

**STATUS, MANAGEMENT AND CONSERVATION
OF THE AFRICAN GREY PARROT *PSITTACUS*
ERITHACUS IN NIGERIA**

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Summary and Recommendations

A survey of the African grey parrot *Psittacus erithacus* was carried out in southern Nigeria from January to March 2001 to obtain up-to-date and reliable information on the species that could inform management decisions. Specifically, methods for making quantitative assessments of populations were to be tested, populations counted in some localities, presence/absence surveys at other sites and all other information on the species to be collected. The trade in the species was also to be determined, through both fieldwork and visits to markets, trappers and traders.

African grey parrots are not easy to count reliably because they are encountered rarely other than when they are flying to or from roosts at dusk and dawn. In order to estimate population densities, various conditions have to be met to ensure that the statistics used in calculating the population density are valid. This was not possible for the African grey parrot during this survey, partly because of low encounter rates, but also because of difficulties moving around the Niger Delta as a result of security concerns.

Nests were counted in defined areas using trappers at two sites, Akassa and Kaiama, which are both in Bayelsa. These gave estimates of a nest density of 2.1 in Akassa and a minimum of 0.5 nests/km² in Kaiama. The Akassa estimate is probably more reliable as the trapper search effort was more intensive as he spent a lot of time searching for nests to take young birds from during the breeding period. The effort at Kaiama was much less systematic, being split between different people in different villages and with a variety of other occupations.

In Akassa, young parrots were removed from all nests that were found. The level of harvesting was difficult to assess at Kaiama. Trapping seemed less intense, but that may have been because land ownership and use meant that people were continually around nests and so it was possible to monitor them reasonably continuously. Therefore, there was less likely to be large numbers of other trappers competing for young birds and so the trappers could allow the young birds to grow quite large before taking them from the nest. It appears that, overall, recruitment into the adult parrot population is very low and in some areas virtually zero. Adults were reportedly trapped by outsiders once a year at Kaiama.

Three other sites were also visited, Ikodi on the Orashi River in Rivers State, Bonny at the mouth of the Bonny River in Bayelsa State and Ekonganaku in the Oban Hills in Cross River State. Ikodi held a large parrot roost, the largest known in Nigeria at the moment and which may contain 700-1200 birds during the winter months. The local community cherishes the roost as young children gather the red feathers that fall to the ground and sell them. Trappers had been driven off in 1997 after the deaths of Ikodi villagers. At Bonny few birds were seen, flying either in from the sea or from across the Bonny river. At Ekonganaku birds were seen each evening and morning and trapping of adults was very much in evidence.

A list of other sites was generated from ornithologists and naturalist historians active in Nigeria, especially the Important Bird Areas project being undertaken by the Nigerian Conservation Foundation. An analysis of vegetation data held at UNEP-World Conservation Monitoring Centre (UK) revealed that the African grey parrots habitat is now widely fragmented and disrupted. This seems likely to cause problems for the African grey parrot when the resources that it needs (food, roost and nest) become increasingly far apart meaning that birds have to fly further and further to obtain all of the resources that they need.

The relevant national legislation governing hunting, capture and trade in wildlife is the Endangered Species Decree of 1985, which prohibits trade in Schedule 1 species. "All parrots" are listed on Schedule 1 and so there should be no hunting, capture or trade in African grey parrots. A moratorium on issuing CITES export permits for specimens of African grey parrots was established in October 2000 although subsequently lifted. Several conditions had been proposed for lifting this moratorium,

which include a review of the species considered most in need of protection in Nigeria so that the Schedules can be revised.

Both adults and young birds are caught. Adults are typically caught when over-flying to or from roost, when trappers use trained African grey parrots to call the over-flying parrots down to tall trees that are in their flight path some distance from the roost. Young are taken from the nest by trappers who can climb the trees and who take all young in the nest.

Mortality of young birds in Akassa was a maximum of 43% before they left the trapper. In Calabar it was reported that three or four birds may be dead in every ten that arrived from the field. Although admittedly anecdotal, these figures may mean that the mortality rate between capture and arrival at the first major trading city is 60-66%. One of the reasons for the high mortality is that some birds are taken from the nest when they are still too small and are dependent upon their parents for feeding. This means that trappers have to feed them individually and often they have neither the time nor the expertise to feed them sufficiently to keep them alive. This is reflected in the low price that such birds fetch: a trapper may sell them for NGN500 (USD4.50) compared with NGN1500 (USD14) for birds that will feed themselves.

Calabar, Port Harcourt, Lagos and Kano are all important for the trade. Birds are seen openly on sale in the market, but it appears that this is fairly small scale with the numbers reportedly being traded and which are kept at other locations (traders houses for example). In Calabar, it was reported that birds were being brought across the border from Cameroon and everywhere it was reported that Kano Airport was the main exit point for birds, typically to the Middle East. In cities, the prices varied, but seemed to be around 4000 (USD36) to (USD63) and young birds were the most sought after because they could be trained to talk.

Although trade in African grey parrots is prohibited under the Endangered Species Decree, there is clearly a thriving trade in it. The over-riding conclusion of this survey was that the current levels of exploitation are not sustainable. The harvesting of young seems so heavy that recruitment into the adult population must be very low, implying a population crash at some stage in the future. Added to this is harvesting of the adult population in some areas. Compounding these problems further is the fragmentation of suitable habitat.

The recommendations are based on the Results (Section 3) and the Discussion (Section 4).

Legislation

- 1) The moratorium on exports of the African grey parrot should be re-imposed indefinitely, in accordance with the Endangered Species Decree.
- 2) Although the Endangered Species Decree states that no permits should be given for international trade in African grey parrots, the Decree is widely perceived as in need of revision and it is thus seen as now being out-of-date. Therefore, it should be revised as a matter of urgency. This will involve drafting the text, assessing which species should be included on which Schedules and then passing the law.
- 3) The role of federal legislation, especially the Endangered Species Decree, in providing legal regulation on the domestic trade, especially within and between states should be clarified. If this clarification suggests that there is a need to draft state legislation so that movement of African grey parrots within the country is properly managed, then this should be done.

Enforcement

- 4) Enforcement should be strengthened in the key cities so that the Nigerian government can meet the obligations that it accepted when it ratified CITES. Key cities include Calabar, Port Harcourt, Lagos and Kano: the areas where trade takes place are well-known, and determining the key traders would not be difficult. Smaller centres such as Yenegoa should also be subject to

improved enforcement. The major need is for an elite intelligence unit that should gather information on dealers and routes.

- 5) Kano clearly provides special challenges, both because of the alleged volume through the airport and because enforcement seems more difficult on the charter flights that leave this airport. Nonetheless, additional enforcement should be provided here, including specialist staff from the CITES Management Authority (Federal Ministry of Environment) so that no African grey parrots, or other species protected by national law or international conventions pass through the airport. There is also a flourishing trade across the international border around Calabar and improved enforcement is also required here.
- 6) There is a need for a coherent national policy for confiscated animals. This should be developed in advance of improved enforcement so that there is clear strategy on handling confiscated animals and the facilities to accommodate. The long-term destination of such animals should be considered, and this should include the likelihood of disease being transmitted to wild birds if confiscated birds are released.
- 7) Regional co-operation in CITES enforcement should be enhanced in West and Central African countries. In particular, a clear means of gathering and disseminating intelligence should be established. This need not be a large and unwieldy structure, as it is likely that there are relatively few dealers and routes. Even if this is not the case, once some dealers and routes have been uncovered, others can be addressed. Technical assistance from outside the region may be required to implement this.
- 8) Specific assistance in stopping illegal shipments should be sought from other CITES Management Authorities, especially Nigeria's neighbours and in countries suggested as destinations for trade leaving Kano, such as Saudi Arabia.
- 9) Whilst support from relevant CITES Management Authorities is being sought, the trade routes used once the African grey parrots have left Nigeria should be traced. This will allow very targeted action to be taken at key points in the route so that CITES can be enforced.

Community programmes

- 10) A comprehensive community management should be initiated at Ikodi as quickly as possible. This should seek to serve as a model programme rewarding local efforts to conserve the African grey parrot and linking development to conservation of biodiversity through the African grey parrot. This should involve an international organisation with appropriate parrot conservation experience and a local organisation that understands rural communities in this area.
- 11) An additional site should be selected for a trial to see if trappers are prepared to start a sustainable harvesting programme, in which not all young are removed from all nests each year. It may also be appropriate to use nest boxes to see if the productivity of the African grey parrot population can be increased. An appropriate site for such a trial would be one where there is some degree of ownership (either individually or collectively) over the land and this can be reasonably enforced.

Raising awareness

- 12) Raise awareness of the Endangered Species Decree and its practical implications amongst all relevant enforcement staff (e.g. customs, airport and seaport authorities).
- 13) Consider whether a network of key contacts can be established in each state to gather information on African grey parrots and publicise their plight, illegal activities etc.
- 14) Multinational companies and diplomatic missions operating in Nigeria should be asked to inform their staff, especially the expatriates, of the Endangered Species Decree and CITES, and the

detrimental impact that the trade in African grey parrots and other species has on wild populations.

Reducing demand

- 15) A critical assessment of the practicality of large-scale captive breeding operations should be undertaken to see if sufficient birds can be produced cheaply enough to dent demand on wild populations.

Research

- 16) Further research is not urgently required in Nigeria to address the most critical problems facing the African grey parrot, but it is required if the species is to survive into the medium and long-term. Key research questions that should be addressed, ideally before any parrot habitat is lost and fragmented include: which forest types provide which resources (food, roost, nest) to the African grey parrot; and where are suitable areas; and how far do parrots fly between areas that provide these different resources. At the same time renewed impetus should be given to the Environmental Conservation Division' Protected Area Programme so that it is able to act once key unprotected areas have been identified.

1. Introduction

The African grey parrot is widely distributed in suitable habitat throughout the forested areas of western and central Africa (Fry *et al.* 1988). In West Africa it is found from Sierra Leone in the west through to southern Nigeria in the east. In central Africa it occurs from Cameroon eastwards to western Kenya and north eastern Tanzania (Juniper and Parr 1998). Overall, it inhabits a variety of wooded habitats, from primary and secondary forests through to forest edges and clearings.

Across its range, the species seems likely to occur in several Endemic Bird Areas (EBAs: see Stattersfield *et al.* 1998), including São Tomé, Príncipe, Upper Guinea forest and Cameroon and Gabon lowlands EBAs. An Endemic Bird Area is an area where two or more bird species are endemic and they have been used by BirdLife International to identify places of high conservation importance (see Stattersfield *et al.* 1998 for further details of this approach). Its altitudinal limits indicate that it may also occur in the Cameroon mountains EBA, which includes the mountains of Bioko (formerly Fernando Po): indeed, there is an altitudinal record on the island from 1900m in moss forest (Forshaw 1989).

The species is not included on IUCN Red List for 2000 (Hilton-Taylor 2000: see also Snyder *et al.* 2000) and is considered common where extensive tracts of forest remain (Juniper and Parr 1998). However, severe habitat loss in some places, together with widespread trapping has led to serious population declines in some places (e.g. Liberia, Ghana and Kenya: Juniper and Parr 1998). Only 12 years ago, the forests of the Congo Basin were considered a stronghold of the species (Forshaw 1989) but recently serious declines around some of the cities in the Basin have been reported (Juniper and Parr 1998).

The species has long been traded, as young birds can be trained to talk and this has made it attractive to people that would otherwise probably not keep a pet parrot. Indeed, in the 1980s it was considered the second most traded parrot in the world after Fischer's lovebird (Collar 1997). *PsittaScene*, the magazine of the World Parrot Trust recently carried an article that stated that demand for all parrots has reduced with the exception of the African grey parrot (Low 2000). This refers to the very high demand for African grey parrots within the UK and is not intended to reflect the situation in all other countries where the demand for African grey parrots has been high. Low's comments refer especially to hand-reared young birds (and therefore those bred in captivity in the UK). The cost of hand-reared birds is so high, however, that birds from other sources are still very much sought after in the UK and this includes imported adult birds (Rosemary Low verbally 2001).

1.1. Distribution and abundance of the African grey parrot in Nigeria

There is only very generalised published information on the distribution and status of African grey parrots in Nigeria. It is now especially found in mangrove and 'riverine' [presumably meaning seasonally and permanently flooded 'swamp' forest] habitats (Fry *et al.* 1988), where it has been traditionally considered common (see for example Sayer *et al.* 1992). In contrast, however, Marchant (cited in Forshaw 1989) considered the species to be uncommon, which he felt was a consequence of exploitation and forest loss. Further information gathered on the ecology and distribution of the African grey parrot during the survey and from within Nigeria is presented in Section 3.2.

The country's mangrove forests are extensive, and in 1989/90 were estimated to cover more than 10,000km². mainly in the Niger Delta, where there was an estimated 5,400km². (SECA/CML 1987 in Sayer *et al.* 1992). Forshaw (1989) implies that the species' occurrence in coastal mangrove forest in both Nigeria and Cameroon is not reflected elsewhere in its range. Large flocks of African grey parrots are reported to roost in these mangroves, where they are suspected to breed colonially (Fry *et al.* 1988).

The species also occurs in lowland rainforest, which is called 'high' forest in Nigeria and which is part of the Guineo-Congolian rainforest belt. However, the amount of this forest type now remaining

is much reduced, with a long history of exploitation being exacerbated in the 1980s when virtually uncontrolled logging led to the prediction in 1992 that Nigeria's timber resources would be exhausted by 1995 (Sayer *et al.* 1992). The most recent assessment of the species' national status was that locally it was not uncommon where large tracts of mature high forest and mangrove remain from Lagos in the west to the Cameroon border and north to Ife and Ogoja (Elgood *et al.* 1994). It was observed, however, that the species was declining because of direct exploitation and habitat loss.

Such large tracts of high forest, perhaps the only ones, are those in the east, especially in Cross River State. These forests fall within the Cameroon and Gabon lowlands EBA and are contiguous with those of western Cameroon. In total they are estimated to cover 280,000km² (Stattersfield *et al.* 1998).

1.2. Trade and CITES in Nigeria

The only information available on the numbers of African grey parrots exported from Nigeria are the annual reports produced by the Nigerian CITES Management Authority, and the Management Authorities of countries where African grey parrots from Nigeria are imported. There have been no published assessments of these data or of any other trade in African grey parrots from Nigeria.

The CITES Management Authority in Nigeria is The Honourable Minister of the Environment in Abuja. There is a CITES Enforcement Unit in Lagos, which also acts as the Secretariat to the Scientific Authority, which comprises

- The Honourable Minister, Federal Ministry of Environment
- Director of Forest Research Institute of Nigeria
- Director of the Institute of Oceanography and Marine Research
- Representative of the Nigerian Ornithology Society
- Conservator General of the National Park Service
- Director of the Department of Forestry

(From: <<http://www.cites.org/common/direct/n/nigeria.shtml>>). Further information relevant to CITES in Nigeria that was gained during the survey is presented in Section 3.4.1).

The annual reports of these CITES Management Authorities indicate that Nigeria has reported that 112 parrots have been exported as wild caught (except for two which were of unstated origin) between 1980 and 1999 (Table 1), although it is not clearly stated what these figures represent and how they were obtained (UNEP-WCMC 2000). For example, the reports could have been compiled on the basis of actual number of parrots exported or they could relate to the number of CITES export permits issued.

Year	Exports reported ¹	Imports reported ²	Year	Exports reported ¹	Imports reported ²
1978	0	1	1990	0	19
1981	0	13	1991	27	9
1982	0	57	1992	33	8
1983	0	91	1993	2	14
1984	0	51	1994	1	9
1985	0	26	1995	8	5
1986	0	17	1996	13	11
1987	0	17	1997	13	149
1988	0	17	1998	13	305
1989	2	14	1999	0	10

Table 1. Reported international trade in African grey parrots from Nigeria. ¹ derived from figures provided by the Nigerian Management Authority. ² derived from figures provided by importing countries on the source of the birds being imported. Trade statistics derived from the UNEP-WCMC CITES Trade database, the UNEP-World Conservation Monitoring Centre, Cambridge, UK.

Strikingly, CITES Management Authorities in countries into which African grey parrots have been imported report that 842 African grey parrots were exported from Nigeria during the same period, with more than half of these occurring in 1997 and 1998 (Table 1). Two figures dominate these reports. The first is that of 140 birds confiscated or seized in the United Arab Emirates in 1997, and the second is 300 wild caught birds that were recorded in the Czech Republic as destined for commercial trade in 1998. Nigeria itself reported that only two African grey parrots were exported under CITES permit between 1978 and 1990.

