Why doesn't biodiversity monitoring support conservation priorities in the tropics?

D. Sheil

The most immediate challenge for biodiversity conservation is less one of good science than of good practice and effective allocation of resources.

Douglas Sheil is a Scientist at the Center for International Forestry Research (CIFOR), Bogor, Indonesia.

Biodiversity monitoring activities can hinder rather than promote conservation in tropical countries. The national institutions responsible for conservation in developing countries have very limited resources, which gives donors and richer agencies scope for considerable influence. However, those nominally concerned with supporting conservation often overlook the practicalities. As a result, many initiatives divert scarce resources away from fundamental management priorities.

Good management demands clear and achievable goals. From a local perspective, there is generally little difficulty in identifying threats to biodiversity – predominantly habitat loss (particularly the loss of natural forest cover), encroachment, unregulated exploitation and various forms of environmental degradation. Most national conservation plans provide clear priorities, such as maintaining natural vegetation cover, preventing conversion of protected areas to other land uses and protecting high-profile taxa. These are priority goals that need to be supported both locally and nationally.

This article addresses the importance of various types of biodiversity monitoring, suggests practical biodiversity conservation priorities and indicates how external agencies can deflect local management from addressing these. The article is an elaboration of opinions published recently (Sheil, 2001), based mainly on the author's personal experiences in Africa and Southeast Asia. One vital step to addressing the problem is a frank discussion of how conservation goals should be supported.

TYPES OF MONITORING

Monitoring and project evaluation are central to any discussion of good conservation management. However, "monitoring" means different things to different people. Four specific classes of activity are relevant here:

- ***identifying and assessing threats and problems***, for example, in the context of protected areas, the general patrolling (site tours) needed to identify encroachment, fire risk, illegal camps, signs of exploitation and snares, so that managers can respond;
- ***implementation monitoring***, i.e. checking to see if planned activities were implemented as prescribed, and supervising and assessing interventions (e.g. assessing the coverage of patrols and the quality of information they provide);
- ***effectiveness monitoring***, i.e. checking to see if the activities and interventions had the desired effect, and checking that threats have been adequately dealt with;
- ***extensive inventories and repeated estimates*** of diversity or populations not clearly tied to a management response.

The first is critical even when resources are extremely limited and can be carried out at minimum cost. The second and third are also a regular part of normal management processes (Noss and Cooperider, 1994). The fourth is emphasized in academic research; it is the type of monitoring that frequently leads to scientific articles, and sometimes to exciting new discoveries. All of these types of monitoring have their place.

Usually, the only direct conservation benefits provided by the fourth type of activity are indirect, by providing an opportunity for monitoring of the first type, i.e. ensuring regular field visits to areas that might otherwise be neglected. Yet those who should be doing the practical management implied by the first three types are often coaxed into doing the fourth, or completely sidelined.

Local managers generally benefit more by developing local knowledge and understanding than by emphasizing technical abilities for tracking of pre-selected

variables. A field presence is vital. Donors and others frequently focus on large-scale regional and global issues and may find that these ultimately are in conflict with local priorities. The relative value of the various monitoring activities must be assessed in terms of their costs and their relevance to achieving fundamental goals. Activities must be prioritized based on a realistic appraisal of what is required and what is possible.



CIFOR/M. RUIZ PEREZ

From a local perspective, there is generally little difficulty in identifying threats to biodiversity – predominantly forest loss and environmental degradation (Lampung, Indonesia)

EXTERNALLY GENERATED PRIORITIES

International aid and development activities increasingly address biodiversity conservation directly or indirectly. Experts of many kinds act as advisers, coordinators and assessors and have considerable influence in determining how funds are used and what activities are endorsed. Most donor-led projects require a commitment of staff and resources by the local agencies. Interventions thus frequently divert scarce staff from activities that may have a higher immediate priority.

Problems are most apparent when projects are viewed *in situ*. Some illustrations are necessary, although it would be unfair to identify specific projects and donors for failings that are common. Several conservation projects known to the author have made detailed assessments of many biological parameters and produced impressive ecological publications, yet local ranger staff never visited parts of the "protected area" and remained untrained in how to use a map and compass. In several long-term projects the local staff nominally responsible for patrolling lacked appropriate footwear for field activities. It is commonplace even in larger projects for field staff to go without payment for months at a time. Under such conditions, local staff improvise for food and income to survive, which can lead to activities like using project transport as a taxi, taking wildlife from the protected areas for meat, selling false licences to illegal pit sawyers or cutting timber. This type of activity often occurs even in projects claiming successful "biodiversity monitoring".

Project success is rarely defined in a manner that reflects conservation requirements (Sayer, 1995; Wells *et al.*, 1999). Certainly, regular funding reviews, in which future financial backing is contingent on perceived success rather than learning from failures, discourages open and frank discussion.

Clearly, an underlying limitation to any conservation activity is the scarcity of basic resources (e.g. Howard, 1991; Inamdar *et al.*, 1999; Barrett *et al.*, 2001). However, the implications of how these resources are allocated need to be recognized. A few years ago, the author reviewed a purportedly comprehensive biodiversity monitoring proposal for a forested national park funded by a major development agency. Encroachment, hunting, illegal timber cutting and fire were widely evident, but were not mentioned in the report. Park rangers admitted that they patrolled very little. The proposed monitoring concentrated on the establishment of a small number of elaborately constructed data-intensive permanent plots. Presumably, the forest can continue to disappear outside such plots.

