3	
<i>Gyps rueppellii</i>			6			6	1,2	5	
<i>Gyps fulvus</i>									
<i>Torgos tracheliotus</i>									
<i>Trigonoceps occipitalis</i>									
<i>Circaetus gallicus</i>									
<i>Circaetus beaudouini</i>									
<i>Circaetus cinereus</i>									
<i>Circaetus cinerascens</i>									
<i>Terathopus ecaudatus</i>									
<i>Dryotriorchis s.</i>									
<i>Polyboroides typus</i>	1		1			2	0,4	9	
<i>Circus macrourus</i>									
<i>Circus pygargus</i>									
<i>Circus aeruginosus</i>	1		1			2	0,4	9	
<i>Micronisus gabar</i>									
<i>Melierax metabates</i>									
<i>Accipiter tachiro</i>	1					1	0,2	14	
<i>Accipiter badius</i>		2	4			6	1,2	5	
<i>Accipiter erythropus</i>									
<i>Accipiter ovampensis</i>									
<i>Accipiter melanoleucus</i>									
<i>Urotriorchis macrourus</i>									
<i>Butastur rufipennis</i>									
<i>K. monogrammicus</i>	2	4	4			10	2,0	4	
<i>Buteo auguralis</i>			5			5	1,0	7	
<i>Buteo buteo</i>									
<i>Buteo rufinus</i>									
<i>Aquila rapax</i>									
<i>Aquila nipalensis</i>									
<i>Aquila wahlbergi</i>									
<i>Hieraaetus spilogaster</i>	2					2	0,4	9	
<i>Hieraaetus pennatus</i>									
<i>Hieraaetus ayresii</i>									
<i>Lophaetus occipitalis</i>									
<i>Spizaetus africanus</i>									
<i>S. coronatus</i>									
<i>Polemaetus bellicosus</i>									
<i>Sagittarius serpentarius</i>									
<i>Falco naumanni</i>									
<i>Falco tinnunculus</i>									
<i>Falco alopex</i>									
<i>Falco ardosiaceus</i>			2			2	0,4	9	
<i>Falco chicquera</i>									
<i>Falco vespertinus</i>									
<i>Falco subbuteo</i>									
<i>Falco cuvierii</i>									
<i>Falco biarmicus</i>			2			2	0,4	9	
<i>Falco cherrug</i>									
<i>Falco peregrinus</i>									
<i>Falco peregrinoides</i>									
Total Espèces	7	7	12	1	2	15			
Total Individus	23	432	172	2	24	653			
<i>Corvus albus</i>		134	31		1	166	32,6		
SP			2			2	0,4		



**JNCC Report
No. 412 (Addendum)**

**Survey of the occurrence and relative abundance of raptors
in Guinea subject to international trade**

Addendum – raptor distribution maps

**Guy Rondeau, Mohammed Moussa Condeé, Bernard Ahon,
Ousmane Diallo & Daniel Pouakouyou**

May 2020

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ISSN 0963-8091



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This report should be cited as:

Rondeau, G., Condeé, M.M., Ahon, B., Diallo, O. & Pouakouyou, D. 2020.
Survey of the occurrence and relative abundance of raptors in Guinea subject to international trade: Addendum – raptor distribution maps. *JNCC Report No.412 Addendum*. JNCC, Peterborough, ISSN 0963-8091.

JNCC EQA Statement:

This report is compliant with the JNCC Evidence Quality Assurance Policy
<http://jncc.defra.gov.uk/default.aspx?page=6675>.

Please Note:

Report 412 was originally published in 2008 and is available here. This Annex of distribution maps was produced at that time but was not published.

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1 Background

In response to an increasing trade in CITES-listed birds of prey from Guinea, the Joint Nature Conservation Committee (JNCC), supported by Defra (Department of the Environment and Rural Affairs), commissioned a survey of the relative abundance of raptors in the country. This survey was undertaken by Fauna & Flora International and Afrique Nature in 2006 and the methods and results of that survey are reported by Rondeau *et al.* (2008).

Counts of raptors were done in the survey by driving road transects, supplemented by spot counts, transects on foot and nocturnal surveys, as a rapid but rigorous and reproducible survey technique which would provide information on distribution and relative abundance of birds of prey in Guinea. The survey thus provided a baseline on the relative abundance of raptors in Guinea using a method that was repeatable and so would enable any trends in time to be reported.

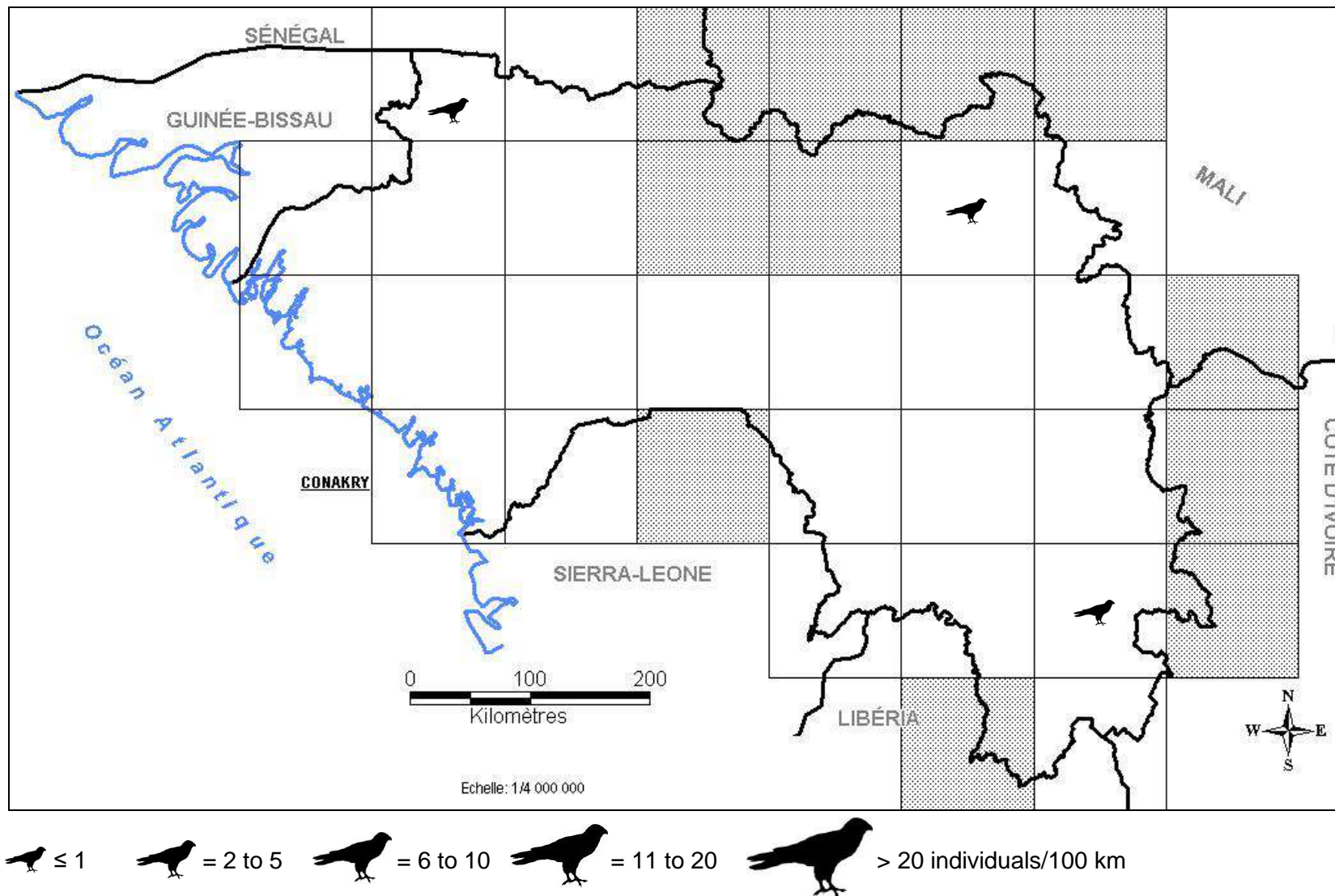
This addendum to that report provides the maps of distribution of raptors, and their relative abundance (expressed as birds seen per 100 kilometres of road transect), encountered on the survey. These maps were produced at the time but not published then. They are being provided now to add value to the report and to provide additional baseline information.

2 References

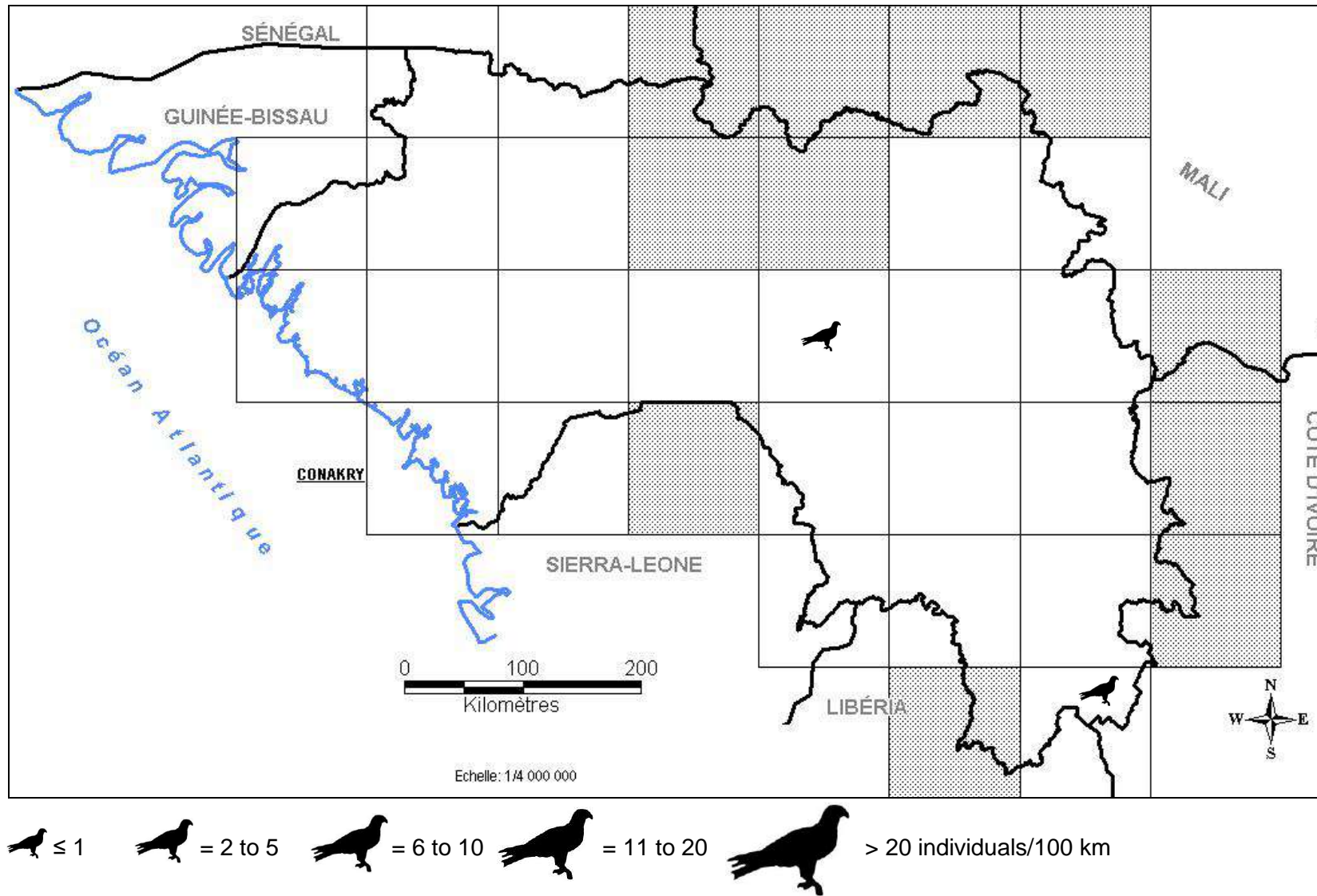
Rondeau, G, Condeé, M M, Ahon, B, Diallo, O & Pouakouyou, D. 2008.
Survey of the occurrence and relative abundance of raptors in Guinea subject to international trade. *JNCC Report No.412*, JNCC, Peterborough, ISBN 978-1-86107-600-7.

3 Raptor distribution maps

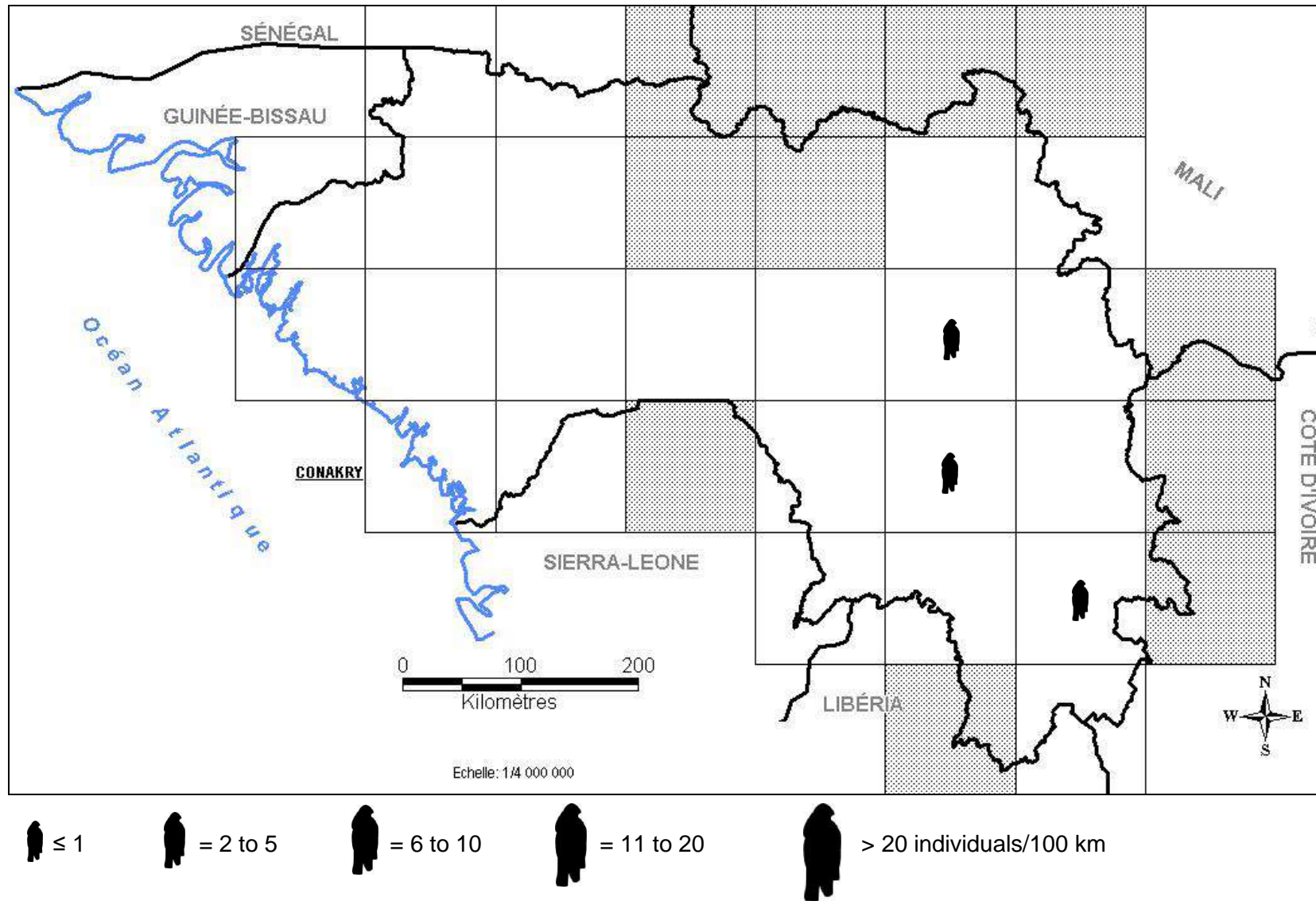
***Pandion haliaetus* - Osprey**



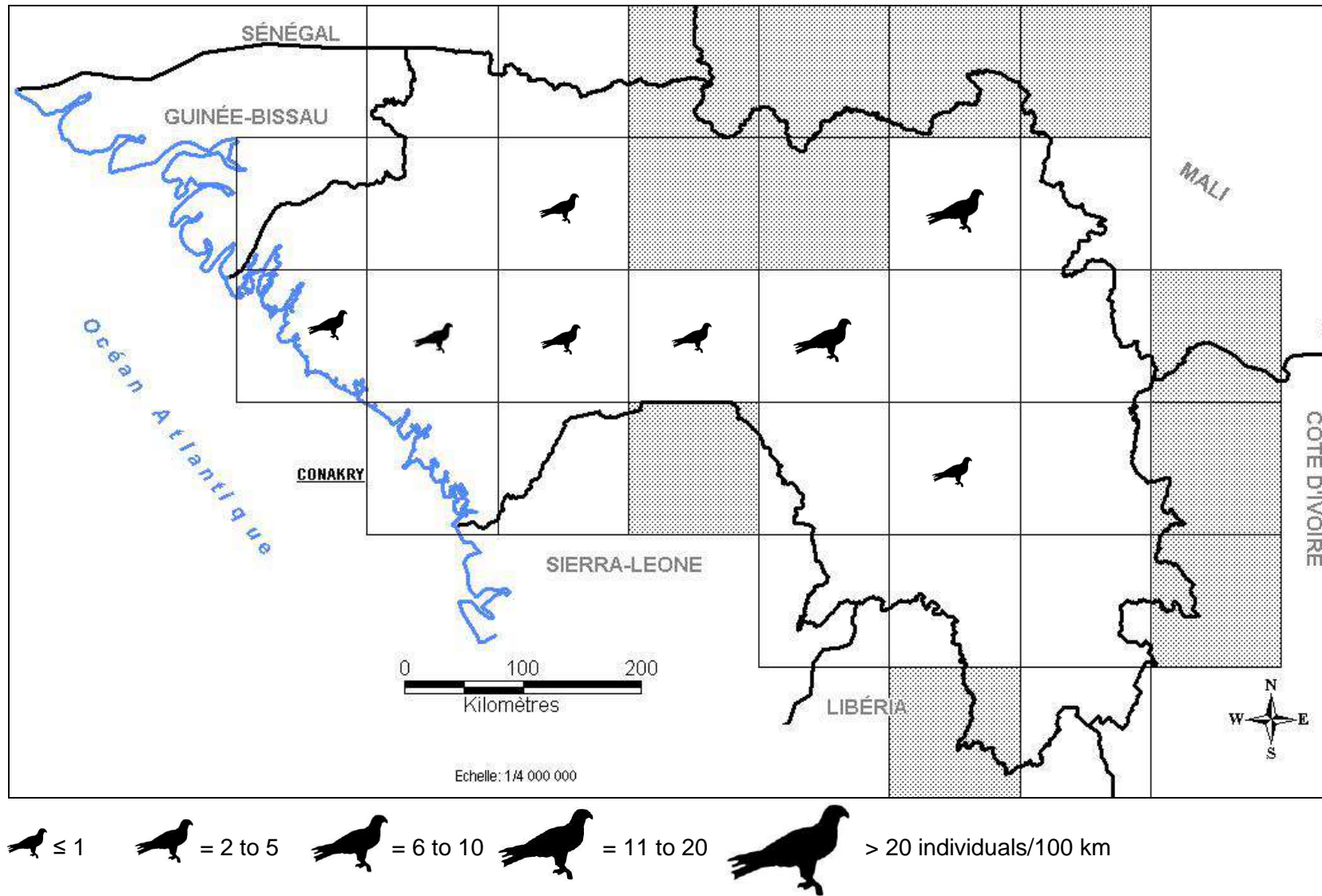
***Aviceda cuculoides* – African cuckoo-hawk**