Across the region as a whole, the number of birds exported from Nigeria which are reported by CITES Management Authorities is only a small proportion of all those that leave West Africa and adjacent Central Africa (Table 2). Again, it is noticeable that the number of birds reported by importing countries is greater than that reported by exporting countries for most countries. The total number of birds reported at the import stage is more than 50% greater than that reported at the export stage.

Country	Exports reported ¹	Imports reported ²	Country	Exports reported ¹	Imports reported ²
Burkina Faso	1	2	Guinea*	573	2665
Benin*	0	3	Equatorial Guinea*	10	6
DR Congo*	40,972	53,531	Guinea-Bissau*	0	7
Central African Republic*	44	97	Liberia*	0	4900
Congo*	9	4280	Mali*	0	46
Cote d'Ivoire*	1856	393	Nigeria*	43	468
Cameroon*	27,174	52,674	Sierra Leone*	5000	2900
Gabon*	89	86	Senegal	3219	4
Ghana*	11	2	San Tome & Principe*	0	1
Gambia	1	0	Togo*	67	19
			Totals	79,069	122,084

Table 2. Reported international trade in African grey parrots from West Africa and adjacent parts of Central Africa between 1995-1999. * denotes range State of African grey parrot (outside West and adjacent Central Africa, it also occurs in Angola, Uganda, Tanzania and Kenya). ¹ derived from information reported by the Management Authority of the country from where the birds were exported. ² derived from information reported by importing countries on the origin of the birds coming into the country. Trade statistics derived from the UNEP-WCMC CITES Trade database, the UNEP-World Conservation Monitoring Centre, Cambridge, UK.

1.3. Status of the African grey parrot in CITES

The African grey parrot is included on Appendix II of CITES. Article II of the Convention text states that:

“Appendix II shall include:

- (a) all species which although not necessarily now threatened with extinction may become so unless trade in specimens of such species is subject to strict regulation in order to avoid utilization incompatible with their survival; and
- (b) other species which must be subject to regulation in order that trade in specimens of certain species referred to in sub-paragraph (a) of this paragraph may be brought under effective control.”

Therefore international trade in the African grey parrot is subject to certain restrictions. Article IV of the Convention identifies the provisions that must be complied with before specimens of the species can be traded internationally. Paragraph 2 of Article IV states that:

“The export of any specimen of a species included in Appendix II shall require the prior grant and presentation of an export permit. An export permit shall only be granted when the following conditions have been met:

- (a) a Scientific Authority of the State of export has advised that such export will not be detrimental to the survival of that species;
- (b) a Management Authority of the State of export is satisfied that the specimen was not obtained in contravention of the laws of that State for the protection of fauna and flora; and
- (c) a Management Authority of the State of export is satisfied that any living specimen will be so prepared and shipped as to minimize the risk of injury, damage to health or cruel treatment.”

If any Management Authority has reason to believe that trade in a species is detrimental to its survival in the wild, then the Conference of the Parties to the Convention recommends that it:

- “a) consult directly with the appropriate Management Authorities of the countries involved or, if this procedure is not feasible or successful, make use of the provisions of Article XIII to call upon the assistance of the Secretariat;
- b) make use of the options provided by Article XIV to apply stricter domestic measures particularly when re-export or transshipment, or trade with a State not party to the Convention is involved; or
- c) make use of the options provided by Article X when trade with a State not party to the Convention is involved....”

Recently the challenges inherent in providing non-detriment findings have been recognised and the development of a checklist of information required has been proposed (IUCN/SSC Wildlife Trade Programme 2000). The proposed checklist identifies qualitative information that would be useful in describing the harvesting regime that is in place for the species of concern, and includes: the type of harvest (captive breeding, live capture, ranching etc); the degree of control (regulated or illegal/unmanaged); the life history stage removed from the population (eggs, juveniles, adult males, adult females or non-selective); the relative level of off-take (low, medium, high or unknown); the reason for off-take (subsistence, commercial or other); and the commercial destination (local, national or international). This information can then be combined with knowledge of the species’ biological characteristics, national status, and various elements of harvest management and control, including whether there are benefits accruing from harvest.

It should be noted that there have been several Notifications issued by the CITES Secretariat that are relevant to the trade of African grey parrots in Nigeria. The first, issued on 25th November 1998 (Notification No. 513) informed all Parties to the Convention that forged CITES documents from Nigeria had been discovered. Parties were urged to contact the Nigerian CITES Management Authority or the Secretariat where appropriate. The Notification also contained the Nigerian Endangered Species Decree of 1985, with attention being drawn to the list of species for which international trade is prohibited. This Notification remains in force.

Notification 993, issued on 29th October 1997 reported the CITES Standing Committee’s recommendation that Parties do not accept any Cameroonian export permit for specimens of *Psittacus erithacus* until the end of 1997 because the level of export during 1996 alone filled the quota for 1996 and 1997. This also contained the strong recommendation that care should be exercised when shipments were received from countries neighbouring Cameroon as several consignments from Cameroon had taken place with export permits from other countries. This suspension was lifted in Notification No. 1998/05 issued on 2nd March 1998.

1.4. Aim and objectives

The aim of the study was to carry out a general study and investigation leading to reliable and up-to-date information on African grey parrots *Psittacus erithacus* in Nigeria. This was to be done by:

1. assessing methods for counting African grey parrots;

2. carrying out population surveys in key localities and undertaking presence/absence surveys elsewhere. In areas that it is not practical to visit during the project compile information from other sources on where African grey parrots occur and their abundance;
3. compiling all unpublished data on African grey parrots, identifying the distribution, the attitude of the local people towards the conservation of the species as well as trade dynamics, pricing and post-capture mortality. These shall be based on the combination of approaches stated in (a) above; and
4. make recommendations for management decisions aimed at conserving the African grey parrot, as well as reducing the pressure on them in the wild.

2. Approach and methodology

2.1. Assessing methods for counting African grey parrots

Snyder *et al.* (2000) state that parrot status assessments are the first step in understanding whether the size of parrot populations are changing and, if they are, what may be causing these changes. Whilst emphasising the limitations of assessments carried out over a short period, they do indicate various ways in which parrots have been counted, such as roost counts, nest counts, river transects, vantage point counts and mark and re-sighting studies. None of these are applicable to all parrot species and the field conditions and the biology and ecology of individual species influence which method is most appropriate in each case. Therefore, the first step in understanding the status of African grey parrots in Nigeria was to determine whether it was possible to count parrots reliably in the field. An additional factor in the present study was the need to provide quantitative data that would specifically assist in determining management priorities. Consequently, a method had to be chosen that would provide such data.

Previous field surveys of African grey parrots in West and Central Africa were reviewed and subsequent developments in sampling theory and practice that have been designed and tested to provide population density estimates was assessed. These methods were then compared with the biology and ecology of the species and the prevailing field conditions to determine how African grey parrots could be reliably counted. Finally, the practicality of the methods was compared with the overriding management needs of the species.

2.2. Distribution and abundance of the African grey parrot

A list of all sites where parrots have recently been reported was compiled from the Federal Ministry of Environment, unpublished reports, the Important Bird Areas project that is being conducted by the Nigerian Conservation Foundation, and from discussion with local ornithologists. From this list sites were selected for both quantitative and presence/absence visits. All available information was collated for the remaining sites. Sites were selected for visits for one of three reasons:

1. they were potential sites for parrot density estimation;
2. trapping had been reported; and
3. visits were safe and logistically feasible.

In the parts of Nigeria where the African grey parrot occurs it is not easy to conduct fieldwork. Security is a concern throughout the Niger Delta and in other areas and this imposes restrictions on movements. Therefore, there were significant constraints on fieldwork, such as which sites could be visited and at what times of day sites could be safely visited. Unfortunately, this typically meant that surveys could not be carried out at dusk or during the hours of darkness, which made it more difficult to detect parrot areas by watching for birds flying to and from roosts at either end of the day.

A third limitation on where we could carry out surveys within a site was local *juju* beliefs. Some areas are considered out of bounds to outsiders and in some case even to most villagers and we were unable to visit some forests for this reason.

2.2.1. Population surveys

Population surveys were carried out on the basis of the outcome of the assessment of appropriate counting methods described in Section 2.1 and the results presented in Section 3.1. Therefore nests were counted, and the number of young harvested was assessed. Two areas were selected for carrying out population surveys: the land of the Akassa Clan in Bayelsa State and the land around Kaiama and adjacent downriver villages, also in Bayelsa State. Each area covered was mapped and the extent of this area determined from 1:50,000 Federal Government of Nigeria maps.

Nests were located that had been found by trappers when searching for nests from which young could be taken during the breeding season. In Akassa the trapper typically found nests by searching the forest in late afternoon and during the evening (including after dark) for adults that showed signs of breeding. Once such adults were located, nest holes were found through intensive searches.

The area searched was 18.2 km² on the mangrove forest islands north of the village of Khongo. The mangrove trees were of variable height: long stretches of small trees interspersed with smaller patches of tall mangrove trees that were of thicker girth. The larger trees were typically at the river edge and were most noticeable at the mouths of small creeks.

In Kaiama, the area surveyed included not only the land around this village, but also around several neighbouring villages that lie along the Orashi River downstream from Kaiama. The original vegetation along this stretch of the Orashi was the freshwater swamp forest that lies between the mangrove belt to the south and the lowland or 'high' forest to the north. The area is seasonally inundated and has now been extensively modified and is now largely cultivated. There are, however, areas of bush between cultivated areas and these do contain trees large enough for African grey parrots to nest in. The main crops in this area were water yam and some groundnut along the riverbank, with plantain, sweet potato and cassava further way from the river. Some villagers made ponds in the forest so that during the rainy season when the forest becomes inundated, fish would concentrate in them and become trapped there when the rainwater receded. Trees are felled for timber and certain species were used exclusively for carving canoes.

2.2.2. Presence/absence surveys

Two additional areas were visited briefly. These were the African grey parrot roost at Ikodi, on the Upper Orashi River and to Bonny south of Port Harcourt. The roost at Ikodi, a community of 8-10,000 people has become well-known to conservationists and ornithologists in Nigeria in recent years, and large numbers of parrots were reported at Bonny during an Environmental Impact Assessment three years ago. Both visits were designed to obtain a qualitative assessment of the importance of each site for the African grey parrot. Therefore, no quantitative counts were conducted.

A visit was also made to Ekonganaku in the Oban Hills of Cross River State to document the species' presence and to determine the scale of trapping. This site was chosen because it was in the lowland rainforest in the east of the country, and which falls within the Cameroon and Gabon lowlands EBA (see Stattersfield *et al.* 1998).

2.2.3. Other information on distribution

There is little detailed information available on the distribution of African grey parrots in Nigeria. Indeed, there is little available within the country that is not available in internationally obtainable regional or taxonomic monographs (see Section 1).

Information on specific sites where African grey parrots have been recorded was collected both verbally and from reports that were unpublished or in preparation. Sources consulted were:

- Fabrice Roux, who carried out bird surveys for the Niger Delta Environmental Survey (report not yet finalised);
- John Mshelbwala, Federal Ministry of Environment;
- Phil Hall, ProNatura;

- Eliza Gadsby and Peter Jenkins, Pandrillus; and
- unpublished information from the Nigerian Important Bird Areas project, courtesy of Augustine Ezealor.

2.3. Extent of available habitat

Nigeria has lost much of its rainforest (see Section 1.1) and therefore the extent of suitable habitat for the African grey parrot is now much less than it was historically. Therefore, in order to complement site visits, the amount of habitat that is believed to be remaining was assessed. Vegetation data were obtained electronically from two sources that were held at UNEP-World Conservation Monitoring Centre (Cambridge, UK).

The EROS dataset is from the United States Geological Survey's Africa Land Cover Characteristics Database and has nominal 1km spatial resolution, being based on 1km AVHRR data collected between March 1992 and April 1993. The map projections are Interrupted Goode Homolosine and Lambert Azimuthal Equal Area. Further information can be found on the website <edcwww.cr.usgs.gov/landdaac/glcc/>. The forest cover data were compiled by Henrik Olesen of UNEP-GRID from AVHRR imagery (1km pixels) collected during the early 1990s, for the TREES (Tropical Ecosystem Environment Observations by Satellite) project of the EC Joint Research Centre, Ispra, Italy.

The two vegetation cover datasets were assessed to provide a comparison of the amount of suitable habitat remaining, and thus an indication of the reliability of the data. The two datasets used different classifications of vegetation types and therefore it was not intended that this analysis would provide a detailed comparison of the amount of habitat remaining. It was, however, expected that they would provide a broad indication of the extent of habitat remaining, and more importantly, the number and size of large blocks of various forest types.

The size of all forest patches was calculated using the Geographical Information System (GIS) package MapInfo. The number of forest blocks in the following size classes was then determined: >1000km², >500km², >100km², >50km², >10km², <10km².

2.4. Trade and its impact on wild populations

2.4.1. Legislation and current controls

Current legislation and controls that are in place to safeguard the African grey parrot were identified through discussion with the CITES Management Authority in Abuja, and with current and past officers in Kano State. An additional perspective was obtained through discussions with several NGOs in Nigeria. All contacts are listed in the acknowledgements. The principal legislation (the Endangered Species Decree, 11/1985) was examined in detail.

2.4.2. Trapper profiles and trapping methods

Trapping methods were determined through discussion with trappers that worked for us as guides during trips to Akassa and Kaiama and adjacent villages. Tree-climbing to inspect eggs in a nest hole was also observed at Akassa and detailed observations of the method used to catch adults were also made at Ekonganaku. Discussions with elders in Ikodi also provided information on the method previously used at that parrot roost.

2.4.3. Level of exploitation

It is very difficult to provide a reliable assessment of the level to which African grey parrot populations are exploited in Nigeria, as hunting, capture and trade is illegal (see Section 3.4) which, although conducted reasonably openly, is very sensitive to any enquiries. A direct assessment of exploitation was, however, made at Akassa where a trapper identified nests that he had located. The number of young that he, and others, had removed from these nests was obtained.

A similar approach was attempted in Kaiama, but this was made more difficult by the more fractured nature of land holdings, the much more agricultural nature of the land and the greater human density. In this case, the nature of trapping was described and nests located wherever possible.

Elsewhere, indirect assessments of the level of exploitation were attempted by asking those involved in the trade about volume of birds in the trade at various stages. Numbers reported in trade could then be compared with number of permits issued by the CITES Management Authority in Nigeria (see Section 1.2).

2.4.4. Mortality

Information on the number of birds that die was collected at two stages. First, the minimum number of nestlings that died between removal from the nest and selling to a trader was assessed directly from information supplied by the trapper in Akassa. Factors that affect mortality at this stage were also determined. Second, discussion with an ex-trader in Calabar provided an estimate of the proportion of birds that arrived dead at dealers in Calabar. This ex-dealer still witnessed the ongoing trade in the market. There may be more intermediate stages involved between birds being removed from the nest and their arrival in major cities for sale. For example, it is possible that dealers who buy birds from trappers in the Niger Delta may sell to other dealers in Yenegoa, who may then sell birds on to dealers in Port Harcourt. The number of dealers involved were not known, and therefore the information presented here can only be considered an approximate guide from two sources.

2.4.5. Dealers, markets and trade

Markets were visited in Lagos, Port Harcourt and Kano. In addition, as noted in Section 2.4.4, discussions were held with an ex-trader in Calabar. During the course of these visits and discussions it became apparent that the information generated was of varying reliability. Therefore, the significant discussions and visits are presented in the Results (Section 3.4) and these are interpreted in the Discussion and Recommendations (Section 4). This is done to allow all of the evidence to be assessed independently so that the conclusions reached in this report can be judged.

2.4.6. Attitudes

The attitudes that people have towards the African grey parrot at various stages of the trapping and trade cycle were not collected systematically. However, some clear evidence, both direct and indirect, was obtained through discussion at various points visited.

2.5. Recommendations

Recommendations were developed based on the results outlined in Section 3. These were developed in discussion with the staff of the Federal Ministry of the Environment and related government organisations during a series of meetings and in seminar involving relevant officers. Staff involved in the workshop were: Musa Wari and Sarah Luka (National Parks Service), Mrs E.F. Okunade, Odey Santos, F.O.Omeni and T.D. John (Environmental Conservation Department) and Chidebelu Okudo (Nigerian Environmental Society of Abuja).

