Sustainable use of whales

May I be permitted to join in the debate between Vassili Papastavrou and Stephanie Pendry about the sustainable use of whales. First, whale-watching is a non-lethal sustainable use, which competes with and is incompatible with whaling; it now has great and growing economic and cultural importance, world-wide, which must not be overlooked.

Second, it is, I think, doubtful that recognition of the fact that not all whale species and populations meet the strict biological criteria was a major factor in some Parties to the Convention on International Trade in Endangered Species (CITES) voting for downlisting. The reality is that behind-the-scenes deals were made of the kind, 'If you vote for opening trade in ivory, I'll vote for renewed trade in whale meat'. It is indeed its susceptibility to those kinds of moves that is emerging as one of the weaknesses in CITES.

But I suggest that such considerations miss the main point relating to the link between International Whaling Commission (IWC) and CITES decisions. The IWC set zero catch limits from 1986, not because all whale populations are threatened or endangered but because it was recognized that there was great uncertainty about their states, that there was no scientifically valid assessment procedure in existence, and that there was no effective monitoring or control, national or international, over commercial whaling operations. The IWC maintains the 'moratorium' primarily because the latter situation still pertains.

If CITES had broken the current link between IWC and CITES decisions – as Japan sought – and then downlisted one or more populations, the effect would have been disastrous for the protection or even sustainable (consumptive, lethal) use of those whales. That link is all that at present restrains Norway's activities in exporting whale products to Iceland (not a CITES Party) and vastly increasing its illegitimate catches of minke whales in the North-east Atlantic under objections to IWC decisions (including the designation of that particular depleted stock as a Protection Stock) in order to export most of the prime meat to Japan. That intended further escalation also calls for discarding the precautionary principle embodied in the IWC's own algorithm for calculating catch limits. And there is no credible independent control of those operations, national inspections having again and again been shown not to be credible.

The point is that concentration only on biological criteria for listings, without much regard for real control of trade in relation to those criteria, is a sure recipe for resuming the depletion of whales that the moratorium was designed to stop.

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PS. At its 50th meeting, in Muscat, Oman, in May, the IWC voted by large majorities in favour of retaining the existing link between IWC and CITES and against a Japan/Norway proposal that future decisions be made by secret ballot – a move that had succeeded in CITES.

New buyers of ivory in the Sudan threaten elephants

Prior to the 1990 Convention on International Trade in Endangered Species (CITES) ban, which prohibited commercial trade in elephant ivory between Parties to the Convention, carved ivory in Africa was bought mainly by people from Japan, Europe and the USA. Today, in many parts of Africa, the main buyers are Chinese and South Koreans. The situation in Sudan, the largest country in Africa, typifies this new trend.

Sudan's ivory-carving industry started in the northern part of the country at the end of the 19th century, when several Egyptian coptic families from Asyut (who were carvers of wood, bone and ivory) moved to the Khartoum area. They immediately started to make ivory necklaces, walking sticks, candle

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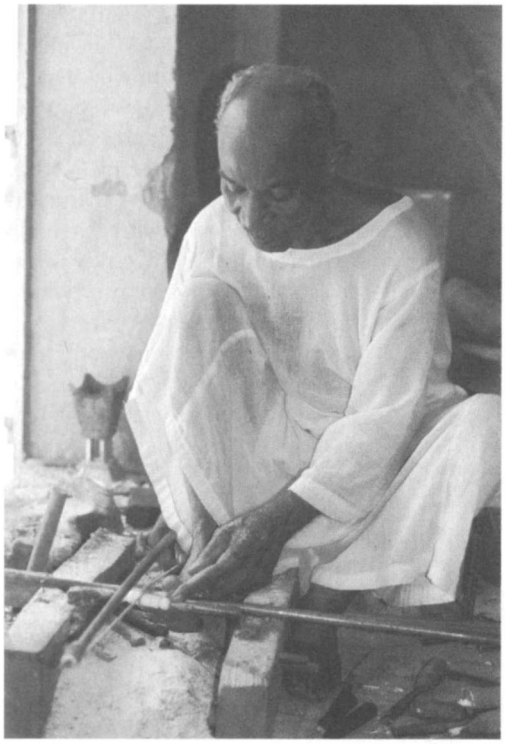

In Omdurman a carver uses a traditional hand-pulled bow to turn a piece of ivory, a technique used in the Middle East for probably thousands of years (*Esmond Martin*).

