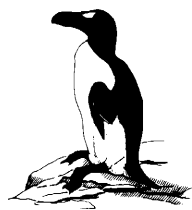


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PERSPECTIVES IN ORNITHOLOGY

CURRENT BIRD CONSERVATION ISSUES IN AFRICA

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BIRD CONSERVATION is low on the agenda in Africa. This is hardly surprising. According to the World Resources Institute (2000), life expectancy across the continent averages only ~51 years (compared to ~65 globally), the mean per capita gross domestic product is ~\$760 per year (compared to ~\$5,260 globally), and the mean national female enrollment into primary school is ~60% (compared to ~83% globally). Nevertheless, the continent holds over 2,000 bird species, 20% of the planet's total, of which nine-tenths are African endemics and most of the remainder are winter visitors from the Palearctic (Dowsett and Forbes-Watson 1993). Further, about 200—one in six—bird species considered globally threatened with a “high probability of extinction in the wild in the medium-term future” are broadly African (BirdLife International 2000). The need to conserve those birds is clear, from moral and aesthetic viewpoints, utilitarian economic viewpoints, and above all as functioning parts of the very ecosystems that sustain Africa's people (Diamond and Fillion 1987). How are we to achieve that, though, given the many demands higher on African political agendas? Here, we highlight three broad sets of issues that must be addressed to conserve Africa's avifauna: data, planning, and—most importantly—implementation. Further, as a theme running throughout those issues, we cannot

overemphasize the importance of ensuring inclusive participation and empowering a broad local constituency for conservation.

Data issues.—The most urgent data requirement for African bird conservation is distributional information: we cannot protect the continent's birds if we do not know where they are found. Large areas remain almost unexplored by ornithologists, with recent expeditions to the Congo, for example, breaking new ground in our knowledge of African bird distributions (Dowsett and Dowsett-Lemaire 1989). Equally, many areas have not been visited in recent years and updates of their avifauna are desperately needed: the 1999 Mt. Namuli survey in northern Mozambique is an exemplary case (Ryan et al. 1999). Perhaps the widest frontier for fieldwork in African conservation ornithology is at a behavioral level, with the insights available from species-specific studies again and again proving critical for management. Good recent examples involve some of the continent's rarest bird, including *Picathartes* (Thompson and Fotso 1995), *Macronyx sharpei* (Muchai 1998), and *Turdoides hindei* (Njoroge and Bennun 1999). Such work forms the essential basis for continental (e.g. Collar and Stuart 1985) and regional (e.g. Bennun and Njoroge 1996) Red Lists.

Such fieldwork goes hand in hand with refinements of alpha taxonomy. Most exciting, of course, is the fact that the continent undoubtedly holds further species as yet wholly un-

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known to science. Witness to that are the 26 new African species that have been described in the last two decades (van Rootelaar 1999); the subsequent description of *Stiphornis sanghensis* (Beresford and Cracraft 1999) adds another species to this total. Astoundingly, these include two new genera: *Xenoperdix* (Dinesen et al. 1994) and *Cryptosylvicola* (Goodman et al. 1996). Equally, field-based revision of poorly known groups is revealing the specific status of numerous taxa, for example, in the *Certhilauda curvirostris* lark (Ryan and Bloomer 1999) and *Otus rutilus* scops-owl (Rasmussen et al. 2000) complexes. Less glamorous but no less important is the job of synonymizing taxa that may not merit specific status, such as *Malaconotus monteiri* (Williams 1998).

A final data issue is the importance of releasing biodiversity data into the public domain and, especially, of repatriating them to Africa. Initiatives within the continent have had remarkable success at that, with the publication of increasingly detailed national-level avian datasets such as those for southern Africa (Harrison et al. 1997) and Uganda (Caswell et al. 2001). Ironically, given that the vast majority of specimens from the continent reside in Europe or the United States, the publication of African data from outside the continent seems to have slowed in recent years, maybe because of a surprising and unfortunate reluctance to make data available. A happy exception is the outstanding *Birds of Africa* series (Brown et al. 1982, Urban et al. 1986, 1997; Fry et al. 1988, Keith et al. 1992, Fry and Keith 2000). Encouragingly, the rapid growth of the internet in Africa (for example, the hundred fold increase in PC users in Nigeria in the last two years) suggests that increasing quantities of bird data should become available within the continent and globally on the World Wide Web over the next few years (Sugden and Pennisi 2000). That will necessitate the implementation of careful standards to prevent misuse (e.g. commercial resale) of data (Graves 2000), but such dangers are minimal in the African context.