3. Results

3.1. Assessing methods for counting African grey parrots

Counting parrots is difficult, and African grey parrots are no different. Birds are often seen flying over the forest and so it is not possible to determine from where they originated and where they are flying to. Therefore, it is impossible to calculate the extent of the area being sampled. During counts, the habitat is often difficult to move through easily and the African grey parrots are reported to be very quiet, if not silent when not in flight. All of these factors make it difficult to obtain large sample sizes using methods that are statistically sound.

3.1.1. Previous African grey parrot surveys

Previous surveys of African grey parrots in Guinea (Dändliker 1992a), Ghana (Dändliker 1992b), Cameroon (Fotso undated, but carried out in 1996) and the Democratic Republic of Congo (Fotso 1998) have concentrated on locating parrot roosts and seeking to count the number of birds using them. These roost counts were then used to estimate the size of the national parrot populations, although some were admittedly a "rough estimate" (Fotso undated). The utility of roost counts in generating population estimates is discussed in Section 3.1.4 below.

Allied to these uncertainties is the difficulty of making reliable counts of parrot numbers at roosts. Birds fly in to roosts, by definition, late in the day and leave early in the morning. This often involved arrival and departure in the dark, making counts of uncertain reliability. Other factors that make accurate counts difficult include the pre-roosting behaviour of birds in which they fly between trees within the roost before settling and all the time are mixing with incoming birds, the size of the area over which the roost extends and the ease with which birds can be seen in the canopy. For example, the area covered by the roost at Ikodi in the Niger Delta (see 3.2.2 below) was extensive, making it difficult to count birds throughout the roost and ensuring that there was no double counting. As the roost trees were oil palms that were well spaced, counting individual birds was not difficult in reasonable light, although birds typically arrived and left in very poor light.

The difficulty in making reliable counts was accepted by Dändliker (1992b) and he presented his counts for each roost as a range, with estimates of a maximum and a minimum.

Juste B. (1996) counted nests of African grey parrots that trappers had found along transects in various habitats on the island of Principe, in São Tomé and Príncipe. Unfortunately, his claim that this produced nest density estimates is wrong, as there are no measurements of distance to each nest from the transect (see Section 3.1.2 below). Therefore, the extent of the area surveyed cannot be computed and thus no density estimate provided.

3.1.2. Distance sampling

Since the first African grey parrot surveys (Dändliker 1992a and b), there have been significant developments in sampling designed to produce population estimates. Most notable amongst these is the proposal of distance sampling (Buckland *et al.* 1993: see also Laake *et al.* 1994), which provides both a statistical framework for such counts and a practical guide to the collection of appropriate data in the field. The most recent field study of parrots undertaken as part of the Significant Trade Review was that of three species of Malagasy parrot (Dowsett 2000). It was intended that this project use distance sampling methods, but it was concluded that this was not possible partly because of the terrain, but also because of the mobility of the birds (Dowsett 2000, page 11). There was not, however, a critical assessment of each of the assumptions and requirements of distance sampling and exactly how Malagasy parrot biology and field survey logistics would result in their violation.

Distance sampling is based on the accurate determination of the distance from the observer to the bird when it is first detected. In the field, data are collected by conducting either line transects or point counts. Simplistically, if the number of birds detected and the distance to each one (or group) is known, then a density can be calculated. There are, however, several critical assumptions that must be met if the density estimate is to prove meaningful. These are:

1. all birds close to the observer are detected;
2. birds are counted in their natural positions; and
3. distance from observer to bird is accurately measured.

Furthermore, sampling points or transects should be randomly positioned in the habitat being surveyed and there must be sufficient encounters of birds to allow the data to be analysed.

Marsden (1999) critically assessed the utility of distance sampling for determining population densities of some Indonesian parrots. He assessed the practicality of meeting all the requirements of distance sampling in collecting field data on 11 species of parrot (and two species of hornbill) inhabiting Sumba, Buru and Seram islands and concluded that the method could be used under certain

circumstances. The background to these assumptions and requirements, and the conclusions of Marsden's (1999) study are given below, together with an assessment of whether these assumptions are met by African grey parrots.

3.1.3. Distance sampling assumptions, sample size requirements and African grey parrots

Distance sampling relies on the ability to accurately determine the 'detection function', which is the probability of a African grey parrot (in this case) being detected at a particular distance from the observer. Therefore, the unbiased and accurate measurement of distances at which birds are detected is critical. It is also important that all (or at least a very high proportion) of birds at and close to the point or line being used for the transect are detected.

All birds close to the observer are detected

It is critical in distance sampling that all birds at the line or point used for the transect are detected, that most of those nearby are also detected and that detection decreases with distance in a predictable way (Buckland *et al* 1993: see also Marsden 1999). This is important because if objects close to the observer are missed, then the estimate of density will be artificially low. Marsden (1999) states that whilst all steps should be taken to ensure that this is the case, it is also acceptable if the probability of detection on the line or point is not certain, but is high and known.

African grey parrots are typically noisy when flying, but in contrast are quiet when foraging and can be very difficult to detect as a result, as vegetation is often thick and birds that move little can be hard to see. In open areas or close to villages, they do not appear too shy and so can be seen occasionally, Marsden (1999) suggests using point counts and then searching intensively around the point after the timed count period, so that any birds that have not been detected may be flushed or may appear from nest holes. It seems likely that this would also work with African grey parrots, as individuals did emerge from nest holes when occupied nests were seen some distance away.

Birds are counted in their natural positions

It is important that birds are recorded in their natural positions, so that the distance between them and the observer can be accurately measured. This is important because if birds move in response to the observer the resulting density estimate will be biased. For example, if birds move away from the observer and so the distance at which they are detected is greater than where it was when counting began, then the density estimate will be lower than it should be. In contrast, if birds move towards the observer, then density estimates will be artificially high (Buckland *et al.* 1993).

As noted above, African grey parrots are often not easy to detect when they are not flying. However, when they are detected and are not overflying, it is probably possible to record them from, or close to, their original positions, as long as count plots are approached silently. In areas where there is intensive removal of nestlings from nests, adults are very wary and seem to call readily. Whilst this allows them to be detected, birds may fly, undetected from a nest cavity for example, and so be detected at some distance from their original position. The observer must be alert to record the original position as the birds often move when calling.

Distance from observer to bird is accurately measured

This assumption also relates to the relationship between distances to birds and the resulting density estimate. Clearly systematic errors in measurements will have an adverse affect: if measurements are consistently higher than real distances, then the density estimate made will be biased as it will be too low. Conversely, if measured distances are lower than in reality, the density estimate will be artificially high (Buckland *et al.* 1993). This is a widespread problem and not confined to grey (or any other) parrots (see Marsden 1999), and there is no reason to assume that the problem is any greater with African grey parrots than with any other species.

Sampling points or transects are randomly positioned in the habitat being surveyed

This is important to ensure that the habitat is being surveyed in an unbiased manner. Walking along existing paths or carrying out transects in boats in mangrove creeks may preferentially sample only a particular subset of the habitat. Therefore, the resulting density estimate would not be for the population as a whole in the habitat (as intended), but only for a part of the habitat.

For the African grey parrot, this is likely to be an issue as both ecological and anthropogenic factors seem likely to affect distribution within a habitat. In mangrove forest in the Niger Delta, for example, it appears that the size of mangrove trees varies considerably throughout extensive tracts of forest. Taller trees (and therefore those that are more likely to provide nest holes and tall trees for roosting to the African grey parrot) appeared clumped around small creeks (see Section 2.2.1 above). Therefore, if counts of parrots were conducted from boats in these small creeks only, then more birds would be detected than if counts were conducted in mangrove away from creeks and the river edge, where trees are typically smaller (providing fewer nesting and roosting trees). In Niger Delta swamp forest there is widespread human impact, from removal of large trees for timber or canoe carving to clearance of large areas for plantation. The distribution of paths and cultivated land is likely to have a significant impact of the distribution of the remaining large trees, and therefore, of sites where African grey parrots may nest, feed and roost.

Despite this being a very important requirement of distance sampling, it is almost impossible to conduct randomly placed point or line transects in some African grey parrot habitats. Sampling interior parts of mangrove forest, for example, is not practical because of the difficulty of walking through this habitat. It can be done, but the degree of disturbance would seriously violate the assumption requiring detection at the initial position. Furthermore, moving through the habitat would be so slow that it would take a long time to detect sufficient birds to perform the analysis (see below).

Number of encounters required

Buckland *et al.* (1993) recommend that there should be 100 encounters for any analysis, although they do say that a "practical minimum" is 60-80 and smaller numbers are accepted under some circumstances (Buckland *et al.* 1993, page 302). The critical issue is the size of the co-efficient of variation attached to the estimate. Marsden (1999), for example, states that about 80 encounters are required to reduce co-efficients of variation to 20%. That study determined the number of point count plots required for 11 species of Indonesian parrots to generate sufficient encounters to allow distance sampling analytical techniques to be used. The smallest number of 10 minute points counts (followed by an immediate intensive search) that would provide 80 encounters was 142 (red-cheeked parrot on Seram) and the greatest was 2860 (purple-naped lory on Seram). Of 23 species/island combinations, only seven required fewer than 500 point counts, seven required between 500 and 1000 and seven required more than 1000. Two species, although present, were not recorded at all from count plots. Marsden (1999) stated that observers could carry out 10 such counts per day during the optimum counting period.

This seems likely to be the critically limiting factor for using distance sampling in some habitats at some times of year in Nigeria. The present study was conducted during the breeding season and most time was spent in mangrove and degraded swamp forest. In neither habitat were many birds seen, apart from when trappers and hunters revealed nests that they had earlier located. Most of the nests visited in the mangrove forest however, already had young removed and the adults were not seen.

Casual observations in swamp forest and mangrove forest in Nigeria suggest that a significant number of point counts would be required to make 80 encounters with African grey parrots. Birds were so rarely seen, other than overflying in the morning or evening or apart from visiting nests with trappers and hunters that it would seem that a very large number of counts would be required, probably taking many person-months, in order to obtain even a single density estimate (i.e. not for separate habitats or areas).

The effect of carrying out this survey during the breeding season is not clear. Whilst adults were observed in nest holes, many nests had already had young removed. Therefore, whilst under natural conditions it may be assumed that the number of birds detected might be lower as fewer birds are foraging and moving about, this may well not be the case now, as nest disturbance is so prevalent. How such disturbance affects the daily and seasonal movements of the African grey parrots is also not known.

It should be pointed out here, that birds overflying the sample plot should not be included. This is because they are not 'using' the plot (Buckland *et al.* 1993). However, Marsden (1999) uses a correction factor to allow inclusion of the proportion of aerial birds in flight when the count begins, as he feels that otherwise it would underestimate the number of birds.

3.1.4. Other methods

Dowsett (2000) undertook an investigation of the status of Malagasy parrots as part of the CITES Significant Trade Review. He stated that his terms of references stipulated that distance sampling should be used to obtain population estimates (Dowsett 2000, page 11), although he found that this methodology was not practical. Despite this, and although the current project was not part of the Significant Trade Review, it was considered desirable to follow this stipulation if at all possible. This was because of the increasing use of distance sampling in quantitative field investigations.

As outlined above, however, the assumptions that must be met and requirements that must be satisfied make this difficult for African grey parrots in Nigeria. Marsden's (1999) assessment of the method's applicability for some Indonesian parrots supports this and concluded that whilst the method can be used, it requires an extended period of fieldwork in habitat that can be adequately searched in order to obtain sufficient encounters to perform appropriate analyses. The current study did not benefit from such an extended period of fieldwork.

Efforts were made, therefore, to assess the usefulness and feasibility of other methods used for counting parrots. Snyder *et al.* (2000) provided a brief outline of other counting methods that have been used for enumerating parrot populations: roost counts, nest counts, mark-re-sighting and transects. Each of these were considered.

Roosts. Dändliker (1992a) derives population estimates for African grey parrots in Ghana from roost counts, presumably because roosts are places where relatively large numbers of African grey parrots can be encountered relatively easily. However, there are significant problems with using roosts as the basis for estimating population densities and thus producing population estimates. In particular, there are two critical questions that must be answered before roost counts can be converted to population density estimates. These are:

- what is the size of the area being sampled: i.e. how far do birds fly to the roost that is being counted? and
- what is the proportion of the population being counted: i.e. what proportion of the birds in an area use the roost being counted?

Dändliker estimates the distances that African grey parrots fly to each of four roosts in Ghana, and these vary between eight and 20km. There does not, however, seem to be a compelling basis for these estimates as they are based on local reports and casual field observation. Whilst the information gathered is of considerable value, the method by which roost counts have been converted to a national population estimate would not withstand rigorous interrogation. If parrots could be tracked and so an estimate of the distance that they travel to the roost each day could be made, then it should be possible to use this as an estimation of the area being sampled. However, the proportion of the population within that area that uses the roost being counted will still not be known.

Snyder *et al.* (2000) indicate the conditions that must be met before roost counts can be turned into population estimates and these reflect the limitations outlined above. These conditions include knowledge of all major roosts in the area being surveyed, so that the number of birds 'missed' is small and all of these being assessed at the same time in case there is any movement between roosts. Where

these conditions can be met, reasonable population counts can be made (Snyder *et al.* 2000). The time of year that the roosts are counted is also important. Locals at Ikodi (see Section 3.2.2) said that the number of birds using the roost was much higher after the breeding season, partly because nesting adults did not use the roost, but also because young birds would be present.

Other congregations. Roosts are potentially not the only African grey parrot congregations that may be counted. May (*in litt.* 2000) reports that in Lobéké Reserve in southeast Cameroon African grey parrots descend in large numbers (“huge colorful cacophonous flocks”) at mineral licks. Whilst clearly affording excellent opportunities to encounter birds, it is not known how widespread this behaviour is and the same survey limitations apply that Snyder *et al.* (2000) give for roost counts. Dändliker (1992a and b) does not mention such places in West Africa and they were not found in Nigeria during the present study. All such licks in an area must be known and they should be counted simultaneously. The Lobéké Reserve lick is in a large ‘baye’ (a natural forest clearing) and it may be possible to identify these from the air, thus permitting a rapid assessment of the number of potential licks. Repeat counts over a period of time at all licks known may provide a minimum number of birds present, assuming that conditions given for roost counts above can be met.

Nest counts. Counting all nests within a defined area also depends on finding a significant proportion of nests in the area being counted. This can be very difficult. However, because of the economic value attached to young African grey parrots, local trappers have a powerful incentive to find all active nests during the breeding season. Therefore, it may be possible to count nests in a mapped area, using trappers. There are two potential sources of error in this. The first is that the trapper would not locate a significant proportion of nests in the area being searched. Given the amount of money that can be earned in parts of southern Nigeria from the sale of young African grey parrots to dealers, a considerable amount of time and effort is spent in locating nests. This involves the trapper going into the forest in late afternoon and listening for adults returning to nests after foraging. He would then search intensively until he found the nest. One trapper in Akassa would often remain in the mangrove until several hours after dark.

The second potential source of error in using nest counts in this way, is that the trapper may not reveal all of the nests that he has found. Obtaining the trapper’s confidence to this degree when he is aware that what he is doing is illegal can be time consuming. However, it is possible to gain his confidence if he does not feel threatened. In Akassa (see Section 3.2.2), it was notable that the trapper first revealed nests from which he said someone else had taken the young, but soon showed a number of nests that he had collected from. Finally, once his trust had been completely gained, he demonstrated his tree climbing technique and took eggs out of a nest before replacing them and climbing down.

Whilst counting nests seemed to work well in Akassa, it seemed less reliable in Kaiama (see Section 3.2.2) and so it must be assessed on a case-by-case basis. Clearly, if a study had sufficient time it would be possible to detect nests without the use of trappers in some habitats, which may be desirable. Given the practical difficulty of moving around in mangrove forests (e.g. Akassa), this would not really be practical. Indeed Snyder *et al.* (2000) conclude that for species that do not nest in congregations locating nests can be so labour intensive as to preclude its use in status assessments.

Transects. The use of transects and the requirements that must be satisfied before these can be converted in population estimates is discussed under distance sampling (see Sections 3.1.2 and 3.1.3).

Mark-resighting and fixed lookout counts. Neither of these were assessed during the study, but are unlikely to be useful. Whilst birds could be caught and marked, a significant number would have to be marked before a large enough proportion is likely to be resighted. A significant proportion is required to allow a population estimate. May (*in litt.* 2000) tagged 40 birds in SW Central African Republic and SE Cameroon and had no resightings.

