This cross-fertilization among different perspectives seems a fertile area for conservation, for there is much to be learned about the human mind and spirit that remains to be incorporated into our collective efforts. The more we can glean from fields such as the policy sciences, sociology, economics, anthropology, law and others, the better equipped we will be to mount the global efforts necessary to incorporate species diversity and human needs into a compatible package. If we ignore the latter, if we choose to remain within the narrow constraints of our particular disciplines, then I fear we not only have neglected an important tool, but surrendered much of biodiversity to base values that we failed to comprehend and may also begin to exhibit the signs of inbreeding depression that we know so much about.

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Important findings by FFI team in Kerinci Seblat, Sumatra, Indonesia

Extending along 345 km of the volcanic Barisan mountain chain, which runs from the south-east to the north-west of the Indonesian island of Sumatra, the Kerinci Seblat National Park covers, in theory at least, 14,847 sq km. Ranging in altitude from 35 m to the 3805-m peak of Mt Kerinci, it is Indonesia's largest national park and one of the most species rich of Sumatra's national parks. In 1993, 43 of Sumatra's 47 key mammal species and 8 of the 12 key birds were recorded as present in the park. Yet, with the exception of its higher peaks, where endemism is presumed to be concentrated, Kerinci-Seblat has been little studied in recent years. With the exception of a few sample surveys and visits by collectors in the early part of the century, the only recent long-term faunal field work has concentrated on the park's few surviving Sumatran rhinoceros *Dicerorhinus sumatrensis*.

When a three-person FFI team started fieldwork in the park in 1995, little was known about the status and distribution of much of the park's fauna, and the number of bird species recorded stood at just 161. By January 1997, the team had confirmed the number of terrestrial bird species as 285, while 23 species of mammal had been photographed, including 18 of Sumatra's key species. Thirty-three of Sumatra's key mammal species have been clearly seen, many on multiple occasions; this total excludes flying squirrels, some of which can be difficult to identify. Some animals known to occur in the park remain elusive; the hog-badger *Arctonyx collaris*, for example, has been neither photographed nor seen – although its footprints are encountered often.

The first real discovery was not faunal but floral, when the team found the very rare parasitic *Rafflesia hasseltii* (see front cover of this issue). This species is slightly smaller (less than 600 mm in diameter) but much more vividly coloured than the better-known and more common *Rafflesia arnoldii*, and appears confined to a single river valley at 620 m. It is the first record for the species in the park and only the third site for the species this century.

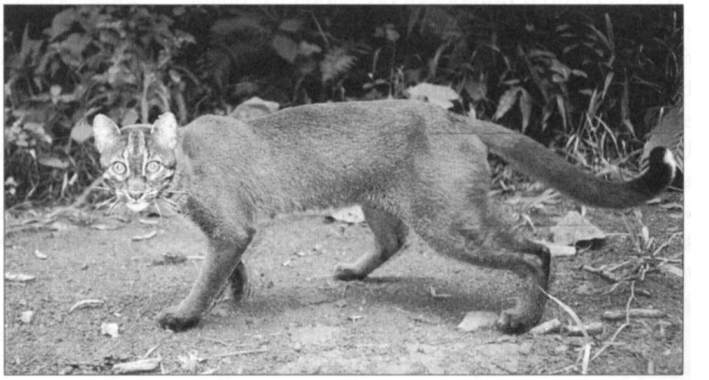
The mainly secondary forest (it had been previously illegally logged) was also found to be richer faunistically than the team had expected. Tiger *Panthera tigris*, golden cat *Felis temminckii*, sun bear *Helarctos malayanus*, Malayan tapir *Tapirus indicus*, yellow-throated marten *Martes flavigula* and binturong *Arctictis binturong* were all recorded. Old rhino traps found at around 1100 m, dating from the late 1950s, confirmed previous reports that rhino had once been present in grater numbers than today. One of the FFI team members, Ahmad Yanuar, has carried out the first detailed primatological study in Kerinci Seblat, on

siamang *Hylobates syndactylus*, agile gibbon *Hylobates agilis*, pig-tailed macaque *Macaca nemestrina*, long-tailed macaque *M. fascicularis* and leaf monkey *Presbytis melalophos* – the five most common of seven primates found in this area.

Work was revolutionized in 1996 when the team started to use 20 TrailMaster infra-red camera units in the Tandai area in the north of the park. Suddenly, animals were not footprints on an old logging trail or mysterious movements in the undergrowth but individuals, including Tandai's two resident tigers. The movements and activity times of the more easily identified animals could be followed. Birds whose presence was only suspected – and in some cases quite unsuspected – walked through the infra-red beams of the cameras and into the record books.

The first big mammal surprise came in late May 1996 when a mysterious black cat was photographed by one of the cameras. The animal's position in the photograph made it difficult to judge size and neither the team nor the park authorities could identify it. The photograph was sent to the Indonesian National Museum of Zoology at Bogor and to London Zoological Society for identification. In mid June, a second photograph was secured – followed by a daytime sighting and casting of prints and the cat could finally be identified – as an exceptionally rare melanistic golden cat. The photograph was the first ever taken of a melanistic golden cat in the wild and only the second record of a melanistic golden cat in Sumatra. There are strong indications from local reports that melanism in golden cats may be relatively widespread in the park and melanism may not occur only in golden cats – the team continues to receive reports of melanistic tigers in specific areas. By the end of 1996 the team was able to confirm that golden cats are relatively widely distributed along the Barisan range of the park. Seven

A melanistic golden cat – the first one ever photographed in the wild (*FFI*).



