Name of Protected Area: Torricelli Mountain Range Conservation Area

Part 1: Basic information about the protected area

Table 1. Protected area information

Name, organisation and contact details for person(s) conducting the assessment ***Person 1***: *Name, Organisation, Address, Email, Phone*	Ann Peterson, SPREP/Protected Area Solutions, 283 Madill Road, Tandur, Q4570, Australia, a.peterson@uq.edu.au, 0414300955
Person 2: *Name, Organisation, Address, Email, Phone*	Warren Jano, SPREP, wjano2009@gmail.com, 73780347
Today's Date	16/08/2016
Name (or names) of protected area	Torricelli Mountain Range Conservation Area
Size of protected area (ha)	185,000
PNG Code or number	
World Database of Protected Areas site code (these codes can be found on www.unep-wcmc.org/wdpa/)	
What level or kind of protected area is it? (National Park, Wildlife Management Area, Sanctuary, Reserve, Locally Managed Marine Area etc)	Agreements have been signed with three Local Level Governments (West Wabei, East Wabei and Yankok). In mid-August 2016, the Tenkile Conservation Alliance (TCA) will facilitate the signing of an agreement with the fourth LLG (Palai) and there will be further negotiations to sign an agreement with the fifth LLG (Trekekikier). The agreement gives permission for the Alliance to take a lead on conservation and development.
IUCN Category	
International protected area? e.g. World Heritage or Ramsar?	
Country	Papua New Guinea
Province/s	West and East Sepik
District/s	Aitape-Lumi, Nuku, Ambunti-Drekikier
Local level governments	Currently agreements are negotiated with three Local Level Governments - West Wapei, East Wapei and Yankok, to be followed by Balli and Trekekikier.
Ward/s	20
Nearest big town	Wewak and Aitape
Location of protected area (brief description)	It is situated in the southern foothills of the Torricelli Mountain Range covering 185,000ha at elevations from 1200-1600m. There are 50 villages and the area consists of montane tropical rainforest and five rivers (Aule, Weinif, Kifange, Yelbu and Aupan). The Tenkile boundary follows the Warasikau River.
Map references	
When was the protected area gazetted or formally established?	2001 (In July 1999 a moratorium on hunting by villagers was put in place. In 2001 there was an official agreement with West Wapei to establish a conservation area. The process to finalise the protected area is ongoing.

Reference for gazettal or Memorandum of Understanding (MoU)	
Who owns the protected area? please enter Government Private Community/ customary landowners, private, Other (name) and include **Clan name(s)**	Customary landowners of the 50 villages. Many clans are involved. The 20 villages of the Tenkile moratorium are Wai'eli, Wuguble, Maiwetem, Walwalem, Soulete, Waunulu, Yongite, Rawete, Wilbeite, Miwaute, Wabute, Sarpoute, Tolgete, Wigote, Hapseim, Yomoum, Lilal, Mupun, Bagam and Uwei. The 30 villages of the Weimang moratorium are Weikint, Nunsi, Awang, Winbe, Muku, Sumil, Weiki, Yapunda, Marakumba, Paita, Sibilanga, Anipo, Yanungen, Aseir, Barkop, Aluna, Suara, Seleb, Brau, Mup, Kolembi, King, Dato, Kofem, Koleik, Kulifi, Komola, Sakap, Serpmel and Maui (near Lumi).
Number of households living in the protected area	2,300
Population size within the protected area	>12,000 (a census was conducted in 2015)
Who manages the protected area? (e.g. please enter government, customary landowners [**add clan names**] management committee [**how many and what gender**])	Customary landowners and the Conservation Area Management Committee, who manage the area on behalf of the customary landowners. There are 50 villages, each with two representatives on the committee (i.e. 100, with 50 males and 50 females). Each village has a sub-committee. There are eight teams; 16 project officers and research officers who look after 5-6- villages each; the conservation committees administer the bylaws, establish rules and oversee development. The committee meets twice per year, depending on funds, which are used to bring people into the meeting and pay for their food etc. Funds are provided by UNDP.
Total number of staff (this means anyone working on the protected area in **paid jobs** – whether NGOs, community, rangers or customary landowners	190
Temporary paid workers	158, including 8 research officers in the research team (works in the mountains) – paid on a casual basis. 150 rangers i.e. 50 villages with 3 rangers each (part time rangers who work once or twice per year).
Permanent paid workers	32, organised into three groups of permanent workers: 16 full time staff; 13 ancillary staff (4 carpenters, 1 painter, 1 plumber, 1 animal keeper, 1cleaner, 2 cooks, 3 security); management - Jim Thomas (CEO), Jean Thomas (Operations Officer) and Matthew Akon (Media and public relations manager)
Annual budget (US$) **–** excluding staff salary costs	About $200,000 (1.8million Kina annually, with a five year contract with UNDP. There are also livelihood projects e.g. fish/protein and rice projects in the 50 villages).
Operational (recurrent) funds	About $300,000
Project or special funds	About $100,000 (e.g. WFN (UK) provided money to complete the protected area; Deakin University assists with research etc).
Reason for park establishment	To protect animal and natural resources and culture. In 1988 Dr Tim Flannery collected information on the area and the IUCN classified the Tenkile (tree kangaroo) as critically endangered. When this information came back to the village, the leaders negotiated an agreement with the customary landowners that involved no hunting and killing of wildlife and establishing a conservation area for future generations. Several projects were funded (e.g. water tanks, fish farming and other protein projects (e.g. farming rabbits and chicken as alternatives to hunting). The boundaries of the conservation area were identified (i.e. above 1200m) and below that height people were able to utilise the land for gardens and hunting. Thus three zones were identified: a hunting zone, conservation zone and commercial zone.

