

Local people and Project Angonoka – conservation of the ploughshare tortoise in north-western Madagascar

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*Project Angonoka, in its aim to conserve the endangered angonoka or ploughshare tortoise *Geochelone yniphora* in north-western Madagascar, has given a high priority to working with local people. Many of the environmental changes threatening the angonoka also cause difficulties for local people. An environmental awareness campaign has used the angonoka as a main theme, as an animal unique to the region whose near extinction symbolizes the impact of environmental changes occurring in the area. This campaign has stimulated the creation of village environmental associations. The activities undertaken by these associations have demonstrated a local willingness to manage and conserve their environment, and show how promotion of a flagship species can stimulate more general environmental conservation and sustainable development.*

Introduction

Wildlife may be the initial focus of a conservation project, but people are always a key element in the conservation process. It is now widely recognized that wildlife conservation cannot be managed in isolation from the broader ecological and human framework (Lusigi, 1981; Western, 1982; Mackinnon *et al.*, 1986; Wells *et al.*, 1992). National and international politics and policies play a crucial role in conservation projects, but local people's use of natural resources in their region has a more direct, immediate impact on their local environment. Often their own welfare is linked to the maintenance of a productive environment; for example the continued availability of forest products and maintained fertility of agricultural land, particularly in developing countries where many rural people live at a subsistence level. Many conservation projects have expanded their objectives beyond wildlife conservation and also aim to promote sustainable use of natural resources and to assist local people to achieve stable and secure livelihoods.

The implementation of such integrated conservation and development projects is problematical, because the way in which they are organized is fundamental to their success. Past approaches to development relied on decisions made at a high level and imposed on a population. More recent approaches have aimed at community empowerment; enabling people to help themselves. It is believed that more enduring changes are achieved by working through existing social institutions and catalysing local initiatives through which people are able to improve their lives while maintaining their self-reliance (Hough and Sherpa, 1989). This approach has been adopted by the Angonoka Project and this paper describes the progress that has been made.

Regional biogeography

The angonoka or ploughshare tortoise *Geochelone yniphora* is restricted in the wild to a few sites (ranging from 150 to 3500 ha) around Baly Bay, north-west Madagascar (Durrell *et al.*, 1993; Figure 1). Angonoka occur in isolated pockets of bamboo scrub and dry

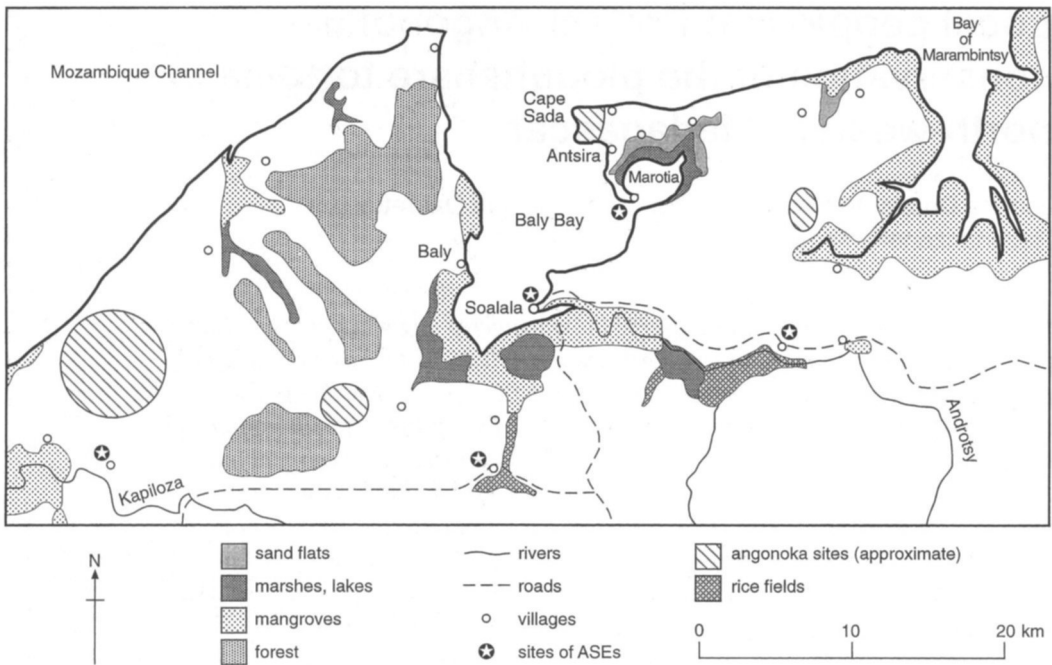


Figure 1. Map of the Baly Bay Area.

deciduous forest, which, over the general area, have been largely replaced by fire-derived palm savannah. Although much remaining forest is severely degraded, there are areas of primary forest totalling around 10,000 ha west of Baly Bay (Faramalala, 1988; Figure 1). There are also around 10,000 ha of mangroves in sheltered areas of bays (within 30 km of Soalala) (SGM, 1958).

