

Tambopata Reserve Zone, South-East Peru

Paul D. Stewart

The Tambopata Reserve Zone covers 55 sq km of tropical rain forest bordering the Tambopata River, a tributary of the upper Amazon. Set up by the Peruvian Government in 1977 to conserve an unusually diverse wildlife community, the reserve has already established a variety of world records for species numbers in vertebrate and invertebrate groups. It also protects a number of threatened species. The fact that the reserve exists at all is largely due to the implementation of a policy that has successfully integrated its conservation objectives with its commercial interests and applied science activities. The author, who worked as a naturalist guide and biologist on the reserve in 1984, 1985 and 1986, discusses the importance of this enterprise.

'It's hell all right, but one comes to like it.' So wrote Colonel Percy H. Fawcett (1953) about the Tambopata River region as he fought his way through it in the 1920s. Today the area still retains much of its pristine forest, but it is no longer the sole preserve of explorers and adventurers. Many hundreds of visitors now reach this remote part of Amazonia each year. Once there they are able to relax in a well-appointed jungle lodge and marvel, in rather more comfort than the Fawcett, at an area that is biologically one of the richest in the tropics. The visitors also play an essential role in a pioneering exercise in tropical forest-reserve management.

The 55-sq-km Tambopata Reserve Zone (TRZ) is located 12°50' 69'25" west, in the Madre de Dios Department of South-East Peru. Under a special resolution of Peru's 'Forestal y Fauna' law, the area has been designated a Zona Reservada (Reserved Zone), but there is some uncertainty about the protection provided by this somewhat vague title, which fails to specify whether it is intended to apply to wildlife, logging or ranching. In terms of size and legal status, TRZ is very much a poor relation of the Manu World Heritage Site, a giant rain-forest park of over 15,000 sq km in the same area. However, Tambopata is of unique importance in as much as it represents an attempt to integrate economics, science and conservation in a way that has so far ensured its continued existence in spite of strong conflicting pressures. It

Tambopata Reserve Zone, Peru

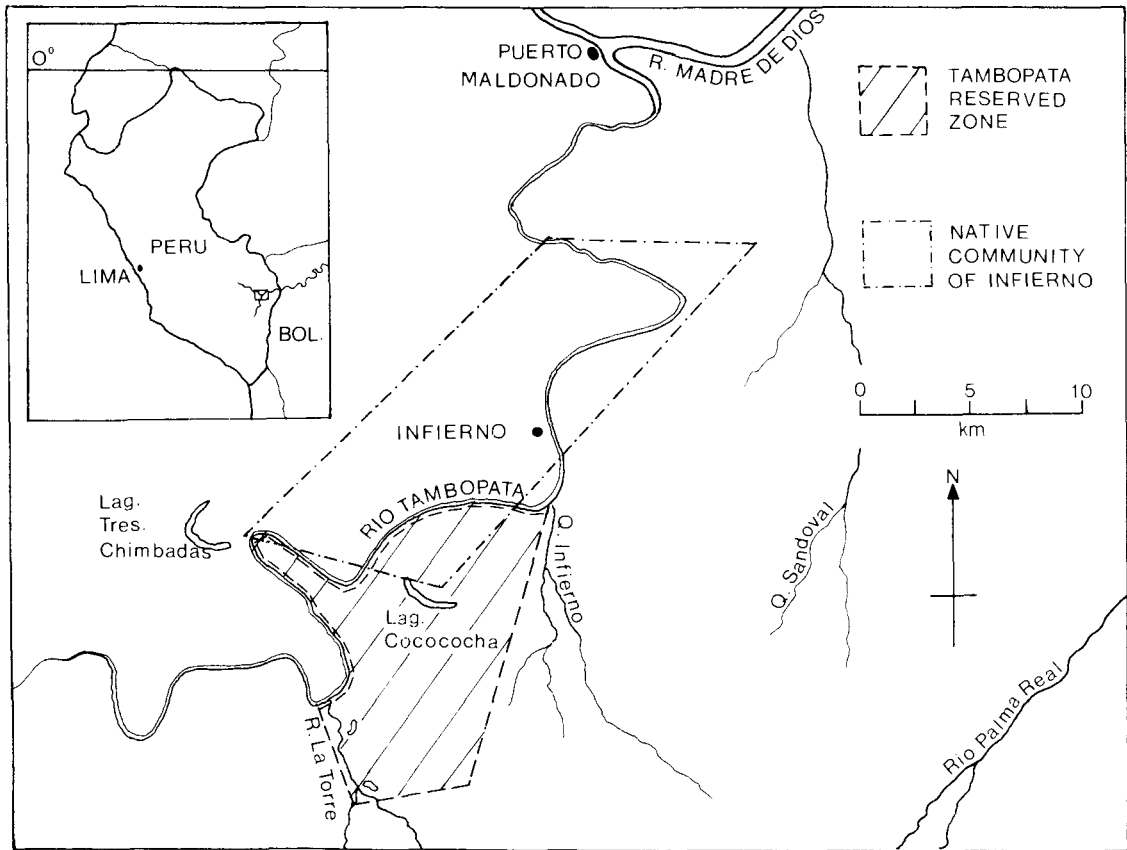
is hoped that other sites facing similar threats can learn from TRZ's successes and mistakes.