Planning issues.—As ornithological data are collected and become available, the next key issue facing African bird conservation is to put those data to use in conservation planning. At a global scale, several conservation organizations have taken the lead in integrating bird and other biodiversity data with information

on threats and opportunities to set geographic priorities. The best examples are BirdLife International's *Endemic Bird Areas* (International Council for Bird Preservation 1992, Stattersfield et al. 1998), Conservation International's *Hotspots* (Mittermeier et al. 1999, Myers et al. 2000) and WWF-US's "Global 200 Ecoregions" (Olson and Dinerstein 1998, Burgess et al. 2001). Although those exercises have clearly been conducted at differing resolutions—they cover ~5% of Africa with 41 priority regions, ~5% with 5 regions, and ~40% with 32 regions, respectively—overlap between them is considerable (da Fonseca et al. 2000). Further, finer resolution studies conducted at a continental level reveal reassuringly similar regions—the Upper and Lower Guinea forests, the Albertine Rift, the Ethiopian Highlands, the Eastern Arc, and the Cape Fynbos, plus Madagascar and the other offshore islands—as the highest priorities (Brooks et al. 2001a).

However, moving those global- and continental-level priorities down to the regional and national scale remains a major challenge. A critical issue here is that as the area considered decreases, it becomes more and more important to have local, up-to-date, information on which to base priority-setting, and to incorporate views of all local stakeholders to ensure conservation recommendations are implemented. Further, it is essential that the biological data are integrated with socioeconomic data to determine conservation priorities for the real world. One tool that has been successfully used to bring such participation into a rigorous priority-setting framework is the Conservation Priority-setting Workshop (Hannah et al. 1998), with key African examples to date being from Madagascar (1995, Antanarvario), the Upper Guinea forests (1999, Elmina), and the Congo basin (2000, Libreville). Where less data exist the trend has been to focus such meetings onto underlying science, as with recent workshops for the Eastern Arc (1997, Morogoro), Ethiopia (1999, Addis Ababa), and the Sahel (2000, Bamako). Conversely—and possibly most successfully—where high-quality data are available, comprehensive conservation plans can be compiled, incorporating cutting-edge science into numerous stakeholder workshops. The only African example to date is the CAPE plan for South Africa's Cape Fynbos (Cowling et al. 1999a). Major regions lacking any significant

prioritization exercise to date include North Africa, the Sahara, the southern African miombo woodlands, the Kalahari and Karoo, the Angola Scarp, the Horn of Africa, and, most important, the Albertine Rift.

Hardest of all is setting priorities for site-specific conservation. For birds, undoubtedly the most successful work at that level has been BirdLife International's "Important Bird Areas" (IBAs) program (Bennun and Fishpool 1998). Using four criteria—the presence of globally threatened, restricted-range, or biome-restricted species, or of major congregations of individuals—to identify sites, that program has so far published site-conservation priorities for Ethiopia (Ethiopian Wildlife and Natural History Society 1996); southern Africa including Botswana, Lesotho, Namibia, South Africa, Swaziland, and Zimbabwe (Barnes 1998); Madagascar (ZICOMA 1999); Egypt (Baha el Din 1999); and Kenya (Bennun and Njoroge 1999). Directories for a number of other countries are in preparation, and a regional directory, which documents all sites of global significance for birds across Africa, is scheduled for publication in 2001. Some national accounts have had to be reviewed through desk study due to financial and logistical constraints (Fishpool 2001), potentially removing the critical local participation from the process. That problem is being circumvented both by ensuring comprehensive in-country review of the desk studies and by planning extensive ground-truthing in the near future. Another potentially major criticism, especially relevant at such fine scales (Reid 1998), is that IBAs may be insufficient to conserve biodiversity more generally. Indeed, studies have shown only poor congruence between birds and other groups in both Cameroon (Lawton et al. 1998) and South Africa (van Jaarsveldt et al. 1998). However, where comprehensive cross-taxonomic national data exist, as for Uganda (Howard et al. 2000), it has been shown that conservation priorities for birds represent other taxa remarkably well (Howard et al. 1998). Although the verdict is not yet out, the current consensus is that although conservation priorities for birds will never manage to represent all biodiversity, they are a valid surrogate in the absence of better information on other taxa (Brooks et al. 2001b).