A craftsman produces an ivory handle for a walking stick using an electric lathe. The ivory powder is sold to traditional doctors for $US3.50/kg in Omdurman (*Esmond Martin*).

sticks and animals, mostly for the British residents. During World War II, when many more British and North Americans were stationed in Sudan, the ivory business flourished, engaging about 200 craftsmen, mainly Muslim Sudanese from Omdurman who had learned the trade from the original Eygptian artisans. Most of these craftsmen specialized in making certain ivory items with the result that the workmanship was of reasonable quality. The business continued to be quite profitable until the CITES ban on all commercial exports of new worked ivory from Sudan.

Before the CITES ban, some carved ivory from southern and western Sudan was also sold in Khartoum and exported. For example, the Fur people in Darfur and the Dinkas in the south made armbands, bracelets and ear rings, mostly for personal adornment, but some of it reached the marketplace. Such ivory is still for sale in Khartoum and Omdurman in small amounts.

The CITES regulation also prohibited all international trade in raw ivory between Parties to the Convention. Sudan has been a Party to CITES since 1983 and did not take out a reservation to continue to trade in ivory, so commerce in raw ivory became illegal in Sudan in 1990. Before 1990, Sudanese traders had been exporting legally large amounts of raw ivory, mainly originating from the vast elephant populations in southern Sudan. This export of tusks was largely responsible for the severe poaching that reduced elephant numbers in Sudan from an estimated 133,000 in 1976 to fewer than 40,000 by 1992.

Sudan's ivory-carving industry continued into the 1990s, but there were dramatic changes. Immediately following the CITES prohibition on the ivory trade, North

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Americans and Europeans in Khartoum reduced their purchases by over 75 per cent. Consequently, the number of carvers in northern Sudan almost halved to just over 100 and those remaining were forced to use more wood. Many of the carvers had to stop specializing in individual items and the quality of the work declined. The ivory industry was 'saved', however, by the arrival in northern Sudan of over 1000 Chinese labourers and hundreds of South Korean businessmen and workers in the 1990s, who, unconcerned by the CITES agreement, bought ivory for personal consumption and export.

Throughout the 1990s the origin of raw ivory was still mainly southern Sudan. During a study in November 1997 in the Khartoum area, merchants disclosed that private businessmen and some military personnel were still moving tusks northwards in trucks. In 1997 ivory was also being imported illegally from Central African Republic, the Democratic Republic of Congo and, in lesser amounts, from Kenya and Tanzania.

In late 1997 the merchants and ivory craftsmen of Omdurman paid on average $US15.50 per kg for a small tusk and $US43.60 for a larger tusk of good quality. These relatively low prices are a result of ivory being cheaper in this part of Africa, partly because it is abundant and partly because tusks tend to crack in the dry hot climate. Historically, many traders have considered the ivory sold in Khartoum to be the worst on the continent.

The ivory artisans today carve mostly in their homes to avoid paying rent and extra taxes, but some work in rented rooms in Omdurman. A typical workshop may have three to four artisans who share a monthly rent of $US50. Sometimes electric lathes and drills are now used as well as hand tools. When there is little demand for ivory, or if the raw product is not available, the craftsmen carve wood instead, but earn less money. Sometimes an artisan receives raw ivory from a merchant who pays him a fixed amount to make an item, and at other times the artisan buys the raw ivory, makes an item and sells it to a curio-shop owner or directly to a customer.

The most frequently made ivory items today are name seals, chopsticks, jewellery, animals, bridges (tusks with animals carved along them) and walking sticks. Less common are candlesticks, chess sets and cigarette holders. Ivory craftsmen earn on average $US100–$US200 a month, but their income is erratic. Their earnings are relatively high, however, compared with the low government and private-sector salaries in a country whose economy has been declining for years.

