

# Wok wantaim: engaging remote Papua New Guinea communities in biodiversity conservation

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## I. INTRODUCTION

In September 1998, the Conservation Breeding Specialist Group (CBSG) of the World Conservation Union facilitated a Conservation Assessment & Management Plan (CAMP) for Papua New Guinea's (PNG) tree-kangaroos in Lae [Bonaccorso *et al.*, 1999]. This arose from concerns by local communities about declines in wildlife populations in PNG's northwestern mountain ranges and was attended by local villagers, PNG government staff and representatives from Australian and US zoos. Two key outcomes were recognition of the Scott's Tree-kangaroo, or Tenkile (*Dendrolagus scottae*), as the most threatened tree kangaroo in the world, and a recommendation for a 'recovery group' to oversee the species' conservation. The Tenkile is only found in the Torricelli Mountain Ranges in Sandaun Province and is listed by the IUCN as Critically Endangered [IUCN, 2010; Martin, 2005].

The Tenkile Conservation Alliance (TCA) was subsequently established in 2000 and registered as a PNG non-government organisation in 2001. The Alliance's initial objective was to address the key threat to the Tenkile, ie. hunting by local people for food. However, it was very soon recognized that this single objective would not achieve meaningful conservation outcomes by itself and the community-based conservation program that is now in place aims to conserve the biodiversity of the Torricelli Mountain Ranges (TMR) using the Tenkile and Golden-mantled Tree Kangaroo (known locally as "Weimang", *D. pulcherrimus*) as flagships [Vincent *et al.*, 2000]. The Tenkile Conservation Program (TCP) integrates biodiversity conservation with securing a sustainable future for the people living in the Mountains. This recognizes that (1) more than 97% of land in PNG is under customary ownership, (2) these are remote communities lacking government services and affected by poor diet and health, and (3) the reality that environment and conservation outcomes will not be achieved in PNG without meaningful participation of local people.

The Tenkile is restricted to the western Torricelli's and activities to reverse its decline are well established. Incorporation of the villages on whose land the Golden-mantled lives, in the east of the ranges, is more recent, although they are equally enthusiastic participants.

The TCA now employs 11 full-time staff, with the Program Manager and Capacity Building Officer being Australians and working in PNG with invaluable support from Australian Volunteers International (AVI). The TCA's major partner is Zoos Victoria.

## II. PROGRAM GOALS

The goal of the Tenkile Conservation Program is to conserve the biodiversity of the Torricelli Mountain Ranges in Papua New Guinea. This will be achieved through six program objectives:

1. Protect the TMR's fauna, flora and ecosystems using tree-kangaroos as flagships.
2. Develop sustainable alternative livelihood strategies within the local communities to alleviate hunting pressure on wildlife.

3. Build local capacity and capability to enable local management of the program.
4. Establish the TMR as a legislated Conservation Area.
5. Implement monitoring and evaluation to assess the effectiveness of the above strategies in conserving biodiversity in the TMR.

A strong element of the conservation program is integration of wildlife conservation goals and social/community needs. Indeed, this is a key criteria applied by Zoos Victoria in deciding which international conservation programs it will support. Achieving wildlife conservation outcomes in any country requires the support and participation of the people living in the area. This is essential in countries where people have strong ties to the land and environment where they live. This is certainly the case in PNG, where the vast majority of land is under customary ownership.

### III. EVALUATING THE PROGRAM'S STRATEGIES

Crucial for any conservation program is being able to demonstrate if it is successful or not. This program is using main two tools to evaluate the strategies being applied, ie. (1) Distance Sampling research from 14 sites is providing data that allows the effectiveness of the hunting moratoria to be assessed, and (2) recording of Most Significant Change Stories enables the broader social/community impact of the program to be evaluated. Analysis of the first six years of Distance Sampling data indicates that the Tenkile population grew by 60% in that period.