Golden cat *Felis temminckii* (*FFI*).

individuals were photographed in three widely separated areas and the first ever photograph obtained of an adult with a cub in the wild (August 1996, age 5–8 weeks.)

Other little-known felids were photographed. No fewer than six photographs of a male clouded leopard *Neofelis nebulosa* were taken – a species photographed in the wild for the first time less than 10 years ago and only rarely since then.

There were also several important avifaunal records. In late May 1996, team member Jeremy Holden made only the second sighting of the endemic graceful pitta *Pitta venusta* in Sumatra in 80 years. The species was last seen in Kerinci in 1917. On 25 July 1996 a 270-mm, black-capped, blue-backed, ground-dwelling bird walked through a camera trap, the first record of a Sumatran giant pitta *Pitta caerulaea* in more than century. Other birds triggered the beams to produce 'first' photographs in the wild – not least the vulnerable Kerinci endemic Salvadori's pheasant *Lophura inornata*, which was photographed on a number of occasions, generally at 900 m.

With photo-trapping under way in Tandai, two members of the team moved out to survey other areas of the national park and its bordering forests. These surveys, too, highlighted the lack of current knowledge about animal distribution along the Barisan range. In south-west Sumatra's Bengkulu province the team found previously unreported populations of agile gibbons and new records of golden cat and other mammals. In the swamp forests of Tapan, west Sumatra, endangered white-winged wood ducks *Cairina scutulata* were seen on a number of occasions – a major extension of range.

Inevitably, after 15 months in the field, the team has had numerous encounters with and sightings of tiger. Although critically endangered over Sumatra as a whole (and, in some areas of the park because of poaching) tigers survive in most areas of the park. However, the team was surprised by the number of tigers identified when photo-trapping moved to the hilly lowlands above Tapan in November 1996. The team had not previously worked in the area because the local tigers have a reputation for being *kurang sopan* (not polite). Within less than 2 weeks the team saw what kurang sopan can mean – in this case the killing of a husband and wife in a daytime attack on their forest edge farm. But which tiger was responsible? In spite of talk of 'many tigers', the team assumed a relatively normal density – until the first photo-trap pictures started to come through. In 6 weeks' photo-trapping, using a maximum of 13 camera units in four locations in a 10 sq km area, nine individual tigers, including three cubs, were photographed – six within 1 sq km. One or more tigers have probably not yet been photographed. These tigers were not photographed in remote, primary forest but on the edge of the national park, close to villages and a major logging concession. Tigers are often seen crossing the main road from the coast to Sungai Penuh, the main village in the Kerinci Valley, both at night and even, on occasions in the early evening; one tiger regularly patrols ridge paths in an old rubber and durian plantation less than 1.5 km from a sizeable village.

Remarkably, the most productive trap in the 10-month-long photo-trapping history of the project (taking images, among others, of tiger, golden cat, banded linsang *Prionodon linsang* and Asian wild dog *Cuon alpinus*) was, until very recently, situated less than 300 m from a logging contractor's bulldozers.

The surviving forests of Kerinci Seblat are under pressure from farmers, timber operators, agro-conglomerates and other interests. For example, 'protected forest' in which we worked 2 years ago is now in the process of being converted to a oil-palm plantation. If these species-rich forests are to be protected, they must be studied and if they are not saved, then at least we will know what has been lost.

Debbie Martyr, FFI team in Sumatra

The FFI Project in Kerinci Seblat National Park is supported by: Bristows Cooke and Carpmael, British Airways Assisting Conservation, BP, ICI, J&B Whiskey, Land Rover, Marshall Motor Group and Rolls Royce.

Discoveries and priorities for mammals in the freshwater forests of the Niger Delta

Inland from its mangrove swamps, the Niger Delta contains the least known of Nigeria's four main blocks of closed forest (Lowe, 1992). Zoogeographically it represents a westward extension of the Lower Guinea faunal zone across two purported river barriers (the Cross and the Niger), although, significantly, it also contains disjunct populations of a few Upper Guinea species. Mammalogists appear to hold contradictory views of its status: (a) as bipartite, with each part occupied by distinct west- or east-of-Niger taxa (e.g. Happold, 1987), and (b) as a minor centre of endemism in its own right (e.g. Grubb, 1990). The true situation, and the relative importance of the two rivers as distributional barriers, is obscured by a lack of basic faunal data.

Today extensively deforested areas separate the delta's closed forest block from the westward Bendel block with the Okomu Forest Reserve, and from the eastward Cross River block with the Cross River National Park. The delta itself lacks protected areas, although two have been advocated: a mangrove reserve and the Taylor Creek area in the forest zone (Stuart *et al.*, 1990; Lowe, 1992; IUCN, 1993).