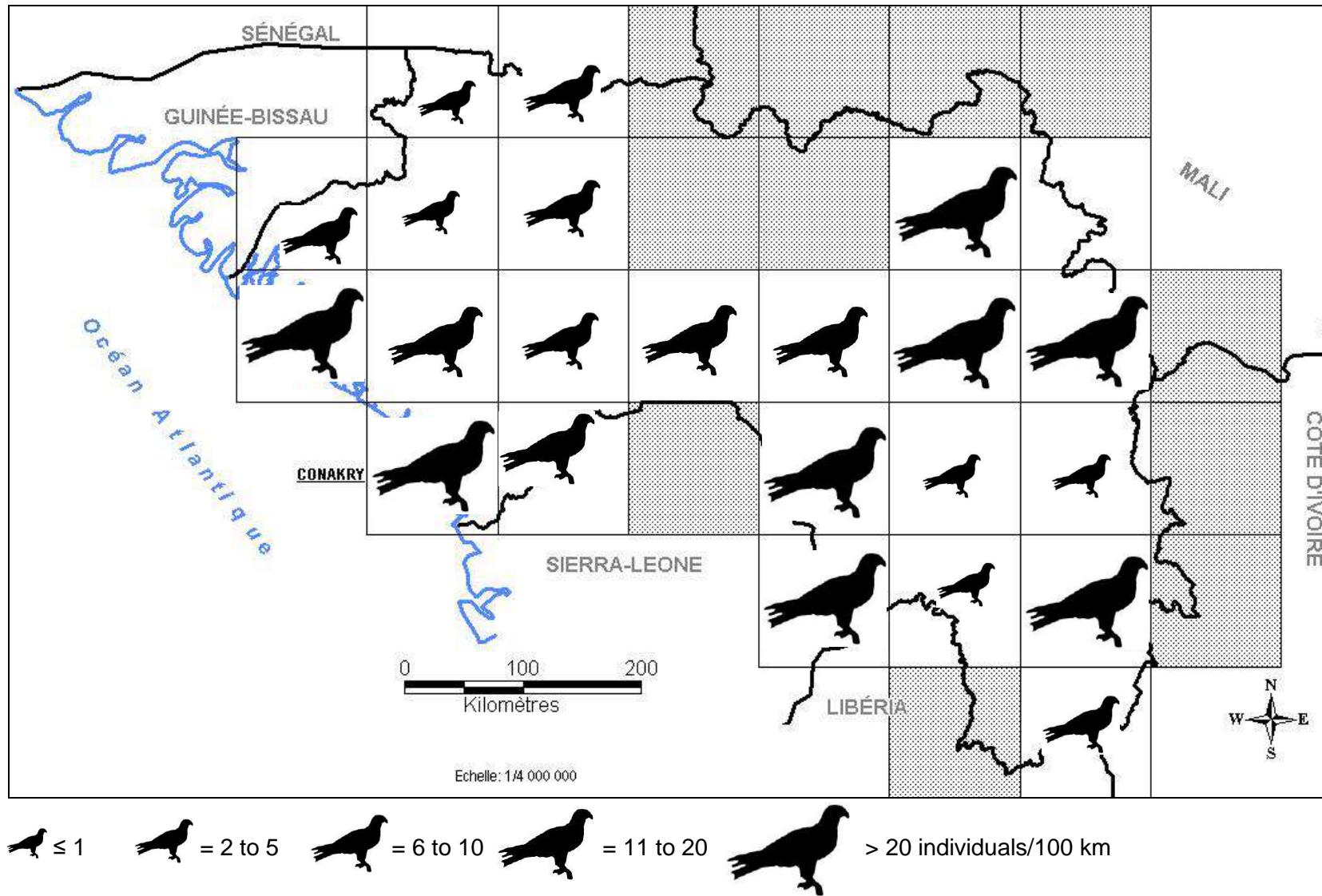
***Pernis apivorus* – European honey buzzard**



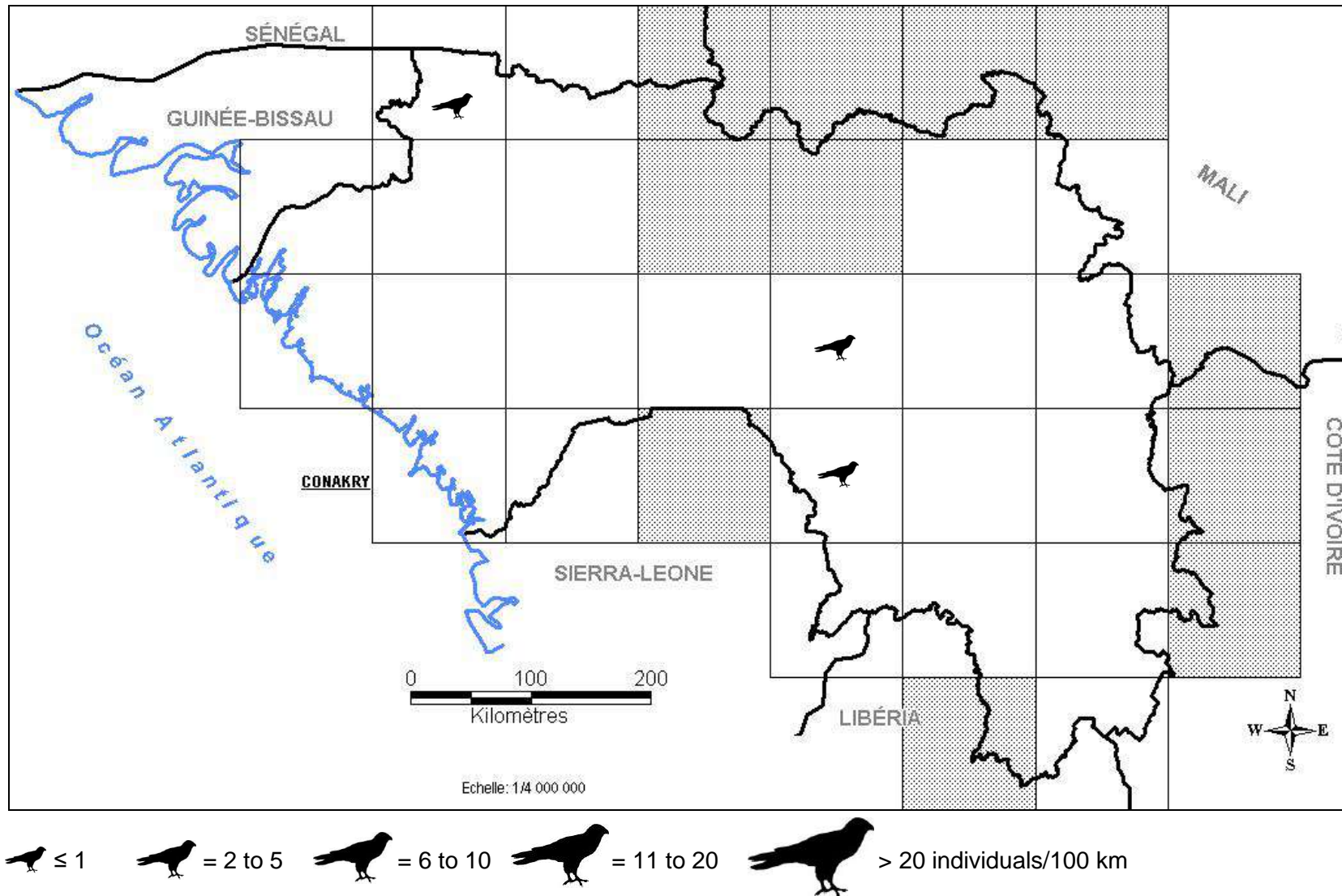
Elanus caeruleus – Black-winged kite



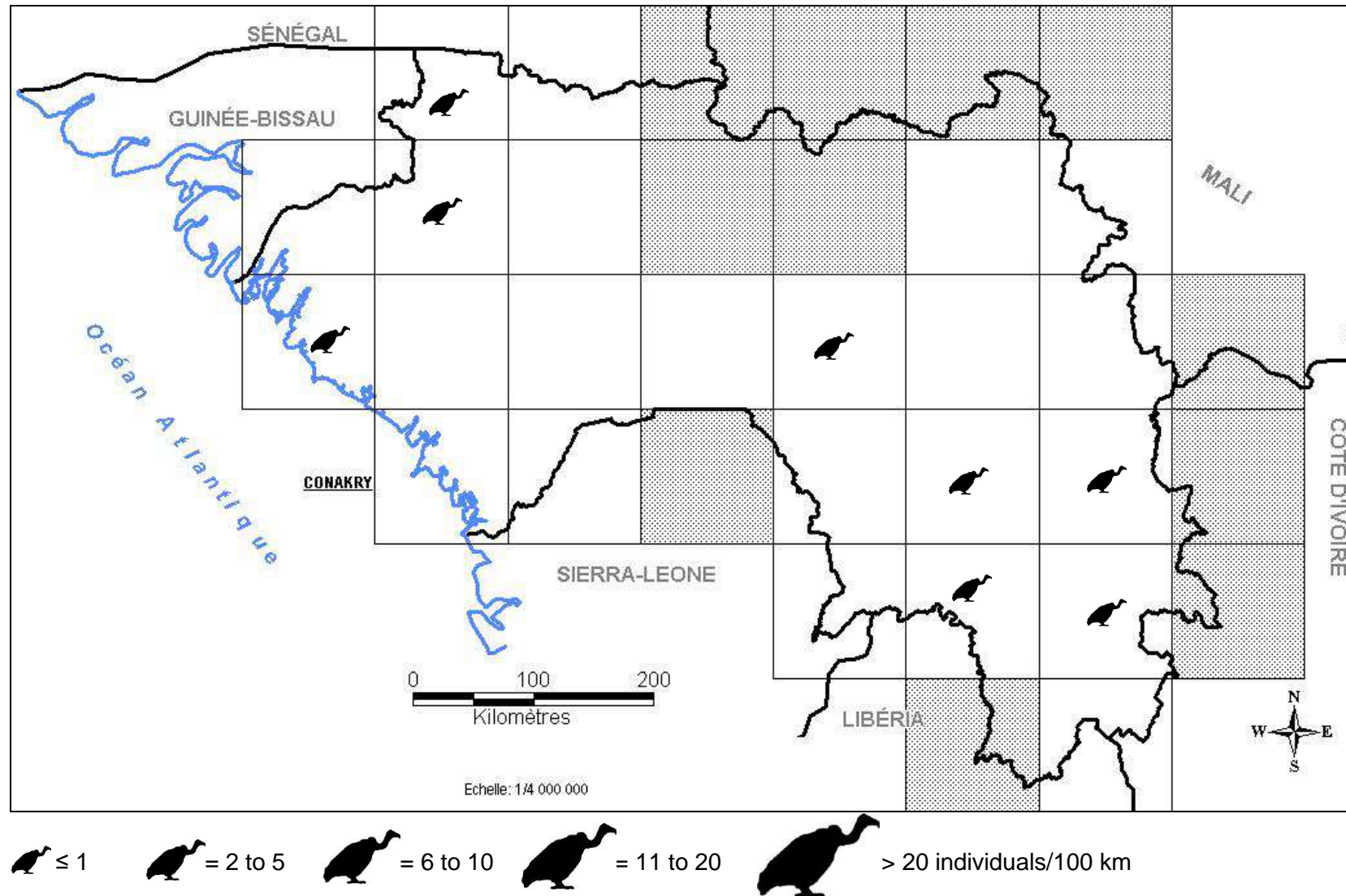
Milvus migrans – Black kite



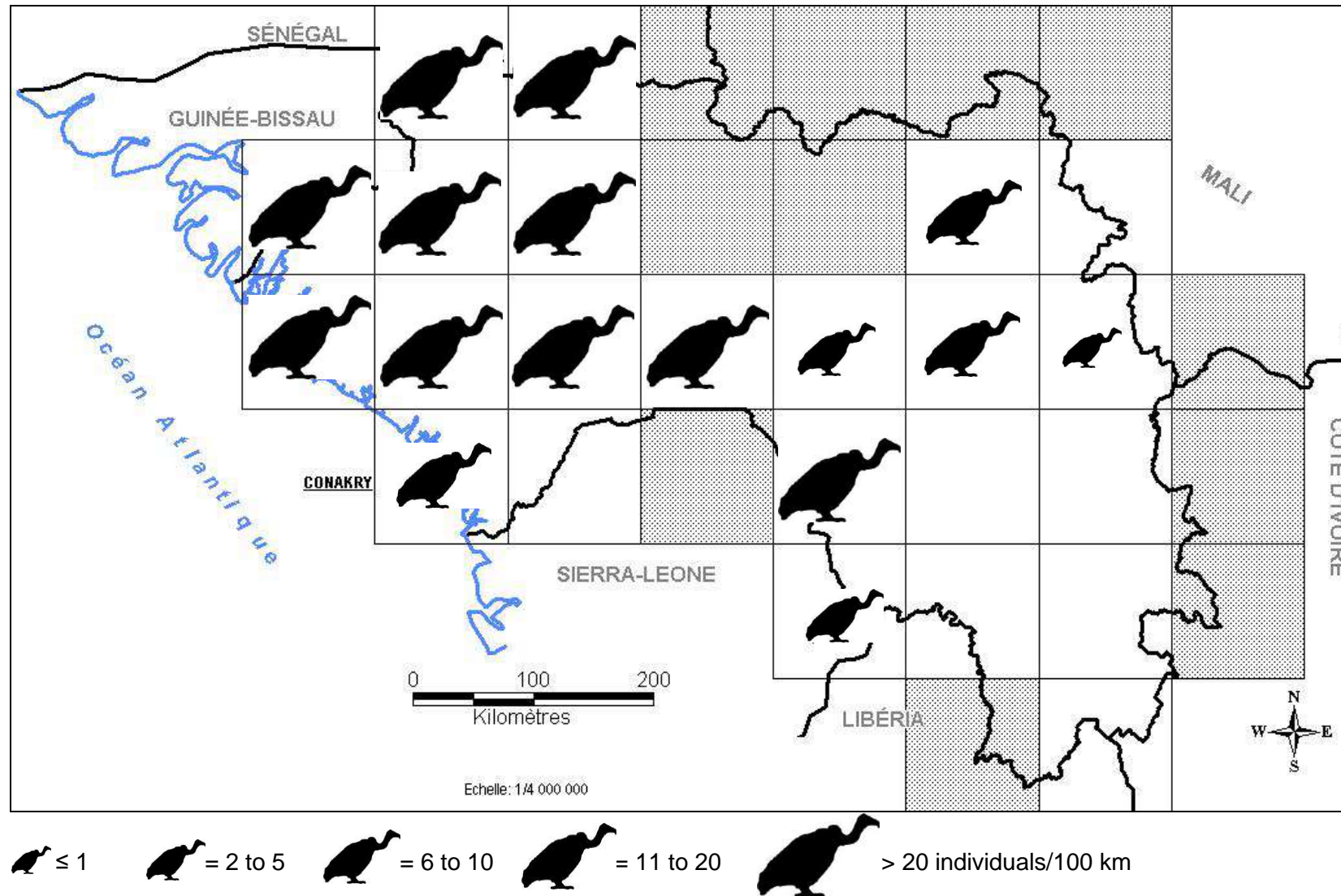
***Haliaeetus vocifer* – African fish eagle**



