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Conserving fragments of paradise

In the recently published *Fragments of Paradise**, Sara Oldfield has drawn together, for the first time in one report, much of the available information on the wildlife of the United Kingdom's Dependent Territories. Not only that, but also she has investigated its conservation, past and present. Although there are few bright spots in a catalogue of missed opportunities, she argues that it is not too late to save some of the endemic species of these scattered lands, as long as appropriate action is taken now.

The UK has 14 Dependent Territories, some remote and uninhabited, others densely populated. Most still support a diverse fauna and flora, although the record of known extinctions in the past 300 years is evidence of a once far greater richness. Declines in commercially useful species led to early conservation measures in some dependencies. In Bermuda, a law was introduced

in 1616 to control the killing of the Bermuda petrel *Pterodroma cahow* for food and in 1620 to prohibit killing of immature turtles. In St Helena, in 1694 the East India Company ordered that the endemic redwood *Trochetiopsis erythroxylon* could not be sold for private use, and in 1709 legislation was passed to protect vegetation by the enclosure of animals and replanting of woodland. These moves were exceptional though, and the measures on St Helena were not sufficient to prevent the island's devastation. The redwood is included in the *IUCN Plant Red Data Book* and of the 49 other endemic plants, seven are extinct, 23 are endangered and 17 are rare.

It was not until the early part of the century that more general concern for conservation came about, notably with the formation, in 1903, of the Society for the Preservation of the Wild Fauna of the Empire (now the FFPS). Other international conservation organizations have since been formed and have grown in prominence but, as



A lagoon-shore inlet in Diego Garcia, Chagos Archipelago, British Indian Ocean Territory. This dependency contains the largest expanse of undisturbed reefs in the Indian Ocean (A.M. Hutson).

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the British Empire shrank, co-ordinated action for conservation in the remaining dependencies was not sustained and lost any clear focus. It emerged only occasionally, as when Aldabra, a former dependency, was named as a possible site for Anglo–American military development in 1965. The Royal Society co-ordinated the conservation action necessary to save Aldabra and paved the way for its long-term conservation.

Many of the dependencies are islands endowed with endemic taxa of plants, invertebrates, reptiles and birds. In addition, virtually all of them are internationally important as resting, feeding and breeding centres for migratory species, including whales, seals, sea turtles and seabirds, all of which have been depleted by human exploitation. Although all the dependencies have been modified to some extent by human activities, some are outstanding examples of virtually undisturbed ecosystems. One of these, Henderson Island, is one of the smallest, but it supports at least 10

endemic plants and four endemic land birds. Its near pristine condition is almost unmatched by other oceanic coral islands, but it came close to being destroyed when an American millionaire offered to buy it in 1982, promising in return an airstrip on Pitcairn Island (see *Oryx*, July 1983, page 109). This proposal was finally rejected after representations from conservationists and the permanent protection of Henderson Island was assured. It is particularly gratifying that this achievement was accompanied by recognition of the needs of Pitcairn Islanders, who lost their chance of an airstrip, but gained instead a more regular shipping service and a new found pride in the importance of Henderson. Even densely populated Hong Kong and Gibraltar retain much of conservation interest; both are internationally important feeding and resting places for migratory birds. Bermuda's coral reefs are the most northerly in the Atlantic, and the Caribbean dependencies have many endemic species still,



Green turtle, one of the world's five threatened species of marine turtle. Several UK Dependent Territories have turtles nesting on their shores, with Ascension Island having one of the most important breeding populations of green turtle (A.M. Hutson).

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despite varying degrees of modification by human settlement. Four of the world's five globally threatened species of sea turtle occur in the dependencies, with Ascension having one of the most important green turtle breeding sites.

This remarkable array of habitats and species must be protected from further damage, not only for their scientific interest but also for their economic value, both direct and indirect, to the local communities. In some dependencies wildlife resources offer the major source of income and their sustainable utilization is essential. In the Turks and Caicos Islands, the queen conch *Strombus gigas* and the spiny lobster *Panulirus argus* are valuable exports, but stocks are nearing depletion and management plans are desperately needed. Tourism is growing in many dependencies, with wildlife being the major attraction. Without adequate conservation measures these places will lose their appeal and an important source of income will dry up.