Conservation importance

The importance of protecting the area encompassed by the Tambopata Reserve Zone is not open to question. Within a 7-km radius of the central reserve buildings, there are world record species numbers of birds, 548 species (Parker, 1979), butterflies 1122 species (Lamas, 1985), dragonflies 151 species (Paulson, 1985); tiger beetles 29 species (Pearson, 1979), and horseflies 73 species (Wilkerson and Fairchild, 1985). Furthermore, the fact that these faunal groups represent a high proportion of those examined in any depth to date points to the likelihood of yet



Heron Tigrisoma lineatum—the Reserve has the world record number of bird species. 547 species (6% of the world list) have been seen in 5 km around the central lodge (Paul Stewart).

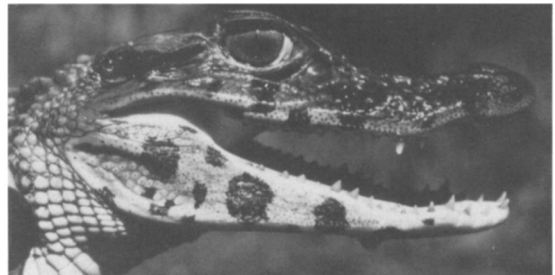


Tambopata Reserve Zone and its environs.

more records to come. Floral diversity is also high. One plot studied ranks second in the world for diversity of woody species (Hartshorn, 1979), although it should be noted that, as it crossed a series of soil types, conditions might not be strictly comparable with plots studied elsewhere.

Tambopata's listing of Red Data Book species is also impressive. For example, there is a healthy breeding population of the endangered black caiman *Melanosuchus niger*, including individuals of more than five metres, which have been largely eliminated in other areas by hunting. The giant river otter *Pteronura brasiliensis* is seen regularly, as well as three very seldom seen and little-known carnivores, namely the jaguarundi *Felis yagouaroundi*, small-eared dog *Atelocynus microtis*, and bush dog *Speothos venaticus*. All of them were observed by the writer in 1985–1986. The reserve would be an excellent centre for initiating some much-needed research on these

species, and it is felt that the bush dog group alone justifies the establishment of a larger reserve (Emmons, 1979). The confirmed killing of a mating pair of jaguar *Panthera onca* and one of a nesting pair of harpy eagles *Harpia harpyja* last year on the reserve's boundaries is a sad testament both to the riches of Tambopata's wildlife and the threat to its future.



Black caiman *Melanosuchus niger*—one of the Reserve's breeding endangered species. Adults reach 6 m (Paul Stewart).

Commercial success

The urgent need to establish a reserve to counteract the consequences of human expansion was first recognized by Neotropical field ornithologists in 1976. However, it was left to a Peruvian businessman, Dr Max Gunther, to translate this need into practical action. In 1977 he acquired a 3-ha jungle small-holding and constructed a tourist lodge on it. He then persuaded the Government to make the surrounding area a wildlife reserve, and his company Peruvian Safaris was later given the responsibility for its management and protection. But for this timely piece of entrepreneurial initiative there is little doubt that the diverse natural community would have been largely destroyed. It is ironic then that the factor that has contributed most to the success of the Tambopata Reserve Zone should be the reason for lukewarm support from the more purist conservation bodies.