The quality of most ivory items is only fair, but sales continue because the items are so cheap. Furthermore, Chinese customers bargain with the shopkeepers more vigorously than other buyers and spend a considerable amount of time moving from shop to shop. Retail prices vary from $US1.70 for a thin ring to $US770 for an ornately carved 15-cm-long box; 10-cm long animals sell for $US23, 25-cm bridges for $US46, walking sticks for $US200 and chess sets for $US400. The most popular items among Chinese and South Koreans are beaded necklaces for $US17, name seals for $US5.70 and chopsticks for $US17 a pair. Arab businessmen from Saudi Arabia and the eastern Gulf sometimes buy ivory, especially walking sticks, while Japanese businessmen buy animals and name seals.

All the main curio shops in Omdurman, Khartoum North and Khartoum (except at the international airport) sell ivory items. There are at least 18 such shops in Khartoum, 15 in Omdurman and one in Khartoum North. According to the shop managers, none exports ivory commodities wholesale, selling mostly to foreign residents or visitors. The Sudanese buy very few ivory items, only occasionally ear rings and necklaces.

Curio shopkeepers say that, compared with the 1980s, the ivory retail business has declined, despite the new buyers from eastern Asia. This is not only because of reduced western demand since the ivory ban, but also because there are fewer foreign visitors. Western businessmen and tourists now seldom visit Khartoum because of the civil war and the policies of the military government that came to power in a coup in 1989. Today, shops selling souvenirs make most money selling wood

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carvings rather than ivory; in one of the largest and oldest souvenir shops in Khartoum, ivory is displayed on just one of the 11 shelves. Shopkeepers say that the average shelf life for an item has increased to around 4 months.

According to Sudanese wildlife officials, the ivory-carving business in Sudan is legal if the ivory being used is not from recently killed elephants. According to ivory craftsmen and merchants, however, almost all the raw ivory being carved today is new. There is no system to monitor the carving industry effectively and the government department responsible, the Wildlife Conservation Administration, seldom checks the carvers to see if old or new ivory is being used. The government also does not check effectively for illicit imports and exports of raw ivory. According to TRAFFIC's 'Bad Ivory Database' (maintained in the TRAFFIC East/Southern Africa office in Malawi), of the 4200 separate ivory seizures carried out round the world from 1989 to 1997, none occurred in Sudan. From this, it appears that the government has not yet put a priority on stopping this illicit trade.

According to merchants, the price of raw ivory doubled between 1996 and 1997 in northern Sudan. This probably indicates a recent and substantial increase in demand from both exporters and artisans.

The major buyers of worked ivory items today are Chinese and South Koreans, many more of whom have come to work in the country very recently. This phenomenon is not peculiar to Sudan. During the 1990s, people from China, North Korea and South Korea have become major buyers of ivory in Cameroon, the Democratic Republic of Congo, Gabon, Kenya, South Africa, Tanzania, Zambia and Zimbabwe. Chinese and Koreans have also been the main buyers, along with Japanese and Taiwanese, of name seals made in Africa. Since the late 1980s workshops making these seals have sprung up in Cameroon, the Democratic Republic of Congo, Gabon, Kenya, Zambia and Zimbabwe.

The major conservation problem arising from the situation is the effect on elephants. The demand for ivory is exerting heavy pressure on elephant populations in central Africa, where they are not well protected. Since the early 1990s there have been reports of significant elephant poaching in Garamba National Park in the Democratic Republic of Congo, the Manovo Gounda-St Floris complex in Central African Republic and in parts of southern Sudan (Dublin *et al.*, 1995; and pers. comm. with ivory traders in northern Sudan, 1997). This poaching has been carried out primarily by Sudanese nationals to procure tusks for the ivory industry in Omdurman and also for re-export from Sudan to China, Egypt and South Korea. If this ivory demand escalates parts of central Africa will witness a serious decline in its elephant populations.

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Reference

Dublin, H.T., Milliken, T. and Barnes, R.F.W. 1995. *Four Years after the CITES Ban: Illegal Killing of Elephants, Ivory Trade and Stockpiles*. TRAFFIC International, Cambridge, UK.