A final planning issue of key importance to bird conservation in Africa is incorporating

ecology into conservation strategy (Cowling et al. 1999b). One obvious ecological process that has yet to be satisfactorily addressed is migration (Nicholls 1998), despite the high profile of the ~200 bird species that breed in Europe and winter in Africa (Moreau 1972). Important Bird Areas do that to some degree by including sites holding congregations of individual birds (Bennun and Fishpool 1998), but a method for measuring the irreplaceability of stopover sites to migrants—and the severity of species-specific threats to such species—remains elusive. Another, more insidious, ecological process that should be considered is "relaxation": areas that have lost extensive habitat in recent years are likely to continue losing species over at least a century, necessitating proactive conservation to halt those losses (Brooks et al. 1999). Linking these issues is the increasing realization that many species migrate even within the Afrotropics, for example altitudinally, and that many local extinctions are occurring as elevational gradients of habitat are lost (Burgess and Mlingwa 1998).

Implementation issues.—The third set of challenges facing avian conservation in Africa involves translating strategy into action on the ground. We argue that the fundamental core of conservation implementation must be the strict protection of irreplaceable biodiversity. However, we stress that for such strict protection to be both practical and morally defensible, the needs of the people affected must be addressed.

The justification for strict protection is simple: uncertainty in the ecology and economy of resource exploitation is too great (Ludwig et al. 1993). If any mistakes are made in the harvesting of small-ranged and critically endangered species or their habitats, not only are they lost locally, but also globally. Extreme examples of such species include *Geronticus eremita* (Brindley et al. 1995), *Eutriorchis astur* (Thorstrom and Watson 1997), and *Turdus helleri* (Brooks et al. 1998), whereas irreplaceable African avian habitats include the last remnants of forest on São Tomé (Atkinson et al. 1991) and the East African coast (Burgess 2000), and Madagascar's Lake Aloatra (Hawkins et al. 2000).

Critically, however, that strict conservation cannot take place without covering its opportunity costs to the people living in the vicinity (James et al. 1999a). That is the case from both a moral standpoint—in striving for equity and

redressing global resource disparities—and from a practical one—in avoiding local resistance to conservation (Norton-Griffiths and Southey 1995). The opportunity costs of conservation will increase primarily with human population density, which is unfortunate because there is a strong correlation between the distributions of people and of biodiversity across Africa (Balmford et al. 2001). As a result, overall cost of bird conservation in Africa will doubtless be high, certainly an order of magnitude or more greater than current expenditure (James et al. 1999b). Nevertheless, a few examples do illustrate that such conservation tactics are both possible and affordable. One of the most direct examples is the implementation of a conservation concession for Odzala, in Congo Brazzaville, whereby logging concessions have been bought out to put the forest into the conservation system (Aveling 2000). A less direct instance comes from Bwindi, in Uganda, where a trust fund to cover the costs of education and other community services around the reserve has been established to compensate for lack of exploitation of the forest (Hamilton et al. 2000).

In cases where the irreplaceability of species and habitats is relatively low, a rather different approach is possible. Here, costs of making mistakes are relatively low, and so the most effective conservation tactic may be to encourage sustainability in natural resource harvest. The most immediate examples of that are in direct species offtake, such as the trophy hunting of sandgrouse in Kenya (Simiyu and Bennun 2001). Equally valid is exploitation of renewable resources, for example, of grass for grazing, papyrus for thatch, or wood for charcoal (Shackleton 1993). At a broader landscape level, that strategy could involve developing sustainable management of entire watersheds, and of planning conservation corridors to link irreplaceable sites together with a matrix of “biodiversity-friendly” landuse (Dobson et al. 1999). National and international development agencies create an important synergy for conservation implementation in such situations, because often they have exactly the same goals of sustainability in resource exploitation (Benedict and Chrisoffersen 1996).

Another bird conservation tactic, which can be applied successfully regardless of the irreplaceability of the biodiversity present, is that

of nonconsumptive use of bird resources. The most common realization of that is through international nature tourism, which can bring large economic benefits in some situations (Sweeting 1999). Safari tourism to the parks of South Africa (Preston and Fuggle 1988) and Kenya (Moran 1994) is the classic example; and specifically, for instance, bird tourism can be seen in Kenya’s Arabuko-Sokoke forest (Fanshawe 1994). More significant in the long-term, however, is use of bird resources to build constituencies for conservation, through small-scale local ecotourism. An outstanding example is the construction of a canopy walkway at Kakum National Park in Ghana: since its opening in 1995, the park has jumped to receiving more than 20,000 visitors per year, many of them Ghanaian, including large numbers of school children (Schildkrodt 1996). The East Africa Natural History Society’s famous “Wednesday Morning Bird Walks” are another case of such local ecotourism (Njuguna 1989).