In 1978 tourists began to arrive at the TRZ for naturalist-guided tours of its wildlife trail system. These activities, and hence the reserve, won much favour in the locality by creating work and generating a source of hard currency for the area. It was, however, more than six years before the operation became commercially viable, and someone with less commitment to conservation than Gunther might well have been tempted to abandon the project and participate in the more lucrative exploitation options. Encouraged by a core of American field biologists, Gunther persevered and by 1986 the Lodge was a confirmed success. The early difficulties provide a warning for other schemes initiated in similar circumstances.

The tourists that visit the TRZ are mostly affluent Americans and Europeans looking for a new experience. Regrettably, some of them are unable to come to terms with the environment and leave the reserve with their worst suspicions of a 'green hell' confirmed. Happily, others are profoundly moved by what is often their first contact with a true wilderness, and keen influential advocates for conservation have been won in this way. At the other end of the scale, the Lodge gives free use of its facilities to the children of the locality to encourage a better understanding of its objectives.

Tambopata Reserve Zone, Peru



Reserve biologist teaches local children about their wildlife (Paul Stewart).

Science

Long-term scientific investigation is being carried out at the TRZ by the Smithsonian Institution under its Deputy Director of Entomology, Dr Terry Erwin, and by Dr David Pearson of Pennsylvania State University. The scientists involved in these and other projects benefit considerably from the logistical support provided by the Lodge, and its maintained trail system. It is also interesting to note that giving tourists the opportunity to become involved in the biologists' activities has proved to be a key feature of their visit, which has greatly enhanced their appreciation and enjoyment of the reserve. Much of the work undertaken on the reserve has an applied conservation value (Erwin, 1986). For example, the Smithsonian Institution has recently initiated an 'Amazonian Garden' project to explore ways of using irrigation and soil technology to extend the working life of slash-and-burn plots.

Gorinsky's (1971) well-publicized Bioresources project, formerly sponsored through the Earthlife Foundation, but now supported with funds from the World Wildlife Fund, is to continue the investigation of the traditional use of plants by the Esse Ejha Indians who share land with the reserve*.

*Since writing this article WWF-funding for the Bioresources project has ceased and new sponsorship is being sought.

Their fast-disappearing knowledge is expected to provide guidance for research on local resources, and it is hoped the profit generated by the identification of useful substances can be invested in local conservation development (Gorinsky, 1971; Trexler, 1985). Gorinsky's work will be linked with the Ametra project, which is being undertaken at the TRZ with the aim of reintroducing some of the traditionally effective plant medicines to westernized Indians. This will be done by pooling the knowledge of various areas and disseminating it through educational programmes. Preliminary research is also under way to set up a butterfly farming venture for the local Indian community at Infierno similar to those in Papua New Guinea (Hutton, 1985).

There is no doubt that some of this work will suffer from the frustrating delays often encountered with projects of this type. Moreover, the Indian communities with whom these schemes are being co-ordinated include Mestizo settlers (part-Spanish part-mountain-Indian in origin) who come from outside the forest. These settlers have much more difficulty in understanding and accepting the concept of sustainable yield, which is central to the project, than the native Esse Ejha Indians who have of necessity practised it for centuries.



Tree boa (Paul Stewart).

If all goes well, these projects should encourage the local people to regard the reserve as something that makes a valuable contribution to their daily well-being, instead of yet another wildlife 'monument'. Unless this goodwill is forthcoming the reserve could well degenerate into the type of besieged island fortress that has been the fate of many other tropical forest reserves.



Leaf mantis (Paul Stewart).

Thoughts on the future

Despite its aura of success, it is difficult to view the future of the Tambopata Reserve Zone with complete equanimity. Only 45 km downriver from its eastern boundary lies the gold boom town of Puerto Maldonado. Formerly just a small frontier post, its population has swollen to more than 30,000 people in the last decade, and recent reports of large oil deposits around the TRZ will undoubtedly lead to further growth.

Should the reserve become isolated by human settlement, it will be impossible to conserve the larger carnivores within its present boundaries (Sullivan and Shaffer, 1975), and the impact on the general biota would also be extremely destructive (Janzen, 1983). Clearly the TRZ must be enlarged if it is to survive, and the legal status of a Biosphere Reserve would obviously be an added advantage. Naturally, Tambopata is not alone in facing problems of this kind. But how are they to be solved?



Rain forest cleared near the Reserve by settlers drawn to the jungle by the promise of gold and oil wealth (Paul Stewart).