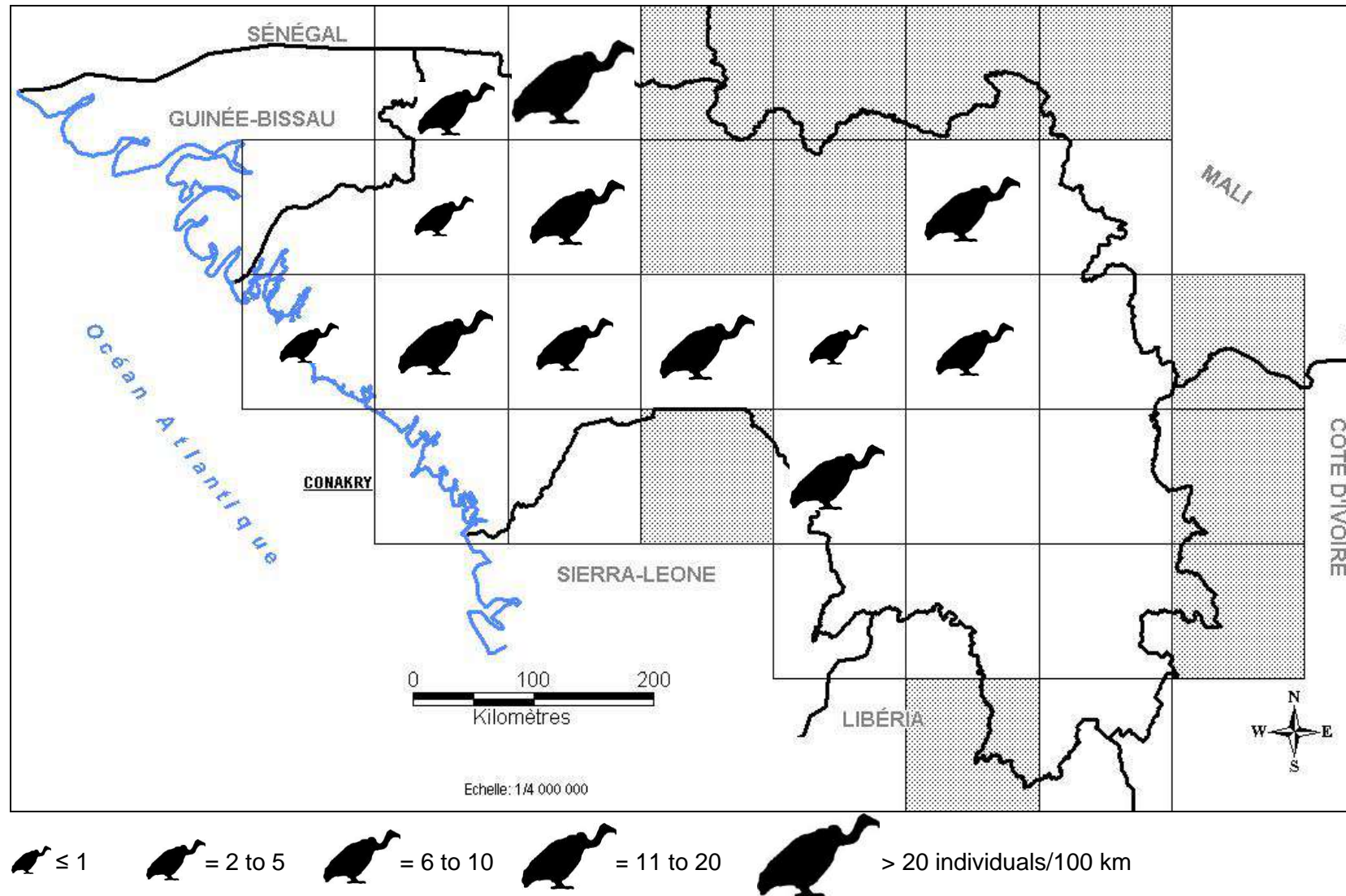
Gypohierax angolensis – Palm-nut vulture