The Taylor Creek area covers over 200 sq km on the north-east flank of the delta, near its apex. It was highlighted by Oates (1989), whereupon its conservation became a project of the Nigerian Conservation Foundation (Stuart *et al.*, 1990). The area thus became a focus of attention, to the neglect of the rest of the delta, which lacked road access and had not been surveyed for wildlife. Oates had noted that surveys were still needed in such areas but that the Taylor Creek area deserved a special conservation effort as an extensive area of relatively undisturbed seasonal swamp forest, representative (as it was then believed) of the Niger Delta and containing one of southern Nigeria's few surviving elephant populations.

In 1993 the author began a wildlife survey of the delta and the adjacent part of the Niger–Cross interfluvium between the Forcados and Imo Rivers. This survey is still in progress but the results to date (Powell, 1993, 1995), shed a new light on conservation priorities regarding both species and areas. In view of the current flurry of environmental interest in the delta area, it seems worthwhile to make some of these available.

The survey has added about 15 mammals, including new taxa and country records, to those known or expected in the area (Table 1). The details depend partly on the taxonomic status of some forms being studied by collaborating taxonomists Peter Grubb, Daphne Hills and Harry van Rompaey. Additional new records may be expected as the identities of some putative species described by hunters are eventually resolved. It now appears that the delta contains about 12 red-listed mammals and probably all of Nigeria's three to six endemic or near-endemic mammals. Provisional distribution maps for around 30 species have been prepared (Powell, 1995).

A major finding important to conservation planning involves zonal differences within the *c.* 5000 sq km of ill-defined 'freshwater swamp forest' encompassed by the delta's flood distributaries between the Forcados River and the Orashi (or Engenni) River. The main ecological division is between the southern, tidal-freshwater (or 'Marsh Forest') zone with much permanently waterlogged ground, and the inland 'Flood Forest' zone, which includes Taylor Creek. The latter zone is characterized by the annual inundation of large expanses of forest by the Niger flood, while in the dry season the soil dries out except for numerous lakes, flood gullies and swamps.

The Marsh Forest zone was found to harbour two conspicuous and locally well known species new to Nigeria – the red colobus and the black-fronted duiker (Table 1). The zone lacks several species of otherwise widespread mammals (e.g. Emin's giant rat *Cricetomys emini* and the cusimanse *Crossarchus platycephalus*). The zone appears to be outside the historical range of the delta's most notable endemic, the Niger Delta pygmy hippopotamus *Hexaprotodon liberiensis heslopi*.

A second significant faunal divide appears

to run north–south parallel to and 10–20 km east of the River Nun. It is the approximate western limit in Nigeria of several eastern taxa: Ogilby's duiker, the small green squirrel, Talbot's tree squirrel and Sclater's guenon (Table 1). The area east of the divide, the 'Eastern Flank', contains the gazetted but unprotected Upper Orashi Forest Reserve.

The above outline is schematic, and certainly not the full picture. However, it is obvious that no single area is representative of the delta's closed forest block. As investigations proceed, the individuality of species boundaries is becoming more evident. The Marsh Forest zone and Eastern Flank each contain at least one endemic form with smaller ranges limited to particular subsectors and very little is known yet about the distribution of rare species or those that hunters do not distinguish to species level.

The selection of protected areas is complicated further by the disparate distribution of relict populations of major species, most of which have been overlooked in the standard literature (Happold, 1987; Stuart *et al.*, 1990; NARESCON, 1991; IUCN, 1993; Oliver, 1993). The best chimpanzee population, probably the only viable one, occurs in the southern part of the Eastern Flank. The only possibly viable elephant herd is near the mouth of the Imo River on Andoni Island. A few maritime hippos also occur on Andoni Island and on the west end of adjacent Bonny Island; they receive a limited degree of traditional protection but the Bonny group appears doomed by new oil- and gas-industry developments. Manatees are most common in the tidal freshwater zone, where they feed on perennial mats of floating vegetation.

Since 1989 many international consultants have visited the delta on missions aimed partly or wholly at recommending conservation action. Meanwhile, the Taylor Creek area lost the elephant herd that was its main attraction (Werre, 1991; Powell, 1993). No useful new information appears to have been produced by the missions and no recommendation has materialized. A Taylor Creek conservation initiative by the Nigerian division of the Shell oil company, occasioned by a visit to

Table 1. Additions to the fauna of the Niger Delta*

English name	Scientific name	IUCN ranking
New to Nigeria		
Delta red colobus	*Procolobus* aff. *pennantii*†	EN
Pygmy flying squirrel	*Idiurus* cf. *macrotis*	NT
Small green squirrel	*Paraxerus poensis*	
Black tree squirrel	*Funisciurus* sp. indet.	
Black-fronted duiker	*Cephalophus nigrifrons*	
New to Nigeria west of the Cross River		
Talbot's tree squirrel	*Funisciurus pyrrhopus talboti*	
Crested genet	*Genetta cristata*	EN
Long-nosed mongoose	*Xenogale naso*	
Ogilby's duiker	*Cephalophus ogilbyi*	NT
Newly reported within the Niger Delta		
Tantalus monkey	*Cercopithecus tantalus*	
Sclater's guenon	*Cercopithecus sclateri*	EN
Cape clawless otter	*Aonyx capensis*	
Speckle-throated otter	*Lutra maculicollis*	
Large-spotted genet	*Genetta rubiginosa*	
Egyptian mongoose	*Herpestes ichneumon*	

* Compared with Table 1.4 in Happold (1987).
IUCN Red List rankings are from IUCN (1996). EN, Endangered, NT, Near Threatened.
† A new subspecies being described by Peter Grubb.

