

biology's moment in history'. We can discuss *ad nauseum* whether we should dirty our hands (but then of course it will be too late), or we can devote ourselves now, 'in our moment in history', to the greatest problems humanity has ever faced. And in that sense, we are a privileged generation: I believe we have obligations to the public interest, to science, and to ourselves to convert our scientific knowledge base to sound and informed public policy. Conservation science demands that we act well, act now, and use the inherent tensions in a creative manner. A complete conservation science demands nothing less.

References

- Gunderson, L.H., Light, S.S. and Holling, C.S. 1995. Lessons from the Everglades. *BioScience Supplement*, 66–73.
- Lovejoy, T.E. 1995. Will expectedly the top blow off? *BioScience Supplement*, 3–6.
- Meffe, G.K. and Viederman, S. 1995. Combining science and policy in conservation biology. *Wildlife Society Bulletin*, 23, 327–332.

Gary Meffe is a Professor at the University of Georgia and the Savannah River Ecology Laboratory, and is senior author of Principles of Conservation Biology (Sinauer Associates, 1994).

NEWS AND VIEWS

Realistic 'game laws'

Spinage (1996), in discussing 'The rule of law and African game – a review of some recent trends and concerns', confuses the need for legislation with what constitutes effective law. He incorrectly implies that Child (1995a) and Clark and Bell (1984; who have each drafted legislation to conserve wildlife for several countries in Africa and the Middle East), are among those who advocate doing away with law to regulate the management and use of wildlife. In so doing he offers a spirited, if subjective, defence of colonial-type legislation that fails to accept that such legislation has contributed little if anything to the well-being of the macrofauna in the 96 per cent of Africa outside protected areas. In reality, the centrally directed protectionist philosophies contained in colonial-type game laws failed outside protected areas in Africa (and elsewhere) as dismally as centrally controlled economies failed in Eastern Europe (and elsewhere), and this was for similar reasons (Child, 1995b). A fresh approach is essential.

Clive Spinage finds the success of the Zimbabwean model of wildlife management uncomfortable and suggests that it has been in operation for too short a period to allow a

reliable evaluation of its merit. In fact, the Zimbabwean approach was introduced progressively and with growing confidence from 1961. By 1970 we were confident of its merit and it became enshrined in law in 1975. Success stems from recognition of the role of landholders in deciding the fate of wild resources, and acceptance that their decisions are driven by social and economic considerations. This does not negate the need for law, but requires that the legislation accept these realities if it is to realize its intent.

Although the conservation of renewable resources deals with biological phenomena, it is the socio-economic process by which societies are attempting to address growing resource scarcities. Success depends on conforming with basic economic principles within the broad parameters laid down by the immutable laws of nature. Regulating the use of a resource is socially inefficient while a resource is still plentiful, but becomes essential once the resource reaches the threshold of scarcity at which overuse commences. Where the resource in question is one of a suite of resources contributing to local human well-being, it is important that measures taken to protect the target resource do not prejudice its capacity to compete for space with the other resources in the suite. Where people live off the land any

such prejudice will result, at best, in neglect of the resource and, at worst, in its elimination in favour of alternative, more profitable uses of the land. It may benefit the macrofauna to offer it full protection in a protected area where alternative land uses are precluded, but this is dangerous to the survival of wildlife if it is applied outside protected areas where the wild animals are in competition with agriculture. Increasingly, even protected areas must become financially self-sufficient if they are to survive.

For reasons elaborated elsewhere (Child, 1995b), wildlife legislation must be both ecologically and economically sound if it is to be effective. In the case of the law relating to the macrofauna, this usually boils down to the conditional devolution of usufructural rights to the landholders on whose land the wildlife occurs and encouraging these landholders to maximize their profits from conserving and using the resource wisely. Benefits and accountability become closely related – those who look after their impala have more impala to use and sell. The State cannot, however, abrogate its ultimate responsibility for ensuring that both biological diversity and ecological productivity are preserved in the long-term interest of the Nation. If nothing else, these are economic imperatives for survival.