New UN list of protected areas

The latest edition of the *United Nations List of Protected Areas*, launched in May at the 4th Conference of the Parties to the Convention on Biological Diversity, reveals a global network in excess of 30,000 protected areas designated under national legislation especially to conserve nature and associated cultural resources. This network covers 13.2 million sq km of land, freshwater and sea, an area larger than Canada and almost equivalent in size to Antarctica. The terrestrial part of the network is much more extensive than the marine component and accounts for some 11.7 million sq km – nearly 8 per cent of the world's land area.

According to Michael Green, whose team at the World Conservation Monitoring Centre was responsible for compiling the list, it is encouraging that the global protected areas network continues to grow. While recognizing

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that the situation varies from country to country, the findings of the team contradict a widely held view that opportunities to expand the global network are diminishing as land and coastal waters face ever-rising pressures from development. However, many of the protected areas listed are poorly resourced and inadequately managed; indeed, a few are no more than paper parks, according to Adrian Phillips, Chair of the IUCN World Commission on Protected Areas. A major emphasis in the Commission's programme will now be devoted to developing methods to help countries to improve the effectiveness with which their protected areas are managed.

The origins of the United National List of Protected Areas go back to 1959, when a Resolution of the 27th Session of the United Nations Economic and Social Council recognized the importance of protected areas in the wise use of natural resources and led to the compilation of the first World List of National Parks and Equivalent Reserves in 1962. Nearly 40 years on, the importance of protected areas in national conservation programmes has been stressed by many of the Contracting Parties to the Convention on Biological Diversity in their national reports on their implementation of the Convention.

The UN List provides a means of measuring progress in implementing Article 8 (a) of the Convention on Biological Diversity, which calls upon each Contracting Party to 'establish a system of protected areas where special measures need to be taken to conserve biological diversity'. The new list shows an increase of some 3.9 million sq km since the previous edition in 1993. Approximately one-third of this increase can be attributed to some 460 new protected areas established since the beginning of 1994. They include the vast Ar-Rub'al-khali Wildlife Management Area (640,000 sq km) in Saudi Arabia and the Arabian Oryx Sanctuary (34,000 sq km) in Oman. The rest of the apparent increase is due to a change in the way the list is compiled, resulting in all protected areas (larger than 1000 ha) qualifying for inclusion.

IUCN, 1998. *1997 United Nations List of Protected Areas*. WCMC and WCPA, IUCN, Gland, Switzerland and Cambridge, UK.
Copies are available from IUCN Publications Services Unit, 219 Huntingdon Road, Cambridge CB3 0DL, UK. Tel: +44 (0)1223 277894; Fax: +44 (0)1223 277175.

Sharks need protection

As many of the world's important fisheries continue to decline, cartilaginous fishes (sharks, dogfish, skates, rays and chimaeras) increasingly appear on lists of 'underexploited species'. Such fishes are identified by national and international fisheries agencies throughout the world to offer fishermen alternative opportunities for exploitation, usually when the primary source of their catch becomes scarce or commercially unexploitable.

The importance of cartilaginous fishes to local, national and international fisheries – and to local and national economies dependent on them – is heightened by the fact that the fisheries are seldom regulated locally, nationally, or internationally. Cartilaginous fishes (hereafter referred to as sharks) are therefore instantly available to fishermen when other species are depleted, restricted or seasonally unavailable, and, as a result, are often subject to intense exploitation. They have become the versatile and 'salvation' fisheries resource of the 1990s in the face of worldwide fisheries production decline.

At the same time, information on the volume and species composition of shark catches and landings, and on the species themselves, remains sparse or non-existent. Before the 1990s, shark fisheries historically were a minor and relatively low-value contribution to the world's catch. Sharks rarely had high commercial or international value and often were fully or partly used only in subsistence fisheries. This was due to the high costs of production and low market value of products such as oil and cartilage, and to the fact that shark meat was considered to be unpalatable by many people, especially in the west. Most sharks landed as bycatch in other fisheries, such as

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those for tuna and swordfish, were usually dumped, dead, back in the sea as 'trash' fish.