Port Harcourt by the Prince of Wales in March 1990, has come to nothing. It was impossible for the Federal Department of Forestry to release funds for the development of Taylor Creek reserve because the Rivers State Department of Forestry was unable to fund a boundary survey, which was a condition of federal funding. Its annual budget of $US6750 (Moffat and Linden, 1995) is probably less than the budget of any single visiting mission.

Ironically, the Rivers State Department of Forestry had already completed the boundary survey of reserves in four other areas. A simple reconnaissance survey would have shown that at least two of them had more distinctive and endangered faunas than Taylor Creek. As we now know, for example, they contain Nigeria's two rarest and only endemic primates, neither of which has a protected area – the new red colobus (proposed Apoi Creek Forest Reserve) and Sclater's guenon (Upper Orashi Forest Reserve, which, according to a reliable hunter, contained a pygmy hippo at least until 1990).

Now these areas are coming into the same limelight as Taylor Creek did, and there is danger of history repeating itself – time and funds being spent on grand plans for large and 'politically correct' reserves dependent on socio-economic surveys, while the species of prime conservation interest are left unprotected. Many species in the delta have very restricted distributions, and logging and forest conversion are out of control. The immediate need is for stop-gap measures to compensate landlord communities for preserving critical core areas of potential sanctuaries. The arrangements might be handled under Customary (traditional) Law with the approval of the State Director of Forestry. Such areas would cost as little as US$1000 per sq km yearly and could also serve as much-needed teaching and research sites for local universities.

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New threats to the Okavango Delta of Botswana

The Okavango Delta is a jewel of green wetland in the parched land of the Kalahari. At 16,000 sq km, it is one of the world's largest wetlands, an international biodiversity priority and a mainstay of tourism income for local people. Visitors from all over the world come to experience the Okavango and its ungulate herds, predators, vivid bird life, aquatic life and rich human cultures. But this wilderness is fragile, hanging by the thin thread of a single river and the grace of meagre rains, and it is threatened with exploitation and development in a region whose growing human and livestock populations are thirsty for water and hungry for watered land.

The Okavango Delta is 175 km long and is maintained by inflows from the Okavango River, which rises in the highlands of Angola and flows through Namibia before reaching northern Botswana. The dominant hydrological feature of the delta is a flood tide from the Okavango River (Ross, 1987), which reaches the upper delta in Botswana in February–March, coinciding with the local rains. As the flood reaches the intricate channels and wetlands of the delta, it spreads out and slows down, reaching the foot of the delta in July–August, the dry season in Botswana. It is this juxtaposition of flood peak and dry season that makes the delta so important to wildlife (Ross, 1987).

Long-standing threats to the delta have included water withdrawal, pesticide applications, habitat fragmentation by fences, encroachment by cattle, aquatic weed invasion and overhunting (IUCN, 1994). Two of these threats, fence construction and water withdrawal, have recently accelerated and pose serious immediate threats to delta ecology.

Water withdrawal

In June 1996 Namibian authorities announced that they would seek to tap the Okavango in under 24 months in an effort to avert a water crisis in the capital, Windhoek (Anon., 1996a), a dramatic acceleration over previous plans to tap the river sometime next century. Namibia has completed the first phase of construction, a canal connecting groundwater sources near Grootfontein with Windhoek. The current proposal plans to connect this canal to the Okavango via a 250-km pipeline (Figure 1).

These plans were announced as Namibia was in the grip of a 3-year drought. In 1996, when the drought over much of the rest of southern Africa broke, rains did not return to Namibia. This left Windhoek with less than an 18-month water supply in the reservoirs that serve the city. Namibia sought international funding for the pipeline and initiated an Environmental Impact Assessment (EIA; Anon., 1996a). Public meetings in Windhoek and the planned offtake point in Rundu uncovered major flaws in the planned EIA.

Initially, the EIA was to examine only impacts in Namibia, excluding the delta and downstream impacts in Botswana from the study. Environmentalists pointed out this deficiency at the Windhoek and Rundu meetings, and invited Namibian officials to a further public meeting in Maun, Botswana. This meeting, which was sponsored jointly by the University of Botswana Okavango Research Centre (ORC), the Kalahari Conservation Society (KCS) and Conservation International (CI), highlighted this flaw. Namibian authorities subsequently expanded the EIA to include the delta and created an independent panel including ORC, KCS and CI to review the findings of the EIA.

Environmentalists also criticized the pipeline planning for proceeding with technical plans prior to the results of the EIA (Anon., 1996b). In commissioning a technical plan for the pipeline at the same time as the EIA, Namibia greatly reduced the chances that alternatives to the piping scheme would receive equal consideration.