Contrary to the aim of protectionist legislation, which seeks to destroy the value of wildlife artificially through legislative mechanisms that inhibit or prevent free legitimate trade, successful conservation outside state-funded protected areas depends on wildlife realizing its economic comparative advantage and becoming financially competitive. The various values that accrue to wildlife from aesthetic and existence values, through the charismatic values associated with game viewing and hunting, to the utilitarian values of game meat and other usable products, combine to provide this competitiveness. All may be necessary if wild animals are to outperform other resource uses, and the 'game laws' should promote and not depress these values. It is also incumbent on the conservation community to quit dissipating its energies on infighting. Instead it should pool its resources

to confront the real adversaries of sustainable living.

More of a failed scenario only hastens the pace of destruction. Wildlife would not be in decline in most African countries with centrally regulated protectionist wildlife philosophies, and fewer countries would be seeking an alternative, if the approach was viable under intensifying resource scarcities. With allocations for wildlife and protected area management declining around the world, from the US Parks Service to the conservation agencies in poor developing countries in Africa who often cannot feed the patients in their hospitals, there is a need for innovative legislation that allows wildlife and protected areas to support themselves. The lessons from economic successes (Rosenberg and Birdzell, 1986) teach that such legislation should be highly responsive to the needs of the grass-roots landholders, who ultimately decide the future of wild animals on their lands and, in the longer term, will determine the fate of Africa's wonderful protected areas. Clive Spinage is right in arguing for laws to guide and support the conservation and use of wildlife, but the legislation must reflect on-going realities and must aim to achieve the possible if it is to succeed.

References

- Child, G. 1995a. Managing wildlife successfully in Zimbabwe. *Oryx*, **29**, 171–177.
- Child, G. 1995b. *Wildlife and People: The Zimbabwean Success. How the Conflict between Animals and People became Progress for both*. WISDOM Foundation, New York and Harare.
- Clark, J.E. and Bell, R.H.V. 1984. Wildlife legislation. In *Conservation and Wildlife Management in Africa* (eds R. H. V. Bell and E. McShane-Caluzi), pp. 479–499. US Peace Corps, Washington, DC.
- Rosenberg, N. and Birdzell, L.E. 1986. *How the West Grew Rich*. Tavis, London.
- Spinage, C.A. 1996. The rule of law and African game – a review of some recent trends and concerns. *Oryx*, **30**, 178–186.

Graham Child
WISDOM Foundation
PO Box MP 510
Mount Pleasant, Harare
Zimbabwe

Realistic 'game laws' – a reply

Having been invited to reply to Graham Child's letter (Child, 1996), I wish to emphasize that, while I made several references to certain statements made by Child in his review (Child, 1995), my paper was not intended as an attack on his review nor on its author, but queried certain statements made therein, which appeared to support a widening coterie of antigame-law lobbyists. Coming from someone of his standing and competence, such statements are liable to be quoted to serious detrimental effect by advocates of the abrogation of game laws.

Graham Child remains obdurate in his assessment that the colonial-type legislation has contributed 'little if anything to the well-being of the macrofauna in the 96 per cent of Africa outside of protected areas.' Yet it is the game in these very areas with which we are concerned today, and the majority of national parks in the remaining 4 per cent is of recent creation. So, because game has survived in many parts of these areas in such numbers, how can one assert that the legislation played no part in such survival? Experience of those areas denuded of game where there has been no attempt to apply legislation tells us that it has played a part. Incidentally, the term 'game law' has been in the English language since the Middle Ages and does not require parentheses, unlike 'wildlife', which was described by Partridge (1947) as gobbledegook.

To state that I am 'uncomfortable' with the Zimbabwean model of wildlife management, I find odd. I stated that I was not against the measures, but I did not believe that they can be held up as a model for universal adoption that will alter the trend in the destruction of African wildlife. I do not disagree with the rationale behind Child's view, only whether it can be made to work in many areas of Africa. In a survey in Botswana conducted in the early 1980s, more than 50 per cent of people interviewed considered that game was a God-given resource, which was inexhaustible (Mordi, 1987). Putting a value on it only serves to exacerbate this naïve approach.

In spite of my reservations, I did not argue for maintenance of the status quo, as Child implies. I questioned the ill-intentioned motives attributed to the colonial legislators (who in fact only implemented what the lobbyists requested of them) and the concept that there was no restrictive law before the advent of colonial legislation, arguing that there was customary law. I also argued that a reimposition of customary law concepts is unlikely to succeed today. Whereas I concede that there is a need for change with respect to certain aspects of the law to ensure that benefit accrues to those people on whose land the game occurs, my contention is that this should be within an effective legal framework.