Fixed lookouts work in places where there are vantage points above the canopy from which flying birds can be counted over a wide area (see for example Gilardi and Munn 1998). However, the land

inhabited by African grey parrots in southern Nigeria that was visited in this study was flat and offered no prospect for vantage points from which birds could be counted.

3.1.5. Data required

The preceding sections on methods for counting parrots have assumed that it is population estimates that are required. Guidelines have been developed by the CITES Animals Committee for field projects to be conducted as part of the CITES Significant Trade Review (Anon. 1993) and they state that the collection of minimum and maximum population estimates should be considered. However, the intention of the guidelines is that data should be generated to "enable assessment of the impact of trade and formulation of management policies". Whilst this study was not a part of the Significant Trade Review, it was clear that initially it was perceived that population density estimates were required. Consequently, it was desirable to consider the guidelines that have been prepared for field studies of species in trade.

The desire for population density estimates probably derives from the perception that population sizes are necessary to determine the non-detrimental nature of the levels of off-take, as required under Article IV of the Convention, and eventually to establish CITES export quotas that comply with the provisions of the Convention. Two factors, however, suggest that an assessment of the population density at one or more sites was not the most appropriate data to collect in this study. First is the difficulty in obtaining such estimates, as described above.

Second, and more importantly, trappers target young African grey parrots far more than adults, because of the demand for young birds that can subsequently be taught to talk (see Section 1). Consequently, as far as the wild population is concerned this is highly age-dependent mortality and will seriously affect recruitment into the adult population. Therefore, counting the size of the adult population will not provide information that is most urgently required for the "assessment of the impact of trade and the formulation of management policies." Therefore, it was decided that the most urgently needed data were those that would provide an assessment of nest density and the proportion of young that are removed from the wild population.

3.2. Distribution and abundance of the African grey parrot

African grey parrots formerly occurred widely across southern Nigeria, but their distribution is now highly fragmented in places as they have disappeared from many areas. The African grey parrot is confined to areas in the south of the country where it inhabits lowland rainforest (usually referred to in Nigeria as 'high forest'), freshwater swamp forest and mangrove forest. Historically, the high forest was distributed in an east-west belt that had its northern limit some 250km inland (Sayer *et al.* 1992) and the swamp forest lay along the many rivers of the Niger Delta. Forest loss and degradation has left both of these habitats significantly reduced and fragmented.

Broadly speaking, the Niger Delta stretches from the Benin River in the west to the Imo River in the east. IUCN (1992) ranked it as one of the highest conservation priorities in coastal West Africa, but one that was virtually unprotected. Campbell and Hammond (1989: page 193) considered that the Niger Delta and to the north of Calabar was one of the poorest known parts of West Africa for plants, yet the data available at the time suggested that this area had a high degree of endemism compared with other parts of West Africa.

No systematic bird surveys have been carried out in the Niger Delta and so there no detailed information on species' distributions. The Important Bird Areas survey recently carried out by the Nigerian Conservation Foundation visited some areas in the Delta, but large areas still remain unsurveyed. African grey parrots have been considered common in the Delta (Sayer *et al.* 1992).

The Niger Delta Environmental Survey was established to collect information on all aspects of the delta's environment. The final report of the second phase of this long-term survey is not yet available. However, the first phase of the survey, which was primarily a search of existing literature and available expertise did conclude that the delta is an important area for parrot feathers (which are used

in traditional medicine or 'fetish': see Section 3.4.6). Furthermore, the capture of live parrots for illegal export was considered "rampant" (Environmental Resources Managers Limited 1997).

3.2.1. Population surveys

Akassa

Twenty-five nests were visited (Table 3) and a further 13 documented (Table 4). This gave a total of 38 nests in an area of 18.2 km² and a density of 2.1 nests per square kilometre.

Nest no.	No young	Collector ¹	Date collected	Comments
1	2	unknown	January	
2	2	unknown	January	
3	unknown	not yet collected		
4	1	unknown	January	egg, not young
5	2	unknown	January	
6	2	known	1st week of February	
7	3	known	Week before Christmas	
8	1	known	Christmas-New Year	
9	3	unknown	Christmas-New Year	
10	unknown	unknown	early Jan	Tree cut down
11	3	known	31-Dec	
12	3	known	24-Dec	
13	1	known	Week before Christmas	Egg taken
14	1	known	Christmas-New Year	
15	2	known	3 days before Christmas	
16	3	known	02-Jan	
17	3	known	First week of January	
18	4	unknown	after Christmas	
19	2	known	mid January	
20	2	not yet collected		Eggs: trapper to return late April
21	1	not yet collected		Egg: trapper to return late April
22	1	known	New Year	
23	1	?unknown	January	? taken: no adults around now
24	2	known	Second week of January	
25	3	known	Christmas-New Year	

Table 3: Nests within the Akassa study area that the trapper knew of and which were visited during the study with the number of young, the collector and date collected, where known. ¹ = where the collector is given as 'known', this refers to the trapper who was used as a guide during the survey and 'unknown' means that someone else collected the young.

Nest no.	No young	Collector ¹	Date collected	Comments
A	2	unknown	unknown	
B	3	known	Christmas-New Year	
C	2	known	First week of January	
D	3	known	First week of January	
E	2	known	Christmas-New Year	
F	3	known	Christmas-New Year	
G	3	unknown	unknown	
H	3	known	?)
I	2	known	?) Cluster of five nests along
J	unknown	unknown	unknown) Somamwe Creek for which only
K	unknown	unknown	unknown) summary information available
L	unknown	unknown	unknown)
M	3	known	First week of January	

Table 4: Nests within the Akassa study area that the trapper knew of but were not visited during the study, the number of young, the collector and date collected, where known. ¹ where the collector is given as 'known', this refers to the trapper who was used as a guide during the survey and 'unknown' means that someone else collected the young.

Taken together, Tables 3 and 4 reveal that these 38 known nests produced a minimum of 69 young (plus two harvested eggs and three eggs that have yet to hatch). However, as all of these young have been, or will be, collected, recruitment into the adult population will be zero from these nests.

Kaiama

The forest surrounding four villages was searched with trappers or generalist hunters and the number of nests recorded is given in Table 5. It was not possible to determine the extent of the area that was surveyed precisely for two reasons. First, the absence of suitable landmarks and appropriately scaled maps made it difficult to determine the size of the area that was visited. Second, it appeared that the local trappers and generalist hunters did not search the forest as thoroughly for nests as the trapper(s) did at Akassa. Therefore, it is quite possible that some nests were not visited.

Village	No. nests visited	No. others reported
Igbedi	3	--
Kaiama	4	2
Oyobo	7	--
Opokumo	4	5

Table 5: No of nests found around each village in the Kaiama area.

In order to obtain a minimum nest density, it may be reasonable to assume that an area of 12.6km² was searched around each village. This is a circle with a radius of 2km from each village. Therefore, a total of 50.4km² was searched by trappers and generalist hunters and 25 nests were found, giving a minimum nest density of 0.5 nests/km².

3.2.2. Presence/absence surveys

Ikodi parrot roost

At Ikodi (see Upper Orashi Forest Reserve in Section 3.2.3 below), the African grey parrot roost lies next to the village on the west bank of the river. It extends over several hectares and is, reportedly, much more extensive outside the breeding season when more birds use the site to roost. The parrots roost in oil palm trees that are scattered either singly or in small clumps and it is those next to the river that were being used during our visit. Later, when the roost comprises more birds, trees further 'inside' are reportedly used. Many of the roost trees appear mature and apparently some are dying, causing the African grey parrots to use trees further from the riverbank. It did not appear that there were many younger oil palm trees, and this may be a cause for concern in the future.

Counting parrots at the roost was difficult for three reasons. First, the African grey parrots mainly arrived after dark and left before it was light in the morning, most birds having left by 6.15am. Second, the extent of the roost meant that only a small part of it could be watched at any one time. Finally, birds would move around once they had entered the roost and it was difficult to see in the poor light which birds were arriving and which birds were simply changing positions.

Despite these problems, it is clear that the roost at Ikodi is a significant congregation of African grey parrots. Many palm leaves were bent under the weight of roosting birds, and there were many hundreds of birds in the roost when counting stopped at 8pm on 6th February 2001. Dändliker (1992b) assigned roosts to size classes, and Ikodi would easily fall within his largest roost size, holding 700-1200 birds. It would seem conceivable that if the entire roost could be counted during the peak season, which locals reported to be from May-August/September, up to 1500-2000 parrots could be counted.

The roost has attracted trappers in the past and this led to the death of four villagers. The villagers have protected the roost, partly because they are proud of the roost, but also because the children of the village make money from collecting the red feathers that fall on to the ground when the birds are roosting. Young boys search the ground beneath the oil palm trees in the morning and can sell the feathers for up to NGN20 (USD0.18) per feather, although NGN12-15 (USD11-14) is more usual. The feathers are used for decoration, but also for traditional medicine. It was not possible to determine what medicinal qualities the feather has as the Ikodi villagers said that they do not use traditional medicine.

It was reported that the trappers who were active in Ikodi were Ghanaians who were given shelter in nearby villages. They would use trained birds to attract adults flying into the roost (see Section 3.4.2 below). The Ikodi villagers fought to remove the trappers and following the death of two brothers in 1997, the Ghanaians fled and have not reappeared.

Bonny

Bonny lies on the east bank of the River Bonny south of Port Harcourt, where it empties into the Gulf of Guinea (=Gulf of Bonny). Large numbers of parrots were reportedly present during an Environmental Impact Assessment carried out on Bonny during the summer of 1998 (Otufu Pasiye verbally 2001). The assessment was carried out on land belonging to Nigeria Liquefied Natural Gas Ltd. and is adjacent to one of the company's large residential compounds in Finima, which is part of Bonny.

Now that this area is a local community park it is being developed as a nature reserve with input from the Niger Delta Wetland Centre. It is predominantly disturbed forest, although there are patches of mangrove and an extensive beach front. The forest was surveyed in the evening and morning, and the beach was watched for birds overflying in the morning.

No large numbers of parrots were recorded, although 13 birds were seen flying into or out of the forest and across the river from the beach during the morning. The first bird was recorded in the morning at 7.10am, although most birds were recorded after 8.20am. This suggests that they were either flying some distance from the roost (judging by the time that birds left the roost at Ikodi: see Section 3.2.2), or they were flying from another foraging site.

It did not appear that the forest at Finima would hold many birds, although it may be an important source of food in this area. Birds were seen flying across the Bonny River and seemingly in from the sea. The opposite bank of the river is apparently mostly mangrove forest (according to local reports and maps) that may be important for roosting and nesting. It is possible that seasonal variation may account for some of the difference in the number of parrots reported during the Environmental Impact Assessment in 1998 and the present survey.

Ekonganaku

Ekonganaku is in the Oban Hills group of forests and has co-ordinates 5° - 6°N, 8°12' - 8°60'E. It is in the southern (Oban) division of Cross River National Park (see Section 3.2.3). In this area of rainforest, there are emergent trees up to 40m high that rise above the canopy. The area is species rich, including large mammals, such as elephant *Loxodonta africana* and an array of primates including chimpanzee *Pan troglodytes*, drill *Mandrillus leucophaeus* and Preuss's red colobus *Procolobus badius preussi*.

Within the Oban Hills forest, the Ikpan Forest Block is contiguous with the Korup National Park of south-western Cameroon. It comprises three main land-uses: National Park (north of Ekonganaku), Forest Reserve (south of Ekonganaku), and Community Forests and farmlands, (in and around Ekonganaku village). The area is characterised by scattered plantations of oil palm trees, rubber trees, *Gmelina* trees, plantain and banana and other food crops, fallowed plots and some secondary forest. The forests within the National Park are relatively undisturbed, but those of the Forest Reserve and

the Community Forests are relatively disturbed by logging activities and the collection of non-timber forest products.

Eight active parrots nests and two nesting sites were seen and inspected and about 50 birds seen flying overhead on each of 10 days, mainly at dusk. When parrots were seen flying overhead, the trappers said that they were nesting on rocks in the hilly areas of the Ekon Road within the National Park, but this remarkable claim was not further investigated.

3.2.3. Other information on distribution

All sites from which African grey parrots have been reported recently are presented in Table 6. Information on some of these sites that were not visited is presented below. The amount of information available varied as some sites were the subject of recent presence/absence surveys by ornithologists and other sites are the subject of second-hand reports and so there is little further information. Unfortunately, there is no information for some sites or than alleged presence.

Afi River Forest

This 40,000ha forest lies adjacent to the Okwangwo Division of Cross River national Park in south-eastern Nigeria. It is considered important for its production forestry, tourism development and wildlife conservation and has an average annual rainfall between 2000 and 2500mm (Ezealor in prep.). The IBA surveys were only concerned with presence/absence of species and so there is no information on the abundance of African grey parrots in these forests other than they are present.

Okomu National Park

This park occupies 12,400ha within a forest block that covers 1,082-km². It is situated about 60km south-west of the city of Benin in Edo State and is approximately 25m above sea level. Its forest is a mosaic of swamp forest, high forest, secondary forest, and open scrub. The mean annual rainfall is about 2,100mm with water draining into the Ose River and its tributaries (Ezealor in prep.). The IBA surveys were only concerned with presence/absence of species and so there is no information on the abundance of African grey parrots in these forests other than they are present.

Oban Division of the Cross River National Park

Oban Division is the more northerly and larger portion of the Cross River National Park, occupying 280,000ha. On its eastern border is Korup National Park in Cameroon. It is lowland rain forest that has been human influenced in many areas resulting in significant secondary growth and rubber and oil palm plantations. It receives more than 3500mm of rain per year (Ezealor in prep.). The IBA surveys were only concerned with presence/absence of species and so there is no information on the abundance of African grey parrots in these forests other than they are present.

Omo Forest Reserve

This Forest Reserve occupies 132,000ha and lies some 135km northeast of Lagos It is a hilly area that rises to about 200m. It is one of six adjoining reserves that have mixed moist semi-evergreen rain forest. It is predominantly old growth secondary forest intermixed with small areas of primary forest. The area also includes a Strict Nature Reserve, to the south of the junction of the Omo and Owena Rivers and which is the site of Nigeria's Man and Biosphere programme. There is up to 2000mm of rainfall per year (Ezealor in prep.). The IBA surveys were only concerned with presence/absence of species and so there is no information on the abundance of African grey parrots in these forests other than they are present .

Okwangwo Division of the Cross River National Park and Afi Forest Reserve

This northern portion of the national park is 92,000ha and lies to the south-east of Obudu in Cross River State on the border with Cameroon. It is bordered to the west by Afi River Forest Reserve and to the east by Takamanda Forest Reserve in Cameroon. It lies within a hilly area that rises to 1,700m on the Obudu Plateau and consists of lowland rainforest, above which lie montane grasslands along high ridge tops. The area has marked wet (March-November) and dry (December-February) seasons, with up to 4,280mm of rainfall per year (Ezealor in prep.). The IBA surveys were only concerned

with presence/absence of species and so there is no information on the abundance of African grey parrots in these forests other than they are present.

Upper Orashi Forest Reserve

These forests lie on the Upper Orashi River in Bayelsa State and cover some 70,000ha. The IBA project treated the Ikodi parrot roost (see Section 3.2.2) as part of this area. The forest is mainly secondary rainforest, some of which is seasonally flooded and contains *Raphia* palms and broad-leaved trees. There are disturbed patches on higher ground and these are typically dominated by oil palm *Elaeis guineensis* and *Musanga cecropioides* (Ezealor in prep.). The IBA surveys were only concerned with presence/absence of species and so there is no information on the abundance of African grey parrots in these forests other than they are present other than they are present.

Biseni Forest

The Biseni forests lie about 80km north-west of Ahoada in the Taylor Creek floodplain of the Niger Delta in Rivers State. The forests are seasonally inundated. *Raphia* palms and some woody broad-leaved species such as *Symphonia globulifera* and *Ficus* spp. are common. There are also areas of tall grass swamps close to the river channels (Ezealor in prep.). The IBA surveys were only concerned with presence/absence of species and so there is no information on the abundance of African grey parrots in these forests other than they are present.