Probably the most serious drawback of the pipeline plan was that it undermined recently created mechanisms for joint management of the Okavango Basin. In September 1994 Botswana, Namibia and Angola signed an agreement creating the Okavango River Basin

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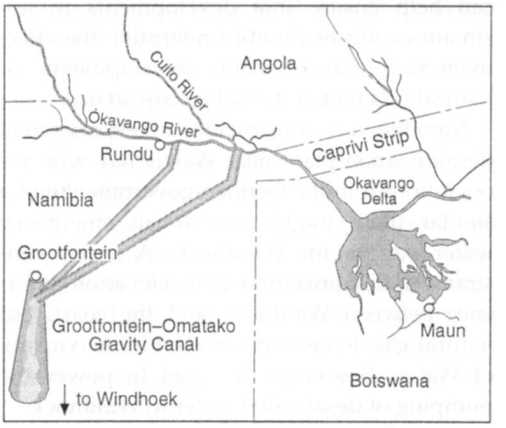

Figure 1. Proposed pipelines from the Okavango River in Namibia.

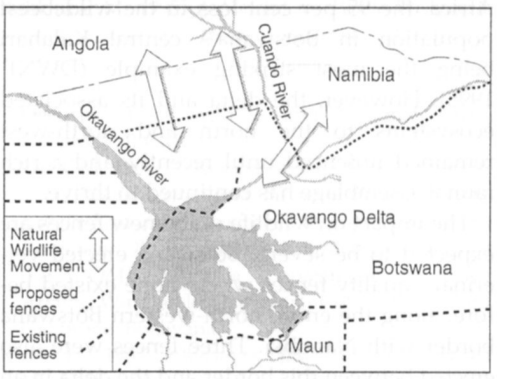

Figure 2. Veterinary cordon fences threatening the wildlife of the Okavango Delta.

Water Commission (OKACOM), composed of three representatives from each of the party countries. It was to meet at least twice a year, and would recommend developments and investigate impacts of surface and subsurface water development of the greater Okavango watershed (OKACOM, 1994).

If environmental interests are well represented, OKACOM is a potentially powerful tool for sound management of the Okavango. Namibia includes a representative of its Directorate for Environmental Affairs in its delegation to OKACOM, but Botswana has environmental participation in an advisory capacity only. The Namibian pipeline plan was developed outside the OKACOM framework. It would double the already uncontrolled withdrawals from the Okavango above the delta and set a precedent for ignoring OKACOM in pursuit of unilateral withdrawals.

The planned Namibian offtake, and particularly the precedent it sets for unplanned development, is one of the greatest threats to the future of the delta. Political instability in Angola and Namibia has limited upstream water development plans in these countries over the past decade. As political instability lessens, prospects for major water withdrawals from the Okavango increase. The current plan may be the first in a series of uncontrolled developments that will spell irreversible change in the Okavango ecosystem.

Fences

In late 1995 Contagious Bovine Pleuro Pneumonia (CBPP) broke out along the northern border between Botswana and Namibia in late 1995. The Botswana Government moved quickly and dramatically to contain the problem. Additional veterinary fences were erected to limit movement of diseased cattle (Figure 2). When these failed to contain the outbreak, the government ordered the destruction of over 250,000 head of cattle in Ngamiland, northern Botswana. With police and military assistance in maintaining quarantine measures along fences, the outbreak was finally brought under control in early May 1996.

These fences were the latest addition to a network in Botswana that has had severe impacts on wildlife. Before the construction of fences the Okavango flood contributed to the maintenance of huge migratory herds of wildebeest and other wildlife, which ranged deep into the central Kalahari (Hannah *et al.*, 1988). The delta was a vital dry season refuge for nomadic species such as elephant, buffalo, zebra and wildebeest, which moved into dispersal areas once the rain arrived. Most of this migratory wildlife has now been killed on the cattle fences or reduced in numbers by the break in access to dispersal area for forage. The loss of these access corridors is one of the great tragedies of conservation in Southern

Africa, the 95 per cent loss in the wildebeest population in Botswana's central Kalahari being the most striking example (DWNP, 1995). However, the delta and its associated ecosystems to the north and north-west remained unfenced until recently, and a rich faunal assemblage has continued to thrive.

The impact on wildlife of the new fences are expected to be severe. Botswana erected veterinary-quality fences where none existed before, along the entire north-western Botswana border with Namibia. Three fences were also erected between this border and the delta in an ultimately failed attempt to halt the southern spread of CBPP. Most potentially damaging are two planned fences within the delta's wildlife migration corridors, one that would extend the existing 'northern buffalo fence', and one that would fence the entire northern Botswana–Namibia border along the southern boundary of Namibia's Caprivi Game Reserve (Figure 2). Both would interrupt major wildlife movements.