The Most Significant Change Stories technique is a participatory management tool that improves the capacity of program staff to respond to community views (Wilder & Walpole, 2008). The Stories are highlighting strong community recognition of the positive changes that this conservation program has brought to their lives.

### IV. ACTION RESEARCH AND ADAPTIVE MANAGEMENT

A widely used approach for developing and working to achieve success *in situ* conservation programs is adaptive management (AM). Also known as adaptive resource management, this is a structured, iterative process of optimal decision-making in the face of uncertainty, with an aim of reducing uncertainty over time through system monitoring (Williams *et al.*, 2007). In this way, decision making simultaneously maximizes one or more resource objectives and, either passively or actively, accrues information needed to improve future management. AM is often characterized as “learning by doing.”

Key features of both passive and active adaptive management are:

- Iterative decision-making (evaluating results and adjusting actions on the basis of what has been learned).
- Feedback between monitoring and decisions (learning).
- Explicit characterization of system uncertainty through multi-model inference.
- Bayesian inference - uses a numerical estimate of the degree of belief in a hypothesis before evidence has been observed and calculates a numerical estimate of the degree of belief in the hypothesis after evidence has been observed.
- Embracing risk and uncertainty as a way of building understanding.

These approaches are very similar to the Action Research or Action Learning and Participatory methods (Dick, 2000; O'Brien, 2001). The typical action research process is cyclical in nature, with each cycle involving the four steps of Plan, Act, Observe and Reflect (Kemmis & McTaggart, 1998). Some models use a more elaborate process of Diagnosis, Plan, Action, Evaluate and Specify Learning; and the cycle is repeated until the problem is solved These are very much the steps that wildlife managers use in conservation programs (CMP, 2000).

## V. PARTICIPATORY ACTION RESEARCH IN THE TENKILE CONSERVATION PROGRAM

The villagers in the Torricelli Mountains comprise a key stakeholder group in the TCP. As such they are active participants at all stages of an Action Research approach to addressing threats to the region's biodiversity. All the activities outlined below are undertaken in Melanesian Pidgin.

### A. *Diagnosis*

The original problem was unsustainable hunting of wildlife by villagers, causing significant declines in wildlife populations, including Tenkile and other tree-kangaroo species. This issue was first raised by the villagers themselves, resulting in the 1998 CAMP meeting to assess the status of all PNG tree-kangaroos. Hunting wildlife for food in PNG has been practiced for hundreds of years, but the increase in human populations over the past three decades has had a major impact on the wild populations of many species, forcing some to the point of extinction (Sillitoe, 2001; Mack & West, 2005).

### B. *Plan*

The main recommendation from the CAMP was to establish a recovery group to oversee conservation of the Tenkile, ie. the TCA. The recovery plan subsequently developed by the TCA included objectives to:

- i. Work with the village communities to gain their agreement to stop hunting wildlife, with a main focus on tree-kangaroos.
- ii. Develop a research project to assess the impact of a cessation of hunting on tree-kangaroos.
- iii. Train villagers in data collection and wildlife monitoring techniques.
- iv. Develop a sustainable alternative to hunting wildlife, ie. an alternative source of protein.
- v. Develop conservation awareness programs to increase and sustain understanding of wildlife and its conservation in the Torricelli Mountains.

Delivery of these objectives is being evaluated by two processes, as outlined above.

### C. *Action*

- i. The first hunting moratorium was signed by representatives of 13 Tenkile villages in 1999. This was renewed and expanded to 20 villages in 2001. Six Weimang villages joined in 2006, followed by a further 13 in 2008. The moratoriums were extended to include the third species of tree-kangaroo living in the Torricelli Mountains, Grizzled Tree-kangaroo or Yongi, in 2009, and are now in place until 2011.
- ii. A research project using Distance Sampling methodology (based on tree-kangaroo scats) was developed in 2002 and commenced in 2003 (Buckland *et al.*, 2001). This operates at seven sites for Tenkile and seven for Weimang, with each research site comprising 20 transect lines that are monitored annually.
- iii. Distance Sampling training courses for participating villages commenced in late 2002. Two or three members of each village are trained, at the TCA base and in the field, and participants become Distance Sampling Officers. The most recent courses are facilitated by local TCA staff.
- iv. A rabbit-breeding program was established in 2003 as a sustainable alternative to hunting wildlife (Lukefahr, 2008). The initial group of rabbits, as well as materials for village breeding cages, was purchased by the TCA. A local rabbit breeder was employed by the TCA to train villagers in rabbit management and breeding. Founder groups of rabbits were provided to the 20 participating 20 Tenkile villages, with each village contributing 10% of establishment costs.