Such educational activities clearly overlap with the issue of capacity building. There is strong evidence that support to local conservation nongovernmental organizations, for example through BirdLife International’s Africa partnership, stimulates motivation, transparency and, critically, effective implementation (Hagen et al. 2000). One particularly exciting activity of those groups is development of “Site Support Groups” of interested local people for IBAs. Another key mechanism for the nurturing of conservation ornithology in Africa is through the Pan-African Ornithological Congress, which increasingly serves as a vehicle for the exchange of bird conservation information between African scientists (Thompson 2001). Meanwhile, most African nations have now established bird clubs (Fanshawe 1994), which further stimulate progress in conservation and ornithology, especially by attracting and retaining bright, young nationals into the field.

The broadest conservation action must be policy-level interventions. International conventions such as the Convention on Migratory Species, the Convention to Combat Desertification, the International Wetland and Waterfowl Convention (Ramsar), and especially the Convention on Biological Diversity (CBD) have yet to incorporate bird conservation fully into policy. For example, whereas 32 of the 50 African countries are party to the CBD reports submitted to the

Fourth Conference of the Parties by August 1999, few of those included accurate information about threatened or endemic birds (Herkenrath 1999). Other potentially useful policy-level mechanisms could include establishment of key conservation areas as UNESCO World Heritage Sites, and development of debt-for-nature swaps. Conservation finance is also moving towards large scale, longer-term models, especially through establishment of conservation trust funds, but there have also been some recent advances in availability of short-term funding in priority areas for conservation, such as through the Critical Ecosystems Partnership Fund (Dalton 2000).

There is no doubt that conservation tactics must be implemented with extreme care; conservation's failures to date outnumber its successes (Oates 1999). Noss (1997) gives examples where poorly planned conservation compensation schemes have merely attracted immigrants into the area, with the net effect of increasing pressure (the so-called "honeypot effect"). A further common problem with sustainable harvesting schemes is a lack of monitoring to ensure that sustainability is indeed being approached (Kremen et al. 1994). Even ecotourism must be developed with great care, to ensure that revenues from the visitors go to the residents in whose hands the future of the resource rests (Wells 1996), and to ensure that ecotourism itself does not degrade resources (Onyeonusi 1986). Newmark and Hough (2000) suggest that conservation programs in the continent will be most effective if they are flexible enough to apply different tactics in different places and situations, a conclusion with which we firmly agree.

Nevertheless, the most serious challenges to effective conservation implementation in Africa remain external. Population growth is an obvious one. Although population growth across the continent is very fast, however, absolute population is still relatively low, presenting an opportunity to conduct large-scale conservation before populations grow. Other key external factors include corruption and greed, political and social instability, poverty and disease, and war. Such unrest continues to affect much of Africa, and can set back conservation by many years (Kanyamibwa 1998). That is not to say that all bird-conservation activity in such regions must stop—Dean's (2000) compilation

of external data on the *Birds of Angola*, while the civil instability of the country remains too great to allow any work actually in-country, is a case in point. Despite that, however, conservation in Africa will ultimately depend on establishment of stable societies within which it is feasible for sustainable conservation to be conducted with and by the people living in and around areas of high biodiversity.

Conclusions.—What, then, is the outlook for bird conservation in Africa? Against a frequent backdrop of poverty and violence, the conservation of Africa's avifauna seems near impossible. Nevertheless, there are success stories, and, in a few cases, negative conservation trends are even beginning to be reversed. Overall, in our opinion, we have made major inroads in tackling the data issues and had some success with the planning issues, but have yet to have a significant, continent-wide effect at the implementation level. We must meet this challenge for bird conservation to succeed in Africa.