Conservation community response

Conservation groups in Botswana including KCS, IUCN, CI and ORC have responded to both the pipeline and fencing issues. The KCS and CI have strongly urged Botswana to insist on OKACOM co-ordination of the pipeline planning. The IUCN has encouraged the Botswana Government to consider listing the Okavango Delta under the Ramsar Convention, and the KCS and CI have engaged parks and veterinary authorities in Botswana in a dialogue on fence alignments and possible wildlife mitigation measures. On 22 October CI released a video on the pipeline and fences threats, and adaptations of this were distributed to more than 100 countries and broadcast in at least six languages.

Conservation groups are also urging the consideration of alternatives to the pipeline scheme that will still meet Windhoek's water needs. Carefully planned development can ensure the integrity of the Okavango Delta at the same time that benefits of Okavango water are equitably realized. International co-operation can help ensure that developments in upstream countries do not undermine the effectiveness of downstream developments or natural function of the delta ecosystem.

Namibia has constructed an experimental desalinization plant near Walvis Bay with co-operation from the German government and a similar plant might provide an emergency water supply for Windhoek. A major constraint to desalinization is the elevation difference between Windhoek and the coast, but natural gas deposits discovered in the vicinity of Walvis Bay could be used to power the pumping of desalinated water to Windhoek.

Ironically, building the Okavango pipeline would probably have to be paid for by water levies, which might drive consumption down to levels at which the Okavango diversion would be unnecessary. Water consumption in Windhoek has already dropped in response to recent price increases, and a German-funded water-reclamation project is under construction. Progressive water pricing could also generate revenues for recycling or desalinization.

The new livestock fences were erected as 'temporary, emergency' barriers without community consultation or environmental impact assessment, contrary to custom in Botswana. More recently, the Botswana Department of Animal Health said that these fences conform to a 'national plan', and would be permanent. Both KCS and CI have urged that proper consultation and environmental impact assessment be conducted before the fences are considered permanent and that fences which do not withstand public or environmental scrutiny should be decommissioned. The Department of Wildlife and National Parks of Botswana has completed a study of fencing techniques, which indicates that alternatives may be available that prevent cattle passage but allow wildlife through (Kalikawa, 1995).

Conclusion

The 1996–97 rains were good in Namibia and reservoirs supplying Windhoek have been replenished. This, coupled with international concern over the pipeline, make international

funding for the project much less likely in the near term. Namibia has said that it still plans to move ahead with the pipeline, but there may now be time for OKACOM regulation of the Okavango to evolve.

Botswana is discussing modifying the extent of border fencing along the Caprivi and is also holding trials of fences that are less damaging to wildlife. Conservationists can contribute to this process through technical advice and CI and IUCN are planning a regional conference on wildlife-friendly fences in June.

In the long term, nature tourism is more important than cattle raising to the economy of northern Botswana. One of the best ways to promote tourism would be to develop a tri-national protected area including the Caprivi Game Reserve, Moremi Game Reserve, and intervening wildlife multiple use areas. A local conservation non-governmental organization, the Chobe Wildlife Trust, has proposed the creation of a tri-national wildlife area connecting Chobe National Park with areas in Angola and Namibia. One of the main attractions of such an area would be that it would allow the dispersal of Botswana's large elephant population into areas of Angola and Namibia that have low elephant numbers because of past civil conflict.

Unless the recent developments in Botswana and Namibia can continue to be constructively addressed, the potential for expanding tourism alternatives, biodiversity safeguards and the regional economic base will be lost.

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Letters

Status of the saola *Pseudoryx nghetinhensis*

The paper by Kemp *et al.* (1997) shows up some of the well-known problems of wildlife survey work and the estimating of large mammal abundance and distribution. The survey team saw no saola and did not provide data to show the locations and routes of their searches, nor the actual methods used – except for saying that teams of three to five persons went on foot, and that half the surveys were carried out with local guides or hunters with tracking dogs.

Locating and recording sparse and probably shy ungulates of less than large size in forest habitats is compounded by various factors, including that of the visibility limit *per se*, plus the probability of animals moving beyond that limit as a consequence of hearing the survey party approach, especially if dogs are involved. An individual walking alone, with frequent halts to listen and scan has much

greater prospects for sightings than is the case when a party, with or without dogs, is involved.

Reliance upon hunters for information on the abundance and distribution of their prey, even if accompanied by the existence of trophies or other animal parts, is notably hazardous science. Hunters have many reasons for disguising what we may refer to as empiricism, and may have no reason to respect our need for information representing accuracy or even truth. Hunters may exaggerate animal population size for bravado, to impress the listener, or to justify hunting activity. Other hunters may minimize population size and withhold identification of the 'best' areas in order to detract attention from their areas of most success, both from researchers and competing hunters.

Tracks as indicators of animal abundance and distribution parameters in forest habitats with ground litter is also an unreliable concept. This becomes particularly obvious when considering the actual land area scanned by the eye for footprints, relative to the overall area of the ecosystem under study. The proportion actually scanned may be far too small to allow any form of conclusion, let alone any extrapolation process. Even 'presence' or 'absence' may not be proven, especially where the ungulates in question have seasonally controlled distribution differences and the researchers visit for only a minor part of the annual cycle.