- v. Community conservation awareness projects also commenced in 2003 – (A) school visits by TCA managers (including donations of materials such as books and basic stationary), (B) train-the-teacher courses to extend knowledge through the schools, (C) village-based drama and song activities, and (D) training to develop skills to manage a 90,000ha Conservation Area. The Conservation Area courses draw heavily on local TCA staff.

#### *D. Evaluation*

- i. The hunting moratoriums have been welcomed by villagers, who are enthusiastic about renewing and maintaining them. Other villages that are not participants in the conservation program have requested to join the conservation program on the basis of the success of the hunting moratoriums.
- ii. Analysis of the data collected in the research project is highlighting an increase in tree-kangaroo numbers by almost 60% from 2003 to 2009. This is complemented by increased sightings of tree-kangaroos, which causes great excitement and pride among villagers, some of who only know of these animals from their grandparents. The research sites have designated as sacred places (“ples masalai”) by villagers, which is important in reinstating their traditional cultures.
- iii. More than 60 villagers trained as Distance Sampling Officers, who now visit the research sites and collect data independently of TCA managers.
- iv. After an initial period of villager enthusiasm for maintaining and breeding rabbits, interest and involvement gradually declined to the point where only seven Tenkile villages still had rabbits in 2006. Part of the reason for this decline was tensions between clans within villages. One villager has maintained a commitment to this activity and now produces more than 100 rabbits each year – his dedication has stimulated renewed interest in other villages.
- v. The various conservation awareness programs have increased knowledge about wildlife and habitats, and their conservation. The Conservation Area management training has developed an understanding about biological processes, such as water cycles and photosynthesis. The village-based drama and songs have also helped to return pride in local culture.
- vi. The recording of Most Significant Change Stories has enabled peoples’ individual views about the conservation program and its various components to be freely expressed. These have been helpful in identifying issues of particular concern, including barriers to further progress.

#### *E. Learning Outcomes and Forward Actions*

- i. The hunting moratoriums are critical for allowing wildlife populations to recover. They are also valuable tools for maintaining and strengthening community awareness of wildlife and its conservation. Research will be undertaken in the next two years to assess their real impact on wildlife populations compared to areas where hunting still occurs.
- ii. The Distance Sampling research is critical for being able to assess trends in wildlife populations in those areas. It is also valuable in being one of few such long-term data sets, particularly in remote tropical environments. This work is continuing and a major goal for 2010-11 is to highlight the study in the peer-reviewed literature.
- iii. The Distance Sampling Officers, whilst critical for the specific research project, play a very important role in being ambassadors for the conservation program in their villages

and across the entire Torricelli Mountains. This has proven to be a very valuable exercise and further training and refresher courses will be delivered.

- iv. The rabbit-breeding program has been very instructive in its own right, almost as a microcosm of the entire conservation program. It has highlighted:
  - The critical need for ongoing training.
  - The need for a permanent Rabbit Manager; which has been included in the program's forward action plan.
  - Incorporating clan structures and relationships into a revised rabbit program.
  - Adopting a more facilitative approach for further training programs, which allows for villagers to explore a range of protein options.
- i. The awareness activities and Most Significant Change Stories will be continued and expanded as resources permit, as they have proven to be very valuable in continuing to move the program forward.