Although the UK Dependent Territories are self-governing in internal affairs and are entirely responsible for local conservation policies, the UK retains strong elements of control and influence. Unfortunately, so far, the UK's record on promoting conservation in the dependencies has not been good, according to the report. A range of conservation mechanisms exists in the dependencies, mainly through legislation, but implementation and enforcement of conservation measures need to be improved. Much more assistance needs to be made available to the dependencies in developing their local conservation programmes. For example, the UK Government, which welcomed the World Conservation Strategy, one of whose main components is sustainable utilization of species and ecosystems, and published its own response in 1986, should give help to the dependencies to develop their own strategies. The report gives recommendations on conservation in individual dependencies and emphasizes that a structure must be created to help put them into effect. The UK Government should establish a focal point for promoting conservation awareness and action. At the same time, conservation non-governmental organizations in the UK and the Dependent Territories should work together more closely to improve the present conservation situation and

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further the success already achieved by small isolated conservation groups and committed individuals.

**Fragment of Paradise*, by Sara Oldfield, published by Pisces Publications for the British Association of Nature Conservationists and WWF-UK, 1987, costs £8.00.

The decline of a mushroom—a key to forest dieback?

The chanterelle *Cantharellus cibarius*, a delicious edible mushroom, was once common and widely gathered in the Netherlands. It has disappeared from many places and has steadily declined in others in the last few decades. Intensive collecting was suggested as a cause, but this theory did not hold up under scrutiny because the decline was also apparent in sites that were closed to the public. In addition, many other macrofungi have declined drastically in the Netherlands in recent years. Worst affected have been those species that form mycorrhiza and, since nearly all forest trees need mycorrhiza-forming fungi to maintain their growth and vitality, it was suggested that the decline of fungi might be a cause of the recent forest dieback reported in the country. Since information on past distribution of fungi is scarce there was little evidence to support this idea.

Because the chanterelle is a much favoured food there existed an opportunity to collect such information. Mushroom-gatherers were likely to be familiar with past and present distribution and abundance. Between 1977 and 1983 about 100 mycologists and mushroom-gatherers were asked each year to give locations of sites where they found chanterelles, with some indication of abundance and site characteristics. They were also asked to provide information on sites where the species used to occur, but from which it had now disappeared. In order to collect additional information, permanent plots were established in localities where chanterelles had been abundant over the past decade, and from 1977 the fruiting bodies were counted and mapped every year. Soil pH was also measured and vegetation analyses carried out.

The questionnaire results showed that since 1960 there has been a marked decline in the number of

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sites where chanterelles grow. This decline can probably be partly attributed to changes in the habitat due to natural succession. Most of the forests where chanterelles grow were planted at the turn of the century on former heathland and inland dunes. As the trees grew and the organic matter in the soil increased the habitat became less suitable for chanterelles, which do not tolerate high amounts of organic matter in the soil.

However, the decline was synchronous in a great number of different localities, which suggests that some other external cause was involved. Comparing the past and present distribution of chanterelles with the pattern of atmospheric sulphur dioxide concentration over the Netherlands revealed that the strongest decline of the species was in areas with the highest levels of sulphur dioxide. In spite of this evidence, sulphur dioxide is not necessarily the only or true cause of the decline. Although sulphur dioxide could increase soil acidity beyond the tolerance of chanterelles (the species prefers a pH of 4.5 and was found to be less abundant at levels lower than this), high concentrations of sulphur dioxide tend to coincide with high levels of nitrous oxides and ammonia, which also cause acidification of the soil. The plot studies presented further supporting evidence for this theory. On the plots where chanterelles had declined, compared with those where chanterelle abundance was unchanged, there was a much higher cover of bilberry *Vaccinium myrtillus* and wavy hairgrass *Deschampsia flexuosa*, both of these species being indicative of more acid conditions. The decline could also be partly due to nitrogenous inputs from air pollution; many fungi are known to be negatively affected by nitrogenous fertilizers. The observed increases in herbs and shrubs support this suggestion—they could be due to increased nitrogen levels in the soil. Chanterelles had also declined more in pine woods than in beech and oak woods, which may be explained by the fact that deposition of air pollutants in conifer stands appears to be much higher than in stands of hardwoods.