Sunvit Farm (Agenebode Forest)

This private farm lies between the towns of Fugar and Agenebode in the centre-south of the country, and is about 5km from the western bank of the Niger River. It is a proposed Nigerian Important Bird Area (Ezealor in prep.) that covers 13,200ha. The vegetation is a mosaic of savannah, riverine forest and open, cultivated or fallow fields. The site is at the northern limit of the African grey parrot's distribution, and the species is rarely seen (Phil Hall verbally 2001).

Ke

This site was visited by Fabrice Roux, a teacher at a French School in Lagos, in February/March 1999. The area lies in the mangrove forests of the Niger Delta between the Sombrero and New Calabar Rivers, and is an extensive area of tall mangrove. Birds were located by calls inside the mangrove and it is estimated that there were "hundreds" of parrots in Ke, which are being trapped (F. Roux verbally 2001). This site could not be visited during the survey period, as there was communal strife resulting in the loss of life.

Ogidibene

Information on this site is second hand and was provided to Fabrice Roux by Famous Ojarike from the Department of Animal and Environmental Sciences at the University of Port Harcourt. He reports seeing birds trapped in Ogidibene, which lies in the Warri South Local Government Area, Delta State.

Bakassi

Bakassi is a disputed territory that lies between Nigeria and Cameroon. Again, information from this site is second hand. Fabrice Roux was advised by a trader in Port Harcourt that some birds in the trade come from the Bakassi Peninsula. Security concerns mean that it is not possible to visit this area at the present time. The ex-trader who was interviewed in Calabar also reported that African grey parrots used to come from Bakassi.

Ekuri Forest

This is a community managed forest in Cross River State and it is good forest, although there appears to be no information on the presence of the African grey parrot (JH Mshelbwala verbally 2001).

Ifon Forest Reserve

Eight or nine years ago this forest reserve had big trees, which would have been suitable nest trees for African grey parrots, but these have possibly been harvested by now (JH Mshelbwala verbally 2001). There is no recent information on this site (FO Omeni verbally 2001).

Site name	Approx. coordinates	STATE and capital	Source	Suitability for intensive visit	Level of information sought
1 Afi River Forest Reserve	06°20'N 09°00'E	CROSS RIVER; Calabar	IBA project	Low sighting record	Existing information
2 Okomu National Park	06°25'N 05°28'E	EDO; Benin	IBA project	Low sighting record	Existing information
3 Oban Division (Cross River NP)	05°25'N 08°35'E	CROSS RIVER; Calabar	IBA project	Low sighting record	Existing information
4 Omo Forest Reserve	06°51'N 04°30'E	OGUN; Abeokuta	IBA project	Low sighting record	Existing information
5 Okwangwo Division (Cross River NP)	06°17'N 09°14'E	CROSS RIVER; Calabar	IBA project	Low sighting record	Existing information
6 Upper Orashi Forest Reserve	05°15'N 06°48'E	RIVERS; Port Harcourt	IBA project	Low sighting record	Existing information
7 Biseni Forests	05°15'N 06°30'E	BAYELSA; Yenegoa	IBA project	Low sighting record	Existing information
8 Akassa Forests	04°21'N 05°59'E	BAYELSA; Yenegoa	IBA project and ProNatura	Birds seen and trapping known	Quantitative survey
9 Sunvit Farm (Agenebode Forest)	07°07'N 06°41'E	EDO; Benin	IBA project	Low sighting record	Existing information
10 Ikodi parrot roost, near Upper Orashi Forest Reserve	05°05'N 06°48'E	RIVERS; Port Harcourt	ProNatura	Difficult as birds only seen at roost	Qualitative visit
11 Ke (between Sombreiro and New Calabar Rivers)	04°35'N 06°50'E		Fabrice Roux	Good, but currently communal conflict.	Existing information
12 Ogidibene	In South Warri LGA	BAYELSA; Yenegoa	via Fabrice Roux	Trapping reported	Existing information
13 Kaiama and surrounding villages			Living Earth	Unconfirmed, second hand report. Trapping reported	Existing information
14 Bonny Island	04°21'N 07°08'E	BAYELSA; Yenegoa	Otofu Pasiye	Many parrots reported and trapping	Quantitative visit
15 Sapele (needs confirmation)	05°50'N 05°40'E	BAYELSA; Yenegoa	Akassa trader & via Fabrice Roux	Many parrots reported in 1998	Qualitative visit
16 Bakassi Peninsula	04°35'N 09°26'E	BAYELSA; Yenegoa	via Fabrice Roux	Unknown, but trapping reported	Existing information
17 Abijo Village, Lekki Peninsula (needs confirmation)	06°30'N 06°00'E	LAGOS; Lagos	Fabrice Roux	Unknown, but probably unsafe	Existing information
18 Andoni Island, near Akassa (needs confirmation)		RIVERS; Port Harcourt	JH Mshelbwala	Unknown, but currently unsafe	Existing information
19 Ekuri Forest (needs confirmation)		CROSS RIVER; Calabar	JH Mshelbwala	Basis for report unknown	Existing information
20 Ifon Forest Reserve		ONDO;	JH Mshelbwala	Basis for report unknown	Existing information

Table 6: List of sites from which African grey parrots have recently been reported.

3.3. Extent of available habitat

Landcover maps are held by the Forest Management, Evaluation and Co-ordination Unit in Abuja. These cover two time periods, the early 1990s and the late 1990s. Unfortunately, it did not prove possible to use these maps as they were not easily accessible in electronic format. In addition, inspection of some hard copies suggested that the data were of unknown reliability. For example, the area where Kaiama occurs, on the Upper Orashi, is marked as swamp forest, whereas it was found to be heavily cultivated with occasional patches of bush containing a few large trees during this survey.

The EROS satellite data collected in 1992-3 analysed here covered 394,239km² of southern Nigeria and neighbouring Cameroon, of which 45% is made up of woody savannahs (taken here to mean degraded primary habitat now under other land-uses), croplands and mosaics of cropland and natural vegetation (Table 7). At this very basic level of vegetation differentiation, this area is comprised of 18,275 vegetation fragments, of which more than 90% are smaller than 10 km² in size.

Originally, most of this land would have been comprised of lowland rainforest, freshwater swamp forest and mangrove forest, which are included under the evergreen broadleaf and permanent wetlands under the EROS classification here. This means that, without allowing for any wrongful assignment of habitat (see below), less than 20% of the area is now under these vegetation types, and considerable portion of this is now in small patches. There are few large blocks of habitat that are potentially suitable for the African grey parrot, and these include larger patches of evergreen broadleaf forest and also of permanent wetland as this classification includes the mangrove forest of the Niger Delta.

Vegetation type	Total area	No. fragments per size class (in square kilometres)							
		Total	>1000	>500	>100	>50	>20	>10	<10
Barren or sparsely vegetated	969	201				2	7	11	181
Closed shrublands	8	7							7
Cropland/natural vegetation	19,598	2948		5	20	26	85	140	2672
Croplands	469	99				3	2	2	92
Evergreen broadleaf forest	57,735	3826	8	9	25	35	109	149	3491
Grasslands	874	244			1	2	3	7	231
Open shrublands	394	161					2	3	156
Permanent wetlands	16,076	1325	3	2	11	5	26	52	1226
Savannahs	20,747	4092		2	25	29	100	157	3779
Water bodies	2582	86				11	1	8	63
Woody savannahs	157,854	5285	11	3	49	38	161	240	4783
Totals	394,239	18,275	23	21	142	141	503	764	16,681

Table 7: Extent and number of fragments per size class of various vegetation types in southern Nigeria, derived from EROS satellite imagery collected between March 1992 and April 1993.

Inspection of the vegetation map indicates that several of these larger forest patches have either been incorrectly assigned or are otherwise unlikely to hold large populations. The most obvious example is the supposedly largest patch of evergreen broadleaf forest estimated at 15,541km² between Lagos and Benin City. Three other large patches totalling 7847km² seem unlikely to hold large parrot populations either because they have been incorrectly assigned or because they are no longer as extensive. These patches now occur close to significant urban areas and at (and indeed above) what is now considered the northern limit of the species in Nigeria.

Comparison of the size of the forest blocks with their location (from the vegetation map) suggests that there are now relatively few forest patches that are large enough to hold good populations of the highly mobile African grey parrot. The key areas now are the mangrove forests of the Niger Delta (some 8000km² in four main blocks) and the rainforest blocks, primarily in Rivers and Cross Rivers States, where there is about 15,000km² in around 15 blocks of forest larger than 200km² (see Figure 1).

The second vegetation dataset has been classified into vegetation categories that more closely reflect the forest types used by the African grey parrots, namely freshwater swamp forest, lowland evergreen broadleaf rainforest and mangrove forest. This dataset covered 278,422km² of southern Nigeria and neighbouring Cameroon, of which 74% is made up of disturbed natural forest, non-forest landcover or sparse trees/parkland (Table 8). At this level of vegetation differentiation, this area is comprised of 15,736 vegetation fragments, of which more than 93% are smaller than 10km².

The three vegetation types that are most used by the African grey parrot (freshwater swamp forest, lowland evergreen broadleaf rainforest and mangrove forest) occupy 24% of the land, assuming that there are no wrongful classifications of land. There are few large blocks of forest, with freshwater swamp forest especially now occurring in very small patches and totalling a mere 306km² (see Figure 2).

Vegetation type	Total area	No. fragments	No. fragments (in square kilometres)						
			>1000	>500	>100	>50	>20	>10	<10
Deciduous\semi-deciduous\broadleaf forest	2623	1073			1	4	8	24	1036
Disturbed natural forest	49,943	4156	3	1	12	17	54	111	3958
Freshwater swamp forest	306	34				3	3		28
Lowland evergreen broadleaf rainforest	51,958	1974	9	3	11	9	49	69	1824
Mangrove	13,786	1028	2	1	2	5	15	12	991
Non-forest landcover	123,857	2768	5	6	22	18	68	109	2540
Sparse trees/parkland	31,986	4052	5	5	20	31	100	163	3728
Upper montane forest	2407	192			6	2	8	9	167
Water bodies	1556	459			3		1	11	444
Totals	278,422	15736	24	16	77	89	306	508	14716

Table 8: Extent and number of fragments per size class of various vegetation types in southern Nigeria, derived from data compiled by Henrik Olesen of UNEP-GRID from AVHRR imagery (1km pixels) collected during the early 1990s, for the TREES (Tropical Ecosystem Environment Observations by Satellite) project of the EC Joint Research Centre, Ispra, Italy.



Figure 1: Vegetation cover of southern Nigeria derived from data collected during 1992-1993 (see Methods for full source details).

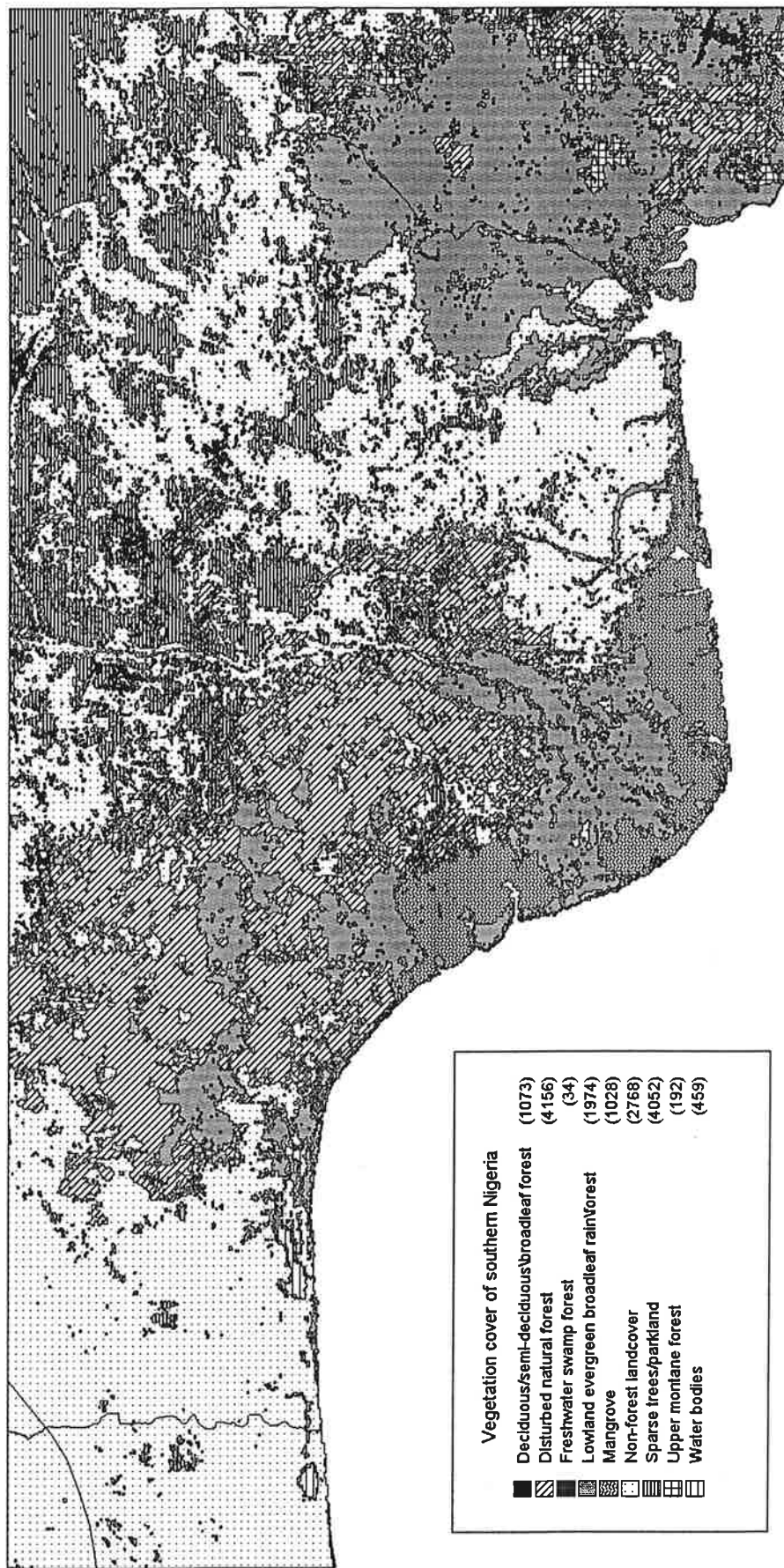


Figure 2: Vegetation cover of southern Nigeria collated for the Tropical Ecosystem Environment Observations by Satellite project in the early 1990s (see Methods for full source details).

3.4. Trade and its impact on wild populations

3.4.1. Legislation and current controls

Government structures

The Federal Ministry of the Environment was created in late 1999 to bring all relevant agencies within one ministry. Previously an independent agency (Federal Environmental Protection Agency) had responsibility for many environment matters, but some areas of responsibility fell under other parts of government: for example, the Wildlife Division was a part of the Forestry Department within the Ministry of Agriculture and Natural Resources. Natural resources conservation matters now all fall under the Environmental Conservation Department. Within this department, there are two divisions: the Biodiversity and Endangered Species Management Division and the Nature Conservation Division. CITES, the Convention on Biological Diversity and the Convention on Migratory Species are all managed by the Biodiversity and Endangered Species Management Division. The other international biodiversity convention (the Ramsar Convention) is administered from within the Nature Conservation Division.

In the early 1990s, the administration of CITES within Nigeria was transferred from the Forestry Department of the Ministry of Agriculture and Natural Resources to FEPA. With the creation of the Ministry of Environment in 1999, it was transferred to the Honourable Minister for the Environment, who is in charge of the new Ministry of Environment. As noted above, the Biodiversity and Endangered Species Management Division administers CITES matters. The CITES Desk is located in Abuja and the CITES Enforcement Unit is situated in Lagos.

All applications for export permits are made to the CITES Enforcement Unit, which has responsibility for ensuring that there has been a veterinary inspection of the health of the animals and for verifying ownership. The application form for a CITES permit costs NGN1000 (USD9). When CITES was administered by the Ministry of Agriculture and Natural Resources, applications for permits were passed directly from CITES Enforcement to the Permanent Secretary to the Minister. Since the establishment of the Environmental Conservation Department (which handles all CITES issues) all applications are now sent from CITES Enforcement to the CITES Desk in Abuja for consideration, which recommends whether applications should be accepted or rejected. The recommendation is then passed to the Head of the Biodiversity and Endangered Species Management Division, then to the Head of the Environmental Conservation Department and to the Permanent Secretary. If an application is approved, an export permit costs NGN5000 (USD45).