## VI. WHY IS THIS PROGRAM A SUCCESS?

A decade after it commenced, the Tenkile Conservation Program has achieved some outstanding success. It has also adapted and evolved in response to changing issues, and will continue to do so in the years to come. Wildlife conservation and community development goals are being achieved and it is worthwhile reflecting on some of reasons for the success so far.

**Address underlying causes, not just symptoms:** in this instance, hunting was the major threat to the survival of wildlife and, whilst it was crucial to address that, the hunting was a symptom of other underlying issues. These were a combination of poverty, lack of alternatives to hunting, and lack of capability to move beyond their circumstances at the time.

**Regular review:** regular internal review, coupled with communication with the major external partner, ZV, enabled field managers to respond to changing needs and information, whilst staying within the program framework. This has kept the program relevant.

**Permanent presence:** the permanency of the two program managers has been crucial to building and maintaining positive relationships with the villagers. People in rural PNG are used to visitors from other countries spending short periods that do not allow for trust and collaboration to develop. The strong positive relationship between the TCA and the villagers is at the heart of this program's success.

**Allowing time:** achieving real conservation success in developing countries often takes considerable time. Different lifestyles, values and beliefs must be taken into account in a collaborative manner if conservation outcomes are to be sustained. A good example in this program is the rabbit farming – after initial enthusiasm, many villagers lost interest and it is the commitment of a few individuals that has now reinvigorated the project and put it on a path to success; but that is five years later.

**Building local capacity & ownership:** implementing training and encouraging personal growth & development is one thing; the real test comes when that translates into independent action and management responsibility. The latter is a concept that may seem second nature to someone raised in western cultures and thinking, but may not be when viewed through the prisms of other societies and belief systems. Time must be allowed for this to develop, coupled with ever-present attention to accountability, honesty and transparency.

Two prime examples of the strength of this approach is the appointment of a local Project Supervisor to manage all daily activities, and the data collection at the research sites now entirely undertaken by local Distance Sampling Officers.

**Community expectations & accountability:** there is widespread expectation among PNG communities that they will be rewarded (financially or in-kind) for participating in activities associated with initiatives such as this program. This is often in addition to wages, or other recognition, such as supported training or travel, that they may be receiving. To our western way of thinking this can be frustrating and perplexing, but it is a reality. Whether this stems from the wontok system (derived from “one talk or one language”; hence, extended families, close friends, etc.), or long-term provision of external aid, or other factors, is unclear. Regardless of its basis, it is an ever-present challenge and one that requires a very careful and sensitive approach to ensure that the overall program is not negatively impacted.

A related issue is jealousy that can surface between villages or clans over a myriad of issues. This can quickly divert focus away from delivering program outcomes. The TCA managers are very aware of this and a very careful and transparent approach in dealing with the local communities has seen a major reduction in problems arising from this over the past two years.

**Integrating wildlife conservation goals and social development needs:** until relatively recently, there was often little integration of these two important aims – wildlife conservation programs dealt with animals and habitats, and social development and aid programs dealt with people. Fortunately, this gap is slowly closing and this program is an excellent example of “the sum of the whole being greater than the sum of the individual parts”. Social acceptance and participation is crucial for conservation to be sustainable, and the two working together will always achieve greater and more sustainable outcomes [Borrini-Feyerabend & Buchan, 2000].

## VII. WHERE TO FROM HERE?

The program has a solid foundation to take it forward over the next planning period to 2015:

- The TCA and its major partner, Zoos Victoria, have an agreed five-year action plan. This is derived from extensive discussions on-site in PNG and allows for annual reviews
- A succession plan is in place, reflecting the continuing increase in local capacity and capability, and a need for ongoing support and training.

The Action Research approach has proven to be very effective at continually moving the program forward and achieving its conservation and community goals. The program is seen as a model for successful *in situ* conservation in PNG. Zoos Victoria is delighted to be an active partner, as it demonstrates our commitment to becoming a zoo-based conservation organisation.