That trend changed in the late 1980s, when the growing economic powers of consumers in Asia and the opening of fisheries markets in China increased demand for and trade in shark fins, which are now considered to be one of the most valuable fisheries products in the world. Shark cartilage is also valuable as an ingredient in remedies in the growing western health food market.

Most shark species are extremely susceptible to overexploitation because they are long-lived, mature later than most comparable bony fishes and have low reproductive rates. Little is known about stock structure, even in most coastal waters, and there is little information on the abundance of individual species or populations, or even their most basic biological requirements for reproduction and growth.

It is difficult to speculate on the management and conservation implications of the rising demand for shark products because there is no historical information on most aspects of these fisheries, or on local and international demand and use. There is poor reporting, or none at all, of fisheries products in trade and there is a lack of species-specific catch data.

In 1994 the Food and Agriculture Organization reported that notable increases in shark catches occurred in the central western Pacific Ocean, Indian Ocean and northwestern Atlantic Ocean. These catches accounted for nearly 57 per cent of the world's shark catches that year. Canada, Mexico and the USA were prominent, not only because of the proximity of their borders and fleets to these areas, but also because of the extent of their catches. Mexico and the USA together landed more than 100,000 tonnes of sharks in 1994 and were considered two of the world's top 19 shark fishing nations. Although Canada has been considered to play a small part in the shark trade, Canadian imports and exports of shark products are poorly documented by the government. TRAFFIC research found that large quantities of shark meat cross the USA/Canada border. Until recently research and management measures in Canada's shark fisheries have been extremely limited. A research programme was started in 1993, and in 1995 a management plan with quotas for three species of sharks was put in place in the Atlantic.

Mexico's artisanal fisheries for sharks have been an important national resource, with shark meat being an important protein source for subsistence users and lower income households. Many shark products are also processed for the international market – fins for Asia, shark skins for exotic leather makers, and cartilage for the health food industry. Mexico's fisheries agencies have instituted long-term reporting of catches and landings. To date, however, the country's shark fisheries remain largely unregulated and even the requirement for a simple permit to engage in the fishery is reportedly evaded frequently.

The USA is probably the best compiler of data on shark fisheries and trade in the world, but much of the information lacks the specificity needed for shark monitoring and management. Directed Atlantic shark fisheries started to develop in the 1980s and rapidly increased after 1984, no doubt in response to declining stocks of tuna and swordfish and the increasing demand for shark products. USA shark catches are dominated by spiny dogfish and skates. Dogfish landings increased by almost 250 per cent and other sharks by almost 300 per cent between 1985 and 1994. The dogfish is being caught largely for export to Europe where the dogfish populations have been depleted by overfishing. There are already clear signs of a decline in the USA. The existing management and precautionary measures in the USA – a controversial shark management plan adopted in 1993 for the Atlantic covered 39 of the 74 species that were known to occur there – have limitations. Most importantly, they tend to focus primarily on the fisheries that specifically target sharks. They neglect fisheries that catch sharks incidentally, which can be a significant cause of shark mortality.

The report calls for the North American countries to take action to ensure the conservation of their shark populations. For the spiny dogfish, it recommends development of

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precautionary measures for fisheries in Canada and cessation of the catch in the USA until a management plan is in place. It also recommends co-operative research and management efforts between Canada and the USA for this species because evidence suggests that a single stock of spiny dogfish migrates between the two countries. In Mexico management measures are needed but must take into account the local economies and importance of these fisheries to small-scale fishermen.

At the international level, two essential steps are needed: specific and consistent monitoring of the catch, landings and trade in sharks; and the establishment of a scientifically based global endeavour to ensure their survival.

Shark Fisheries and Trade in the Americas: Volume 1: North America. A TRAFFIC North America Report, March 1998. Further information from: TRAFFIC International, 219 Huntingdon Road, Cambridge CB3 0DL, UK. (Tel: +44 [0]1223 277427; Fax: +44 [0]1223 277237; E-mail: traffic@wcmc.org.uk), or TRAFFIC North America, 1250 24th Street, NW, Washington DC 20037, USA. (Tel: +1 [202] 293 4800; Fax: +1 [202] 775 8287; E-mail: tna@wwfus.org.