Researchers may feel under some obligation or perceived pressure to make an estimate of population size, when in fact it may often be more objective to simply state that 'we don't know'. The figure postulated by Kemp *et al.* has no basis in objective data and may be quite misleading as a consequence, and therefore without value for management purposes. In the same issue, a most valuable and salutary lesson exposing poor methodology and logic in population estimation is provided by Collar (1997). This serves as a strong signal, warning us to be careful when attempting to base management and conservation recommendations upon unsubstantiated population estimates, and especially when what we really need is a true and clear picture of the population's recent trend, whether upwards or downwards.

In only one situation during 40 years of work have I felt confident that trend and something very close to actual population size resulted from direct observation undertaken during (repeated) field surveys. This was in relation to the barasingha *Cervus duvauceli* population of Suklaphanta Wildlife Reserve, Nepal (Henshaw, 1994). The circumstances leading to that opportunity are extremely rare in field research on wildlife anywhere.

Although the concept was not discussed by Kemp *et al.*, it may be valuable to consider the pros and cons for captive breeding of saola, assuming that more data accrue to suggest a critical population level in a downtrending mode. However, the lack of solid information on the environmental requirements, especially food, as well as the social needs and behavioural patterns of this species renders the idea less than advisable at present. The evidence so far suggests that the saola may be highly susceptible to post-capture myopathy, unless methods of capture and post-capture care standards can be greatly improved, and unless zoo-type holding areas can be abandoned in favour of an extensive enclosure system.

Traisawasdichai (1996) reported on the deaths of six saola captured from the forest. Four of these were caught at the behest of the Laotian military-owned Bolisat Pattana Khet Phudoi (BPKP), a logging organization with ambitions to develop a zoo. It reputedly encouraged these captures with an offering price equal to about $US1200 per saola. It would appear obvious that the future of saola should be put on a more professional basis, as well as a more scientific one.

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Mammals of Namcha Barwa, Tibet

The paper on the large mammals of Namcha Barwa region of Tibet (Qiu and Bleisch, 1996) interested me because this remote area has a similar flora and fauna to that of nearby north-eastern India where I have worked.

However, I would like to make a few points. First, the occurrence of the Hanuman langur *Semnopithecus entellus* needs further confirmation. The eastern limit of distribution of the species in India is the Buxa Tiger Reserve in north Bengal. This species is not found in Assam, Arunachal Pradesh and other areas of north-eastern India. It occurs in some areas towards the south-west of Bhutan (Choudhury, 1990) and in the Chumbi Valley of Tibet. From this distribution pattern, it is unlikely to occur in the Namcha Barwa region.

The only langur species recorded near Namcha Barwa is the capped langur *Presbytis pileata*, which is not uncommon on the Indian side of the border in Arunachal Pradesh. Here it occurs only west of the Siang (as the Tsangpo River is known locally). The langur has not been recorded between the Siang and the Dibang River but from there its distribution extends to Myanmar.

The known range of the hoolock gibbon *Hylobates hoolock* in south-eastern Tibet is not anywhere near Namcha Barwa. On the Indian side its western limit of distribution is the Dibang River (Choudhury, 1987; Figure 1).

The recognized elevation of Namcha Barwa is 7756 m (National Geographic Atlas of the World, 1990).

The record of Gongshan muntjak *Muntiacus gongshanensis* from the area is very interesting and suggests that the species might also occur in Arunachal Pradesh, India.

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Dr Choudhury questions the occurrence of the Hanuman langur *Semnopithecus entellus* in the Namcha Barwa region of south-eastern Tibet and suggests that the only langur in that region is *Presbytis pileata*. Our record of the Hanuman langur is based on interview results and on earlier Chinese survey reports (Cai and Zhang, 1980; Liu, 1993), and we can provide no additional direct evidence because we were unable to travel into the disputed border areas where the langurs are likely to occur. If earlier Chinese records of Hanuman langurs in this region were based on collected specimens, as is likely, then it may be possible to determine definitively which species was the source of the reference.

Choudhury also questions reports of *Hylobates hoolock* in south-eastern Tibet. It should be noted that Chinese maps demarcate the disputed border between Tibet and Arunachal Pradesh in a very different manner from that in the range map provided by Choudhury. Comparing maps, it appears that southern Motuo County as defined in China does indeed include a portion of the range of *H. hoolock* as described by Choudhury. It is unfortunate that neither Chinese nor Indian authors seem to be in a position to describe the political situation openly, further adding to the general confusion about the area. These misunderstandings forcefully underscore the desirability for cross-border communication and co-operation in planning for conservation in this biologically rich and unique region.

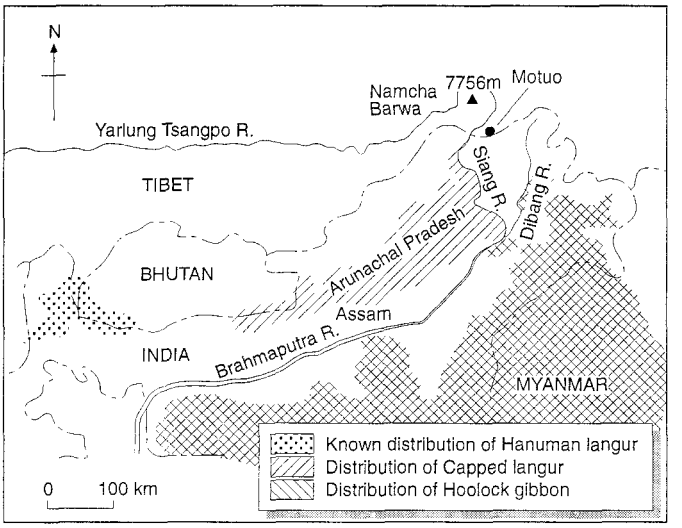

Figure 1. Map showing primate distribution in areas of India, Bhutan, Tibet and Myanamar lying south of Namcha Barwa, Tibet.