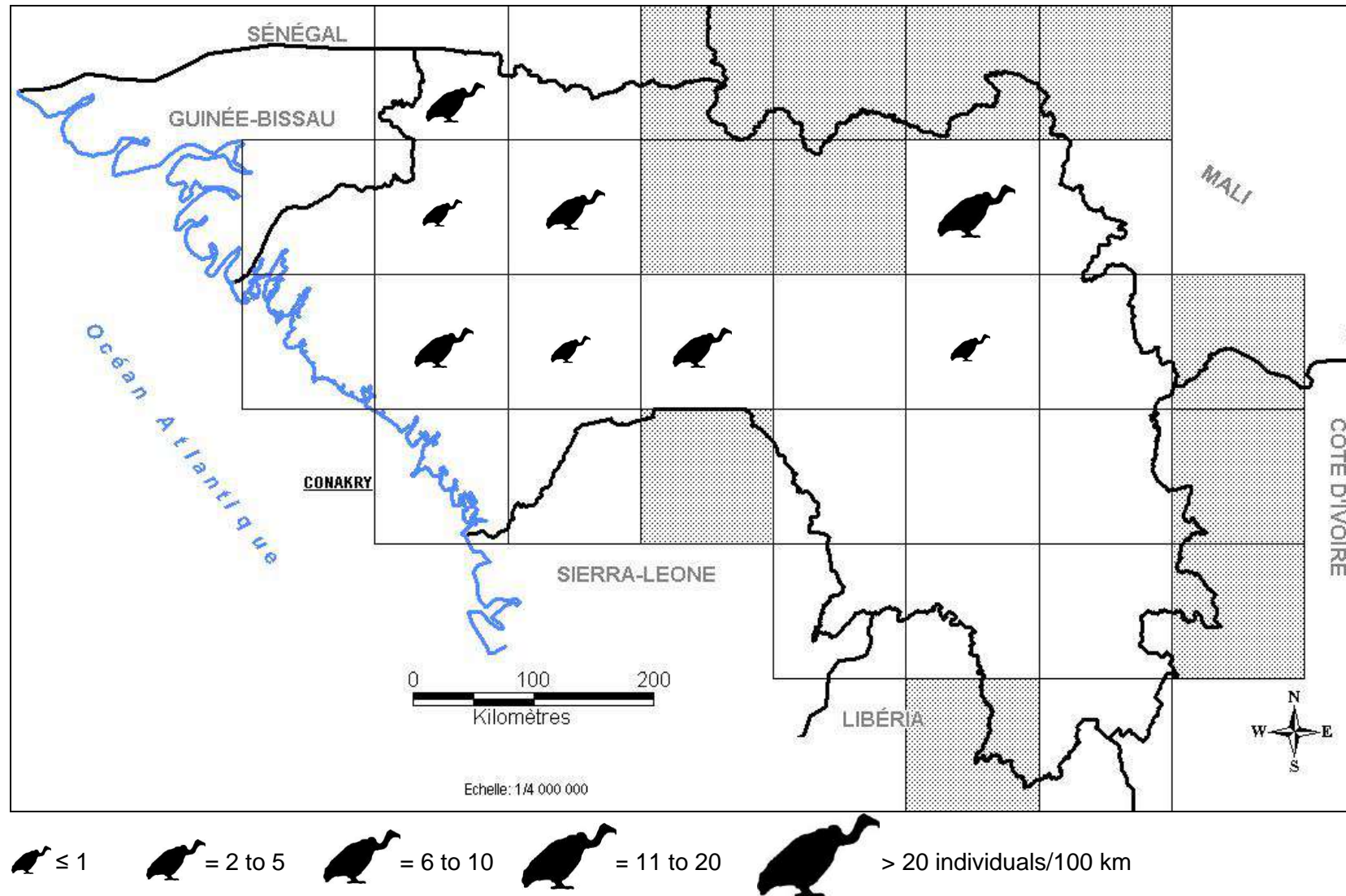
Necrosyrtes monachus – Hooded vulture



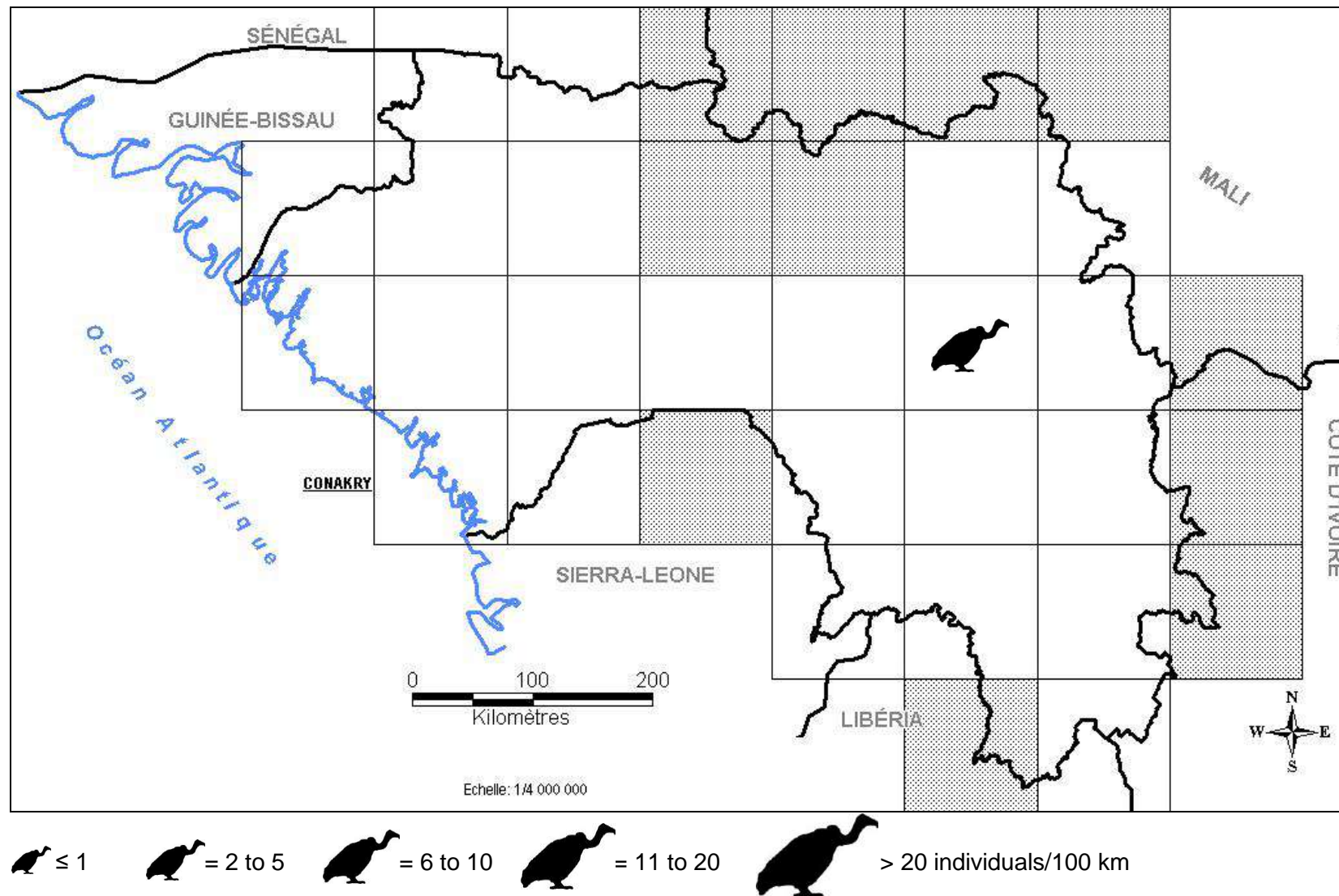
Gyps africanus – White-backed vulture



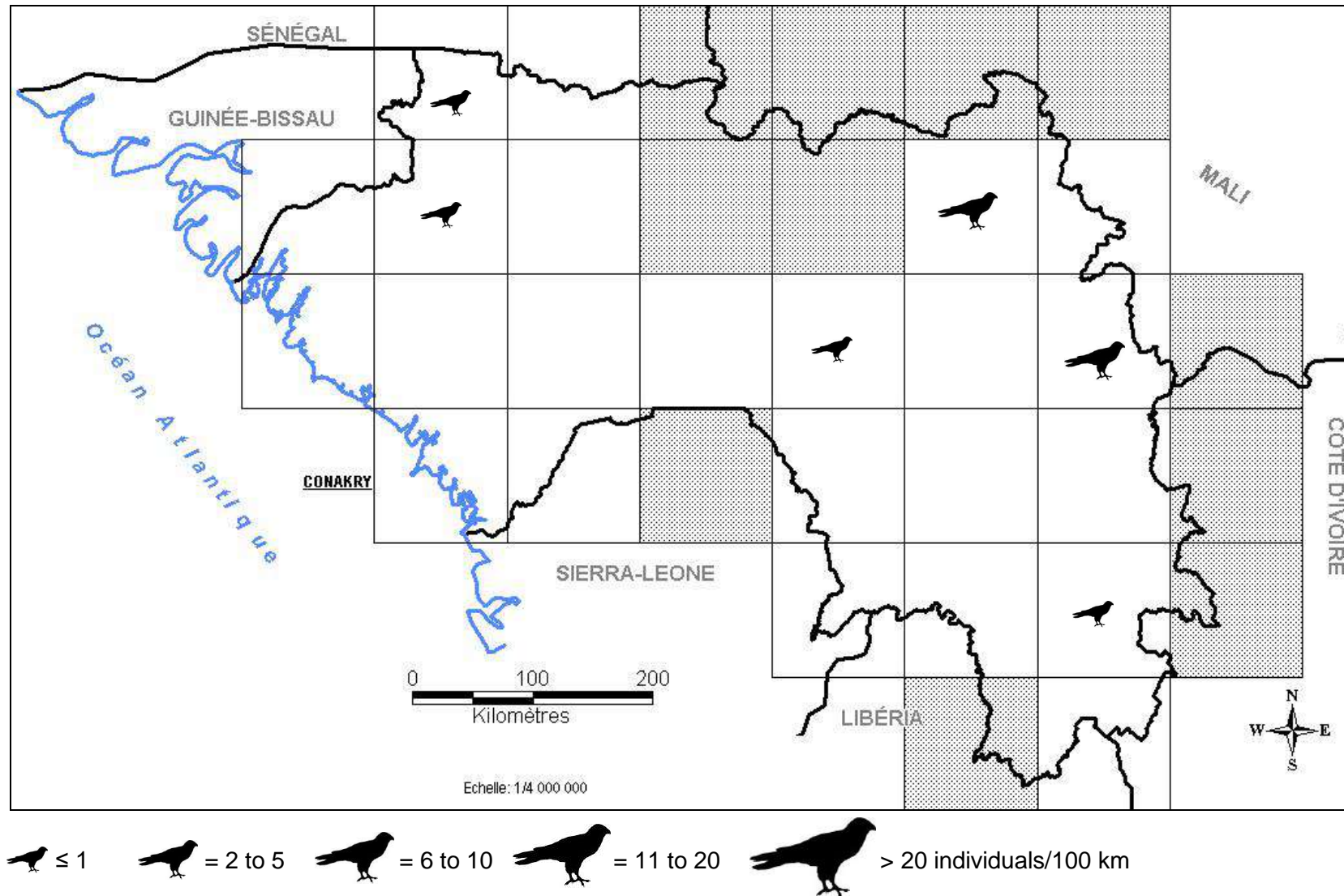
Gyps rueppellii - Rüppell's vulture



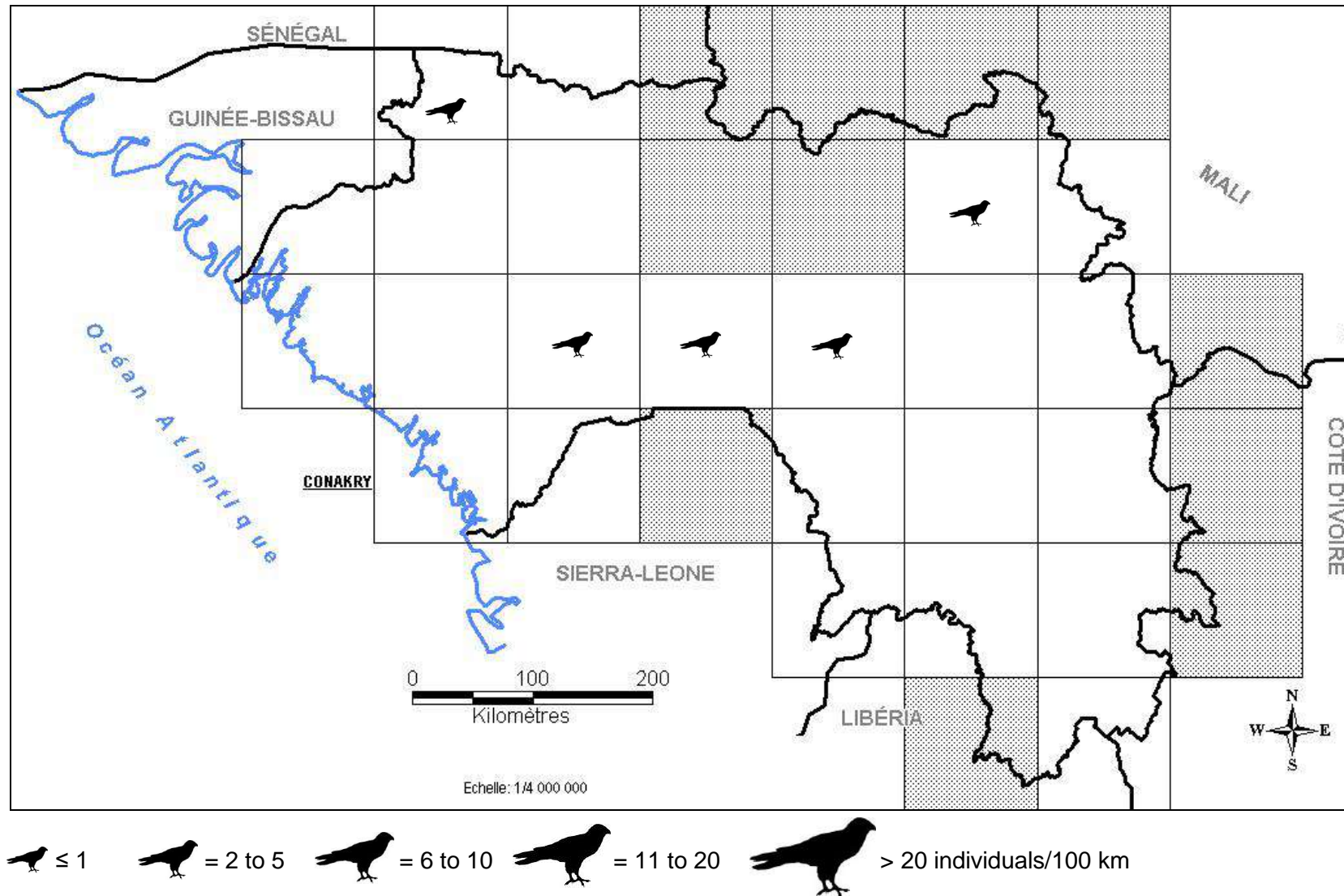
Gyps fulvus – Griffon vulture



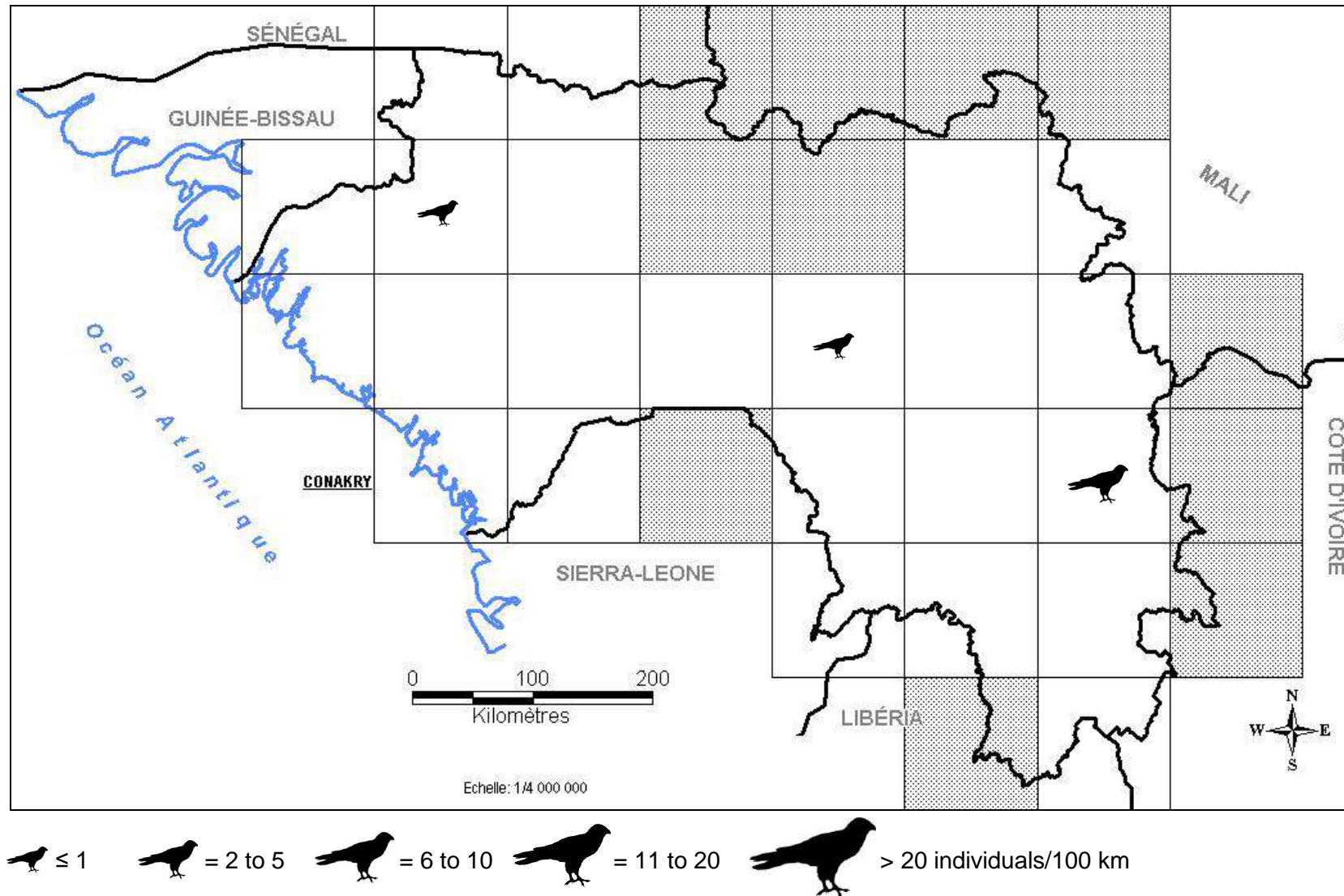
***Circaetus beaudouini* - Beaudouin's snake eagle**



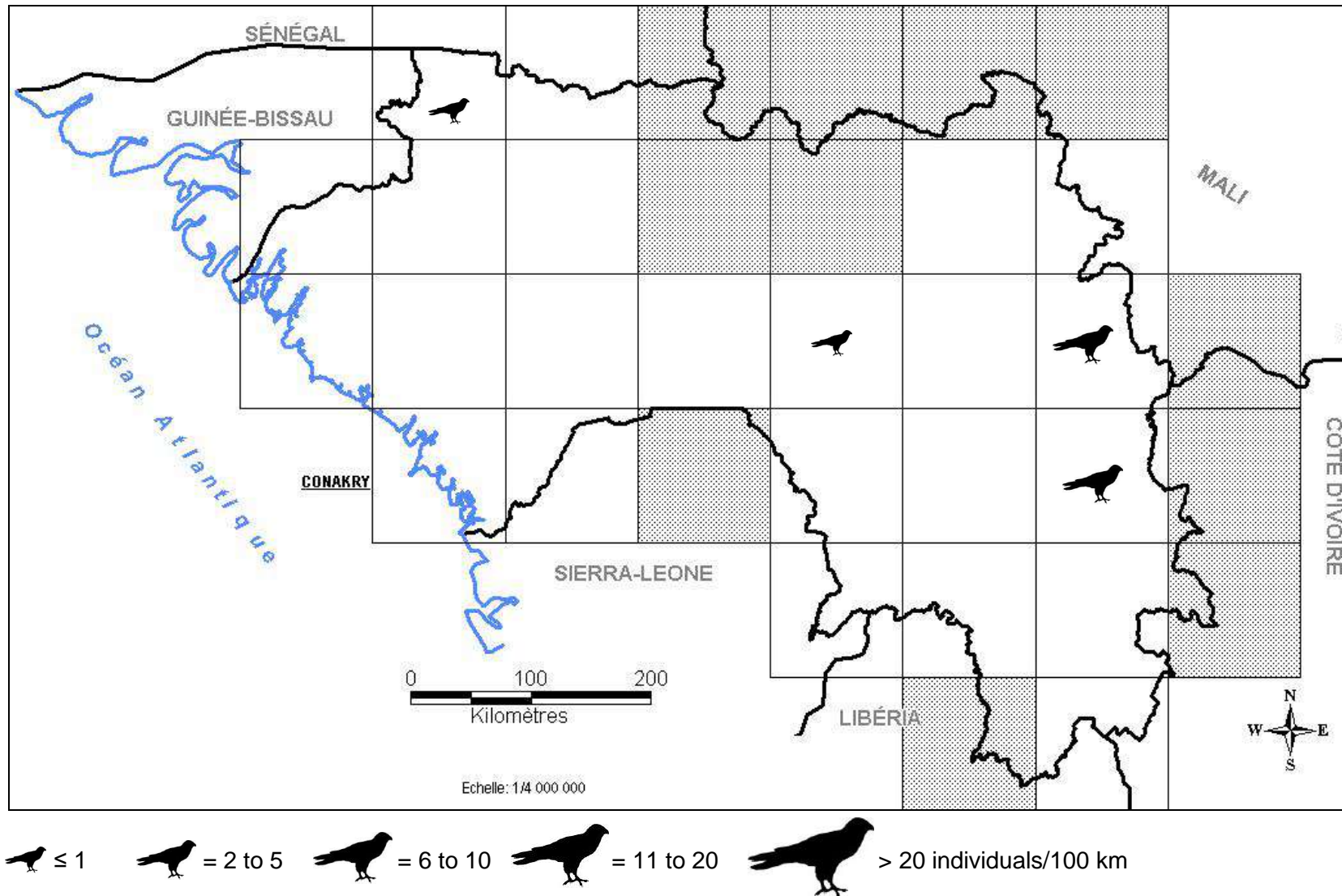
Circaetus cinereus – Brown snake eagle



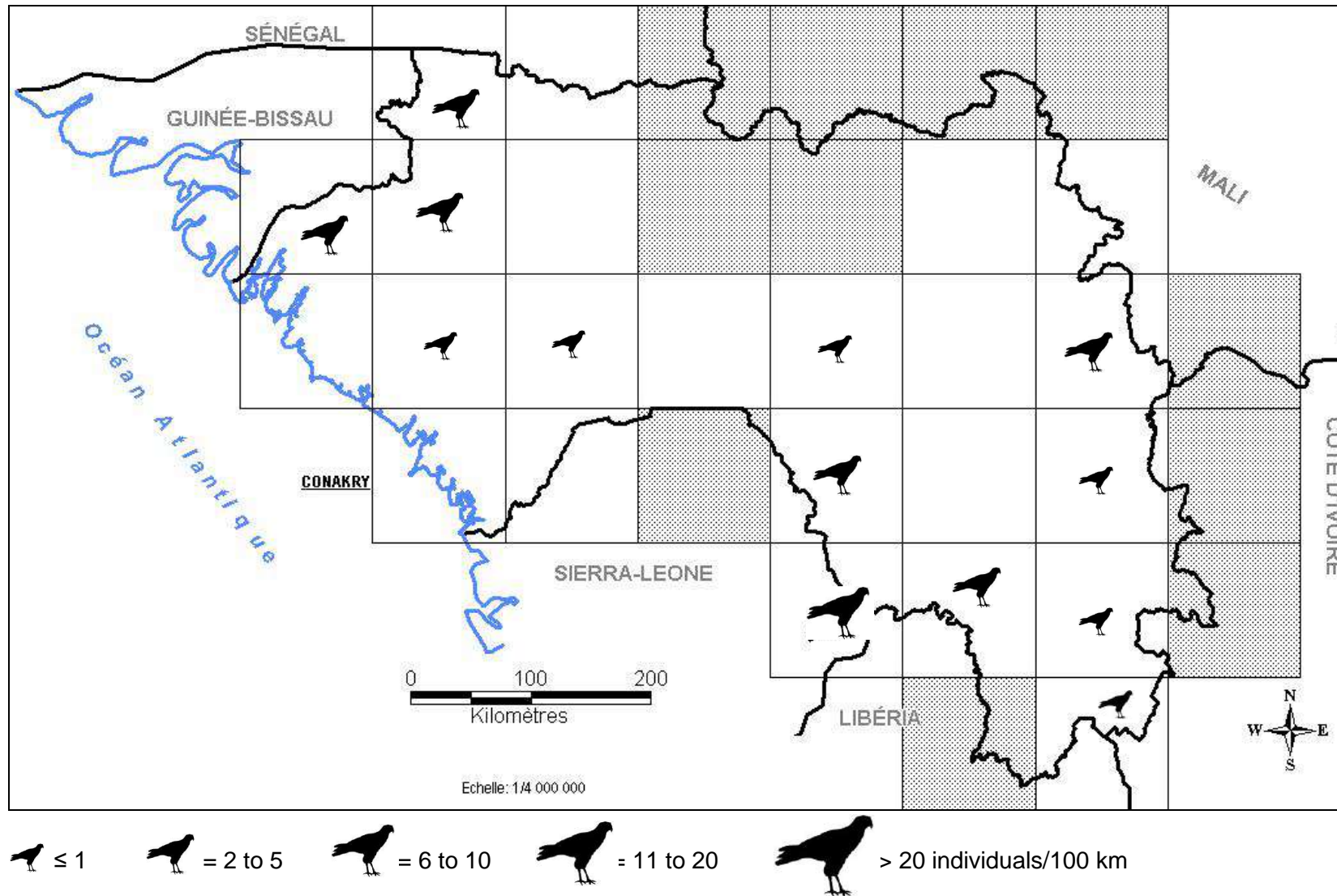
***Circaetus cinerascens* – Western banded snake eagle**