NEED FOR FRANK DISCUSSION

Having recognized the problem, the next stage is to identify the factors that have led to the present situation, and to seek



D. SHEIL

Detailed botanical work in Kalimantan – many projects divert local staff from activities that may have a higher immediate priority

remedies. Relevant factors include the following.

Donors and agencies have needs and priorities of their own. They require their own defined project goals and indicators by which success can be measured. In many cases, these needs become paramount in any activity where funding hinges on success. Both funders and projects seek to make tenable claims of success for their survival. The need for success encourages a competitive mode of project activity that can be far reaching. Bruenig (2000), discussing forest aid, asserts "researchers in aid projects often fear competition, are suspicious of openness, transparency and easy access to data, and are overly protective of their intellectual property rights".

The list of donor and constituency issues might run to many pages, but a few examples may highlight the difficulties. Brown *et al.* (1999) suggest that donor countries favour bilateral activities precisely because they have their own priorities that can get diluted through multilateral processes. Persson (2000) remarks that "criticism to aid has long been met by the argument that the problems described were solved some time ago and that we now should concentrate on the future. This is hardly true. Recipients still have, for instance, to accept all the hobby horses and bureaucratic peculiarities of different donors. Donors certainly vary (from bad to good) but there is no donor whose assistance could not be significantly improved." Donors are concerned about the popular image of their activities, sometimes allowing propaganda to dominate over transparency (Kaimowitz, 2000). Donors are also sometimes unwilling to support normal running costs, such as payment for forest guards, because there is usually little hope that these activities can be sustained (Kaimowitz, 2000). However, blaming donors will solve little – a broader web of issues conspires to eclipse priorities and thwart constructive developments.

There is confusion surrounding what biodiversity is, and why it should be monitored (Redford and Richter, 1999). For example, signatories to the Convention for Biological Diversity (CBD) agree to assess and monitor biological diversity. However, the CBD text provides no guidance as to what this means. Not being specialists, aid agencies seek out experts for guidance. Since standards do not exist, these experts can promote what they choose. Many (including the author) would assume that a biodiversity agenda is equivalent to a conservation agenda, e.g. that National Biodiversity Action Plans provide national conservation priorities. However, the very term biodiversity is now so broad in meanings that other opinions may easily be accommodated under the buzzword (Redford and Richter, 1999). Biodiversity monitoring and research by conservation staff should support conservation goals.

To be valuable, information should be useful. Popular biodiversity data collection activities are not usually relevant to local conservation requirements. Why should limited local resources be used to collect information irrelevant to management? What is the value of counting species (a common theme in modern biodiversity monitoring)? Environmental degradation in old-growth forests can lead to increases in species richness as well as declines, and species richness *per se* has no unambiguous link to ecological viability or system health (Sheil and van Heist, 2000; Sheil, Sayer and O'Brien, 1999). How does species counting translate into a management response? It is too easy to assume that more data allow more understanding and thus better management. Technical data collection will seldom be cost effective when financial and human resources are scarce.

Measuring is not protecting. Managers are largely concerned with control

factors whereas scientists can be preoccupied with response variables. Much of the current scientific emphasis is on watching problems proceed rather than trying to halt them. Examples include estimating deforestation rates with increasing levels of precision, rather than defining means of slowing forest loss. Such data can be useful, but good resource managers know that stocktaking is not the priority. It is far more valuable to identify threats quickly, and to ensure that adequate management interventions can be taken (Ludwig, Mangel and Haddad, 2001).

Some aspects of tropical conservation are quicker to complete, simpler to document and easier to sell than others. Some necessary activities may be especially unpalatable. Every management system, however democratic and participatory, requires some form of enforcement to guard against improper behaviour. There is increasing evidence to support the view that conservation requires some degree of regulation (Wells *et al.*, 1999; Bruner *et al.*, 2001). It is true that regulatory activities involve complex ethical concerns and raise questions of moral standpoint, legitimacy and governance (Brechin *et al.*, 2002), but difficult decisions need to be made. Rights must be balanced with responsibilities. Even the best traditional systems of common resource management require rules and institutions able to implement and enforce them (Ostrom *et al.*, 1999; Jensen, 2000). Yet donors vigorously avoid actions that could ever be viewed as repressive (Byron, 1997). Instead, they support the collection of technical data because it is a low-risk, politically correct and scientifically condoned activity.

CONCLUSIONS AND RECOMMENDATIONS

Despite the threats to tropical forests, conservation capacity is limited and resources must be allocated effectively if conservation is to be successful. Research and monitoring activities must be approached with sensitivity to local management priorities, especially when local resources are involved. Outsiders should ensure that they are familiar with local management issues before they become general advisers about local conservation needs. Protected areas must be managed to protect the values they contain, not to provide statistics.