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LITERATURE CITED

- ATKINSON, P. W., N. PEET, AND J. ALEXANDER. 1991. The status and conservation of the endemic bird species of São Tomé and Príncipe, West Africa. *Bird Conservation International* 1:255–282.
- AVELING, C. 2000. Extension du parc national d'Odzala au Congo. *Canopée* 16:10.
- BAHA EL DIN, S. M. 1999. Directory of Important Bird Areas in Egypt. BirdLife International, Cairo, Egypt.
- BALMFORD, A., J. MOORE, T. BROOKS, N. BURGESS, L. A. HANSEN, P. WILLIAMS, AND C. RAHBK. 2001. Conservation conflicts across Africa. *Science* 291:2616–2619.
- BARNES, K. N. 1998. The Important Bird Areas of Southern Africa. BirdLife South Africa, Pretoria.
- BENEDICT, F., AND L. E. CHRISTOFFERSEN. 1996. Environment and Development in Africa: Participatory Processes and New Partnerships. Scandinavian Seminar College, Copenhagen, Denmark.
- BENNUN, L. A., AND L. D. C. FISHPOOL. 1998. Important Bird Areas in Africa. *Ostrich* 69:150–153.
- BENNUN, L., AND P. NJOROGI. 1996. Birds to Watch in East Africa: A Preliminary Red Data List. Centre

- for Biodiversity Research Reports: Ornithology 23:1–16.
- BENNUN, L., AND P. NJOROGE. 1999. Important Bird Areas in Kenya. NatureKenya, Nairobi.
- BERESFORD, P., AND J. CRACRAFT. 1999. Speciation in African forest robins *Stiphornis*: Species limits, phylogenetic relationships, and molecular biogeography. *American Museum Novitates* 3270: 1–22.
- BIRDLIFE INTERNATIONAL. 2000. Threatened Birds of the World. BirdLife International, Cambridge, United Kingdom.
- BRINDLEY, E., C. DIMMICK, C. BOWDEN, M. RIBI, D. HOFFMANN, AND A. DEL NEVO. 1995. The Bald Ibis: A species on the brink? *RSPB Conservation Review* 9:76–79.
- BROOKS, T., A. BALMFORD, N. BURGESS, J. FJELDSÅ, L. A. HANSEN, J. MOORE, C. RAHBK, AND P. WILLIAMS. 2001a. Towards a blueprint for conservation in Africa. *BioScience* 51:in press.
- BROOKS, T., L. LENS, J. BARNES, R. BARNES, J. KAGACHE KIHURIA, AND C. WILDER. 1998. The conservation status of the forest birds of the Taita Hills. *Bird Conservation International* 8:119–139.
- BROOKS, T. M., S. L. PIMM, AND J. O. OYUGI. 1999. Time lag between deforestation and bird extinction in tropical forest fragments. *Conservation Biology* 13:1140–1150.
- BROOKS, T., ET AL. 2001b. Conservation priorities for birds and biodiversity: Do East African Important Bird Areas represent species diversity in other terrestrial vertebrate groups? *Ostrich* 72: in press.
- BROWN, L. H., E. K. URBAN, AND K. NEWMAN. 1982. The Birds of Africa, vol. 1. Academic Press, London.
- BURGESS, N. D. 2000. Global importance and patterns in the distribution of coastal forest species. Pages 235–248 in *Coastal Forests of Eastern Africa* (N. D. Burgess and G. P. Clarke, Eds.). IUCN—The World Conservation Union, Gland, Switzerland.
- BURGESS, N. D., J. D'AMICO, E. UNDERWOOD, D. OLSON, E. DINERSTEIN, AND I. ITOUA. 2001. Terrestrial Ecoregions of Africa. World Wildlife Fund U.S., Washington, D.C. In press.