## REFERENCES

- Bonaccorso F, Clark P, Miller P, Byers, O. (1999) Conservation Assessment and Management Plan for the Tree Kangaroos of Papua New Guinea and Habitat Viability Assessment for Matschie's Tree Kangaroo: Final Report. Apple Valley: Conservation Breeding Specialist Group (IUCN/SSC). 192pp.
- Borrini-Feyerabend G, Buchan D. (eds.) (2000) Beyond Fences: Seeking Social Sustainability in Conservation (Volume 1 – A Process Companion). Cambridge: IUCN. 129pp.
- Buckland, S.T., Anderson, D.R., Burnham, K.P., Laake, J.L., Borchers, D.L. & L. Thomas (2001) *Introduction to Distance Sampling: estimating the abundance of wild populations*. Oxford University Press, Oxford, pp.430.
- CMP (2010) Open Standards for the Practice of Conservation. Downloaded from Conservation Measures Partnerships; <http://www.conservationmeasures.org/>
- Dick, B. (2000) *A beginner's guide to action research* [On line]. Available at <http://www.scu.edu.au/schools/gcm/ar/arp/guide.html>
- IUCN (2010) 2010 IUCN Red List of Threatened Animals. Downloaded from [www.iucnredlist.org](http://www.iucnredlist.org) on 20 July 2010.
- Kemmis, S. & R. McTaggart (eds.) (1988) *The action research planner*. (third edition). Deakin University, Burwood..
- Lukefahr, S.D. (2008) Role of organic rabbit farming for poverty alleviation. In, Preston, R. & N. Van Thu (eds.) *Proceedings of MEKARN Rabbit Conference: Organic rabbit production from forages*. Cantho University, Vietnam. At [www.lrrd.org/lrrd19/9/luke19138.htm](http://www.lrrd.org/lrrd19/9/luke19138.htm)

Mack, A.L. & P. West (2005) Ten thousand tones of small animals: wildlife consumption in Papua New Guinea, a vital resource in need of management. *Resource Management in Asia-Pacific Working Paper No. 61*. Resource Management in Asia Pacific Program, The Australian National University, Canberra.

Martin R. (2005) Tree-kangaroos of Australia and New Guinea. Collingwood, CSIRO Publishing.

O'Brien, R. (2001). Um exame da abordagem metodológica da pesquisa ação [An Overview of the Methodological Approach of Action Research]. In Roberto Richardson (Ed.), *Teoria e Prática da Pesquisa Ação [Theory and Practice of Action Research]*. João Pessoa, Brazil: Universidade Federal da Paraíba. (English version) Available: <http://www.web.ca/~robrien/papers/arfinal.html>

Shearman P, Bryan J, Ash J, Hunnam P, Mackey B, Lokes B. (2008) The State of the Forests of Papua New Guinea: mapping the extent and condition of forest cover and measuring the drivers of forest change in the period 1972-2002. Port Moresby: University of Papua New Guinea. 148pp.

Sillitoe, P. (2001) Hunting for conservation in Papua New Guinea Highlands. *Ethnos* vol. 66, 3: 365-93.

Vincent M, Slater G, Clark P, Bonaccorso F, Hamilton S. (2000) Recovery Plan for the Scott's Tree-kangaroo *Dendrolagus scottae* and Golden-mantled Tree-kangaroo *Dendrolagus goodfellowi pulcherrimus*. Parkville: Zoos Victoria. 42pp.

Wilder E, Walpole M. (2008) Measuring social impacts in conservation: experience of using the Most Significant Change method. *Oryx* 42 (4): 529-38.

Williams, Byron K.; Robert C. Szaro; Carl D. Shapiro (2007). *Adaptive Management: The U.S. Department of the Interior Technical Guide*. US Department of the Interior, Washington, D.C.

Wood S, Sawyer R, Simpson-Hebert M. (1998) PHAST Step-by-step guide: a participatory approach for the control of diarrhoeal disease. Geneva: World Health Organisation. 127pp.