International trade

Nigeria is a signatory to CITES and the Head of the CITES Management Authority is the Honourable Minister for the Environment. The designated Scientific Authorities are the Ahmadu Bello University at Zaria and the Forestry Research Institute of Nigeria at Ibadan. CITES is translated into Nigerian law by the Endangered Species (Control of International Trade and Traffic) Decree (Decree No. 11) of 20th April 1985. The Endangered Species Decree states that Nigeria signed the Convention on 11th February 1974 and ratified it on 9th May 1974. Consequently it was amongst the countries whose signatures brought the Convention into force on 1st July 1975.

This decree prohibits the hunting, capture and trade in certain animal species ("being animal species threatened with extinction") that are listed on Schedule 1. Schedule 2 ("being animals which though not necessarily now threatened with extinction may become so threatened unless trade in respect of such animal species is controlled") contains a list of animal species that can be caught hunted and traded only if a valid licence has been issued under the Decree.

All parrots are listed on Schedule 1, and, therefore, it is explicit that no permits should be issued for their export. African grey parrots were, however, exported in all years between 1981 and 2000, although Nigeria itself reported no exports until 1991, apart from two birds in 1989 (see Table 1 on page 6). This situation changed in October 2000, when the Nigerian CITES Management Authority placed a moratorium on the issuance of CITES permits for African grey parrots. Originally intended

to last three months, it was lifted in March/April 2001 since when permits have been issued again. The moratorium was primarily stimulated by an increasing awareness that the status of the species in the country is not known. When the moratorium was imposed, it was stated that four criteria should be satisfied before it be lifted. These were:

1. review the Endangered Species Decree (including a review of the status of the country's animals to identify which species should be listed and under which conditions);
2. carry out an overhaul of the process by which applications and enforcement are managed; and
3. the proper functioning of rescue centres for confiscated animals.

Domestic trade

There is no separate federal legislation relating to domestic trade. However, although the full title of the Endangered Species Decree refers to international trade, as do the two Schedules, the text of the decree refers to hunting, capture and trade in general. Indeed, the Decree has been widely taken to apply to all hunting, capture and trade, whether for international or domestic markets. There does not appear to have been any legal ruling on whether the Decree does apply to domestic trade and the apparent ambiguity has served to give the impression that all listed species are protected.

There is state legislation that relates to capture, hunting and trade, although tracing this back through the changes that have resulted in the creation of new states can be complex. Original domestic legislation derives from the 1963 Wildlife Acts, which place certain constraints on exploitation of wildlife and states various activities that require permits and licences to be obtained.

With the creation of each new state, they are governed by the legislation that applied in the state from which the new state was created, until new legislation relating specifically to the new state is passed. It is, therefore, likely that not all states will have passed their own legislation and that will have inherited wildlife legislation from the 'parent' state and in some cases this may be the 1963 Wildlife Acts.

The legislation governing exploitation of wildlife in force in Kano State is presented here as an example of such state legislation. The legislative basis is the 1976 Kano State Wildlife Edict, which updated the 1963 Northern Nigeria Wildlife Law. (There is also other, older, legislation that is relevant.) This update was an attempt to provide for the proper regulation of activities that had been ongoing for some time, such as hunting and wildlife trade. A permit or licence was required for each of four activities, as follows:

1. trophy dealer's licence, permitting the holder to deal in body parts;
2. captive licence, which allows the holder to keep and breed animals in captivity;
3. hunting licence, which allows the holder to hunt for animals in Schedule 2 (and those not listed), but not in any game reserve;
4. free disposal permit, which allows the holder to trade in live animals. It is at the discretion of each state as to whether it accepts a permit issued in another state, or whether another permit is required before trade is allowed within its borders.

No permits or licences should be issued for any species listed on Schedule 1. All applications are made to the Director of Wildlife Services (the 'Chief Wildlife Officer'), who has a permit/licence officer under him. All states issue the same four permits listed above. It was widely reported that free disposal permits had been used to take birds out of the country and, presumably, taken by importing countries as evidence of lawful export from Nigeria.

Whilst these procedures have been in place for many years, uncertainty in their implementation still exists. For example, it was considered that there is a need for Endangered Species Regulations to make clear how the Endangered Species Decree should be implemented (e.g. specific direction on what forms must be completed for international trade). The issuing of permits for African grey parrots noted above is evidence of this confusion.

In the past, it was felt that the authorities at the airport in Kano required some technical assistance with checking trade in plants and animals and so state wildlife staff were posted there. However, in the early 1990s a federal circular stated that only customs, police and immigration staff should operate at the airport and so since then there have been no wildlife officers at the airport.

3.4.2. Trapper profiles and trapping methods

Trappers

Trappers were met in Akassa, Kaiama and Ekonganaku. The contexts in which trapping was taking place in these two places were very different and it is worth recording these differences as they may have a bearing on trapping pressures.

In Akassa, collecting and selling young African grey parrots was a significant commercial activity for the trapper who provided information on nest sites and numbers of young. He and the other people in his village (Okobotou) were renting the land from the people of the Akassa clan for the purpose of fishing. Therefore, they were only paying to fish and only had permission to earn a living from fishing. Overall, collecting young parrots was his principal activity during the nesting season, from November until about April, and fishing the main way he earned money during the rest of the year. No one else in the village collected young parrots and nobody caught adults. He learnt his skills from his father and worked for him until he died about four years ago. His father was a migrant trapper and used the money that he earned from selling parrots to build a 'block' building, which is a significant status symbol in rural villages.

The Akassa clan had been involved in two 'crises' during the previous year or so that had involved gun and machete battles with neighbouring villages and clans. People on both sides of the conflicts had been killed and villages razed to the ground. The result is that the chiefs of Akassa explicitly forbade tenants, such as the people of Okobotou, from allowing strangers onto Akassa land. Therefore, in order to work with the trapper from Okobotou, it was necessary for someone influential from Akassa's principle village, Khongo, to vouch for the survey team. In doing this, the Khongo people learnt about the trapper's activities and therefore, at the end of the survey, he was concerned that he would be fined by Akassa for earning money from an undeclared activity and then levied on all earnings. From the sale of the 29 young birds harvested so far during the 2000/2001 season, he had earned NGN45,000 (= USD410).

Trappers or general hunters were interviewed in Kaiama and several surrounding villages. Selling young parrots did not appear to be as important a source of income as it was to the trapper in Akassa. Some of the people interviewed had stopped collecting birds as they were too old to climb trees and no one had taken their place and others would only check a few nests later in the year, during April. The overall impression is that there was less competition for young African grey parrots although it was not clear whether all nests would still have all young removed, but later in the year, or whether there was actually less collecting pressure on the species.

Many of the nests that were identified by the trappers and hunters were around areas that were being farmed, usually for plantains, but also for other crops. There is little undisturbed forest around these villages and so much of the area is comprised of cultivation and there is a network of paths joining cultivated areas to each other, to villages and to the river. Therefore, villagers may become aware of trees being used for nesting when they are working on their farms or walking to or from them.

The trapper in Kaiama revealed four nests and knew of two others. He had not checked any of these nests this year as he was waiting until the young were ready to collect, which he predicted would be April. His main source of income was from his plantain crop. He was very friendly with the trapper from Opokumo (see below) and it seems likely that they had discussed the present survey. Most notably both of them reported selling young birds to dealers for astonishingly high prices: NGN7000 (USD64), which is the highest amount that dealers in Lagos were requesting, and one that is far higher than any other figures quoted during this survey for this stage of the trade. It was, therefore, thought to be unreliable.

The trapper in Opokumo was a Ghanaian who had migrated to Nigeria several years ago when the economy in Ghana was in a very bad state. He had married a woman from Opokumo and was now settled there, mainly farming. He did, however, know a group of Ghanaian 'brothers' who lived in Yenegoa (the nearby Bayelsa State capital), who had previously contacted him each year to find out where active nests were. They would then come and take the birds, paying him a commission. This year he had not heard from them, but he suspected that they would come in May or June to catch adults. This trapper had not checked any nests this year, but revealed seven nests that were active last year and reported another five that were in swampy areas.

There was no trapper in Igbedi, and three nest holes were revealed by a hunter. It appears that no one here has the skill or interest to climb the trees to collect young parrots, whereas there were several hunters who would take guns into the bush to shoot animals. It did seem that there was a genuine lack of interest in making money from selling parrots around this village.

The guide in Oyobo was retired from collecting parrots as he said that he was 70 years old. He did, however, still carry a gun in the bush in case he saw animals to shoot and would spend a few days at a time farming alone. He had last climbed a tree after young parrots two years ago, when his son tried to collect the young. He had given his son his climbing ropes, but as his son could not climb the tree, he did it. He knew of no one who was currently active.

The hunter from Oyobo used to be very active, but he could never catch adults and only took young from the nest and he said that there was no dealer coming into the area and buying all of the young that been collected: they were sold one by one. He revealed seven nests although he did seem to know of more.

Three trappers and a trainee trapper were accompanied into the field from Ekonganaku in the Oban Hills. As the trappers were known there was no problem in obtaining their confidence. One of the trappers was effectively, the 'head trapper' and he had learnt how to catch parrots in the Niger Delta and this had been his major business for the last six years.

Trapping methods

The Akassa trapper would enter the mangrove forest alone during mid-late afternoon and would search for African grey parrots, mainly seeking to detect adults returning to the nest site to roost in the evening. He would then search intensively in the area that he had seen birds flying to until activity around a particular tree allowed him to find a nest hole. He would then climb the tree to see whether there were eggs or young in the nests and he would then predict when to return to check on or collect the young.

He would collect young in a bag carried slung across his back and climb down the tree. Birds would then be kept in a cage in Okobotou that was about 100cm x 60cm x 30cm. Previously he kept birds in a basket or carton in his house until a rock python ate some of the young and so built the fairly substantial cage that he now uses.

The guide at Opokumo reported the trapping method used by 'his brothers' when they had visited the area to catch parrots. Although they could climb trees and take young from the nest, they would also catch adults flying into the roost. He reported that they would cut a vine and let sap run out. Lime juice would be added to this and mixed in so that the gum would become thick and allow the trappers to take it home. On the day that they want to use it, they fry it and it becomes thinner and stickier. The trappers only trap in the mornings and leave home at about 4am to trap birds. They attach the gum to branches in a tree which they have previously seen parrots overflying and use a trained parrot to call these parrots down.

When the parrots are caught the trappers remove the gum from the feet, which is apparently not a problem, and they spread the gum on their wings so that they cannot fly off. They then drop each

parrot down to the base of tree, and he said that this does not hurt the parrots, and as their wings are gummed up they cannot escape. If the birds are picked up on the ground they will make alert calls, which will scare the overflying parrots off. Therefore, they are not picked up until the morning and trapping has finished. The feathers that are gummed up are cut off with scissors and when the trappers return to their houses, the parrots rub their feet in ashes and pick off any remaining gum. Last year he saw them catch 15 in one morning at one tree.

In Ekonganaku, the trappers do not collect parrots from the nest because they thought the nests were too high in the trees and they believed that if provoked the parrots pluck out their eye balls. Therefore, they trapped birds using gum, which was made locally using both exudates from trees and gum that was sold commercially for catching house rats. Occasionally, both types of gum are mixed together to increase efficiency.

Trapping was always done in an active roost. A single tree was usually selected and was usually one that could be easily climbed and that is a good shape for setting traps in (i.e any good crown and height). A ladder is made from Indian bamboo and this is then tied to the selected tree and the trapper then climbs to the top where one or two bamboos may be joined together. Once the trapper has climbed to the top another trapper, often an apprentice, climbs to join him.

The trappers work together using machetes to create an opening that is almost always in the middle of the crown where they then construct a high hide using palm fronds from nearby palm plantations and branches from the tree. The high hide (shade) is constructed firmly to withstand the force of local winds as well as to protect the trappers from bad weather and to conceal them from easy view of parrots.

When the hide is completed, four green (fresh) palm fronds are pulled up using ropes and the trapper then carefully spreads the gum on the surface of the fronds and ties a well-trained parrot to the middle of each palm frond (usually about 2.5m long). The whole lot (fronds, gum and parrots) are carefully placed at the top of the tree crown. The assemblage is well fastened to prevent it from falling if more than one parrot is caught in the trap at once. Finally, the trapper and his assistant or trainee enter the hide with another parrot (usually a trained male) that screeches and whistles loudly when struck. These calls attract parrots flying overhead towards the traps.

Trapping takes place in the mornings and evenings and starts whenever the trapper hears or sees parrots leaving or returning to their roost or nest sites. This is usually around 0600-0930hrs and from 1600hrs. The end of the palm frond covered with gum sticks out slightly above the crown and as the parrots normally perch on branches such as this, they alight and are caught. On perching, the claws and the feet are stuck in the gum and the trapper can easily reach out and remove the parrot immediately and also reset the trap. The new parrot is then placed in a box or basket with air holes.

3.4.3. Level of exploitation

Akassa

In Akassa it appears that all nests found had young African grey parrots removed. Searching was intense and it seems reasonable to assume that few nests would remain undiscovered. The trapper reported that from the 38 nests visited during the survey, a minimum of 74 birds or eggs had been or would be harvested (Table 9).

Collector ¹	No. nests	No. young
Known	22	51
Unknown	13	20 ^a
Not yet collected	3	3 ^b
Totals	38	>74

Table 9: African grey parrot harvesting level in study area at Akassa. ¹ where the collector is given as 'known', this refers to the trapper that used as a guide during the survey and 'unknown' means that someone else collected the young. ^a this is a minimum number as the number of young in one nest was not known. ^b this is a minimum number as the number of young in four nests was not known.

Kaiama

This provided a less clear picture of the level of exploitation, but still provided an indication of pressure. The lack of clarity is probably partly because the intensity of removal of nestlings is lower, but also because some trappers were less forthcoming. In three villages (Igbedi, Sabagreia and Oyobo), there did not appear to be any currently active trappers living in the village, although the possibility of outsiders coming in periodically cannot be discounted. In Igbedi and Oyobo, generalist hunters identified several nests, but were not able to provide information on their productivity. There was an elderly ex-trapper in Sabagreia who had not collected for many years and no one seemed to have taken over this activity.

In two villages (Kaiama and Opokuma), currently active trappers revealed several nests, although in the latter case, this was admitted to be an incomplete picture as the trapper only searched for nests when he had word that his colleagues from Yenegoa were coming to catch birds. He had not heard this year that they were coming and so had not searched thoroughly for currently active nests. Therefore, nests that had been active last year were revealed. The Kaiama trapper also claimed that he had not searched thoroughly this year as he planned to collect birds later in March or in April. All of this meant that a detailed assessment of the level of exploitation could not be made.

Ekonganaku

There was a significant level of trapping activity in Ikpan Forest Block, even though the trappers acknowledged that their trade was illegal. They also accepted that whilst it appeared that Ikpan Forest still harboured a good population of parrots, it was declining. The 'head trapper' pointed out that his catch has been declining and he believed that parrots were becoming familiar with their trapping technique and were therefore able to avoid their trapping stations. This appeared to have forced trappers to roam over larger distances in the forest to search for unwary parrots and this may take them into the National Park. In addition, this means that new trails are often cut and at each new site, Indian bamboo and young palms are cut to make traps.

He carried out parrot trapping throughout the year with peaks in the dry season months, as rain makes the gum almost useless. He does not know how to train parrots but buys his parrots from a dealer in Port Harcourt. The trained parrots which he bought at NGN8000 (=USD73) each three years ago had been kept by him at home with most of the flight feathers plucked. He feeds them mostly on oil palm fruits and seed such as maize, blackweeds, groundnuts, rice grains beans etc.

Almost any faunal species of reasonable size can be trapped (using wire or metal snares) or shot (using single or double barrel 12' bore guns crafted locally) in this area. Primates such as the mangabey *Cercocebus torquatus*, drill and Preuss's red colobus have been traded for bush meat in the area. Forest duiker, bush pig, dwarf crocodile and forest buffalo have also been reported for sale as bush meat from time to time. It is notable that in and around the Ikpan Forest Block it is stated that a large portion of bush meat comes from Cameroon, indicating cross-border trade.

3.4.4. Mortality

Obtaining reliable estimates of mortality is difficult. This is because the capture and trade is known to be illegal and whilst it is carried out in the open in some areas, those involved in the trade do not tend to be very confiding to strangers. A second reason that made it difficult to obtain a precise figure for the number of birds that died in Akassa between removal from the nest and sale to dealers, was that dead birds do not fetch any money. Therefore, the trapper in Akassa could say how many birds he had sold so far in the season, but was not interested in how birds had died as he had not earned any money from them.