Graham Child agrees that I am right in arguing for laws to guide and support the conservation and use of wildlife; and I, in turn, agree with much that he has expounded in the last three paragraphs of his letter. But as to whether airing important issues in a review constitutes dissipating energies by infighting, I leave the readers to decide for themselves.

References

- Child, G. 1995. Managing wildlife successfully in Zimbabwe. *Oryx*, **29**, 171–177.
- Child, G. 1996. Realistic 'game laws.' *Oryx*, **30**, 228–229.
- Mordi, R. 1987. *Public attitudes towards wildlife in Botswana*. PhD thesis, Yale University.
- Partridge, E. 1947. *Usage and Abuse*. Penguin Books, Harmondsworth.
- Spinage, C.A. 1996. The rule of law and African game – a review of some recent trends and concerns. *Oryx*, **30**, 178–186.

Clive Spinage
Wickwood House, Stanford Road
Faringdon, Oxon SN7 8EZ, UK

Commercial whaling sanctioned

This is an urgent call to arms for all those people concerned about wildlife conservation. In a world now guided by the paradigm of sustainable use, it is now the turn of even the

greatest wildlife icon, the whales. This year, at the 48th International Whaling Commission (IWC) meeting in Aberdeen, UK, a population estimate for the minke whale *Balaenoptera acutorostrata* was accepted as 'adequate' for use in the IWC's Revised Management Procedure.

Does it matter? It matters a lot to those who find whaling ethically unacceptable. It should also matter to those concerned with wildlife or fisheries conservation, because the move towards the resumption of commercial whaling is, at best, premature. Contrary to the main press coverage of this year's IWC meeting, it also has little to do with a sensible interpretation of the relevant science.

Significant debates have surrounded the development of an acceptable population estimate for the north-east Atlantic minke whales. This is the test case for the IWC and such an estimate is part (but only part) of the information required to generate a catch quota. With such a quota, and once other measures (for example concerning observation and control) have been agreed, IWC-sanctioned whaling can resume. Where the minke whales lead, other whale species are poised to follow and because the IWC provides the world's exemplary 'fisheries' management regime, other wildlife resources will be treated similarly.

This population estimate for minke whales in the north-east Atlantic may appear high enough to justify exploitation, but an unprecedented nine pages of the report of the IWC's Scientific Committee indicate the uncertainty that surrounds this figure. In fact, two equally valid estimates now exist: 69,000, based on data from surveys made in 1989; and the new estimate, 118,000, from 1995 data.

The generation of these estimates is a mathematical saga and only fully understood by a few specialists. Following earlier controversy, a small working group was charged by the Committee to evaluate estimates. Two computer programs were examined: one from the Norwegian Computer Centre (NCC) and the other from the Centre for Ecosystem Management Studies (CEMS) in Germany. The CEMS model was subjected to a full set of simulation trials but the NCC program was so slow that only four simple trials were run.

Key points from the 48th IWC Meeting, Aberdeen 1996

- A controversial abundance estimate for north-east Atlantic minke whales was accepted.
- The US proposal to take five grey whales for the Makah tribe was withdrawn for the moment.
- A standing working group on environmental factors was established.
- A move to forbid the use of the 'electric lance' as a secondary killing method was narrowly defeated.
- It was agreed that a workshop should consider Japan's 'community-based whaling.'
- It was recommended that the Scientific Committee should continue its work on small cetaceans (traditionally outside the purview of the IWC).
- In majority resolutions, Norway was called upon to halt its unilateral whaling activities (conducted 'under objection' to the moratorium), and Japan was requested to refrain from taking minke whales under 'scientific permit', especially in the Southern Ocean Sanctuary.

Despite this, the NCC program was selected by the working group.

When the 1989 data were analysed by both the NCC and CEMS models, the NCC results were 33 per cent higher. The reasons for this remain to be determined. A number of other peculiarities can be found in the Committee's report. For example:

- one member of the working group of eight did not agree with its conclusions;
- several Committee members did not consider that four simple simulation trials adequately validated the NCC procedure;
- six different reasons were presented to explain why the 1989 and 1995 estimates are so far apart, but it is not known which, if any, are correct;
- three different estimates exist for just part of the stock area – the North Sea: 1989, 5580 (from the Norwegian survey); 1994, 3000–4000 (from the European Small Cetacean Abundance in the North Sea survey; and 1995, 20,294 (the NCC estimate), although a number of reasons are given why such comparisons are inappropriate;

- some Committee members felt that the situation paralleled that of 1992, when a population estimate was accepted prematurely.