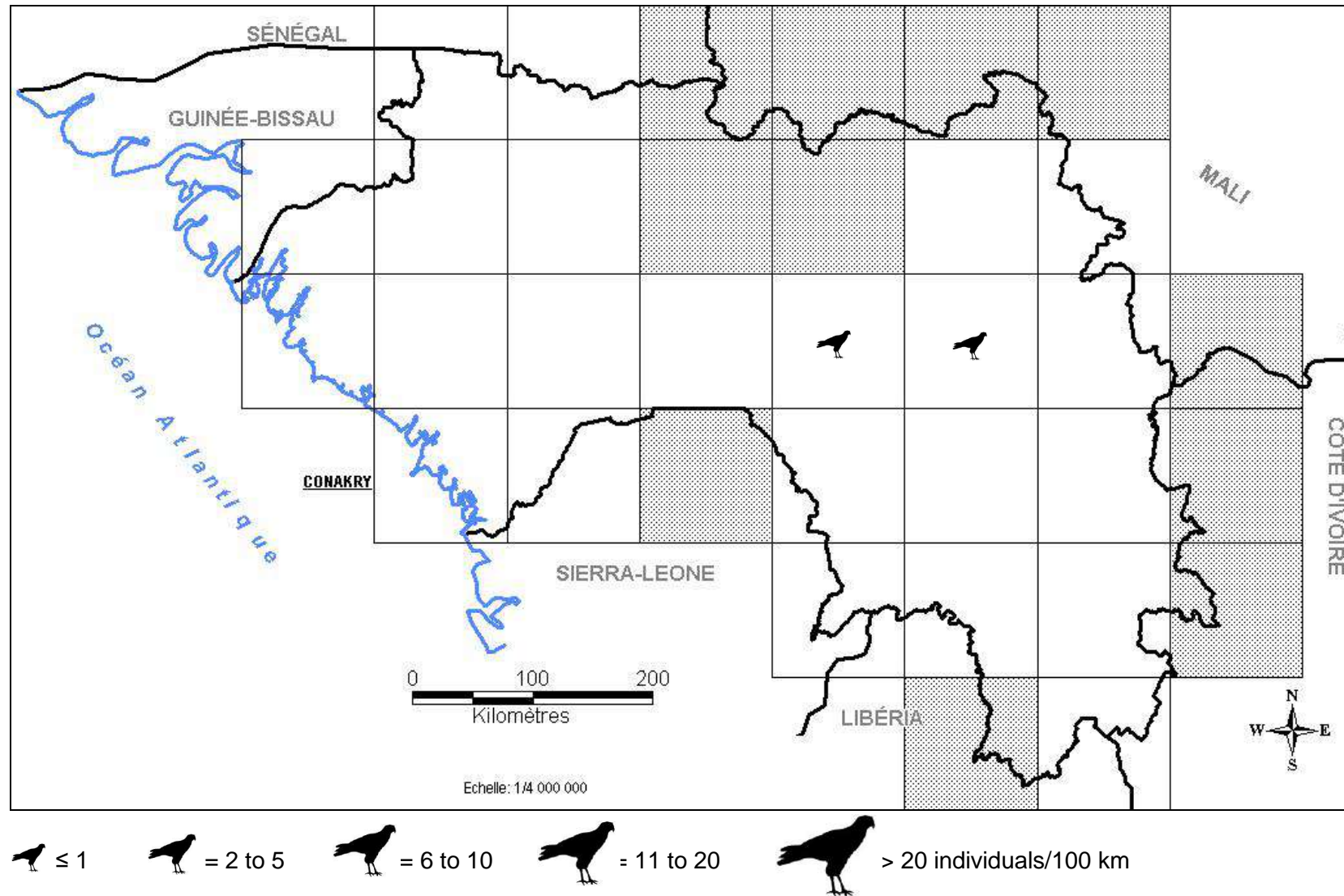
Terathopius ecaudatus - Bateleur



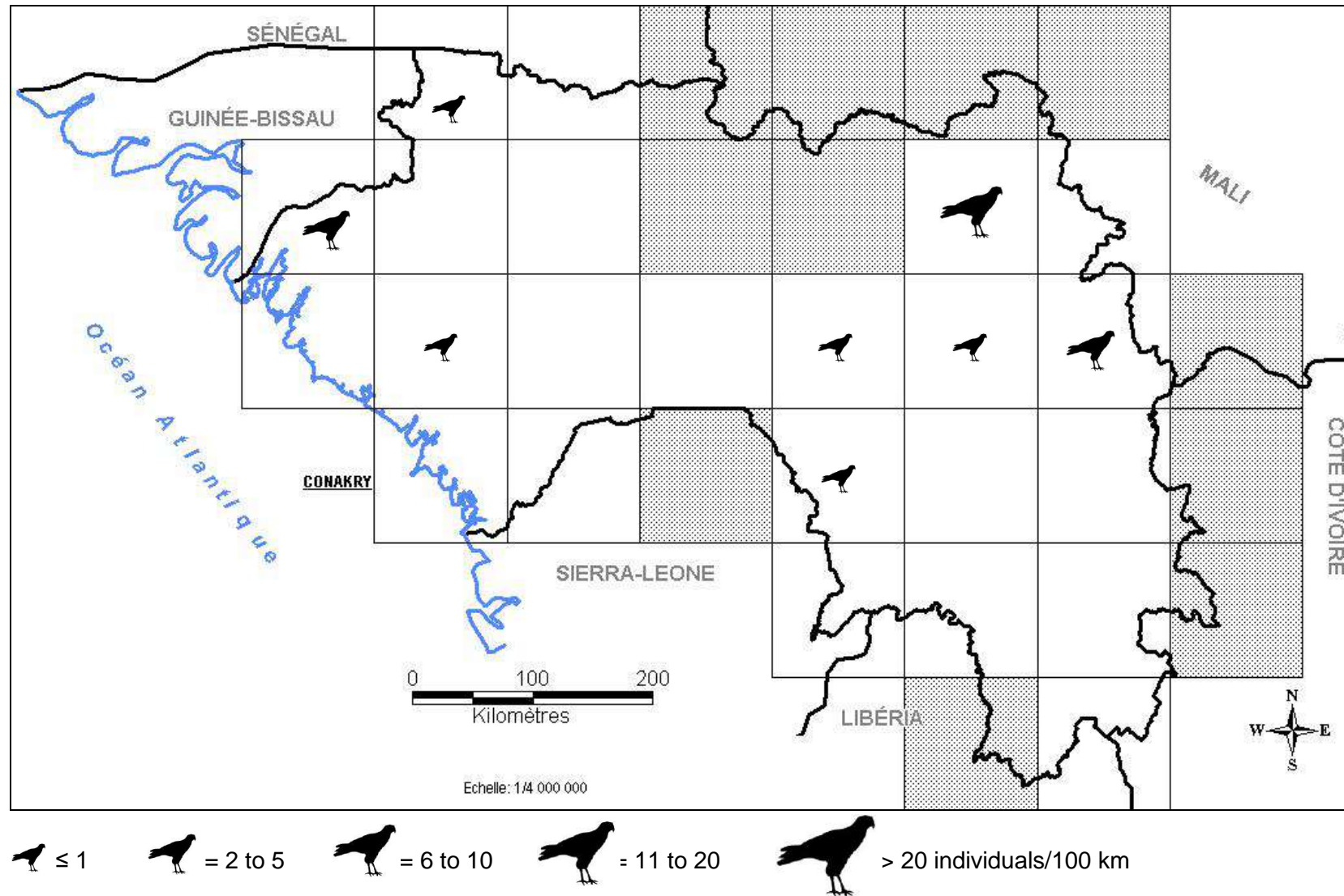
Polyboroides typus – African gymnogene



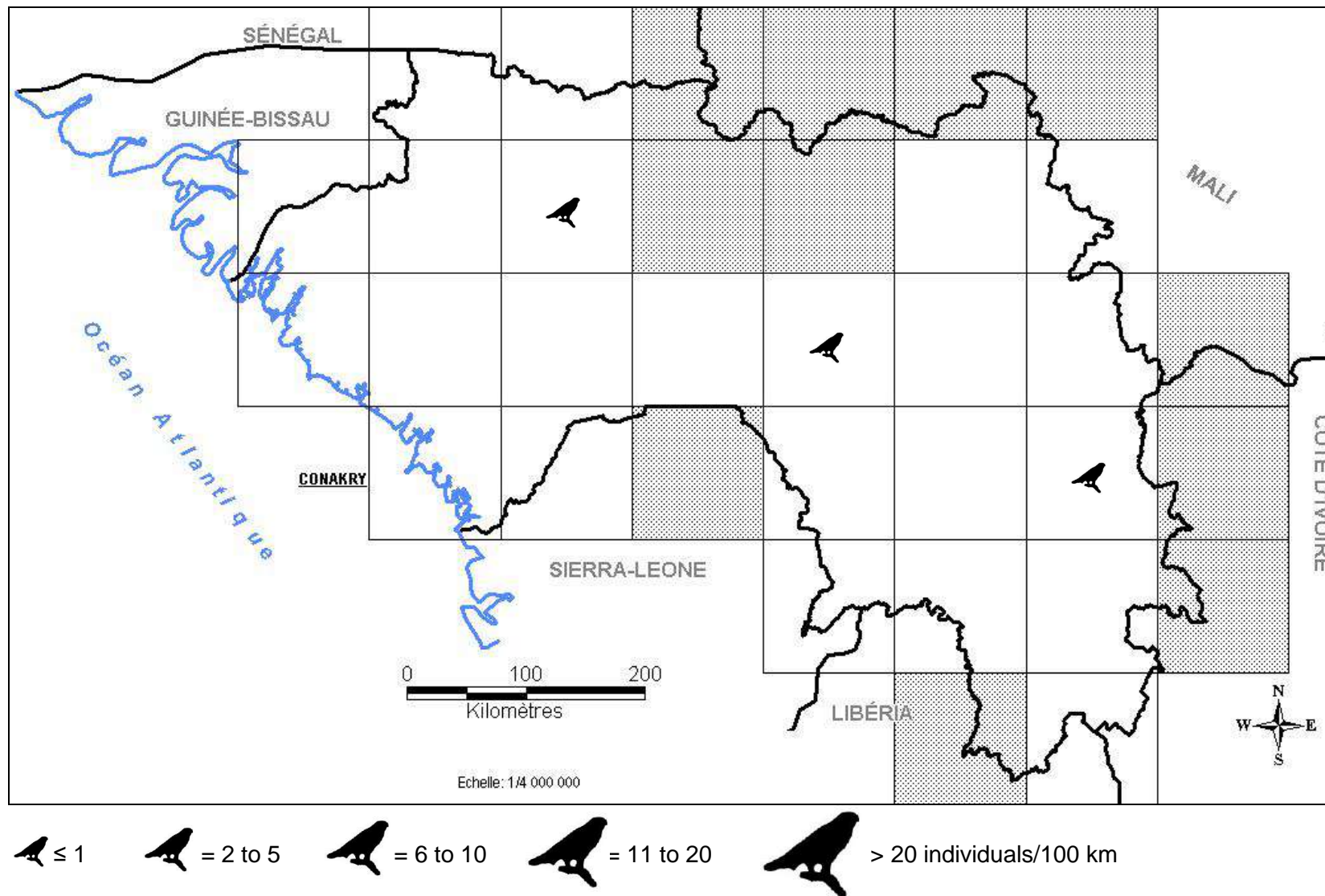
***Circus pygargus* – Montagu's harrier**



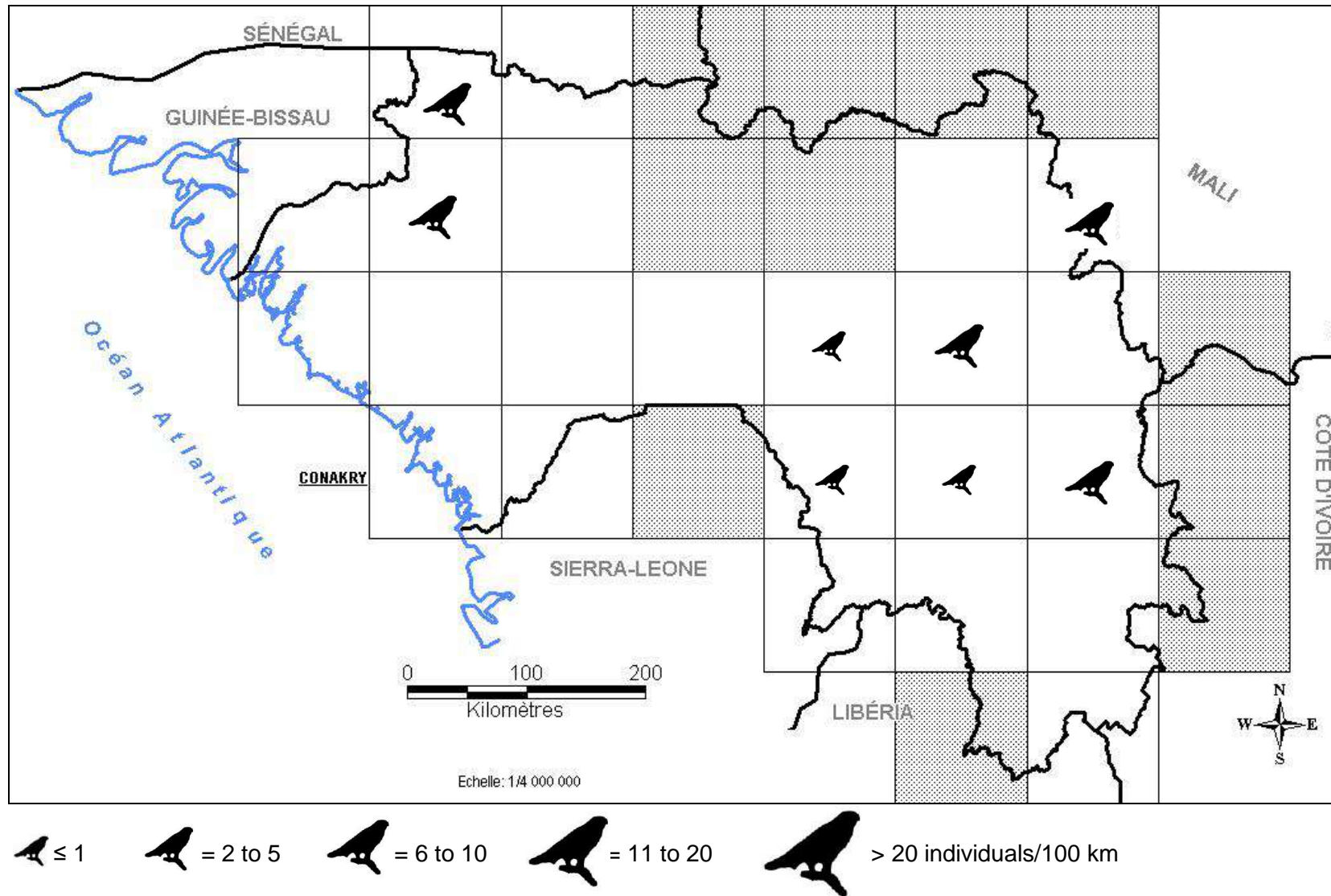
***Circus aeruginosus* – Western marsh harrier**



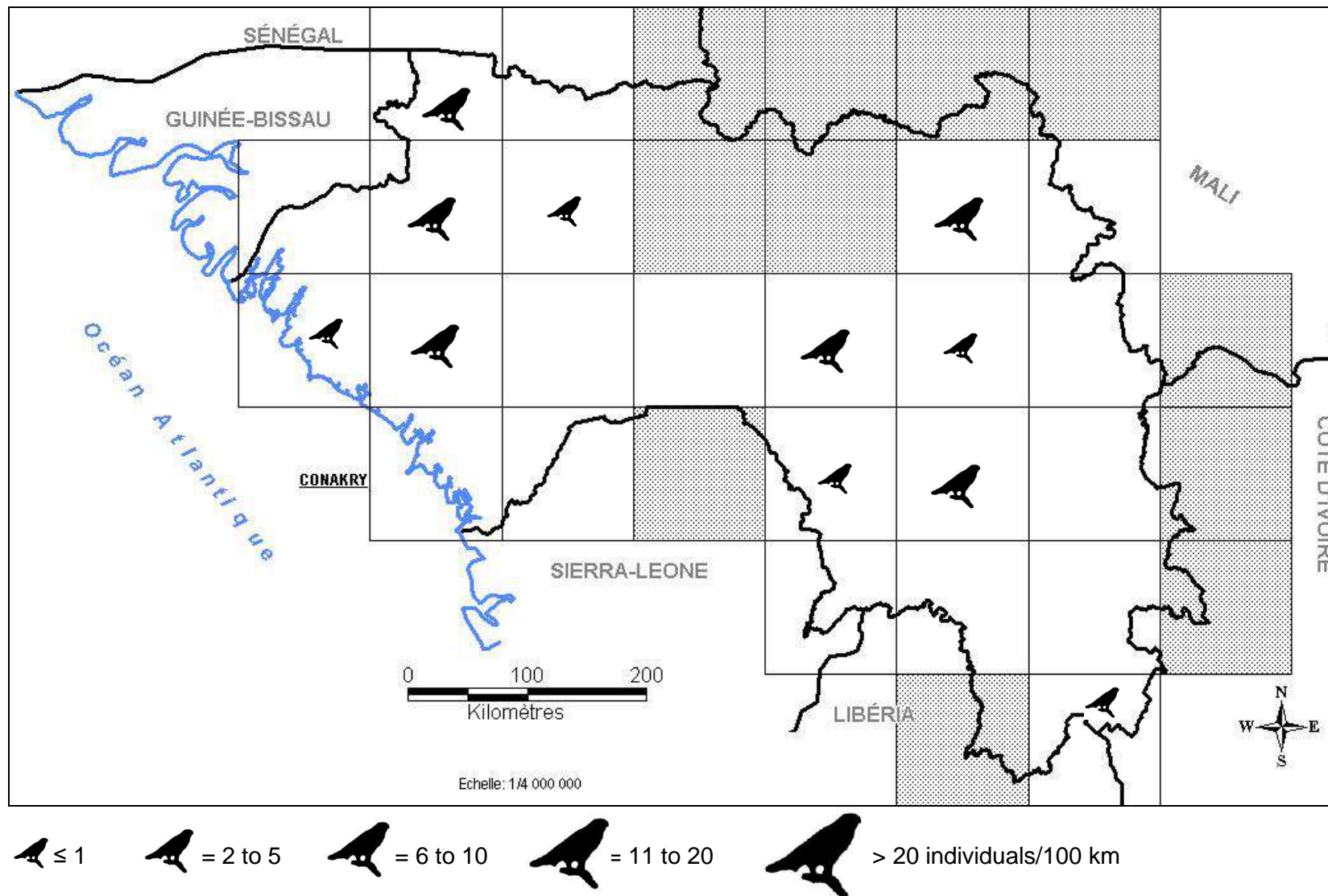
***Micronisus gabar* – Gabar goshawk**



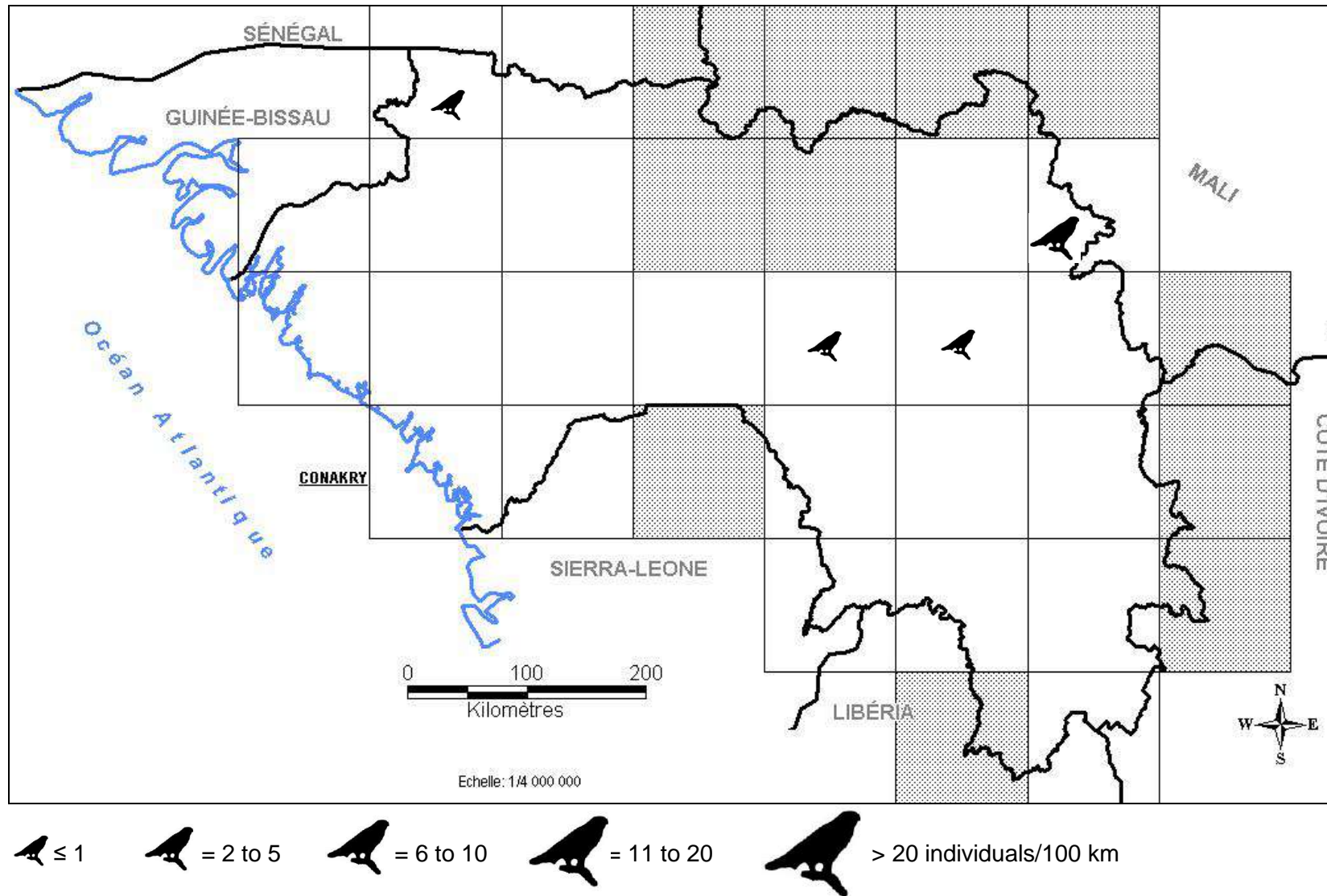
***Melierax metabates* – Dark chanting goshawk**