Fighting in Casamance, Senegal, continues to threaten wildlife

There has been a fierce upsurge in fighting in the 15-year-old war in the southern Casamance region of Senegal. The Movement for the Democratization of Casamance (MFDC) started its rebellion in the early 1980s and each year since has seen an escalation in the fighting between rebels and government soldiers. Fighting has spread from the former MFDC strongholds in the far south-west of Casamance to cover most of the region and the insecurity is even affecting neighbouring areas of Guinea Bissau. Clashes can occur almost anywhere and there is a strong military presence in the most densely wooded areas, including the former Basse Casamance National Park.

On a recent visit I attempted to ascertain the status of wildlife in the area. Although conditions were difficult I was able to do some work in areas temporarily free of fighting.

As a result of the total ban on gun ownership in the Casamance region there has been no hunting around villages for several years. Only the rebels and army have guns, and they normally only shoot each other, remaining concealed in the forest when not engaged in fighting. I spoke to members of the MFDC and to government soldiers who spend large amounts of time in the forest; both admitted setting snares for antelopes, but it was impossible to tell what impact they may be having on wildlife. In the Badioure Forest in northern Casamance the tracks of bushbuck *Tragelaphas scriptus* and duikers *Cepahalophus monticola* were common. I saw large duiker tracks on a forest path on one occasion, suggesting that the yellow-backed duiker *Cepahalophus sylvicultor* is still present. Local people (former hunters) know the species in this area although they say that it is very rare. It was good to discover a small colony of the Casamance flying squirrel *Anomalurops beecrofti hervoi*, which was described from five males captured in the same area in 1946. It has been seen seldom since then. In the same forest I also saw red colobus *Procolobus badius temmincki*, Campbell's mona monkey *Cercopithecus mona campbelli* and sooty mangabey *Cercocebus atys*. The latter species had not been recorded in Senegal since 1968, when Andre Dupuy described it from another part of Casamance (the Bissine Forest). I also heard the distinctive calls of *Galagoides thomasi*. This represents a considerable northward extension of their known range, which is the dense forests of central West Africa. Shortly after I left Badioure Forest in September 1997, there was a major escalation of fighting there so the threat to wildlife may be greater now.

A new trend of widespread land mine use by both sides in the conflict has created a further threat for wildlife and there are no records of where the mines have been laid. It was impossible to visit the areas of forest near the former Basse Casamance National Park in

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the west of the region because there is almost constant heavy fighting in that area. It is almost certain that many of the larger mammals have gone. If animals flee across the border into Guinea Bissau they are at threat from huge numbers of refugees from Casamance. These people are short of food and hunting restrictions are not enforceable in the present situation. I heard reports of heavy hunting of antelopes and moneys in the border area, and saw skins of several bush pig *Potamochoerus porcus porcus*, which had been killed by hunters. The normal taboos against hunting these animals appear to have been abandoned. These pigs are very rare in Senegal and only slightly more common in Guinea Bissau, where the widespread availability of guns since independence in 1975 has affected adversely all wildlife.

The situation described above is almost identical in other parts of Casamance and fear prevents people from entering the forest unless absolutely necessary, even as far east as Tambacounda. However, in Niokolo Koba National Park in east of the region, poaching is rife; it is not clear whether some of the killing is carried out by MFDC rebels for food or as a means of funding their war. This world heritage site is scarcely protected because the war has almost bankrupted the Senegalese government. The park still contains good herds of buffalo *Syncerus caffer brachyceros*, hippopotamus *Hippopotamus amphibius*, Buffon's kob *Kobus kob kob* and roan antelope *Hippotragus equinus koba*, and *c.* 150 Derby's eland *Tragelaphus oryx derbianus* remain. In total, 70 species of mammal have been recorded there.