Not only has the new estimate been endorsed, but legends have sprung up around it. The Norwegian IWC Commissioner told the media, 'the stock is large and increasing' – although the figures support neither an increase nor a decrease.

When Norway officially objected to the moratorium in 1982, it was technically left free to hunt minke whales, although this unsanctioned kill may be said to have challenged the authority of the IWC as the international regulatory body for whaling. The Norwegians seem to believe that the acceptance of the new estimate goes a long way towards endorsing their hunts.

The actions at the meeting of the overtly pro-whaling countries, such as a stage-managed walk-out by Norway, may be easy to interpret. The same was not true for those that are traditionally anti-whalers. In particular, the political machinations of the USA (traditionally a leading anti-whaler) were puzzling. The US delegation arrived at the meeting with one important and unusual aim. They wished to obtain a quota of five grey whales *Eschrichtius robustus* for the Makah Indian tribal council of Washington State.

Requests for aboriginal quotas require evidence of nutritional and cultural needs. The Makah have not practised whaling for 70 years, many of their elders oppose the hunt, and the US proposal proved to be controversial. It seemed possible at one point that the USA might promote a redefinition of the requirements for an aboriginal take, limiting them only to cultural aspects. This could have opened the flood gates for other similar proposals. Fortunately, the USA finally withdrew the proposal instead.

What domestic considerations made the Makah claim so important and where did the instructions to the US delegation come from? It is perhaps telling that on 26 June, while the IWC plenary was in session, a resolution expressing opposition to the 'Makah proposal' was unanimously approved by the US House of Representatives Committee on Resources. A

press release noted, 'We're sending a strong message to the IWC that we don't agree with the Clinton Administration on this issue.'

The Makah proposal took up a lot of IWC time, although it is difficult to believe that it influenced the negotiations at the IWC so greatly that this somehow allowed the controversial population estimate to be waved through. No doubt other considerations, perhaps relating to international relations, also contrived to give Norway a winning hand. Even the pro-whaling protesters, who arrived at the meeting with 'Science on our side' emblazoned on their banner, seemed to have been able to prejudice the mood of the meeting rather too well.

Justin Cooke of CEMS, in a letter to *New Scientist* (27 July 1996), noted that, 'estimating the numbers of whales is a difficult but ultimately solvable problem. Unfortunately, the politicization of the issue has not made its resolution easier.' I have an even broader concern and this is that the relevant debates and modelling have now gone on over a long time in a very rarefied forum – such that very few people understand what is now contained in the IWC's regimes. For the IWC to be fully credible, all aspects of its work – including the development of estimates – should now be exposed to the widest possible public scrutiny. I call for your help in achieving this.

Mark Simmonds
Whale and Dolphin Conservation Society
Alexander House, James Street West
Bath, Avon BA1 2BT

Recovery programme for hog

Nearly 10 years after its conception, a recovery programme for the pygmy hog *Sus salvanius* was launched with the signing of an International Conservation Management and Research Agreement on 16 February 1995 in New Delhi, India. This Agreement, the first of its kind in India, was signed by the Secretaries of the Ministry of Environment and Forests



Part of the new Pygmy Hog Research and Breeding Centre on the outskirts of Guwahati in Assam, India, photographed prior to its completion in June 1996 (*William Oliver*).



A 5-day-old pygmy hog, one of 19 born in three litters at the new breeding centre (*William Oliver*).

and Assam State Government, the IUCN/SSC Pigs and Peccaries Specialist Group and Jersey Wildlife Preservation Trust. The European Union is supplying the majority of funds for the first 3 years of the programme.

The pygmy hog is critically endangered and is confined to a few remnants of tall grassland in north-western Assam, India, and possibly extending into south-east Bhutan. Although it is legally protected in India, the species's survival has been jeopardized by the gross diminution of its tall grassland habitat. The continued widespread dry-season burning of what remains of these grasslands is extremely prejudicial to the hog's survival. The only viable population is in Manas National Park, part of which remains under the control of insurgent groups.