What are the main values for which the area is designated (Fill this out after data sheet 2)	Tree kangaroos, endemic species, culture, livelihoods, water and rivers, and forest habitat.
List the primary protected area management objectives (add lines if needed after the most important objectives): *Management objective 1*	Protect biodiversity and culture – establish the Torricelli Mountain Range as a legislated Protected Area to ensure the protection of all biodiversity and culture; maintain and upgrade the conservation area rules and regulations; and maintain the hunting moratorium on tree kangaroos.
Management objective 2	Ensure sustainability and community development - develop alternate livelihood strategies to alleviate poverty and hunger, improve health and minimise hunting pressure on wildlife, and enable the sustainable use of natural resources; and develop sustainable sources of income to enable Papua New Guineans to successfully lead, manage and administer their own projects and organisations, with current, solid and transparent governance.
Management objective 3	Conduct research and mitigate climate change – implement a monitoring and evaluation program to assess management effectiveness in conserving biodiversity and participate in REDD+ and other programs to combat global warning and climate change, relieve poverty and improve health.
Number of people involved in answering the assessment questions	4
Name/organisation/contact details of people participating the assessment *(Please do not insert return/enter or dot points)*	Tenkile Conservation Alliance
Customary landowners/other community; CEPA, Other national government agency; Provincial govt; local level govt; Protected area staff (anyone working on the protected area in paid jobs; NGO; Donors; External experts; Others	*Jim Thomas* (Tenkile Conservation Alliance), TCA Base-Lumi, Sepik Highway Lumi, PO Box 1304 Wewak, East Sepik Province, jim@tenkile.com, 73140170; *Mathew Akon*, TCA (TCA Base-Lumi, West Sepik Province), matthew.akon@hotmail.com, +675 79070706; *Samuel Kabau*, TCA (as above), samuelkabu@mail.com, 71785085; *Alison Kufa*, TCA (as above, West Sepik Province) 73632095.
Please note if assessment was carried out in association with a particular project, on behalf of an organisation or donor.	SPREP through the PNG Protected Area Assessment Project, which is a component of the GEF Community-based Forest and Coastal Conservation and Resource Management Project in PNG.

Part 2: What makes this protected area special and important?

Tenkile is located in the Torricelli Mountains and covers 185,00ha. We value the protected area because of the tree kangaroos. There are 20 villages that have the tenkile (Scott's tree kangaroo, *Dendrolagus scottae*) on their land in the western half of the Torricelli Mountain Range (Lumi area) and 30 villages have the Weimang or golden-mantled tree kangaroo (*Dendrolagus pulcherrimus*) found in the eastern half of the Torricelli Mountain Range. Our ancestors used the tree kangaroo for food and for customary ceremonies. About five big rivers run from the ranges to the Sepik and to the coastal areas such as Aitape. We value the rivers because we get fish from them and fresh water, and we have small scale gold mining in the rivers. We value the trees as we use the bush timbers in making houses. Most important is that the conservation area helps us to conserve our customary and traditional way of life and provides important areas for gardens, hunting and other crop production. The Tenkile Conservation Alliance (TCA), a non-government organization was established in 2001 to improve the conservation outcomes and livelihoods of the customary landowners.