Information of mortality was obtained from two sources. First, although the trapper in Akassa could not say how many birds had died, it was possible to obtain a maximum estimate from other information that he provided. The young birds that he collected are given in Tables 2 and 3 in Section 3.2.1. Addition of all those that he collected (i.e. collected by 'known' in the tables), indicates that he had obtained 51 young during the season from this area. Although the area surveyed is likely to be close to the maximum area searched by the trapper, it is not certain whether he obtained young from nests outside the survey area. Therefore, 51 should be considered the minimum number collected by him.

The trapper reported that he had sold a total of 29 birds so far this seasons and that the remainder had died. This means that 22 birds out of a minimum of 51 had died. This gives a maximum mortality of 43%. Given the area searched by the trapper and the effort involved in finding nests and returning to collect young, it seems unlikely the number of young collected by him will have be much larger than 51 during the season.

It was stated that a main reason for the deaths is that birds are removed the nest too early. If this trapper were the only one operating in the area, he would leave many young birds in the nest longer than he currently does. However, some birds he removes are too young as he is afraid that another trapper will take the bird before he returns to collect it when it is mature enough. The likelihood that these very young will not survive is reflected in the much lower price that they fetch.

The second stage where a figure for mortality was obtained was in transit to a major dealer centre. A former dealer in Calabar who was still familiar with the dealers and trade in Calabar stated that he had recently seen three 'cartons' (about 45cm x 30cm) arrive with up to ten birds in each. He said that mortality was high, with three or four birds out of 10 arriving dead. He said that this was because some trappers who send the birds do not have the time to feed them. These young birds require feeding individually by the trapper or dealer, and it is this that greatly increases the chance that they die. The difficulty in keeping these very young birds alive accounts for the high mortality reported by the trapper in Akassa, and the lower price that they are sold for.

The generality of these figures for mortality is clearly not known. However, if they do have broad applicability for these two stages in the trade, they would mean that for every 100 birds trapped, 43 would be dead before leaving the trapper and of the surviving 57, 34-40 would reach a market such as Calabar. That is a mortality rate to this stage of 60-66%.

3.4.5. Dealers, markets and trade

Dealers and markets

Port Harcourt. The trapper in Akassa reported that dealers from Port Harcourt would travel down to his village to buy parrots, although there was a dealer in the village of Khongo nearby. This dealer guarded the sources of his birds very closely and would not reveal their whereabouts. First he stated that they were active in Sapele, which lies to the north-west, and that he was sending birds to Lagos. This did not make sense as Sapele is far closer to Lagos and so birds would be taken directly, rather than via a long and difficult journey south through the Niger Delta to Akassa and then back north again. With time, and through discussions with the trapper that we used as our guide, it did become apparent that Port Harcourt was a far more usual destination for birds trapped in Akassa.

The two principal bird/animal markets (Mile 1 and Mile 3) in Port Harcourt were visited. In Mile 1, only African grey parrot was seen, and this had reportedly already been sold for NGN8000 (USD73). The dealer said that he had 10 more birds and a friend of his a further 4-5. He said that he could get more if there was demand.

At Mile 3 there was only one trader involved with wild birds. He had no African grey parrots and said that a dealer had placed a big order for the species and so was buying up as many as could be provided. This meant that there were few available more generally. He said that this buyer had gone to Abua (a place near Ikodi; see Section 3.2.2) to buy birds. The trader that we spoke to had sold birds to

this buyer for NGN7500 (USD68). He claimed that this buyer was prepared to spend two million Naira (USD18,200) on African grey parrots and whilst this may be exaggerated, it would appear that a large order is being satisfied. If all birds were bought for NGN7500 (USD68), this amount of money would buy more than 250 African grey parrots.

A small stall outside the Port Harcourt Polo Club had four African grey parrots for sale: two young and two adults. The price was NGN6000 (USD55) each.

Calabar. Discussion with the ex-dealer that we met in Calabar (see Sections 2.4.4 and 2.4.5) provided information on the trade from the forests of south eastern Nigeria and Cameroon. There were four main traders currently operating in Calabar, of which one is considered the principal dealer. People bring birds from the forest to sell to him and he will then fly with them to Lagos. He flies to Lagos every week or two weeks and can take as many as 200 or more each time. Although the season for his trips was during the survey period, birds are brought in for sale until May.

It is unlikely that many parrots will be seen in the markets as few birds are sold in Calabar itself. Most of the birds are kept at the dealers' houses. The dealers buy the youngest birds, which still need to be fed by hand, for NGN500 (USD4.50) each and the older, more independent ones, for NGN1000-NGN1500 (USD9-14). When the younger ones can feed for themselves, they are sold for NGN1000-NGN1500 (USD9-14), and the older birds are sold for NGN2000 (USD18). Four birds from a recent consignment were sold for NGN8000 (i.e. NGN2000 each [USD72, i.e. USD18 each]). Adults are also involved in the trade and the ration of young to adult birds available in Calabar depends upon what trappers bring in from the bush and this varies from time to time.

The week before the site was visited he had seen a consignment of three 'cartons', each of which he estimated was holding up 10 birds (based on his previous experience when he was involved in the trade). Each carton was an estimated 45cm x 30cm with airholes in the side. Smaller containers are used sometimes and about six birds are kept in each one.

The ex-dealer reported that a Cameroonian woman brings parrots in by boat from Cameroon and has brought up to 400 or more African grey parrots in at a time. She comes to Nigeria every two weeks or so, although the frequency is very variable and it can be more or less often. Some men also come from Cameroon but it was not clear what numbers of birds they brought in. The woman has two big wooden crates, and there may be up to 200 or so birds in each one. She does not sell in Calabar, but takes them directly to Lagos herself.

Some ships that call in at Calabar have crew that buy parrots. The main port for birds coming in by boat is Orun. The ex-dealer was vague about which bush areas birds come from, apart from mentioning Ikun, Cameroon and 'across the water'. Ikun may refer to Ekiang, where the road crosses the border into Cameroon and seems likely to include to this whole forest area north of Calabar. Bakassi was a source of birds in the past, but since the eruption of trouble and the presence of the army in the area he believed that birds no longer came from there.

This ex-trader reported that the volume of African grey parrots in trade in Calabar is now much higher than it was 10 years, mainly because the economic value of the birds was not known then.

Kano. In the company of Sulaiman Abubakar Fagge, the principal market for selling birds, Abubakar Rimi Market, was visited. Discussions were held with three of the traders, who all dealt mainly in birds, although some other species are also involved. A new traders' association was reportedly being formed and this was to comprise the nine main traders plus their sons and brothers etc. The objective of the association was stated as the improvement of liaison and communication between traders. Eight of these traders sell African grey parrots.

Birds in the market were reportedly brought up to Kano by general traders who travel down to Port Harcourt, rather than people dealing specifically in wildlife. If these traders see parrots for sale they

will buy them as they know that they can sell them in Kano. Allegedly there were about 100 sold in the entire market during a year and they were sold mostly to Nigerians who keep them in cages.

One dealer typically bought at NGN3500-4000 (USD32-36) and sold for NGN4500-5000 (USD41-45). A second dealer would buy at NGN2500 (USD23) and sell at NGN2800 (USD25), being more interested in dealing in bulk. This latter dealer said that it had proved more difficult to obtain birds this year, but 20 young and 20 adults were the maximum that he could sell in a year.

A Nigerian conservation colleague in Kano reported that when he made the Hajj pilgrimage to Mecca in 1997 or 1998 he was in Jeddah when an empty chartered plane flew in to take the pilgrims back to Nigeria. About 20 cages, each containing a single parrot, were taken out of the passenger cabin and into the airport. He says that they fetch a lot of money there.

Lagos. Twenty-three birds were seen for sale at Iddo Market, where prices ranged from NGN7000 (USD64) for two young to NGN10,000 (USD91) for two very young birds or two adults. Earlier in the week many parrots had been seen crated up and ready for shipping. Birds, including up to 6-8 African grey parrots were regularly seen for sale in small cages at a stall at the African International Bank roundabout.

3.4.6. Trade in traditional medicine

An unpublished report by Gerhard Nikolaus to the Nigerian Conservation Foundation stated that African grey parrots were found in 17 out of 24 traditional medicine or 'fetish' markets visited throughout the country between 22 August and 10 September 1999. The markets visited were those that sold 200 bird species used in traditional medicine (fetish, juju or black magic). The markets visited and the number of African grey parrots found in each is given in Table 10. The African grey parrot is important because it is believed to give intelligence (Nikolas 1999). All birds are sold by people from the Yoruba tribe from the south-west of the country and are mostly run by women. The practice is kept within families as it is only certain people who are able to turn a dead bird into a medicinal product.

Market	No. African grey parrots	Market	No. African grey parrots	Market	No. African grey parrots
Lagos 1	0	Kaduna	0	Calabar	3
Lagos 2	2	Kano 1	3	Ikot-Ekpene	1
Ibadan	3	Kano 2	0	Port Harcourt	1
Ife	2	Jos	6	Onitsha	22
Ilese	2	Akwanga	0	Ore	0
Oshogoto	8	Lafia	0	Ijebu-Ode	5
Ilorin	7	Makurdi	1	Epe	1
Jebba	2	Ikom	0	Abeokuta	4

Table 10: Number of African grey parrots recorded at traditional medicine markets by Nikolas (1999).

The markets in Lagos, Oshogbo, Ilorin, Kano, Onitsha, Ijebu-Ode and Abeokuta are considered the main markets and traders travel to smaller markets from here. Many of the birds were considered to had been in the markets for a long time and so the annual turn over for medicinal purposes was not thought to be high.

3.4.7. Attitudes

Many people that were encountered were not especially aware of the African grey parrot. Those that were aware of it, mainly considered the African grey parrot as a resource that could earn money,

although some rural villagers did have a fondness for seeing the and respected for their intelligence. Indeed, several trappers and others reporting that birds could learn to take measures to avoid being trapped when they had seen other parrots be caught.

There was little awareness of its conservation plight, although the situation at Ikodi seems remarkable in that the villagers do have a real regard for the African grey parrots. The collection and sale of moulted red feathers by the village children does mean that there is a minor sustainable economic incentive to maintain this roost. Above this, however, there does seem to be a pride that this roost has received outside attention. Despite this, there is now a feeling that their efforts to conserve the roost (including the loss of life: see Section 3.2.2) have not brought any major benefits to the village, in terms of a doctor or dispensary, active bore holes for water or a road.

Finally, it was commented in Abuja, that God must have had a purpose in designing the African grey parrot with such mimicking abilities. Perhaps this purpose was that the species should live with humans.

4. Discussion and recommendations

The most striking results presented here are the direct evidence of intensive harvesting of birds at the sites that were visited, and the subjective information obtained on the scale of trade through major cities. Together these imply that the trade in African grey parrots is far in excess of that reported in international trade through CITES. Most of this trade appears to be international.

4.1. Pressures

4.1.1. Trapping pressure

The evidence that parrots were heavily trapped was most conclusive in the mangrove forests of Akassa, where considerable time was spent gaining the confidence of a trapper who collected young parrots from the nest and who had intensively searched the forest around his village. A dealer in the main village of Akassa, Khongo, was also seen to have many young birds from different trappers in the area. Further north, in the cultivated land with tiny, scattered swamp forest patches around Kaiama on the Orashi River, the picture was not so clear. This seemed to be because of the fragmented nature of land-holdings and there was a greater reluctance to talk in as much detail as in Akassa. This could have been due to the lack of the trust compared with that gained in Akassa through association with the Akassa Community Project there (see Acknowledgements). However it did seem that the African grey parrot habitat was highly disrupted, there were more opportunities for making money from agriculture and less interest by younger people to learn the African grey parrot catching skills as trappers age and retire.

Nonetheless, the locations of many nests were known and direct ownership of land could mean simply that harvesting was not so competitive as in Akassa and that trappers were simply letting young birds reach a reasonable age before harvesting them. Allegedly outsiders usually visited each year to catch adult birds and the ease of access to a major town, such as Yenegoa, would easily allow access. Trapping of adults was also widely practised in the Oban Hills, where information was considered to be reliable. Consequently, although obtaining completely objective estimates from several sites was not possible in the time available, it is evident that there is widespread harvesting of both young and adults. Whether it is young or adults, or a combination of both, that are harvested seems to vary from place to place according to skills that locals have and the accessibility to outsiders with different skills.

What is open to question is the exact degree of harvesting: i.e. the exact proportion of the population that is being removed. It would be exceptionally difficult to obtain reliable estimates of the number of birds that are removed from the population either as adults or young at a reasonable sample of places. This is both because field research is very time-consuming as it is not always possible to build a sufficiently close relationship with a trapper, and because of the security concerns that are widespread through African grey parrot areas. However, in order to design a management strategy for this species

in Nigeria, knowing the exact proportion of the population that is being harvested is not necessary at present. This is because the evidence collected so far suggests that it is not sustainable.

All nests at Akassa that are found are harvested of all birds. Elsewhere the location of nests tends to be known by land-holders or others who have a reputation in the village as parrot trappers or general hunters. Given the financial incentive to collect the young, or pass on the information to others, it seems likely that nests in these areas are similarly harvested, although perhaps a few do escape each year. Finally, the presence in areas visited of outsiders who travel from place to place, trapping adults at roosts using tame birds, means that there is certainly a considerable amount of pressure on wild parrot populations.

The most worrying element of this is that although the population of African grey parrots will decline as adults are trapped and habitat is lost over the next few years, the very low level of recruitment into the adult population means that the population is likely to crash at some stage in the future. This is because as adults die there will be too few youngsters to replenish the population.

Adding to the evidence from the wild is the admittedly anecdotal evidence from trappers and dealers. As all of the participants know that their trade is illegal obtaining much detailed information is not easy. The information gained in Calabar, however, was alarming and suggested that the trade in parrots had increased over the last 10 years and now includes birds coming across the border from Cameroon. Although it appears that there is a market in Nigeria for some birds, mainly amongst foreigners apparently, the consensus is that the African grey parrots are leaving the country, mainly from Kano and usually on charter flights towards the end of the birds' breeding season (e.g. Hajj flights). The small number of birds purchased by foreigners is part of the visible trade in African grey parrots, whereas it appears that the large numbers of birds reported to leave Kano on Hajj flights are not seen openly in markets are a traded by Nigerians.

4.1.2. Habitat loss and fragmentation

An additional pressure is the increasing fragmentation of African grey parrot habitat. African grey parrots require habitat for food, nesting and roosting and so these must be provided in sufficient quality and quantity for viable populations to survive. Not all of these requirements may be available in the same area. For example, birds were often seen flying to and from the roost at dusk and dawn respectively. This implies that suitable roost sites are not necessarily in areas where there is sufficient food. At Akassa, many nests were found in mangrove, and birds would roost there, but can this habitat provide food for parrots? Although there are fringing rainforests along the coast, and historically freshwater swamp forest would have occurred along the upper reaches of the major rivers of the Niger Delta, the increasing degradation and fragmentation of these food-providing patches may mean that parrots have to fly further and further from the roost or nest to feed each day. If this is the case, then the birds may be placed under considerable food-stress, either now or in the future.

A second example is the roost at Ikodi. Although the Upper Orashi forests (see Section 3.2.3) are not very far away, the distribution of other food resources within the usual daily commuting distance of African grey parrots is likely to have been changed considerably over time. All of this means that the mosaic of resources that parrots require must be managed at the landscape level if African grey parrots are to have a healthy long-term future in Nigeria.

4.2. Addressing the pressures

4.2.1. Legislation

The national legislation regarding this project (i.e. international trade in African grey parrots) is clear: the Endangered Species Decree of 1985 states that hunting, capture and wildlife trade are prohibited and that there should be no permits issued for trade in this species. This is widely interpreted as referring to domestic capture and trade as well, although this is not explicit from the Decree. Despite this legislation, CITES export permits were issued until October 2000 and are now being issued again. The enforcement of the Endangered Species Decree is poor and there is a large illegal trade in the African grey parrot and other species that are nominally protected under the Decree.