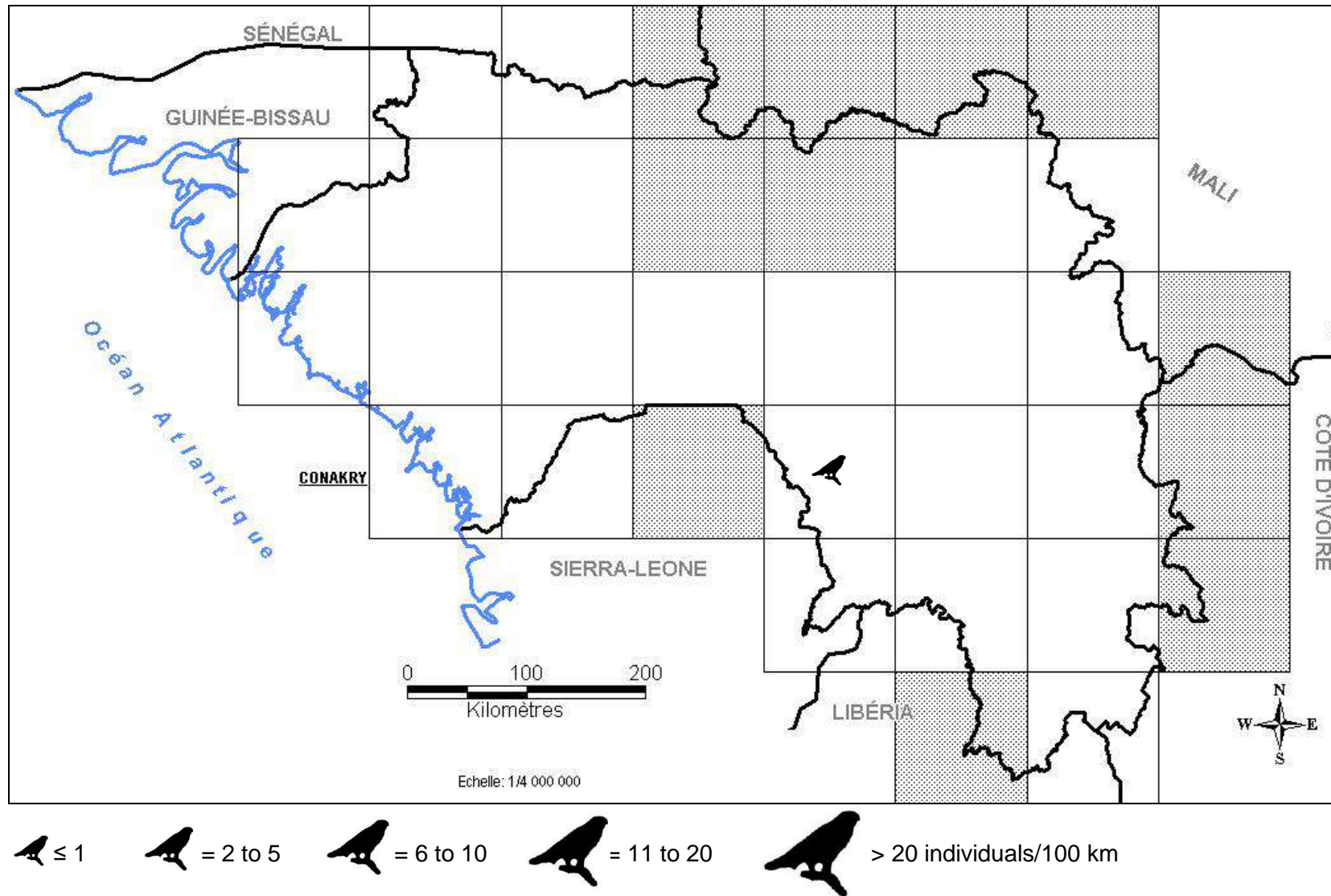
Accipiter badius - Shikra



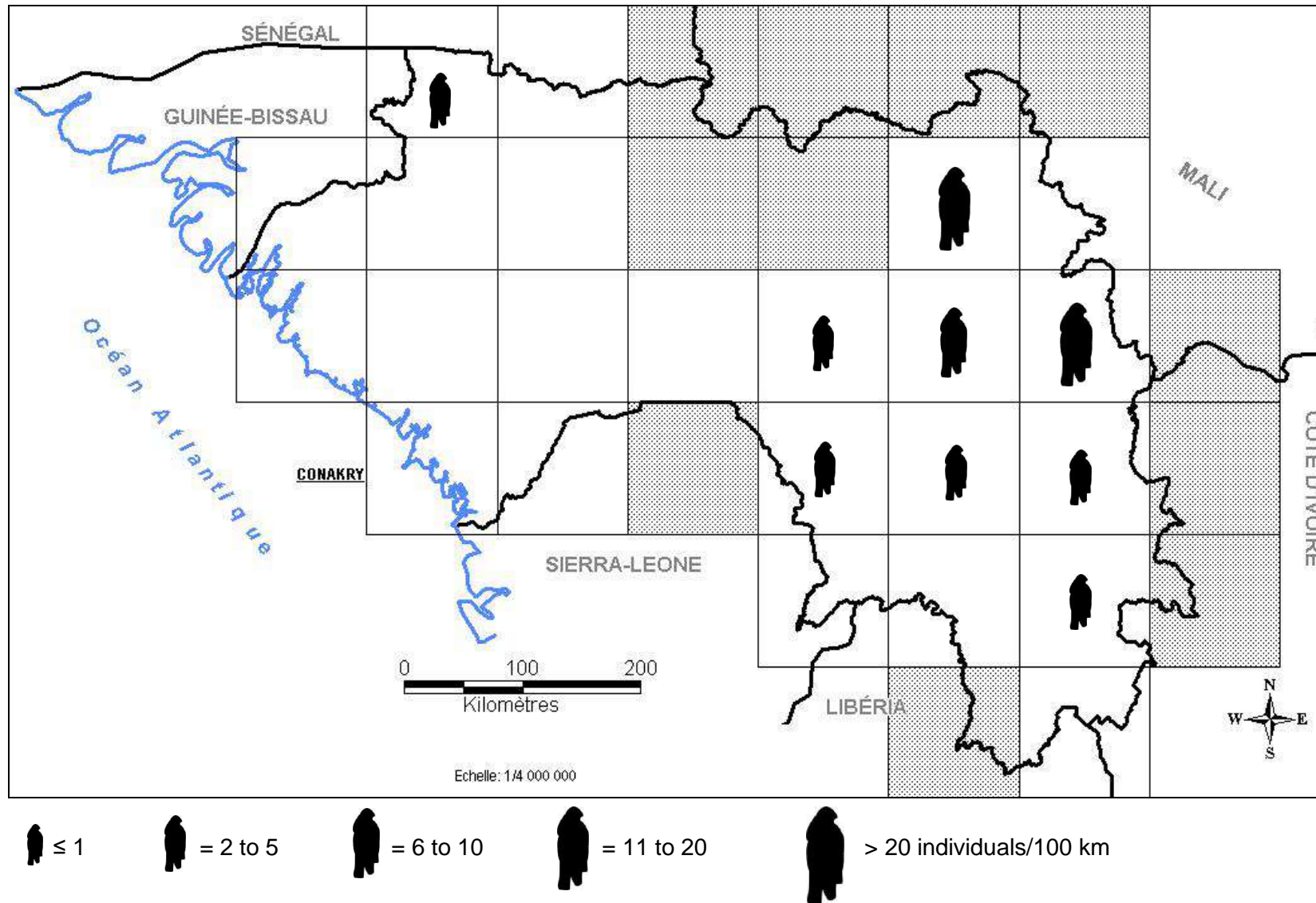
Accipiter ovampensis - Ovambo sparrowhawk



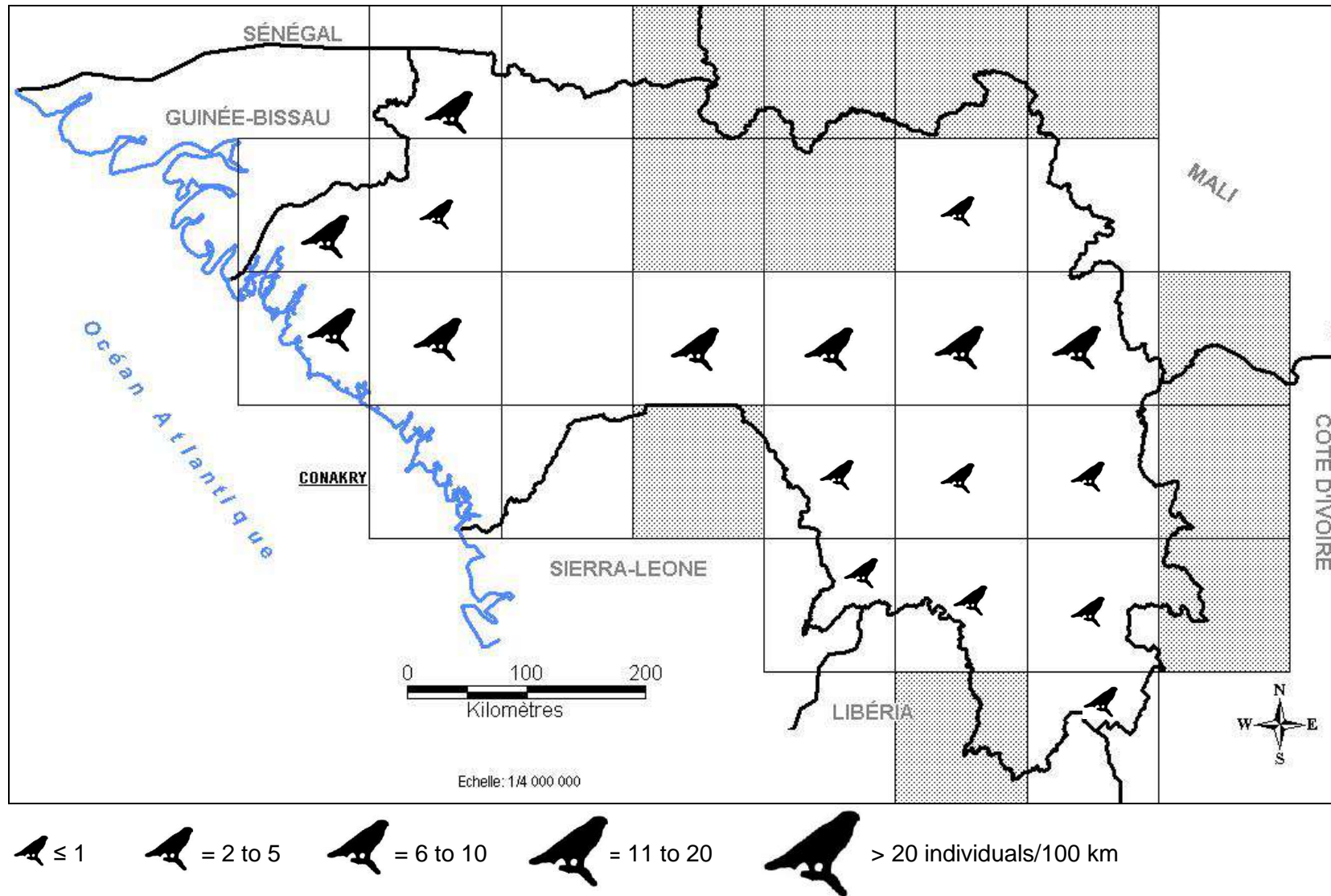
Accipiter melanoleucus – Black goshawk



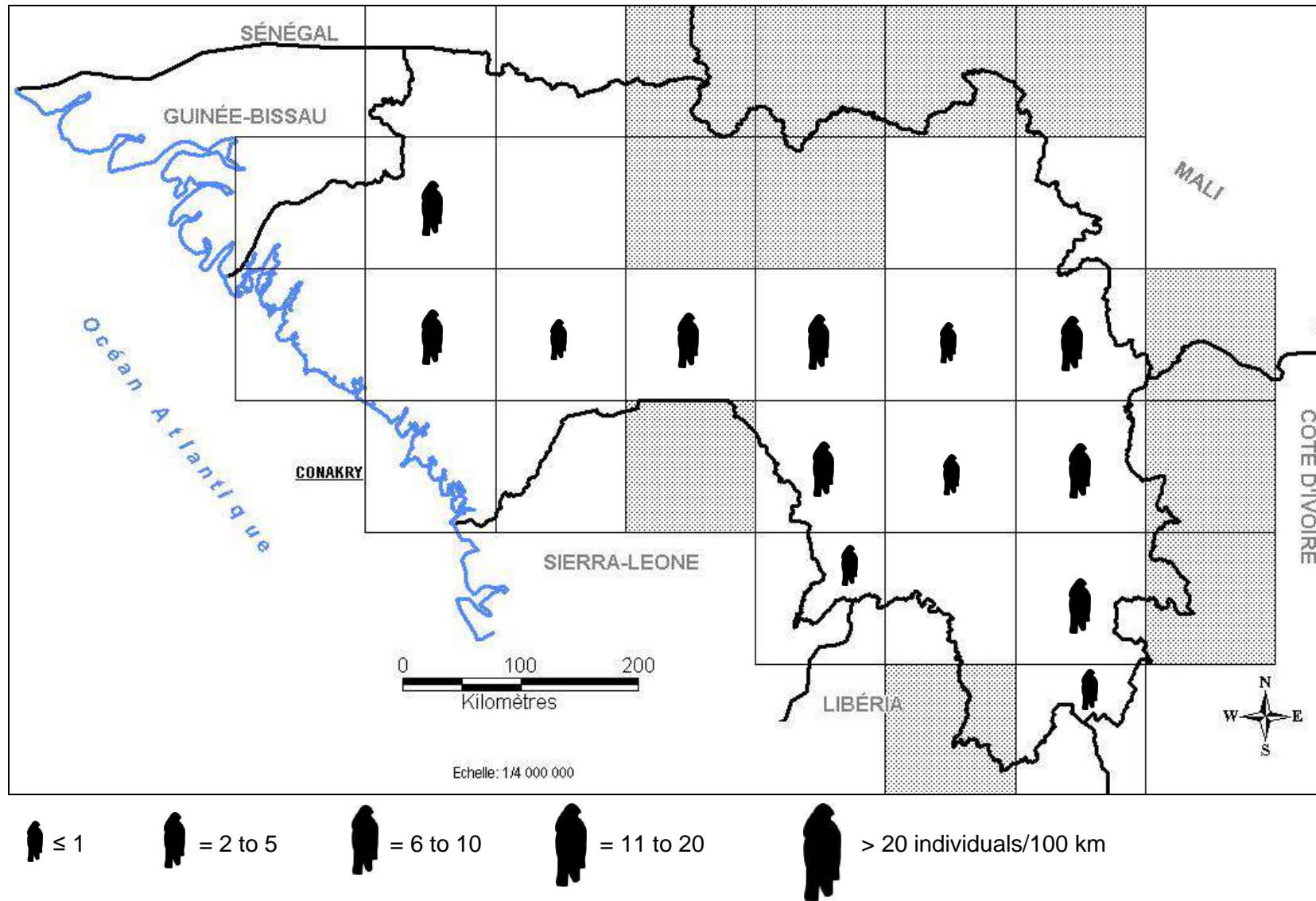
***Butastur rufipennis* – Grasshopper buzzard**



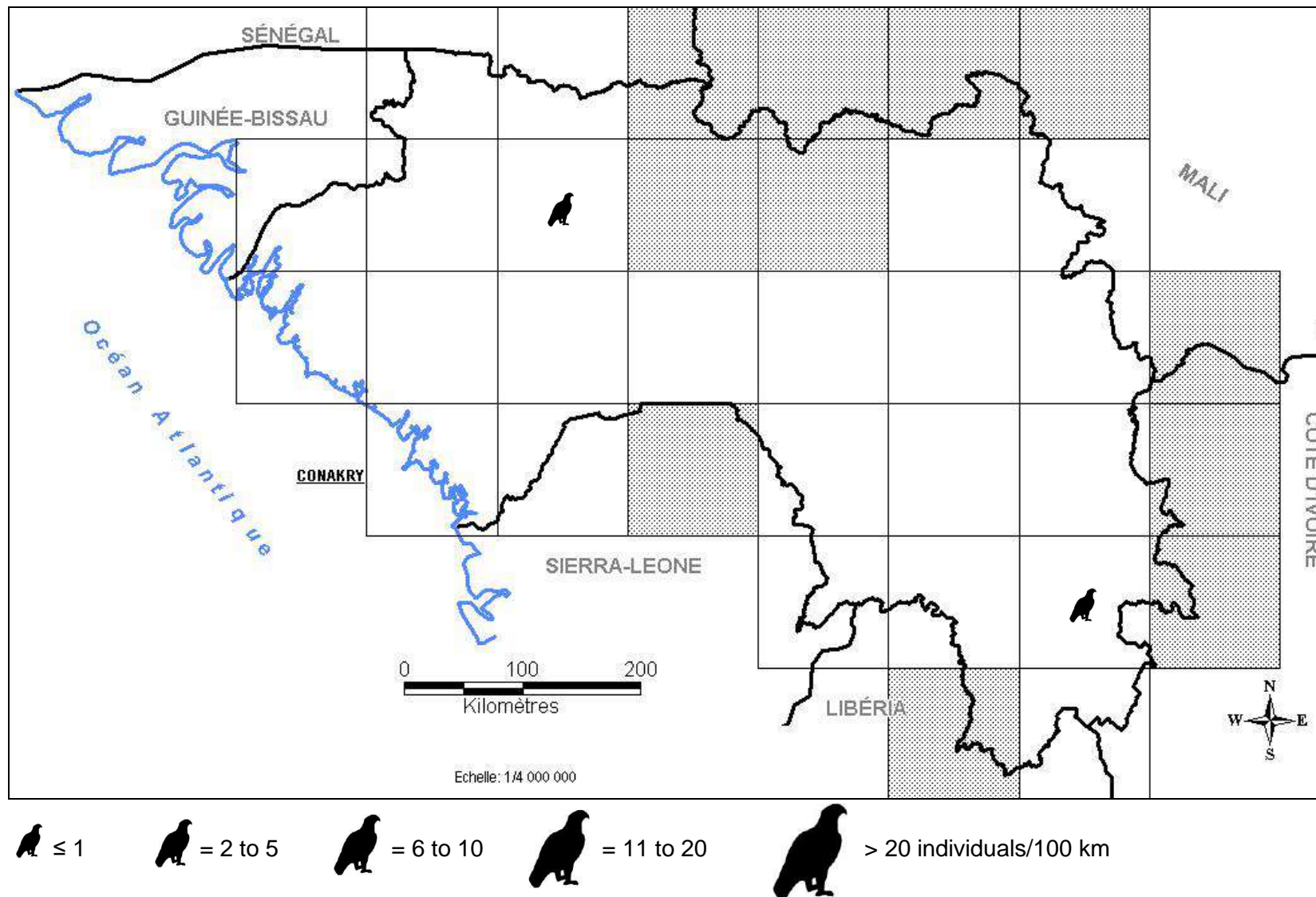
Kaupifalco monogrammicus – Lizard buzzard