The conservation programme for the pygmy hog has made good progress to date. Major developments include: the appointment and training of two full-time staff (local conservation biologists), ancillary personnel and local scientific consultants; carrying out preliminary field surveys in selected priority sites (including the confirmation of the survival of three small, but hitherto presumed recently extinct, hog populations); construction of the Pygmy Hog Research and Breeding Centre in a social forestry nursery on the outskirts of Guwahati, the capital of Assam State; capture under permit of 11 hogs in Manas National Park, of which six (two males, four females) were retained for captive breeding and the

others released immediately after the attachment of radio harnesses; the subsequent monitoring of the tagged hogs; and the birth of 13 hogs (seven males, six females; only one male did not survive) in three litters at the breeding centre. Various other studies of these animals, and the ecology and management of their tall grass habitats are planned under the aegis of the programme, which was identified as the single highest priority in the Pigs and Peccaries Specialist Group's action plan (IUCN, 1993).

Reference

- IUCN, 1993. *Pigs, Peccaries and Hippos: Status Survey and Conservation Action Plan* (ed. W. L. R. Oliver). IUCN, Gland, Switzerland and Cambridge, UK.

William Oliver

IUCN/SSC Pigs and Peccaries Specialist Group

Conservation of Indian Ocean invertebrates

The islands of the Western Indian Ocean are widely recognized as important areas of biodiversity. Conservation in the region has achieved notable successes, despite extensive habitat degradation and development pressures. Almost all conservation projects to date

have concentrated on vertebrates and plants; invertebrate conservation has been assumed to follow from habitat management. While this is of undoubted importance in helping to conserve at least part of existing invertebrate faunas, its use in conserving threatened island endemics has not been assessed. Although insular vertebrate faunas are important in evolutionary terms, they form only a very small part of the diversity present on islands. In addition, while the ecological significance of some of the vertebrate taxa is known, the role of invertebrates is very poorly understood. Island conservation requires more knowledge of invertebrates than we possess at present.

The region's first full status review for invertebrates has recently been completed for the Seychelles. The Seychelles Red Data Book, prepared by the Nature Protection Trust of Seychelles (NPTS), with publication expected in late 1966, lists all threatened species according to the new (1995) IUCN categories. This includes 138 invertebrates, approximately 5 per cent of the fauna. Two per cent of these are classed as extinct, 64 per cent critically endangered, 5 per cent endangered and 24 per cent vulnerable. Because 65 per cent of invertebrate species have naturally restricted ranges and are vulnerable to stochastic environmental changes, the Red Data Book lists only vulnerable species for which there is evidence of decline. From this review, it is apparent that 97 per cent of listed taxa are threatened by habitat changes and 3 per cent by introduced predators. The Red Data Book identifies measures to reduce the threats facing species, and implementation of these has already started with habitat restoration at key sites. Until 1996, invertebrate conservation in Seychelles was limited to research into the effects of habitat degradation. Early this year the first invertebrate conservation projects were initiated by the NPTS and the Zoological Society of London's Invertebrate Conservation Centre with the establishment of captive breeding colonies of the giant tenebrionid beetle *Polposipes herculeanus*, Fregate Island snail *Pachmodus fregatensis* and Seychelles giant millipede *Sechelleptus sechellarum*. All three are threatened by the colonization of Fregate

Island by brown rats *Rattus norvegicus*. The captive colonies provide an insurance against extinction while rats are eradicated.

Recent surveys of butterflies in the Comoros revealed a largely intact fauna despite extensive deforestation, but it is not known whether this group is representative. Information from Madagascar is similarly difficult to interpret. The Mascarene invertebrate fauna is relatively well documented, but threat assessments have been made only for molluscs. If the status of molluscs – 26 per cent extinct and 31 per cent endangered – is an indication of the status of invertebrates as a whole, then it is clear that the situation is critical on Mauritius and Rodrigues. Invertebrates are probably slightly more secure on Reunion, which is the only Mascarene island with extensive natural forest, but even there 5 per cent of molluscs are extinct. The Mauritian satellite islands were almost entirely neglected until recently; a small, largely endemic invertebrate fauna existed on Round Island last century but most species are now extinct; recent collections have yet to be fully identified but appear to be dominated by introduced species. The incompleteness of our knowledge of such small islands in a relatively well studied part of the world is demonstrated by the discovery of two new species – a large centipede and a spider – on Round Island and nearby Serpent Island in 1993 (see *Oryx*, 30 [1], 14). These are among the few Mascarene invertebrates for which conservation measures have been proposed. The only other invertebrate conservation measures have been experimental reintroductions of some molluscs to Ile aux Aigrettes.