The moratorium that was implemented by the CITES Management Authority in October 2000 until early 2001 was prompted by concern that there was insufficient information on the country's threatened species to ensure that they were being adequately protected by the existing legislation. Fulfilling the conditions that were laid down for the lifting of the moratorium (see Section 3.4.1) should have involved a wide range of actions, and the result presented here could contribute towards the information required to assess the situation of the African grey parrot in Nigeria. The first condition was a review of the status of Nigeria's species as part of an overhaul of the Endangered Species Decree. The results obtained here would suggest that the African grey parrot is currently very persecuted and should receive the highest form of legal protection that is possible. This means that a moratorium on trade (international and domestic) should be put in place immediately until it can be proven that trade is not having a significant impact on the status of African grey parrots in the wild.

Clarification of the relationship between the federal Endangered Species Decree and state legislation would be valuable, especially in determining the species that should be included on Schedules on any state legislation. Explicit guidance on the role of the Decree in legislating on domestic trade should also be provided.

4.2.2. Enforcement

Although the legislation in force in place at the moment states quite clearly that permits should not be issued for African grey parrots, there is clearly significant hunting, capture and trade. This is at a level that threatens the survival of the species in Nigeria. Therefore, it must be assumed that enforcement has to be improved so that the Endangered Species Decree is enforced completely. There is no doubt that this will present a considerable challenge as the financial rewards from the African grey parrot trade seem to be high enough that the those involved will almost certainly try to maintain their trade by all means possible.

Most of the people who carry out this trade know that what they are doing is illegal and so obtaining accurate figures from several sources is difficult, which in turn means that it is not easy to build up a national picture of the trade. Despite this, several conclusions can be drawn that should guide enforcement efforts.

First, there is a small number of major centres. These include Calabar, Port Harcourt, Lagos and Kano. In these places trade appears to be of two types: modest trade that is visible in markets and much more widespread trade that is kept out of the market, but which seems to involve a small number of dealers who keep birds elsewhere. Calabar and Port Harcourt appear to act as collection points for birds that come from the surrounding areas: Cross River and Cameroon for Calabar, and the Delta for Port Harcourt. Kano is reportedly the major exit point from the country, with birds (and other animals) leaving the airport. Trade in Lagos lies somewhere in between, and it is an obvious transit point from Calabar, which is connected by air to few Nigerian cities, as well as an exit point by air and sea. Smaller towns, such as Yenegoa in the Delta are also implicated as points where birds are gathered together before being moved to larger cities.

A second conclusion is that although it was stated that wildlife officers were removed from airport in Kano more than years ago, African grey parrots are so distinctive in Nigeria, and all parrots appear on Schedule 1 of the Endangered Species Decree that identification of these birds at Kano Airport should not prove difficult if relevant officers (e.g. customs) are aware of the legislation. However, specialist advice should be available, especially as it has been reported that Free Disposal Permits, which are domestic permits (see Section 3.4.1), have been used to take birds and other animals out of the country.

Third, as the financial incentives to take parrots out of the country are very high it is reasonable to assume that every effort will be made by dealers to circumvent enforcement efforts within Nigeria. Therefore, the assistance of other CITES Management Authorities should be sought to help combat

the illegal trade. Countries which should be alerted include Nigeria's neighbours and countries connected to Kano, especially by charter airlines: Saudi Arabia was frequently mentioned.

Wherever possible, the route that birds and other illegally exported animals follow once they leave Nigeria should be traced so that reliable information can be presented to Management Authorities of the countries that are transit and destination centres. It is clearly possible that some countries involved may not be signatories to the convention.

Finally, at the other end of the African grey parrot trade chain, the chances of successfully enforcing the protection that the species is entitled to under law will be equally difficult. Nests and roosts are widely dispersed and are often in increasingly inaccessible areas. Furthermore, the current security situation would make it very difficult for law enforcement officers to enter many of the communities in the African grey parrot's range. One trapper in Akassa had already made NGN45,000 (USD410) during the 2000/2001 breeding season, and in rural Nigeria this is a significant amount of money. The day-to-day pressures of life meant that conservation concerns were of little interest to many people that were encountered, although there did appear to be affection for the African grey parrot in some places. However, most villages have more pressing issues to worry about, such as the lack of water pumps, decent schooling and medical care.

4.2.3. Community programmes

At the level of local communities, it appears that the only possibility for reducing the harvest pressure on the African grey parrot is through some sort of community project that seeks to emphasise the long-term value of the African grey parrots. There is clearly limitless potential here, through sustainable harvesting (leaving one young parrot in every nest), or even putting up nest boxes, planting supplementary food and providing suitable roost trees. The over-riding need, however, is an acceptance that all of these activities are long-term and designed to ensure that the African grey parrot is a harvestable resource long into the future. The critical difficulty is that leaving one young bird in a nest hole means that the trapper will not be maximising his short-term financial gain. Convincing the trappers that they should take a drop in income in the short-term to ensure long-term income will be extremely hard. Even if methods were used to try and enhance the population's reproductive output at a site (nest boxes etc), the trapper's inclination would be to take and sell all the young that are produced

Part of the reluctance to leave birds is that in some areas there is no land-ownership and there are no parrot-collecting rights. Therefore, it is perceived, and rightly, that if a trapper does not harvest the young from a nest, then a competitor will. This is the fear that leads to young parrots being taken before they are fully independent (see Sections 3.4.4 and 3.4.5) and thus presumably contributing significantly to mortality. However, there is also a belief that financial gains should be maximised all the time and there appears to be no long-term planning, certainly with regard to parrot harvesting.

The striking example that may provide a model way forward is Ikodi (see Section 3.2.2). This is a community that has recognised that the income that they can generate from the sale of dropped parrot feathers is valuable to the children that collect them. Indeed, some children report that the income from this assists considerably with the payment of their school fees. As a consequence, the community guards its roost and has suffered loss of life as a result. As this is the largest known roost in Nigeria at the moment, and it has received a considerable amount of media attention, it seems ideal for a project that ties community development to the conservation of the African grey parrot's roost very closely.

The village at Ikodi has suffered from the lack of infrastructure that was evident in other villages. Working with the village to provide such resources (such as a bore-hole), whilst at the same time emphasising the link between such support and the conservation of the African grey parrot would help reinforce the community's pride in 'their' roost. This would also provide the opportunity to carry out biological assessments on the roost to ensure that it will survive (e.g. age-structure and recruitment

into the oil palm population). Once a working relationship is established, it may prove possible to provide long-term aid to the community, such as a doctor.

Such a project could involve both an international organisation, such as the World Parrot Trust, and a local organisation with experience of working with rural communities. This would ensure that the needs of both the African grey parrots and the local community were being balanced. Although there are no other large congregations of parrots known at present, any new ones that are discovered should be considered for such a programme.

4.2.4. Raising awareness

The financial benefits from the dealing in live African grey parrots is a significant motivating factor in the continual illegal trade and represents a major obstacle that conservation efforts must overcome if the species is to survive. However, modest awareness-raising efforts may have some benefit in reducing this pressure on wild populations.

These awareness-raising efforts should range from making relevant officials (e.g. customs, police, immigration and the judiciary) aware of the Endangered Species Decree and exactly what it means. A single workshop, with appropriate supporting materials may play a major role in meeting this need. The Nigerian Conservation Foundation is seeking to run just such a workshop. People with a genuine interest in natural history are familiar and concerned about the African grey parrot. Developing a network of regional contacts (e.g. one in each state) with some responsibility for gathering information about the status of the species could serve to gather information very rapidly as well as publicise its plight. Each contact could then serve as the focus for gathering information and making the media aware of major stories within their state.

A small number of African grey parrots continue to be purchased by expatriates working for multinational companies and embassies. It is likely that these purchases are mostly made in ignorance of the status of the species and post-capture mortality rates. Therefore, letters addressed to these organisations indicating the relevant law and the plight of the African grey parrot would be of value in reducing this pressure.

4.2.5. Reducing demand

There is no doubt that the single biggest contribution to the conservation of this species would be the drastic reduction and even elimination of the demand for this species in captivity. The characteristic that sets this species apart from other species in the pet trade is its ability to mimic and thus 'talk'. This means that many people who would otherwise not keep parrots have a single bird in their homes. How can the resultant demand on wild populations be reduced? There seems to be two alternatives. First is to eliminate the desire of people to keep the birds and second is to meet the demand without taking birds from the wild.

There are very strong cultural reasons why some people will always wish to keep African grey parrots in their homes. Whilst it may be possible to alert people to the consequences of continually buying parrots, it seems likely that this will take a long time, because first the market(s) for Nigerian birds must be traced. The time that all of this will take is probably time that the African grey parrot in Nigeria may not have.

The second possibility is ranching African grey parrots. Captive breeding outside the range States is likely to be economically challenging. Captive breeding African grey parrots is not easy and where birds are widely bred (e.g. Europe and North America), they are typically very expensive. This means that wild caught birds are likely to be much cheaper than birds reared in these countries, where there is captive breeding expertise. There does not appear to be any captive breeding expertise in Nigeria and certainly on the scale that would be needed to dent current demand.

Large-scale captive breeding may demand some consideration, especially when the impact of trade across the whole of the species' range is considered. However, the scale of demand is huge, as

indicated by the recorded international trade from some range States (see Table 2 on page 8) and a huge output would be required very rapidly for this option to succeed. It would also need to be very tightly controlled to ensure that ranching operations are not used to 'legitimise' wild caught birds. This could happen if wild caught birds were given certificates to say that they originated from legitimate African grey parrot ranches.

4.2.6. Research needs

It should be stressed that the overwhelming threat to the survival of Nigeria's African grey parrots from overexploitation does not require any demanding research to further understand. If the African grey parrot is to have a chance of surviving the appropriate harvest and trade restrictions should be enforced much more vigorously until an appropriate mechanism for managing it is in place, and is being adhered to.

As pressures on land are also significant, however, the African grey parrot's habitat is also under threat. At present the African grey parrot is mainly confined to two habitat types, mangrove and lowland rainforest. The species also persists in areas where lowland rainforest and freshwater swamp forest have been partly degraded and replaced by plantain and other crops. Different habitat types seem almost certain to provide different resources to the African grey parrot (see Section 4.2) and so the exact nature of the mosaic of vegetation required to maintain a healthy African grey parrot population over the long-term is not yet clear. For example, whilst the mangrove forest does provide both roost and nest sites for the African grey parrot it seems unlikely to provide much in the way of food. If this is the case, then the only mangrove forests that will hold the African grey parrot will be those that are close to areas where food is contained. Therefore, it is not just the maintenance of areas of suitable habitat that is important, but the distances between them.

Key questions that should be answered before any more forest is lost and thus African grey parrot habitat patches become more fragmented, include:

1. which forest types provide which resources (food, roost, nest) to the African grey parrot;
2. where are suitable areas that provide these resources; and
3. how far do parrots fly between patches of forest that provide these different resources.

The issue of forest blocks becoming too far apart to support a parrot population has been proposed as an important factor in the likely survival of the cape parrot in KwaZulu Natal in South Africa (Snyder *et al.* 2000). A spatial analysis of the most recent vegetation maps of the distribution is required, bearing in mind that the data vegetation data analysed here were collected in 1992-3. Oil companies operating in the Niger Delta might be one such source of up-to-date information.

It should be borne in mind that the necessary resources may not be dispersed equally throughout the available habitat. For example, the observation made above on the distribution of tall mangrove trees (Section 2.2.1), if supported by more detailed assessment, may mean that the African grey parrot is restricted to only a small part of the mangrove forest, and is not widespread throughout the extensive mangroves are seemingly currently perceived. This would mean that assuming that all mangrove forest supports the species would constantly over-estimate its current extent of occurrence. This pattern may be due to the distribution of nutrients that are brought into the mangrove by the regular tidal flow of the estuarine river system: more nutrients are available to trees where river flow allows sediment to build, such as around river and creek mouths.

The Environmental Conservation Division does have a Protected Areas Programme and appropriate preparations should be undertaken so that the Programme is able to act upon the results of the research outlined above, as soon as they are made available. For example, it may prove necessary to adequately protect areas of evergreen and swamp forest that lie close to mangrove forest if a mosaic of these different forest types is necessary to ensure that the African grey parrots' needs are met in the long term.

5. Recommendations

These recommendations are based on the Results (Section 3) and the Discussion (Section 4) above and so the appropriate background is not repeated here. Please refer to those sections for further details if required as the rationale is explained more fully there.

5.1.1. Legislation

- 1) The moratorium on exports of the African grey parrot should be re-imposed indefinitely, in accordance with the Endangered Species Decree.
- 2) Although the Endangered Species Decree states that no permits should be given for international trade in African grey parrots, the Decree is widely perceived as in need of revision and it is thus seen as now being out-of-date. Therefore, it should be revised as a matter of urgency. This will involve drafting the text, assessing which species should be included on which Schedules and then passing the law.
- 3) The role of federal legislation, especially the Endangered Species Decree, in providing law on the domestic trade, especially within and between states should be clarified. If this clarification suggests that there is a need to draft state legislation so that movement of parrots within the country is properly managed, then this should be done.

5.1.2. Enforcement

- 4) Enforcement should be strengthened in the key cities so that the Nigerian government can meet the obligations that it accepted when it ratified CITES. Key cities include Calabar, Port Harourt, Lagos and Kano: the areas where trade takes place are well-known, and determining the key traders would not be difficult. Smaller centres such as Yenegoa should also be subject to improved enforcement. The major need is for an elite intelligence unit that should gather information on dealers and routes.
- 5) Kano clearly provides special challenges, both because of the alleged volume through the airport and because enforcement seems more difficult on the charter flights that leave this airport. Nonetheless, additional enforcement should be provided here, including specialist staff from the CITES Management Authority (Federal Ministry of Environment) so that no parrots, or other species protected by national law or international conventions pass through the airport. There is also a flourishing cross border trade around Calabar and improved enforcement is also required at this international border.
- 6) There is a need for a coherent national policy for confiscated animals. This should be developed in advance of improved enforcement so that there is clear strategy on handling confiscated animals and the facilities to accommodate. The long-term destination of such animals should be considered, and this should include the likelihood of disease being transmitted to wild birds if confiscated birds are released.
- 7) Regional co-operation in CITES enforcement should be enhanced in West and Central African countries. In particular, a clear means of gathering and disseminating intelligence should be established. This need not be a large and unwieldy structure, as it is likely that there are relatively dealers and routes. Even if this is not the case, once some dealers and routes have been uncovered, others can be addressed. Technical assistance from outside the region may be required to implement this.
- 8) Specific assistance in stopping illegal shipments should be sought from other CITES Management Authorities, especially Nigeria's neighbours and in countries suggested as destinations for trade leaving Kano, such as Saudi Arabia.

- 9) Whilst support from relevant CITES Management Authorities is being sought, the trade routes used once the African grey parrots have left Nigeria should be traced. This will allow very targeted action to be taken at key points in the route so that CITES can be enforced.

Community programmes

- 10) A comprehensive community management should be initiated at Ikodi as quickly as possible. This should seek to serve as a model programme rewarding local efforts to conserve the African grey parrot and linking development to conservation of biodiversity through the African grey parrot. This should involve an international organisation with appropriate parrot conservation experience and a local organisation that understands rural communities in this area.
- 11) An additional site should be selected for a trial to see if trappers are prepared to start a sustainable harvesting programme, in which not all young are removed from all nests each year. It may also be appropriate to use nest boxes to see if the productivity of the African grey parrot population can be increased. An appropriate site for such a trial would be one where there is some degree of ownership (either individually or collectively) over the land and this can be reasonably enforced.

Raising awareness

- 12) Raise awareness of the Endangered Species Decree and its practical implications amongst all relevant enforcement staff (e.g. customs, airport and seaport authorities).
- 13) Consider whether a network of key contacts can be established in each state to gather information on African grey parrots and publicise their plight, illegal activities etc.
- 14) Multinational companies and diplomatic missions operating in Nigeria should be asked to inform their staff, especially the expatriates, of the Endangered Species Decree and CITES, and the detrimental impact that the trade in African grey parrots and other species has on wild populations.

Reducing demand

- 15) A critical assessment of the practicality of large-scale captive breeding operations should be undertaken to see if sufficient birds can be produced cheaply enough to dent demand on wild populations.

Research

- 16) Further research is not urgently required to address the most critical problem facing the African grey parrot, but it is required if the species is to survive into the medium and long-term. Key research questions that should be addressed, ideally before any parrot habitat is lost and fragmented include: which forest types provide which resources (food, roost, nest) to the African grey parrot; and where are suitable areas; and how far do parrots fly between areas that provide these different resources. At the same time renewed impetus should be given to the Environmental Conservation Division's Protected Area Programme so that it is able to act once key unprotected areas have been identified.

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