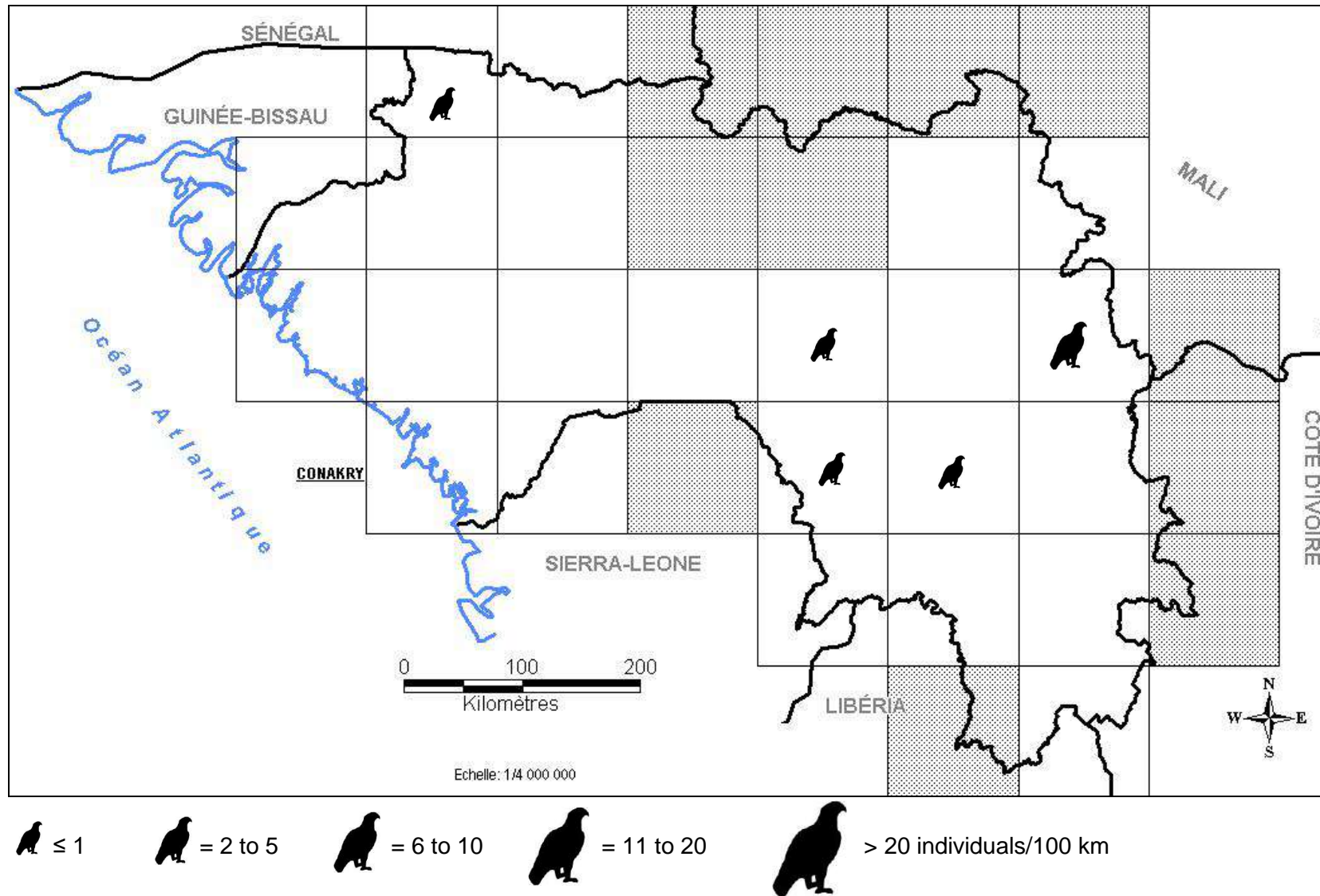
***Buteo auguralis* – Red-necked buzzard**



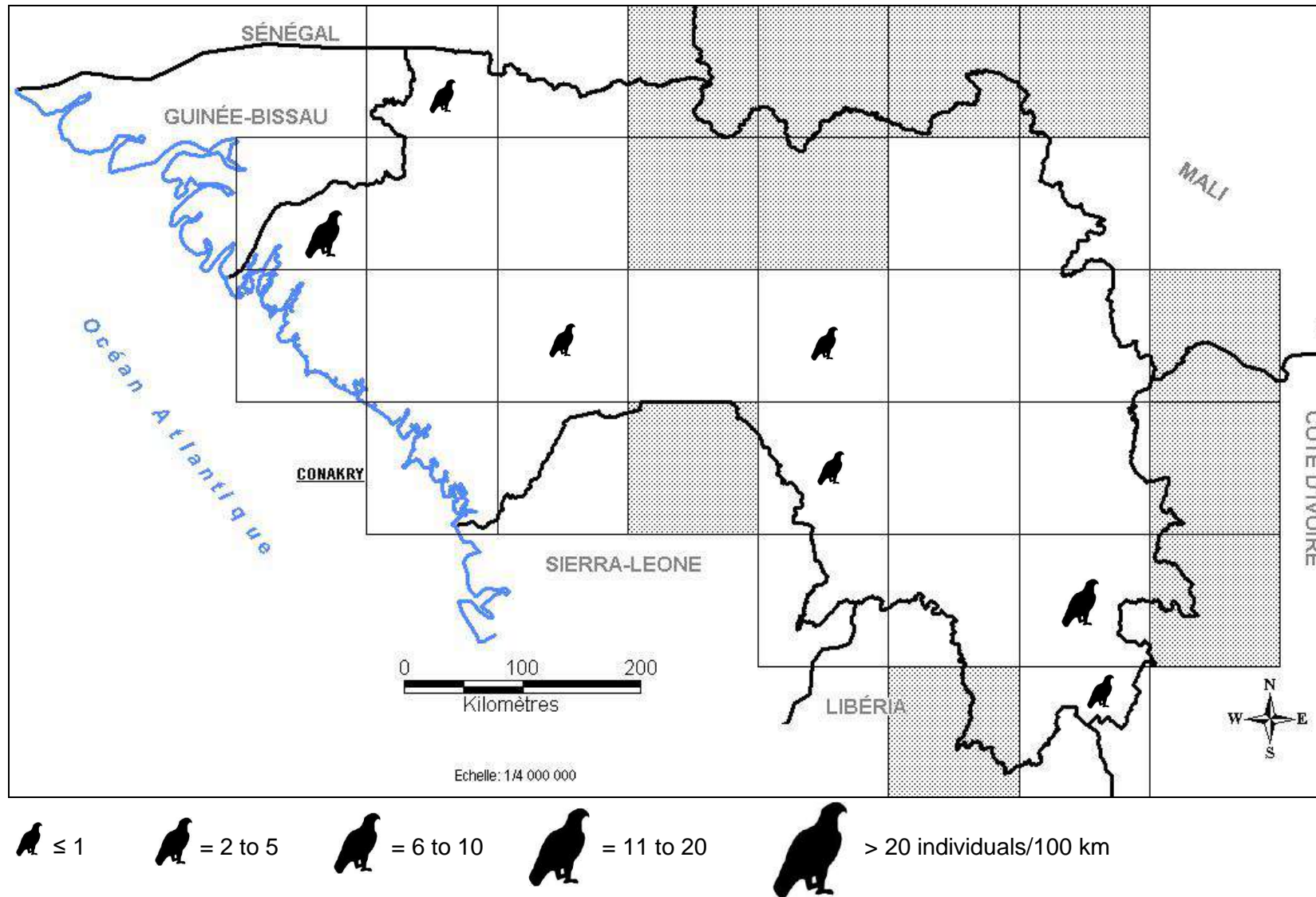
Aquila rapax – Tawny eagle



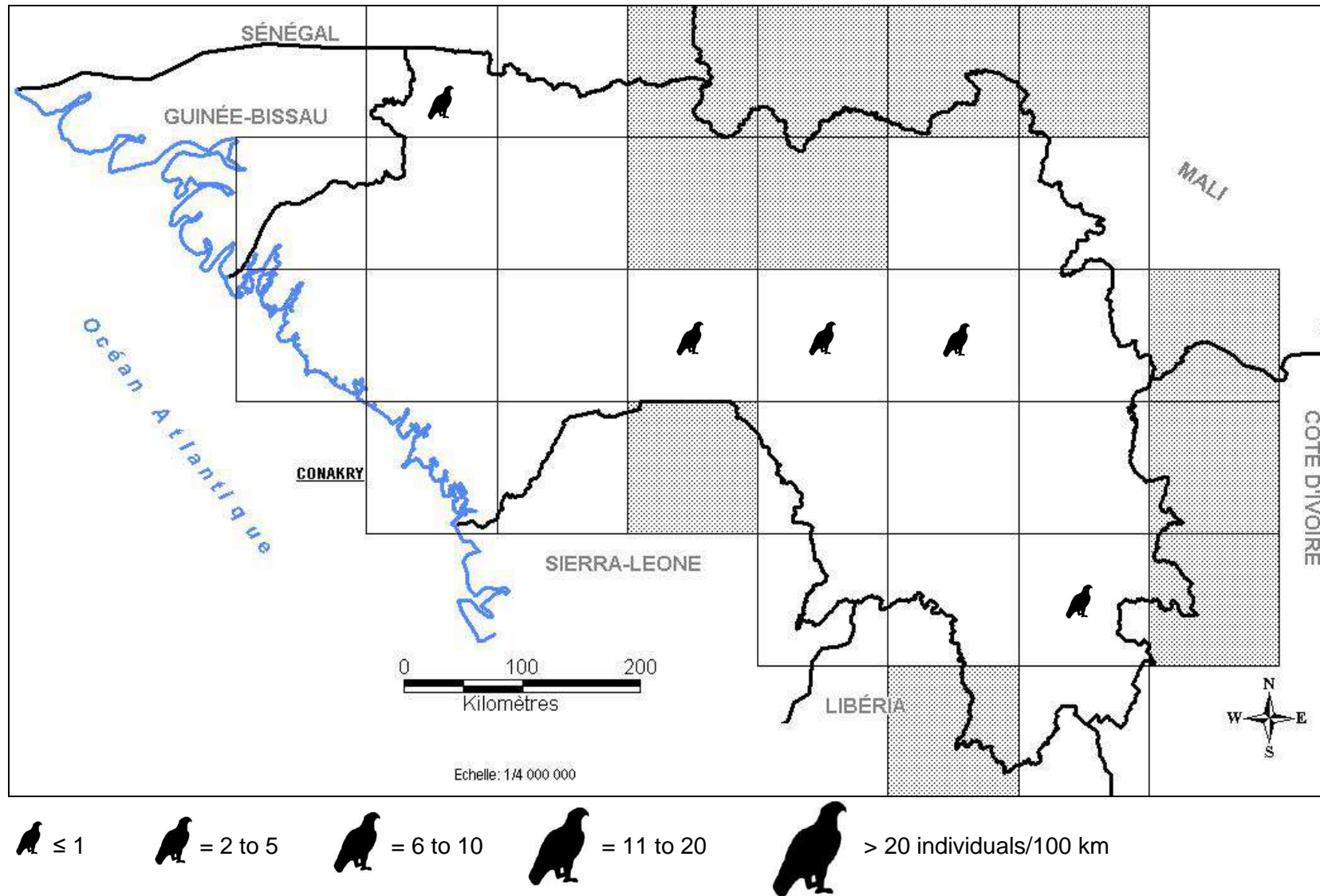
Aquila wahlbergi – Wahlberg's eagle



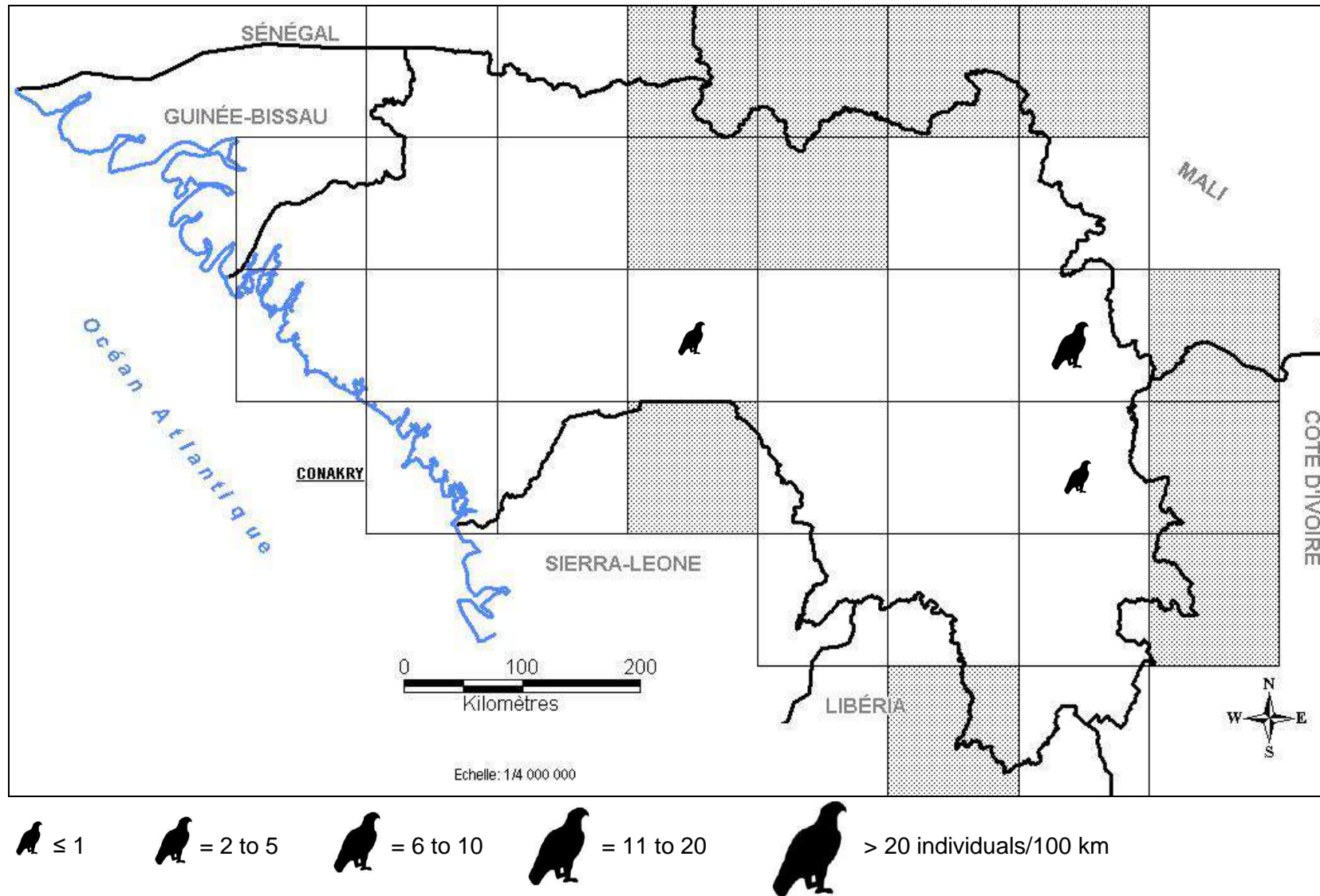
Hieraaetus spilogaster – African hawk-eagle