Up until now much emphasis has been placed on the contribution that reserves like TRZ can make to the local economy, and from a short-term standpoint there is much to be said for such an approach. The destruction of a section of primary forest or the extinction of a species is after all irreversible, and every valid argument must be advanced to prevent it. But if we seek to justify conservation primarily on economic grounds, how can we logically expect to defend the existence of a wildlife reserve against the greater benefits flowing from the development of oil and mineral resources.

It seems clear that if we are to achieve a solution that will be viable in the longer term, we must pursue a different policy, and in the writer's opinion more emphasis must be placed on moral and ethical aspects. When rarity, beauty or utilitarian values are involved, it will often be expedient to focus attention on them, but we cannot afford to let it be assumed that when such factors are not present, man may discard or destroy as he pleases. We must promote the concept of an inherent right to life and a reverence for life, which mankind has a responsibility to uphold. It will not be easy to cultivate this ethic, but fortunately there are signs that its moral force is beginning to be more widely appreciated. The urgency of the present situation calls for desperate measures. However, if we can strike the right balance between pragmatism and morality it should be possible to develop a *Tambopata Reserve Zone, Peru*

strategy that will help the Tambopatatas of today, and provide a more effective global conservation policy for the future.

Acknowledgments

I would like to thank the Southampton University Convocation, and Forsey Fund, for financial help during my work in Peru. Also Peruvian Safaris S.A. for much logistical support, and the members of the Tambopata Reserve Society for their efforts on behalf of the reserve.

References

- Erwin, T. 1986. Zona Reservada de Tambopata. A plan for strengthening science, conservation and community utilization of bioresources in the Tambopata region. Special Report. Smithsonian (Washington).
- Emmons, L.H. 1979. Mammals. In *Preliminary Faunal and Floral Survey. Tambopata Reserved Zone, Madre de Dios, Peru* (ed. D.L. Pearson). Mimeo. Smithsonian Institution, Washington.
- Fawcett, P.H. 1953. *Exploration Fawcett*, pp. 139–153. Hutchinson, London.
- Gorinsky, C. 1971. In Defence of the Primitive. *The Ecologist*, 1, no. 12.
- Hartshorn, G.S. 1979. Forest vegetation. In *Preliminary Faunal and Floral Survey. Tambopata Reserved Zone, Madre de Dios, Peru* (ed. D.L. Pearson). Mimeo. Smithsonian Institution, Washington.
- Hutton, A. 1985. Butterfly farming in Papua New Guinea. *Oryx*, 19, 158–162.
- Janzen, D.H. 1983. No park is an island: increase in interference from outside as park size decreases. *Oikos*, 41, 402–410.
- Lamas, G. 1985. Los Papilionoidea (Lepidoptera) de la Zona Reservada de Tambopata, Madre de Dios. Peru I: Papilionoidea Pieridae y Nymphalidae. *Revista Peruana de Entomologia*, 27, 59–73.
- Parker, T.A. 1979. Birds. In *Preliminary Faunal and Floral Survey. Tambopata Reserved Zone, Madre de Dios, Peru* (ed. D.L. Pearson). Mimeo. Smithsonian Institution, Washington.
- Paulson, D.R. 1985. Odonata of the Tambopata Reserved Zone, Madre de Dios, Peru. *Revista Peruana de Entomologia*, 27, 15–24.
- Pearson, D.L. (ed.). 1979. Preliminary faunal and floral survey. Tambopata Reserved Zone. Madre de Dios, Peru. Mimeo. Smithsonian Institution, Washington.
- Pearson, D.L. 1985. The tiger beetles (Coleoptera Cicindelidae) of the Tambopata Reserved Zone. Madre de Dios, Peru. *Revista Peruana de Entomologia*, 27, 15–24.
- Sullivan, A.L. and Shaffer, M.L. 1975. Biography of the megazoo. *Science*, 189, 13–17.
- Trexler, M. (ed.). 1985. Double standards in the gene jungle. *IUCN Bulletin*, 16, 1–3.
- Wilkerson, R.C. and Fairchild, G.B. 1985. A checklist and generic key to the Tabanidae (Diptera) of Peru with special reference to the Tambopata Reserved Zone, Madre de Dios. *Revista Peruana de Entomologia*, 27, 37–53.

Paul D. Stewart, Department of Biology, Building 44, The University, Southampton SO9 5NH, UK.