- BURGESS, N. D., AND C. O. F. MLINGWA. 1998. Evidence for altitudinal migration of forest birds between montane Eastern Arc and lowland forests in East Africa. *Ostrich* 69:184–190.
- CARSWELL, M., D. POMEROY, J. REYNOLDS, AND H. TUSHABE. 2001. A Bird Atlas of Uganda. British Ornithologists' Union, Tring, United Kingdom. In press.
- COLLAR, N. J., AND S. N. STUART. 1985. Threatened Birds of Africa and Related Islands: The ICBP/IUCN Red Data Book. International Council for Bird Preservation, Cambridge, United Kingdom.
- COWLING, R. M., R. L. PRESSEY, A. T. LOMBARD, C. E. HEIJNIS, D. M. RICHARDSON, AND N. COLE. 1999a. Framework for a conservation plan for the Cape Floristic Region. A Report of the CAPE Project for World Wide Fund: South Africa. Institute for Plant Conservation, Cape Town, South Africa.
- COWLING, R. M., R. L. PRESSEY, A. T. LOMBARD, P. G. DESMET, AND A. G. ELLIS. 1999b. From representation to persistence: Requirements for a sustainable system of conservation areas in the species-rich Mediterranean-climate desert of southern Africa. *Diversity and Distributions* 5: 51–71.
- DA FONSECA, G. A. B., ET AL. 2000. Following Africa's lead in setting priorities. *Nature* 405:393–394.
- DALTON, R. 2000. Biodiversity cash aimed at hot-spots. *Nature* 406:818.
- DEAN, W. R. J. 2000. The Birds of Angola. British Ornithologists' Union Checklist no. 18, Tring, United Kingdom.
- DIAMOND, A. W., AND F. L. FILION. 1987. The Value of Birds. International Council for Bird Preservation Technical Publication no. 6, Cambridge, United Kingdom.
- DINESEN, L., T. LEHMBERG, J. O. SVENDSEN, L. A. HANSEN, AND J. FJELDSÅ. 1994. A new genus and species of perdicine bird (Phasianidae, *Perdicini*) from Tanzania: A relict form with Indo-Malayan affinities. *Ibis* 136:3–11.
- DOBSON, A., ET AL. 1999. Corridors: Reconnecting fragmented landscapes. Pages 129–170 in *Continental Conservation: Scientific Foundations of Regional Reserve Networks* (M. E. Soulé and J. Terborgh, Eds.). Island Press, Washington, D.C.
- DOWSETT, R. J., AND F. DOWSETT-LEMAIRE. 1989. Liste préliminaire des oiseaux du Congo. *Tauraco Research Report* 2:29–51.
- DOWSETT, R. J., AND A. D. FORBES-WATSON. 1993. Checklist of the Birds of the Afrotropical and Malagasy Regions. *Tauraco Press*, Liège, Belgium.
- ETHIOPIAN WILDLIFE AND NATURAL HISTORY SOCIETY. 1996. Important Bird Areas of Ethiopia. Addis Ababa, Ethiopia.
- FANSHAWE, J. H. 1994a. Birding Arabuko-Sokoke Forest and Kenya's northern coast. *Bulletin of the African Bird Club* 1:79–89.
- FANSHAWE, J. H. 1994b. African Birding. *Bulletin of the African Bird Club* 1:39–48.
- FISHPOOL, L. D. C. 2001. Important Bird Areas in Africa—A preliminary synthesis. *Ostrich* 72:in press.
- FRY, C. H., AND S. KEITH. 2000. The Birds of Africa, vol. 6. Academic Press, London.
- FRY, C. H., S. KEITH, AND E. K. URBAN. 1988. The Birds of Africa, vol. 3. Academic Press, London.
- GOODMAN, S. M., O. LANGRAND, AND B. M. WHITNEY. 1996. A new genus and species of passerine