Whatever the cause, the decline of the chanterelle and of other mycorrhiza-forming fungi should not be neglected as a contributory, possibly even a key factor in the present process of forest dieback.

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Source

Jansen, E. and van Dobben, H.F. 1987. Is decline of *Cantharellus cibarius* in the Netherlands due to air pollution? *Amibo*, **16**, 211–213.

Curieuse tortoises on the way out?

Poaching and theft are likely to eradicate the population of Aldabra giant tortoises *Geochelone gigantea* on Curieuse Island in the Seychelles, according to members of a Zoological Society of London expedition. The tortoises—299 in all—were introduced between 1978 and 1982. One reason for the move was to establish a second population as a safeguard in the event of a natural disaster at Aldabra, the home of the only self-maintaining breeding colony in existence. Another reason was the desirability of providing an alternative population for tourists because the increasing visitor pressure on Aldabra was becoming damaging ecologically. It was hoped that studies of the new group of tortoises on Curieuse, which were more accessible than those on Aldabra, would be useful as a basis for establishing more translocations to other islands in the Indian Ocean.

Surveys conducted between 1978 and 1984 indicated that the Curieuse population was doing well. In January and February 1987 the Zoological Society of London carried out a field study to obtain biomedical data to provide information for improving the management of the species in captivity and to assess the progress of the colony. The team found 144 post-hatchling tortoises, including only one, a four-year-old, that had hatched on Curieuse, and 17 hatchlings of the 1985/1986 season. Their general health seemed good, and it was not immediately obvious why the tortoise population was declining, and what had happened to 50 per cent of the original population.

Only three individuals are known to have died from natural causes since their introduction. There is no disease and there are no natural predators so it appeared that poaching for food or the theft of live specimens must be responsible for the loss. There is evidence of poaching. The team found skeletal remains of six adult tortoises, all with the plastrons hacked off and the extremities missing, in secluded parts of the island. The

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A giant tortoise safe on Aldabra, unlike those on Curieuse (A.M. Hutson).

Warden reported that he had found a tortoise with severe knife or machete wounds in both legs and mutilated skeletons had been found in the sea. In the course of his normal duties the Warden is absent from the island for up to three months at a time, so the tortoises are unprotected for long periods.

The team calculated that, on the basis of the number of females found, there should be a group of about 400 tortoises between 0 and 5 years old by now. The presence instead of a single four-year-old and 17 hatchlings indicated either that breeding activity and/or hatchling survival were severely depressed or that hatchlings were disappearing from the island. There is considerable evidence that thefts are to blame. One group of 24 hatchlings kept in confinement by the Warden disappeared in his absence and the 17 hatchlings found by the team were later reported to have disappeared. It is difficult to avoid the conclusion that hatchlings are being stolen for the illegal pet trade and some of the larger ones may be suffering the same fate. At the present rate of loss the entire population of giant tortoises will disappear from Curieuse in the next five years.

Although the island was designated a national park in 1979, the tortoise population does not seem to be benefiting from the protection that this status should afford. Tourist trips from nearby Mahe and Praslin are frequent and the visitors are free to wander anywhere on the island, including where the tortoises nest and where hatchlings have been seen. Only on two occasions in the three-week expedition did the team see tourists showing genuine biological interest. Most simply wanted to photograph the

tortoises, often with humans sitting or standing on them.

The growing desire of the international market to obtain giant tortoises and the easy income that this trade offers is a temptation to tourists and local inhabitants alike. If the loss of tortoises is to be prevented, stricter legislation and more effective policing are needed. There should be careful selection of staff involved in any work on the island and a tighter control of tourists. The team says that a properly managed tortoise nursery and rearing unit could provide both a popular attraction for visitors and income from the sale of tortoises to well-established organizations. It believes that the availability of tortoises on the official market could reduce the demand for animals poached or stolen from the colonies of Curieuse and Aldabra.