There is an urgent need for surveys of island invertebrates. Without a better understanding of both current and extinct faunas, restored habitats are likely to be ecologically unstable and prone to continued invasion and degradation. Historical information is fragmentary, but in all the islands concerned deposits of vertebrates, molluscs, arthropods and plants exist, which have not been examined systematically.

Studies of the original fauna and flora will be undertaken for Seychelles cave and marsh deposits in 1996–97 and similar research is

planned in the Mascarenes. We have a unique opportunity to combine systematic biology, palaeontology and conservation to support existing and planned efforts to conserve the biodiversity of the western Indian Ocean.

Justin Gerlach

The Nature Protection Trust of Seychelles

Mervyn Cowie: 1909–1996

'The father of East African wildlife conservation' would be a just assessment of the career of Kenya-born Mervyn Cowie, who died on 19 July in his 88th year. Without his energy and persistence most of Kenya's national parks might well not have been declared in time, and so now be submerged under farming and even industrial development. But for him, the millions of wildlife tourists, who have enjoyed the wildlife of these and other East African parks, and have made tourism one of Kenya's two top earners of foreign exchange, might have had to go elsewhere.

It all began with a most ingenious ruse some 4 years after he returned to Kenya in 1932 to set up as an accountant, and incidentally to become an honorary game warden in one of the colony's inadequately managed game reserves. Writing to the *East African Standard* as 'Old Settler', he called for the slaughter of all the wild animals, which were obstructing the development of the colony. So enthusiastically was he supported by the farming community that the desired reaction set in and began to put some strength behind Cowie's hitherto almost lone campaign to save Kenya's already diminishing numbers of larger animals. Indeed, while he was a member of the colony's Legislative Council, he was nicknamed the Member for Wild Animals.

But hardly had the Government been persuaded to appoint a Game Policy Committee, before Hitler intervened. After his distinguished war career, ending as a lieutenant-colonel in the Kenya Regiment, Cowie returned to the attack. In 1946 he became

Director of the Royal Kenya National Parks, starting with Nairobi National Park, uniquely only a taxi-ride from the city centre. Here he welcomed Princess Elizabeth shortly before she became Queen. By 1948 he succeeded in persuading the Government to declare Tsavo National Park – still one of the largest in Africa and a few thousand hectares larger than Wales. Tanganyika (as Tanzania was then called) and Uganda soon followed suit with the Serengeti (1951) and the Queen Elizabeth National Park (1952), respectively. By the time the independent Government of Kenya ungraciously and unceremoniously sacked Cowie in 1966, he had been able to add three more parks to the portfolio: Mount Kenya (1949), Aberdare (1950) and Nakuru (1961), with Meru and Mount Elgon being upgraded from game reserves the year after he left.

All this was achieved by enormous and unceasing effort, not only administrative, but political and fund-raising as well. In the autumn of 1955 the Fauna Preservation Society (FPS; as it then was), arranged a lecture tour for Mervyn Cowie in Britain. He spoke at 14 cities and towns throughout the country, north to Aberdeen, east to Norwich, south to Bridgwater and west to Cardiff, not just about his national parks but also about the already serious threat to wildlife from poaching. At the same time he appeared on television, hosted by Peter Scott. All this brought much welcome publicity for wildlife conservation, both generally and in East Africa.

In 1960 he was appointed CBE and in 1975 became a member of the Netherlands' Order of the Golden Ark. In 1966 the FPS elected him as a Vice-President. He also became a trustee of the East African Wildlife Society and the Uganda National Parks, as well as receiving the Gold Medal of the San Diego Zoological Society of California.

He wrote three books: *Fly Vulture* (1961), *I Walk with Lions* (1964) and *African Lion* (1965). The first of these arose out of the well known pioneer wildlife film, *Where No Vultures Fly*, which was based on his achievements.

Richard Fitter
FFI Vice-President