- from the eastern rain forest of Madagascar. *Ibis* 138:153–159.
- GRAVES, G. R. 2000. Costs and benefits of web access to museum data. *Trends in Ecology and Evolution* 15:374.
- HAGEN, R., F. TREMPPE, AND J.-R. KASISI. 2000. African NGO–Government Partnerships for Sustainable Biodiversity Action Project RAF/97/G13/1G/31: Mid Term Evaluation. United Nations Development Program, New York.
- HAMILTON, A., A. CUNNINGHAM, D. BYARUGABA, AND E. KAYANJA. 2000. Conservation in a region of political instability: Bwindi Impenetrable Forest, Uganda. *Conservation Biology* 14:1722–1725.
- HANNAH, L., ET AL. 1998. Participatory planning, scientific priorities, and landscape conservation in Madagascar. *Environmental Conservation* 25: 30–36.
- HARRISON, J. A., D. G. ALLEN, L. G. UNDERHILL, M. HERREMANN, A. J. TREE, V. PARKER, AND C. J. BROWN. 1997. The Atlas of Southern African Birds. BirdLife South Africa, Johannesburg.
- HAWKINS, A. F. A., R. ANDRIAMASIMANANA, S. T. SEING, AND Z. RABEONY. 2000. The sad story of the Alaotra Little Grebe *Tachybaptus rufolarvatus*. *Bulletin of the African Bird Club* 7:115–117.
- HERKENRATH, P. 1999. An Analysis of National Reports to the Conference of the Parties to the Convention on Biological Diversity. BirdLife International, Cambridge, United Kingdom.
- HOWARD, P. C., T. R. B. DAVENPORT, F. W. KIGENYI, P. VISKANIC, M. C. BALTZER, C. J. DICKINSON, J. LWANGA, R. A. MATTHEWS, AND E. MUPADA. 2000. Protected area planning in the tropics: Uganda's national system of forest nature reserves. *Conservation Biology* 14:858–875.
- HOWARD, P. C., P. VISKANIC, T. R. B. DAVENPORT, F. W. KIGENYI, M. BALTZER, C. J. DICKINSON, J. S. LWANGA, R. A. MATTHEWS, AND A. BALMFORD. 1998. Complementarity and the use of indicator groups for reserve selection in Uganda. *Nature* 394:472–475.
- INTERNATIONAL COUNCIL FOR BIRD PRESERVATION. 1992. Putting Biodiversity on the Map. Priority Areas for Global Conservation. International Council for Bird Preservation, Cambridge, United Kingdom.
- INTERNATIONAL TELECOMMUNICATIONS UNION. 2000. Internet User Statistics Africa. [Online.] Available at <http://www.hitechmarketing.co.za/stats.africa.htm>.
- JAMES, A. N., K. J. GASTON, AND A. BALMFORD. 1999a. Balancing the Earth's accounts. *Nature* 401:323–324.
- JAMES, A. N., M. J. B. GREEN, AND J. R. PAINE. 1999b. Global Review of Protected Areas Budgets and Staff. World Conservation Monitoring Centre, Cambridge, United Kingdom.
- KANYAMIBWA, S. 1998. Impact of war on conservation: Rwandan environment and wildlife in agony. *Biodiversity and Conservation* 7:1399–1406.
- KEITH, S., E. K. URBAN, AND C. H. FRY. 1992. The Birds of Africa, vol. 4. Academic Press, London.
- KREMEN, C., A. M. MERENLENDER, AND D. D. MURPHY. 1994. Ecological monitoring: A vital need for integrated conservation and development programs in the tropics. *Conservation Biology* 8: 388–397.
- LAWTON, J. H., D. E. BIGNELL, B. BOLTON, G. F. BLOEMERS, P. EGGLETON, P. M. HAMMOND, M. HODDA, R. D. HOLT, T. B. LARSEN, N. A. MAWDSLEY, AND N. E. STORK. 1998. Biodiversity indicators, indicator taxa and effects of habitat modification in tropical forest. *Nature* 391:72–76.
- LUDWIG, D., R. HILBORN, AND C. WALTERS. 1993. Uncertainty, resource exploitation, and conservation: Lessons from history. *Science* 260:17–26.
- MITTERMEIER, R. A., N. MYERS, P. ROBLES GIL, AND C. G. MITTERMEIER. 1999. Hotspots. CEMEX, Mexico City.
- MORAN, D. 1994. Contingent valuation and biodiversity—Measuring the user surplus of Kenyan protected areas. *Biodiversity and Conservation* 3: 663–684.
- MOREAU, R. E. 1972. The Palaearctic–African Bird Migration Systems. Academic Press, London.
- MUCHAI, M. 1998. Some aspects of the conservation biology of Sharpe's Longclaw (*Macronyx sharpei*, Jackson 1904)—a Kenyan grassland endemic. M.S. thesis, Moi University, Eldoret, Kenya.
- MYERS, N., R. A. MITTERMEIER, C. G. MITTERMEIER, G. A. B. DA FONSECA, AND J. KENT. 2000. Biodiversity hotspots for conservation priorities. *Nature* 403:853–858.
- NEWMARK, W. D., AND J. L. HOUGH. 2000. Conserving wildlife in Africa: Integrated conservation and development projects and beyond. *BioScience* 50:585–592.
- NICHOLLS, A. O. 1998. Integrating population abundance, dynamics and distribution into broad-scale priority setting. Pages 251–271 in *Conservation in a Changing World* (G. M. Mace, A. Balmford, and J. Ginsberg, Eds.). Cambridge University Press, Cambridge, United Kingdom.
- NJOROGE, P., AND L. BENNUN. 1999. Status and conservation of Hinde's Babbler *Turdoides hindei*, a threatened species in an agricultural landscape. *Ostrich* 71:69–72.
- NJUGUNA, P. 1989. East Africa Natural History Society from 1909–1989, 80th anniversary. *East Africa Natural History Society Bulletin* 19:42–49.
- NORTON-GRIFFITHS, M., AND C. SOUTHEY. 1995. The opportunity costs of biodiversity conservation in Kenya. *Ecological Economics* 12:125–139.
- NOSS, A. J. 1997. Challenges to nature conservation with community development in central African forests. *Oryx* 31:180–188.