In summary it is probable safe to say that all the wildlife of the Casamance region is gravely threatened by the conflict, although it is not possible to discover the true situation. Some species, monkeys for example, may have benefitted from the lack of hunting but the larger antelopes are probably under threat from soldiers and rebels. The war has not reached eastern Casamance yet but appears to be spreading. The indiscriminate use of landmines is especially worrying. Senegal contains the best protected populations of many of the larger mammals of the region, which are in grave danger elsewhere. It is of vital importance that this wildlife is saved for the world and for the people of Senegal.

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PS. At the time of going to press (late May) the situation remains tense, with major clashes near Ziguinchor (the provincial capital) between rebels and the army. Fierce fighting has been recorded in the Badioure Forest area.

Dragonflies: Status Survey and Conservation Action Plan

Before there were dinosaurs there were dragonflies (Odonata). Today their size and beauty make them especially valuable subjects for research in insect behaviour and ecology, and for art. Because their larvae are aquatic, dragonflies can be used in making rapid assessments of water quality. In addition, because they are predators they have considerable potential for the biological control of mosquitoes, which transmit diseases to humans.

Over 5000 species of dragonfly have been described and many more await discovery. Most species live in the tropics, mainly in rain forest. Our knowledge of them is very patchy. Much is known about the relatively few species that inhabit the temperate regions, where most specialists in dragonflies live; on the other hand, very little is known about hundreds of species in the tropics where there are few odonatologists. The rapid destruction of rain forest makes the conservation of dragonflies a very urgent matter. The Dragonfly Action Plan, which was published in 1997, faces these problems and outlines the necessary solutions. The strategy for conserving dragonflies contains three basic elements.

1 Establish protected areas

2 Conserve habitats outside protected areas

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by modifying agricultural, forestry and industrial procedures

3 Carry out measures to support 1 and 2. The principal ones are:

(a) Research – notably taxonomy and studies of the distribution and biological requirements of species

(b) Pollution control

(c) Legislation – notably to provide protected areas, to control development and to control pollution

d) Education and raising public awareness.

Fortunately, the action that would protect most dragonfly species does not require detailed information about species: there is good evidence to show that if viable examples of the main habitat types in each country are conserved, this measure would effectively conserve most dragonfly species. Therefore, by far the most important recommendation of the action plan is that governments, statutory conservation bodies and non-governmental organizations that manage nature reserves should establish or complete networks for protected areas to cover all the main habitat types found in each country. This procedure is necessary to conserve all groups of invertebrate animals where, as with the dragonflies, there is not enough time or resources to study the distribution and habitat requirements of thousands of species. No country would consider undertaking the work for dragonflies alone, but when it is realized that it is an essential first step in maintaining the biodiversity of the world as a whole, it becomes an entirely practical objective.

Apart from supporting this general measure, it is recommended that odonatologists make the maximal use of the facilities available to them to study particular centres of endemism and special species that are threatened. To assist them the Action Plan for Dragonflies provides guidance on which areas and which species should be given priority. By using the *1996 IUCN Red List of Threatened Animals* as a starting point, the listing of dragonflies must be improved so that it can be used effectively as a guide to detailed conservation work. Proposed work on centres of endemism and species would involve the training of odonatologists where they are most needed. Finally, studies that contribute to the Odonata Conservation Database are proposed so that better use can be made of existing information in collections and publications. Individual entomologists and others have an important role in promoting this work and industry in supporting it.

Dragonflies – Status Survey and Conservation Action Plan, Norman W. Moore (compiler). 1997. IUCN/SSC Odonata Specialist Group, IUCN, Gland, Switzerland and Cambridge, UK.

The Ethiopian Wolf: an Action Plan for its Conservation

Ethiopia's varied environmental conditions have resulted in the evolution of a plethora of endemic animal and plant species, especially those confined to the Afro-alpine ecosystem. The futures of several of these wildlife species are in question because of the continuing pressures on the habitat and on the species themselves. The Ethiopian wolf *Canis simensis* is one of the many species endemic to the highlands of Ethiopia. With probably fewer than 400 adult individuals surviving, it is the world's most endangered canid. It survives in only a few mountain ranges, with the largest population in the Bale Mountains National Park. Elsewhere, with the probable exception of those at Menz and Arsi, wolf populations are so small that they may not be viable.