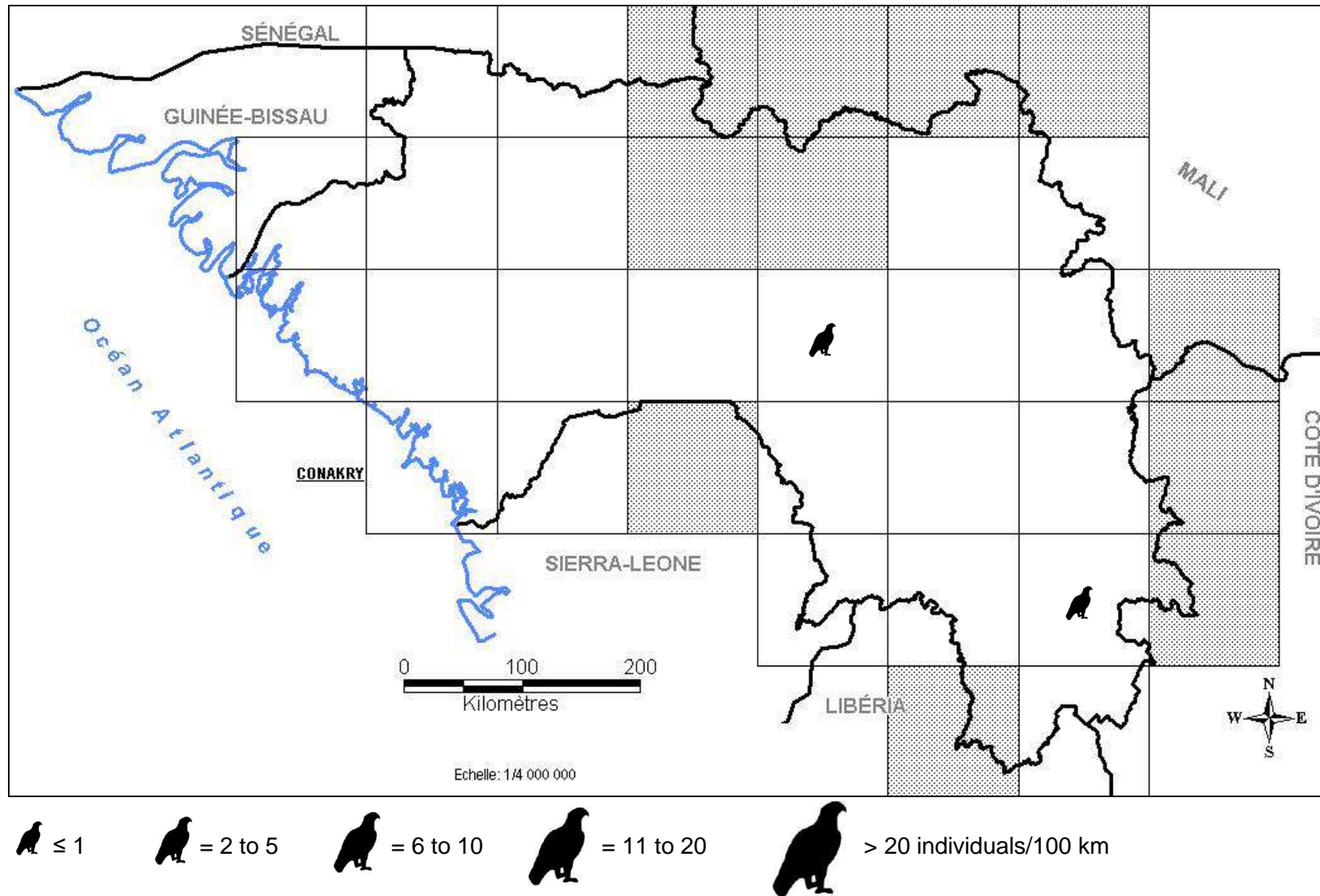
Hieraaetus pennatus – Booted eagle



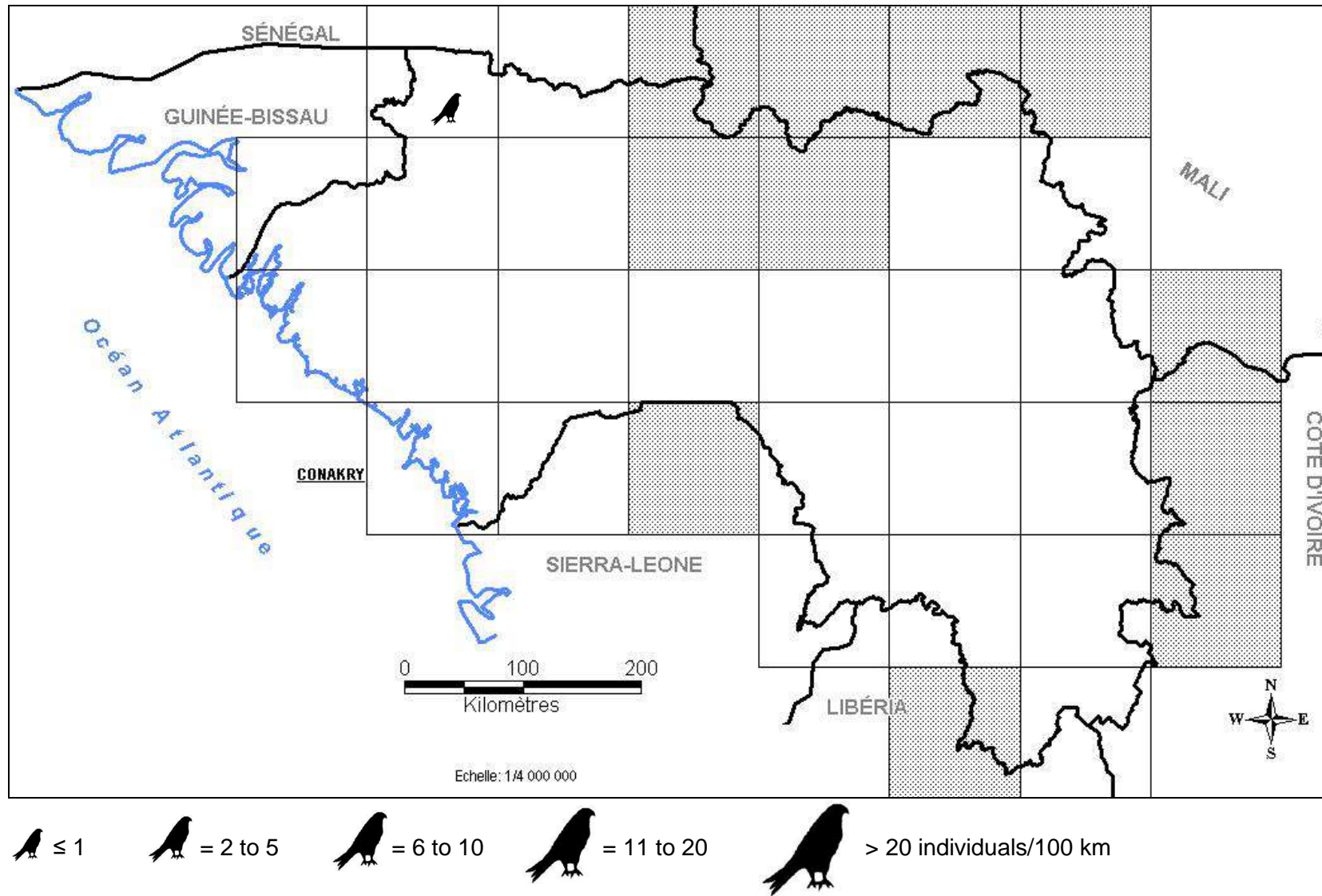
Lophaetus occipitalis – Long-crested eagle



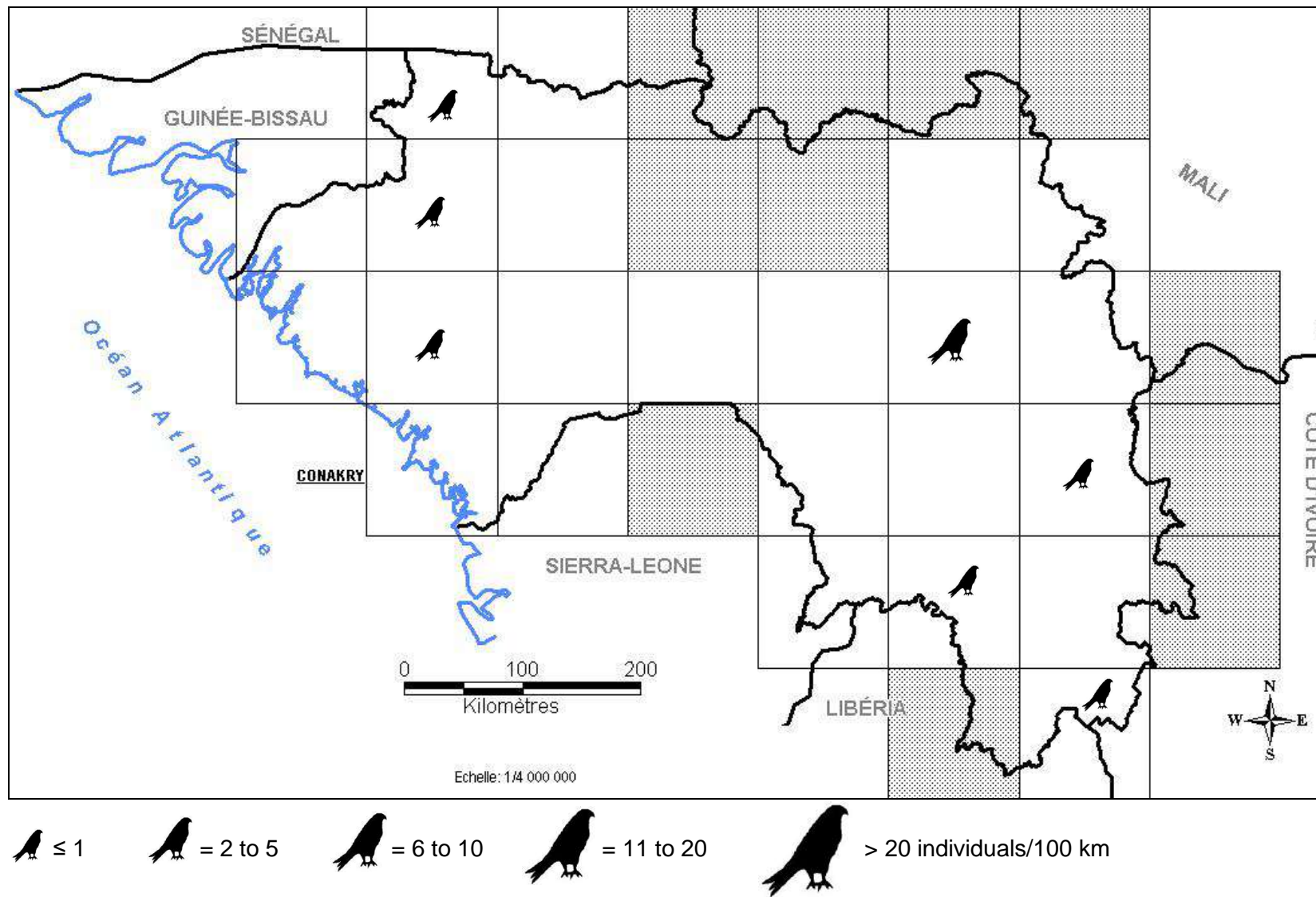
***Stephanoaetus coronatus* – Crowned eagle**



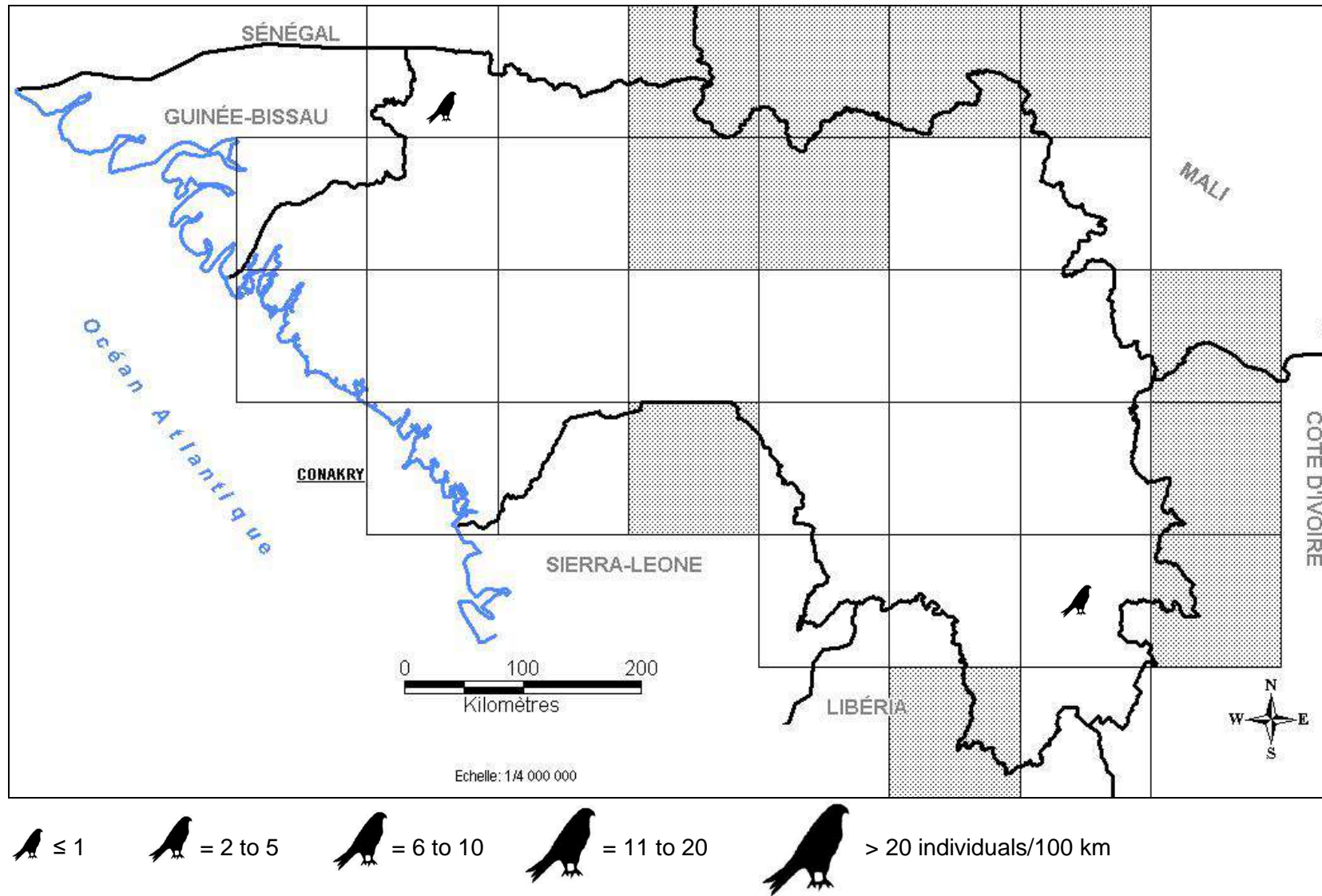
***Falco alopex* – Fox kestrel**



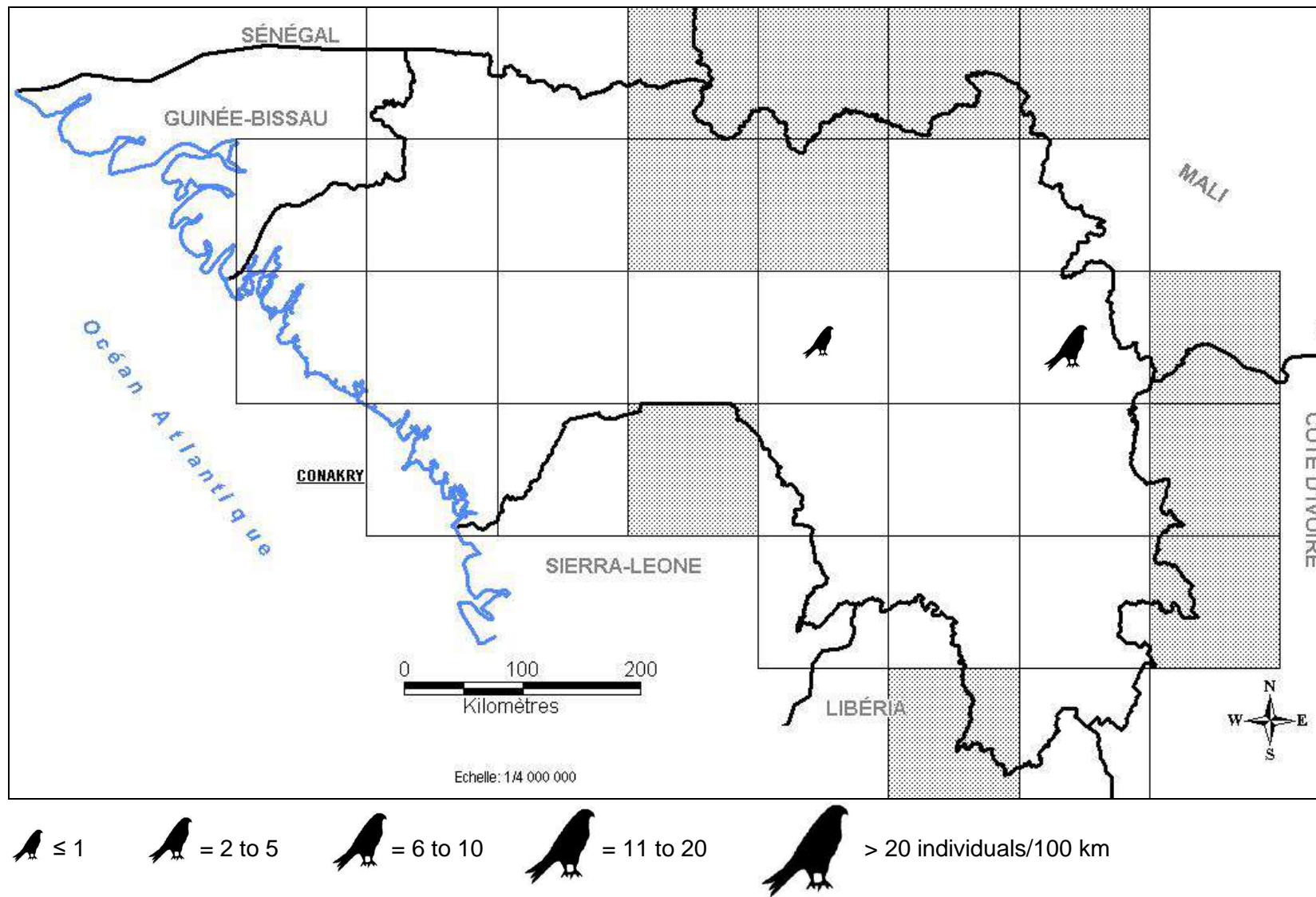
Falco ardosiaceus – Grey kestrel



***Falco subbuteo* – Eurasian hobby**



***Falco cuvierii* – African hobby**



***Falco biarmicus* – Lanner falcon**