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The occurrence of *Presbytis pileata* in the forests on the border between northern Yunnan and Burma is supported by specimens at the Kunming Institute of Zoology. However, we received consistent reports about the absence of that primate from local people, who mostly inhabit the degraded eastern bank of the Yarlung Tsangpo River. It is possible that *P. pileata* used to occur throughout the eastern Himalaya on the south side of the main ridge.

The occurrence of gibbons needs to be confirmed, although it has appeared in the Chinese literature. Citing on that needs to be careful, because I do not wish to see an academic issue create a political problem over a disputed territory.

Muntiacus spp. certainly deserve more research. Local hunters have described what may be another species, which is said to be darker than *M. gongshanensis*, although that was not mentioned in our paper

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Disinformation campaigns and indigenous peoples

I am writing on behalf of the Inuvialuit to support J. M. Hutton's letter (The [dis]information age – a reply; *Oryx*, **30** [3], 159–160). Under a native land claim the Inuvialuit, the indigenous people of the western Canadian Arctic, share the responsibility with the government for the management of wildlife and the environment under an internationally recognized system of integrated resource management known as co-operative management. Through this system the Inuvialuit Game Council (IGC) has achieved a number of successes in wildlife management. It negotiated an international polar bear agreement with the Inupiat of Alaska – the first wildlife management agreement to be initiated and concluded by aboriginal user groups in two countries. A similar agreement modelled on this one is being negotiated by the USA and Russia.

The IGC has also been involved in research into beluga whales and through its efforts a management plan for beluga whales in the Canadian part of the Beaufort Sea was developed. This plan is being considered as a model for a scheme to be applied to the beluga shared by the Alaskans and the Inuvialuit.

In spite of these successes the IGC has been less successful in trying to undo the damage caused to the international fur trade and other consumptive wildlife uses by the disinformation campaigns of various animal rights groups. The Inuvialuit, like many other indigenous cultures around the world, are victims of these powerful, well-organized groups, whose agenda is the elimination of any consumptive use of wildlife under the guise of conservation. The Inuvialuit believe that conservation encompasses animal welfare but this does not extend to animal rights – the saving of every individual animal life. Their view is a holistic one – that the entire land is a unit that must be cared for and that the taking of individual animals for food or commercial purposes is inconsequential to the welfare of the whole.

Direct attacks by animal rights organizations on the Inuvialuit philosophy of conservation can and are being dealt with successfully. The more subtle, indirect attacks of these organizations by the use of disinformation through international conventions, such as the International Whaling Commission (IWC) and the Convention on International Trade in Endangered Species, are much more difficult to counter.

An example of the use of disinformation is the animal rights campaign against sealing. In the late 1970s and early 1980s, this campaign destroyed the European market for seal skins. The loss of this market has had economic and social impacts on Inuvialuit communities. Another example of disinformation deals with the catching of beluga whales. The Inuvialuit have caught beluga in the Beaufort Sea on a subsistence basis for thousands of years. They also sponsor research on this species as part of their legal responsibilities to manage wildlife. Recent studies have shown that the population of beluga whales in the Beaufort Sea numbers more than 40,000 individuals, far more than a previous estimate of 14,000. From this population the Inuvialuit have consistently taken 100–150 animals a year, a number recognized as sustainable at the previous estimated population level and quite insignificant at the new accepted level. In spite of this, animal rights organizations continue to attack this take as unsustainable through the media and the IWC.

I agree with Hutton that disinformation is systematically disseminated by many groups and that it is equally dangerous, be it from animal rightists or from the 'wise use movement'. It polarizes issues and prevents rational discussion. An example of this lack of rational discussion is the fact that in many circles, including some management agencies, it is regarded as heresy to raise the issue of amending the US Marine Mammal Protection Act or the Endangered Species Act. The Inuvialuit are not fond of either of these two pieces of legislation, having suffered in the past from their heavy-handed use.

I also support Hutton's view of North versus South. International conventions have become battlegrounds between countries of the developed North and the under-developed South. However, northern developed countries are not only trying to impose their wills on their southern neighbours, they are also imposing their wills on the indigenous cultures within their own countries. An example of this is the IWC's requirement for indigenous whaling cultures to justify, irrespective of sustainability, their need for food products from whale stocks they have harvested for generations. There is much common ground between the Inuit hunter of the circumpolar north, the whaling-based cultures of the south Pacific and the tribal cultures of Africa. The use of disinformation by animal rights groups through international conventions is a direct threat to the survival of indigenous cultures.

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