The Afro-alpine range is threatened by loss of habitat to high-altitude subsistence agriculture and livestock overgrazing. The small size and isolation of the remaining wolf populations have brought in new threats, such as inbreeding and loss of genetic diversity, and those arising from sympatric populations of domestic dogs, such as disease and hybridization. Development in areas of Ethiopian wolf habitat may also have a negative impact upon its survival, with road traffic accidents and shooting bringing in new mortality factors.

In view of the persisting human impact on the Ethiopian wolf and its vulnerability to

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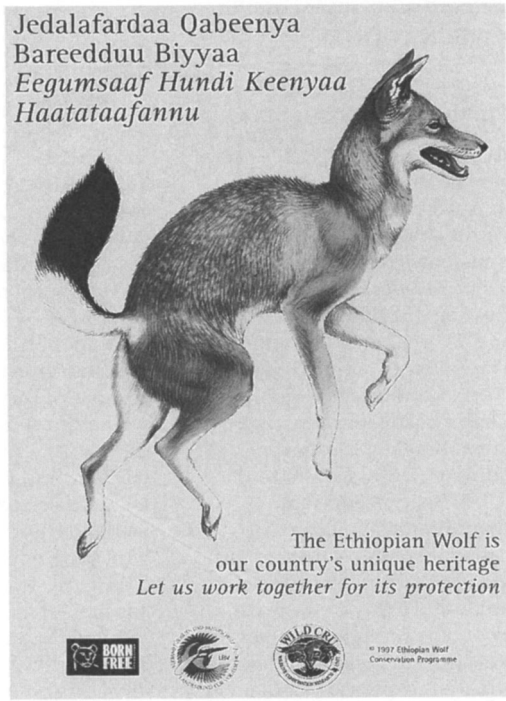
extinction, immediate action on three fronts is required. Protective measures require effective management of protected areas, active efforts to monitor and protect remaining populations, and the establishment of a population management programme. Better management in Bale and the Simien Mountains, and the establishment of other conservation areas in Menz and possibly elsewhere, will help protect the Afro-alpine ecosystem and many of its rare highland endemic plants and animals. Improved park patrolling, control of domestic dogs and community education, backed up by further epidemiological and demographic studies are required.

A small captive breeding nucleus will contribute to the conservation of genetic variability and purity. This operation may take place in existing facilities world-wide, followed by the construction of a breeding facility in Ethiopia. Each wolf population, including the captive one, must be considered as part of a global metapopulation, with some genetic flow occurring among them. Thus, a limited number of captive-bred or wild-bred wolves may be exchanged between populations, reintroduced to areas where the wolves have been extirpated, or used to restock depleted populations.

The outset of such a programme is dependent upon developments in funding, possible locations and Government approval. The population management strategy will be complementary to efforts to protect wild populations and their habitats. Conservation priorities must be decided pragmatically with regard to the allocation of resources and manpower, which implies that current conservation efforts should be directed to established conservation areas. Provided the Ethiopian authorities step up appropriate park management with increasing support from the international community, the Bale Mountains will remain the best refuge for the survival of these canids. Menz may soon become a conservation area, providing protection for an additional wolf population. Ethiopia's current progress in securing long-lasting peace and stability may help secure more international funding for Afro-alpine conservation. It is hoped that highlighting the plight of the Ethiopian wolf by turning it into an Ethiopian flagship species will trigger renewed efforts to conserve the Afro-alpine ecosystem, and thus conserve many other of its lesser known endemic fauna and flora.



A poster produced for the Ethiopian Wolf Conservation Programme's education campaign. *(Drawing by Jonathan Kingdon.)*

The Ethiopian Wolf: An Action Plan for its Conservation. Claudio Sillero-Zubiri and David Macdonald (eds), 1997. 120 pp., £15, $US25. Available from the SSC Canid Specialist Group, Wildlife Conservation Research Unit, South Parks Road, Oxford OX1 3PS, UK, or in the USA from Dr James Malcolm, Department of Biology, University of Redlands, PO Box 3080, Redlands, CA 92373, USA.

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