The angonoka is the largest extant Malagasy land tortoise and has a characteristic gular projection from the front of the plastron, whence derives the name 'ploughshare tortoise'. It has long been considered to be in danger of extinction (Decary, 1950; Juvik *et al.*, 1981; Jenkins, 1987). Other wildlife in the region include Decken's sifaka *Propithecus verreauxi dekeni* ('High Priority' conservation rating, Mittermeier *et al.*, 1992), Madagascar fish eagle *Haliaeetus vociferoides* ('Critical', IUCN category, Collar *et al.*, 1994) and several endangered species of sea turtle, which nest locally (Rakotonirina and Cooke, 1994).

The local human population and economy

Humans are believed to have arrived in Madagascar in the early part of the first millennium AD. The Soalala area is predominantly populated by people of the Sakalava ethnic group. Arab or Islamised people founded a trading settlement at Baly (Figure 1) at the end of the 16th or the early 17th century. Similar settlements throughout northern Madagascar provided important trading links with Islamic settlements in East Africa and, later, with Europeans (Verin, 1986). Most people of the town of Soalala are Muslim. In rural villages there are few practising Muslims, but some aspects of Muslim custom, for example a taboo on eating pork, are widespread.

Soalala town (approximately 1000 people), the administrative centre of the region, is linked by very poor roads (passable only by four-wheel drive from May to November) to the provincial capital Mahajanga, 120 km to the north-east. The rural population lives in dispersed villages and hamlets. Fishing and

some subsistence agriculture are practised on the coast, with irrigated rice cultivation further inland (see Figure 1). Cattle are important economically, to prepare rice fields and for trade, and are also important culturally. At the rice harvest and during the prawn-fishing season many people have a small cash income, but for much of the year they live at subsistence level and rely on forest products for building materials, medicinal plants and supplementary food.

Links between local people and tortoise conservation

Threats to the angonoka

The angonoka is believed to be threatened primarily by loss of habitat and habitat modification, although collection of tortoises by people and predation on eggs and young by African bush pigs *Potamochoerus larvatus* (a relatively recent arrival in Madagascar, probably introduced by man [Oliver, 1993]) may have contributed to their decline (Durrell *et al.*, 1993). There is a particularly high density of bush pigs in the Cape Sada area.

Trade may have had a big impact on angonoka populations in the past. There was, historically, a substantial trade in tortoises for meat, both as provisions for crews of maritime vessels and for the growing populations of other Indian Ocean islands. In the early 17th century many tortoises* were available for trade in the Bay of Boina, 75 km north-east of Soalala (Mariano, 1614, in Grandidier *et al.*, 1905). In the 17th century Arab traders collected large numbers of tortoises at Soalala for export as food to the Comoro Islands (Vaillant and Grandidier, 1910, in Juvik *et al.*, 1981). Decary (1954) reported from maritime archives that 'in the 18th century Arabs bought many tortoises in the Bay of Boina, and that one saw on the banks, stalls were full of these animals'. Decary implies that these tortoises were angonoka, although their range no longer extends there, probably because no



Local man with pet angonoka (J. C. Durbin).

other land tortoises occur in the north-west of Madagascar. Decary (1954) noted that people in Soalala, although not the Sakalava, regularly collected tortoises to sell to Europeans, who appreciated the meat, even though the angonoka was protected by government decree in 1931.

Angonoka are not now generally eaten locally, although most people said that this was not because of taboo ('fady') and there is very little trade. Angonoka are, however, collected opportunistically from the wild and kept locally in courtyards. It is believed that they protect chickens from a disease (*koropoky*) and they are appreciated as pets. Although such collection currently appears to be on a small scale it could affect the very small remaining wild populations.