This discussion is similarly applicable to the current emphasis on criteria and indicators (simple monitoring procedures) for biodiversity and sustainable forest management (e.g. Kremen, 1992; Noss, 1999). Care must be exercised whenever research or monitoring activities are promoted at the possible expense of day-to-day conservation management. Managers should only be required to collect data that will help them be better managers.

It is true that monitoring and research of many kinds may ultimately be valuable, but this ought not to be at the cost of failing to halt the overwhelming threats facing many conservation areas now. Academic research and high-level monitoring are vital – there is a need for information on the ecological state of the planet (Phillips and Sheil, 1997) and the behaviour of biological systems. But the responsibilities for generating such information must be allocated with care. Bureaucratic needs for project accountability should not be allowed to become



FAO/15925/N. TASHI

Measuring is not protecting; the relative value of various monitoring activities must be assessed in terms of their costs and their relevance to achieving conservation goals

an excuse for project irrelevance. Interventions should bolster, not undermine, the attainment of conservation goals. Case-by-case assessment is needed. Conservation in many parts of the world needs more resources. But in the short term, more can be achieved through careful allocation of the resources already available, if circumstances can allow it (Sheil, 2001). ◆



Bibliography

Barrett, C.B., Brandon, K., Gibson, C. & Gjertsen, H. 2001. Conserving tropical biodiversity amid weak institutions. *Bioscience*, 51: 497-502.

Brechin, S.R., Wilshusen, P.R., Fortwangler, C.L. & West, P.C. 2002. Beyond the square wheel: toward a more comprehensive understanding of biodiversity conservation as social and political process. *Society and Natural Resources*, 15: 41-64.

Brown, D., Richards, M., Schreckenberg, K., Shepherd, G. & Tiller, S. 1999. *Getting aid delivery right: host country, donor and international complementarity for greater aid effectiveness in the forest sector*. European Union Tropical Forestry Paper 4. Brussels, Belgium and London, UK, European Union and Overseas Development Institute.

Bruenig, E. 2000. Delivery of aid to tropical forestry: personal observations and comments. International Forestry Review, 2: 212- 217.

Bruner, A.G., Gullison, R.E., Rice, R.E. & da Fonseca, G.A.B. 2001. Effectiveness of parks in protecting tropical biodiversity. *Science*, 291: 125-128.

Byron, N. 1997. International development assistance in forestry and land management: the process and the players. *Commonwealth Forestry Review*, 76: 61-67.

Howard, P.C. 1991. *Nature conservation in Uganda's tropical forest reserves.* IUCN Forest Conservation Programme Publication No. 3. Gland, Switzerland and Cambridge, UK, World Conservation Union (IUCN).

Inamdar, A., de Jode, H., Lindsay, K. & Cobb, S. 1999. Capitalizing on nature: protected area management. *Science*, 283: 1856-1857.

Jensen, M.N. 2000. Common sense and common-pool resources – researchers decipher how communities avert the tragedy of the commons. *Bioscience*, 50: 638-644.

Kaimowitz, D. 2000. Forestry assistance and tropical deforestation: why the public doesn't get what it pays for. *International Forestry Review*, 2: 225-231.

Kremen, C. 1992. Assessing the indicator properties of species assemblages for natural areas monitoring. *Ecological Applications*, 2: 203-217.

Ludwig, D., Mangel, M. & Haddad, B. 2001. Ecology, conservation, and public policy. *Annual Review of Ecology and Systematics*, 32: 481-517.

Noss, R.F. 1999. Assessing and monitoring forest biodiversity: a suggested framework and indicators. *Forest Ecology and Management*, 115: 135-146.

Noss, R.F. & Cooperider, A.Y. 1994. *Saving nature's legacy: protecting and restoring biodiversity*. Washington, DC, USA, Island Press.

Ostrom, E., Burger, J., Field, C.B., Norgaard, R.B. & Policansky, D. 1999. Sustainability – revisiting the commons: local lessons, global challenges. *Science*, 284: 278-282.

Persson, R. 2000. Assistance to forestry: what have we learnt? *International Forestry Review*, 2: 218-224.

Phillips, O. & Sheil, D. 1997. Forest turnover, diversity and CO_2. *Trends in Ecology and Evolution*, 12: 404.

Redford, K.H. & Richter, B.D. 1999. Conservation of biodiversity in a world of use. *Conservation Biology*, 13: 1246-1256.

Sayer, J.A. 1995. *Science and international nature conservation*. Occasional Paper No. 4. Bogor, Indonesia, Center for International Forestry Research (CIFOR).

Sheil, D. 2001. Conservation and biodiversity monitoring in the tropics – realities, priorities and distractions. *Conservation Biology*, 15: 1179-1182.

Sheil, D., Sayer, J.A. & O'Brien, T. 1999. Tree diversity and conservation in logged rainforest. *Science*, 284: 1587.

Sheil, D. & van Heist, M. 2000. Ecology for tropical forest management. *International Forestry Review*, 2: 261-270.

Wells, M., Guggenheim, S., Khan, A., Wardojo, W. & Jepson, P. 1999. *Investing in biodiversity. A review of Indonesia's integrated conservation and development projects.* Washington, DC, USA, World Bank. ◆