- OATES, J. F. 1999. Myth and Reality in the Rain Forest: How Conservation Strategies are Failing in West Africa. University of California Press, Berkeley.
- OLSON, D. M., AND E. DINERSTEIN. 1998. The Global 200: A representation approach to conserving the Earth's most biologically valuable ecoregions. *Conservation Biology* 12:502–515.
- ONYEANUSI, A. E. 1986. Measurements of impact of tourist off-road driving on grasslands in Masai Mara National Reserve, Kenya—A simulation approach. *Environmental Conservation* 13:325–329.
- PRESTON, G. R., AND R. F. FUGGLE. 1988. Profiles and preferences of visitors to three South African Nature Reserves. *South African Journal of Wildlife Research* 18:1–5.
- REID, W. V. 1998. Biodiversity hotspots. *Trends in Ecology and Evolution* 13:275–280.
- RYAN, P. G., C. BENTO, C. COHEN, J. GRAHAM, V. PARKER, AND C. SPOTTISWOODE. 1999. The avifauna and conservation status of the Namuli Massif, northern Mozambique. *Bird Conservation International* 9:315–331.
- RYAN, P. G., AND P. BLOOMER. 1999. The Long-billed Lark complex: A species mosaic in southwestern Africa. *Auk* 116:194–208.
- SCHILDKROUT, E. 1996. Kingdom of gold. *Natural History* 105(2):36–44.
- SHACKLETON, C. M. 1993. Fuelwood harvesting and sustainable utilisation in a communal grazing land and protected area in the eastern Transvaal lowland. *Biological Conservation* 63:247–254.
- SIMIYU, A. M., AND L. A. BENNUN. 2001. Gamebird hunting in Kenya: Developing local management models. *Ostrich* 72:in press.
- STATTERSFIELD, A. J., M. J. CROSBY, A. J. LONG, AND D. C. WEGE. 1998. Endemic Bird Areas of the World: Priorities for Biodiversity Conservation. BirdLife Conservation Series, no. 7. BirdLife International, Cambridge, United Kingdom.
- SUGDEN, A., AND E. PENNISI. 2000. Diversity digitized. *Science* 289:2305.
- SWEETING, J. E. N., A. G. BRUNER, AND A. B. ROSENFELD. 1999. The Green Host Effect: An Integrated Approach to Sustainable Tourism and Resort Development. CI Policy Papers, vol. 3. Conservation International, Washington, D.C.
- THOMPSON, H. S. 2001. Future directions for bird conservation in Africa. *Ostrich* 72:in press.
- THOMPSON, H. S., AND R. FOTSO. 1995. Rockfowl: The genus *Picathartes*. *Bulletin of the African Bird Club* 2:25–28.
- THORSTROM, R., AND R. T. WATSON. 1997. Avian inventory and key species of the Masoala Peninsula, Madagascar. *Bird Conservation International* 7:99–115.
- URBAN, E. K., C. H. FRY, AND S. KEITH. 1986. The Birds of Africa, vol. 2. Academic Press, London.
- URBAN, E. K., C. H. FRY, AND S. KEITH. 1997. The Birds of Africa, vol. 5. Academic Press, London.
- VAN ROOTSELAAR, O. 1999. New birds for the world: Species discovered during 1980–1999. *Birding World* 12:286–293.
- VAN JAARSVELD, A. S., ET AL. 1998. Biodiversity assessment and conservation strategies. *Science* 279:2106–2108.
- WELLS, M. P. 1996. The social role of protected areas in the new South Africa. *Environmental Conservation* 23:322–331.
- WILLIAMS, E. 1998. Green-breasted Bush-shrike *Malacotus gladiator* and its relationship with Monteiro's Bush-shrike *M. monteiri*. *Bulletin of the African Bird Club* 5:101–104.
- WORLD RESOURCES INSTITUTE. 2000. World Resources 2000–2001. People and Ecosystems: The Fraying Web of Life. World Resources Institute, Washington, D.C.
- ZICOMA. 1999. Zones d'Importance pour la Conservation des Oiseaux a Madagascar. Project ZICOMA, Antananarivo, Madagascar.