No protected area currently exists in the Soalala region, but there have been repeated recommendations for the creation of a reserve specifically to maintain remaining wild populations of the angonoka (Blanc, 1974; Juvik *et*

*In these French texts the word 'tortues' may refer in part to freshwater turtles.

al., 1981; Curl *et al.*, 1985; Durrell *et al.*, 1989). Project Angonoka, a conservation programme for the ploughshare tortoise, which has been managed from its initiation in 1986 jointly by Jersey Wildlife Preservation Trust (JWPT) and the Water and Forests Directorate (DEF) of the Malagasy Government, has undertaken research in preparation for the creation of a protected area (Curl, 1986; Durrell *et al.*, 1993). The creation of a protected area for the angonoka in the Baly Bay area is planned as part of the Madagascar Environmental Action Plan (initiated 1989) (DEF/ANGAP, 1992).

Local people and natural resource conservation

Much of the original vegetation has been destroyed by uncontrolled bush fires, which can enter the deciduous forest, especially in the dry season, where the forest has been disturbed by heavy exploitation for wood or by cyclones. Fires are started to stimulate new growth of grasses for cattle pasture, to create clearings to keep bush pigs away from cultivated land, or as a gesture against authority, because it is illegal to start a fire without a permit. In practice, permits are never given and the attempts of local authorities to control fires are ineffective.

Although young grass shoots are important for their livestock, people also rely on forest products, particularly for wood to build houses, boats and pig-proof enclosures for cultivation, for edible roots, for ravinala *Ravenala madagascariensis* leaves used in salt-making, and for small-scale traditional uses such as for medicines and facepacks. Many local people believe that fires should be more carefully controlled, especially because repeated burning is said to favour less palatable fodder grasses. People suffer from reduced availability of forest products and from erosion, which silts up their rice fields and fills in lakes formerly used for fishing. They have noticed a reduction in surface water for their cattle in the dry season. Mangroves, important breeding grounds for the prawns and fish they catch, may also be affected by erosion and increasing cutting of trees for wood.

Bush pigs constitute a major pest and all

vegetable gardens must be protected with stout fences of adjacent wooden posts to keep pigs from ravaging crops, particularly cassava *Manihot esculenta*. These fences require large quantities of timber (the 10 households of Antsira [Figure 1] require 1400–2300 new fence posts annually, depending on the quality of wood used, in comparison with 20–150 poles annually for house maintenance; Durbin, 1994), are time-consuming to build and maintain, and severely limit the area under cultivation. As preferred forest hardwoods become less available, people are increasingly using mangrove wood. Bush pigs are seldom hunted for food, because of a widespread taboo on pork, but local people were very enthusiastic about the idea of participating in programmes to control bush-pig populations.

Initiating local participation

Education and awareness campaigns have been based both in Soalala town and in selected villages close to angonoka localities. The World Wide Fund For Nature's education programme in Madagascar (WWF-Education) promotes environmental education throughout the country. A WWF-Education training session held in Soalala in May 1991 involved community and religious leaders and local officials, in addition to education staff, and collaboration with Project Angonoka enabled local conservation issues to be highlighted. Discussion, training and activities focused on the impact of degradation of the environment and the importance of conservation, using the angonoka as a main theme, as an animal unique to the region whose near extinction symbolizes the impact of environmental degradation.

As a result of the training session, participants created an association (Association to Safeguard the Environment, ASE). ASEs have been formed at many WWF-Education training sessions and form a national network. The aims of the ASEs are to organize small-scale conservation activities and promote environmental awareness. They also distribute the



Children wearing tortoise carapaces at one of the 'fety angonoka' (V. Rajafetra).

WWF-Education quarterly publication, *Vintsy*. This is sold for 300 Malagasy Francs (FMG) (less than £0.05 in January 1995), of which half is retained by the ASEs and the remainder returned to WWF-Education to help cover production costs. The Soalala ASE has also sold Project Angonoka T-shirts and *lambahoany* (brightly coloured 2-m wraps decorated with a motif and proverb, which are worn by men and women) provided by JWPT, and angonoka wallet calendars provided by British Airways. The ASEs use these sales, membership fees (which each group sets themselves), and other means to raise funds for their activities and for administrative expenses.

Villagers living close to angonoka areas felt strongly that they should be involved with activities related to the angonoka, so in October 1991 and October 1992, WWF-Education, JWPT and the Soalala ASE collaborated to hold 3-day events in villages near angonoka areas (two villages on each occasion). Local people from these and surrounding

villages participated in debates, handicraft workshops, songs and dances, often using the angonoka as a theme. The events were concluded in traditional style by a large feast with meat from an ox killed in honour of the occasion. For much of the time, people separated into groups of men, women and children. Wildlife films were shown in the evening, which caused a great impression in a region where few people had seen a television. The events had a festival atmosphere and were known locally as *fety angonoka*.