Source

Samour, H.J., Spratt, D.M.J., Hart, M.J., Savage, B. and Hawkey, C.M. 1987. A Survey of the Aldabra Giant Tortoise Population Introduced on Curieuse Island, Seychelles. *Biol. Conserv.*, **41**, 147–158.

Twin birth in wild mountain gorillas

by David P. Watts and Jörg Hess

As all readers of *Oryx* will know, the mountain gorillas *Gorilla gorilla beringei* of Rwanda, Zaire, and Uganda are highly endangered. The low reproductive rate of females contributes to the fragility of the conservation situation. Infant mortality is high (about 35 per cent in the first year, based on long-term data from the Karisoke Research Centre in Rwanda's Parc National des Volcans), and if her infant survives a female will, on average, not give birth again until four years later (Harcourt *et al.*, 1980). Consequently,

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those of us associated with the Mountain Gorilla Project are always delighted to discover a newborn infant. To this usual delight was added astonishment on the morning of 3 May 1986, when J. Hess, on the first day of a study of mother/infant behaviour, visited Group 5 and discovered that the first known twin birth in wild gorillas had occurred the previous night.

Walanza, the mother, had transferred into the group nine months earlier. Her previous history was unknown. Initially her maternal behaviour towards her infant daughters was careful and solicitous. She carried both ventrally with the support of one arm, and when she fed she cradled both ventrally with one arm while she used the other and her teeth to prepare food (as is typical of mothers with young infants). When she rested, often lying on her back, she often held one infant against herself with each arm. She appeared highly competent in the fine art of infant handling and transport.

By the fourth day, however, both mother and infants were experiencing considerable difficulty. Walanza had trouble supporting both while she walked, and often one had to cling unaided to her side, where it was more subject to thermoregulatory stress in the cool, wet Virungas weather. Both twins cried increasingly often; this was true especially while Walanza fed, when she was unable to maintain both in comfort and, more importantly to provide both with access to a nipple.

On day 7, Walanza left one of the twins behind when the group moved on after a midday rest. Several gorillas showed interest in the infant, which was still alive, but none attempted to care for it. The baby died within several hours. An autopsy showed that it had pneumonia and an empty gut—dramatic evidence of the severity of the mechanical problems that Walanza had in adequately providing both warmth and nourishment to two neonates simultaneously. We hoped that the second twin might then survive, but sadly it too died, two days later. We never retrieved the body, which Walanza carried for over two days before abandoning it.

Among the higher primates, with their relatively great maternal investment in each infant and long periods of infant dependency, twinning is

the rule only in the Callitrichidae (tamarins and marmosets). There have been occasional multiple births in captivity among all three great apes, however. Seal *et al.* (1983) give frequencies for twin births of 1:88 in orang-utans, 1:122 in gorillas and 1:59 in chimpanzees; these are similar to a frequency of 1:90 in humans. We now have 65 documented births in the Karisoke research groups, and additional births have been recorded in the 'tourist' groups in the same habitat; thus the incidence of twinning in the wild is comparable to that in captivity.

Multiple-birth ape infants are at much higher risk of mortality in captivity than are single birth infants (Seal *et al.*, 1983), and we had few illusions about the chances of the wild-born twins. Rather than be discouraged by their perhaps inevitable deaths, however, we should be encouraged by the results of the 1986 census of mountain gorillas in the Virungas (A. Vedder, in preparation). These show the fruits of positive signs noticed in 1978 (Weber and Vedder, 1983) and 1981 (Aveling and Harcourt, 1984): the population has increased and the gorillas are reproductively healthy, particularly in those areas where, thanks to the efforts of the Governments of Rwanda and Zaire and to the Mountain Gorilla Project (in which Karisoke now officially participates), they are well protected. The gorillas' long-term future remains tenuous, but these positive factors show the great importance of continued support for the MGP and for the host governments in their conservation efforts.

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David P. Watts, Centre de Recherche à Karisoke, BP105, Ruhengeri, République du Rwanda; and Department of Anthropology, The University of Michigan, Ann Arbor, MI 48109, USA.

Jörg Hess, Muhlenberg 20, CH-4052 Basel, Switzerland.

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