The reactions of the villagers were encouraging. Many were surprised that the angonoka is so rare and found only near Soalala. There was general agreement about the importance of maintaining natural resources, and people spoke freely of the decline in natural resources during their own lifetimes. It was clearly effective to have separate sessions with women, who seldom participate in formal village meetings but have considerable influence within the family. An interesting and positive

proposal by the men of one village was to create a traditional convention (*dina*), whereby everyone should be responsible for extinguishing unattended fires in surrounding savannah, and those who did not help would pay a fine.

Village associations acting for conservation

People in these villages were enthusiastic about the idea of creating their own ASEs. This was a new departure for the ASE network, because even the Soalala association was the smallest existing ASE. The village ASEs chose to be financially independent from the Soalala ASE, which gives them more incentive to encourage membership, to ensure payment of membership fees and to decide, and spend their money, on their own activities. The different ASEs became competitive, which acted to motivate each group. The Soalala association members see themselves as regional ASE co-ordinators.

All the associations have planted cashew nut trees *Anacardium occidentale*, whose nuts can be used for food or sale, and some plan to start tree nurseries, for which local DEF agents, themselves members of the Soalala ASE, will give training. Other activities include renovation of a well, making furniture for a school, market gardening, building corral traps for bush pigs near crops, a women's cooperative in Soalala and literacy classes. Association meetings have also served as a discussion forum to agree local conventions to control bush fires and to organize complaints to the authorities about the illegal encroachment of large commercial fishing vessels into the bay.

Of these activities, the renovation of the well at Marotia (Figure 1) has been particularly successful. A request for funding (£170) was made to Project Angonoka by the Marotia ASE with the help of the Soalala ASE committee, which paid for cement and employment of a mason. People of Marotia collected the sand and gravel required, made the cement bricks and helped the mason. This project

elicited the widespread participation of villagers and has promoted a sense of pride in this achievement and in the angonoka (L. J. Rakotoniaina, *in litt.*, March 1994). Following the completion of the well, people of the Marotia region have demonstrated their enhanced motivation for angonoka conservation by helping to create a firebreak around the tortoise habitat at Cape Sada and pledging to help guard wild angonoka from poachers and to help control bush fires (L. J. Rakotoniaina, *in litt.*, June 1994).

Conclusions

We hope that in the future the village associations will become well-established and influential, covering a wider area as more villages become involved. Although still in their infancy, the ASEs are a positive step in the conservation of the environment, giving responsibility for long-term protection to the people themselves. We also believe that the potentially lengthy and antagonistic process of creating and successfully maintaining a legally protected area will be greatly facilitated by the substantial community involvement already established.

In addition to the funds raised locally, ASEs will be able to seek financial help from community development funds becoming increasingly available in countries like Madagascar, but where donors sometimes have difficulty finding successful community-run projects to support. Project Angonoka would probably only assist with projects linked closely with angonoka protection and sustainable management of the environment, but would have helped people to build the capacity to organize themselves to achieve their own development priorities.

It should be emphasized that such village associations are a new departure for integrated conservation and development in Madagascar. Most other projects have set up teams of Malagasy professionals and expatriot advisors in nearby towns. These teams visit the villages and propose projects to the communities as a whole or to individuals. The

advantage of working through community empowerment is that any development or conservation activities that are adopted are most likely to continue in the long term without outside support.

This project also shows how a 'flagship' species, even a reptile, can provide a focus and stimulus for wider conservation and sustainable development activities. Many projects have demonstrated the effectiveness of flagship species to motivate international and national conservation organizations, governments and the general public (e.g. the Golden Lion Tamarin Conservation Programme in Brazil; Dietz *et al.*, 1994; Mallinson, 1994). Project Angonoka confirms how effective a flagship species can be in raising interest in environmental conservation among an isolated rural population living at a subsistence level in one of the world's poorest developing countries.

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Rakotoniaina as Project Angonoka co-ordinator for the Baly Bay region, whose energy and enthusiasm will ensure the successful continuation of this project. An earlier version of this paper was presented at the Second World Congress of Herpetology held in Adelaide, Australia, December 1993-January 1994.

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