Table 2. Key values of the protected area

No.	Key values	Brief description	*Note if endangered species or ecosystem (IUCN)*
1	Tree kangaroo	All species are critically endangered. There has been a hunting moratorium (MOU) in place since 2003 and numbers have increased from 100 to >300. Some are returning to areas where they have not been seen in a long time. All 50 villages have tree kangaroos on their land.	Tenkile *Dendrolagus scottae* (critically endangered), Weimang *D. pulcherrimus* (critically endangered) and the grizzled tree kangaroo *D. inustus* (vulnerable).
2	Endemism / unique species	There are high levels of endemism, e.g. black spotted cus cus and northern glider and several undescribed species (e.g. perhaps four new species of mammals).	Northern glider, *Petaurus abidi* (Critically Endangered), black spotted cuscus, *Spilocuscus rufoniger* (critically endangered).
3	Traditional culture	The establishment of the protected area was also about linking protection of the natural world with protection of our cultural values. We have spiritual places where people are not permitted to hunt or use the resources. These areas are important for wildlife ('ples masalai'). The conservation area helps to protect and maintain our stories and legends. If a logging company comes in we won't have any of this left, so we protect our land, as it is our culture and customs. There is also strong leadership in the community and high levels of awareness of the benefits of conservation.	
4	Better lifestyle/livelihoods	The conservation area has brought many benefits which have improved the lives of the customary landowners. For example it has reduced our workload on some tasks e.g. it saves time in relation to collecting water. As part of the agreement in setting up the conservation area, water tanks were provided to the villagers. The tanks especially make a difference to the lives of the women and "women feel this difference - before the women had to carry water a long distance, but when the tanks were provided it saved this time". 350 water tanks have been provided in 50 villages as well as roofing material (each household receives a set of 30 tin sheets, gutters, etc and information on how to install and manage the tanks/roofs). Many households have their own toilet. This was mostly funded by the EU, which started delivering tanks from 2004 – 2012. The Alliance will receive more tanks this year through Wateraid Australia. The Alliance needs 200-250 tank packages so that everyone has access to water. The community pays 10% of the price, which is achievable. The tanks cost 7,500kina per tank set and thus each household/community must raise 750 kina. There needs to be a substantial incentive to obtain the conservation outcomes. The people stopped hunting because the tanks were there. As they use water every day, this is a reminder to the people not to hunt. The Alliance is in the process of setting up an endowment fund, with the aim to have US$7million, with the interest used to cover all overheads and basic programs, insurance, and food.	
5	Water and rivers	There are five main rivers which supply important water to the community and which are a source of some small gold mining (helps with school fees). The Alliance is improving water and sanitation and starting to undertake water testing and monitoring to retain water quality and improve people's livelihoods and health.	
6	Forest habitat	The forest provides timber for making houses, traditional medicines, and habitat for animals. It also supplies coco and vanilla (in the gardens) and the bark of some trees is used to make oil for perfumes.	

Table 3. Checklist of values/benefits

Not important 0; Important 1; Very important 2; Don't know DK

How important is the protected area for each of the listed values/benefits?	Score (0,1,2, DK)	Comment
1. Biodiversity – the presence of many different kinds of plants, animals and ecosystems	2	Many species (e.g. cassowary, bird of paradise, tree kangaroo, fish, forest, orchids etc).
2. Presence of rare, threatened, or endangered species (plants and animals)	2	Many endangered species and these species are found nowhere else in the world. There are three tree kangaroo flagship species: the tenkile *Dendrolagus scottae* (critically endangered), Weimang *D. pulcherrimus* (critically endangered) and the grizzled tree kangaroo *D. inustus* (Vulnerable); the northern glider (*Petaurus abidi*) (Critically Endangered) and the black spotted cuscus (*Spilocuscus rufoniger*) (critically endangered). Protection is achieved by establishing hunting moratoriums every two years. This is a written, signed agreement which reminds and recommits the customary landowners to their commitment of protecting endangered species in their area.
3. Ecosystems (e.g. wetlands, grasslands, coral reefs etc) that are rare because they have been cleared or destroyed in other areas	2	Very special because it is on a mountain and this has very high importance due to its scarcity both in PNG and globally.
4. Protecting clean, fresh water	2	Have five main rivers – important for fish and water supply, especially in the dry season.
5. Sustaining important species in big enough numbers that they are able to survive here	2	Currently there are three Local Level Governments within the Alliance and other areas are to be added and this will help to support the habitat needs of a diverse range of species.
6. Providing a source of employment for local communities now	2	Since establishment it has provided employment opportunities to the customary landowners (e.g. about 190 paid staff; several community development projects).
7. Providing resources for local subsistence (food, building materials, medicines etc.)	1	Trying to secure funding for permanent houses thus reducing the need for timber extraction from the forests. No hunting in the conservation area, although there are areas allocated for hunting. Most resources are extracted from outside the conservation area, which is an 'untouched' area. Tenkile also provides clean water.
8. Providing community development opportunities through sustainable resource use	2	A range of projects are in place: tank packages, health care, HIV/Aids, hygiene and sanitation, family planning, training and education (to adopt better hygiene).
9. Religious or spiritual significance (e.g. tambu places)	2	The landowners recognize the need to pass on cultural information to the younger generation. The spiritual places are special – it is part of our culture that young people respect these areas.
10. Plant species of high social, cultural, or economic importance	2	Masshoi bark wood (used to produce oil for perfumes) is sold for 5Kina per kilogram (mainly sold to Asian markets) and has important economic value. There are medicinal plants (Salat) that reduce pain (similar to Panadol).
11. Animal species of high social, cultural, or economic importance	2	Tree kangaroo (ceremonial importance – used in feasts, marriage ceremonies; skins used in sing sings; tails used to make necklaces (like a string); black spotted cuscus – use skin for sing sings and bride price; cassowary (2 species – northern and southern); bird of paradise (4 species) – feathers for ceremony and money. There are five lakes with fresh water eels (not found anywhere else) and these are an important food source.
12. Attractive scenery	2	Very attractive scenery – mountains, rivers, lakes, animals, waterfalls, orchids.

13. Tourism now	1	Only researchers – orchid, bird and frog research.
14. Potential value for tourism in the future	2	We are working on developing tourism facilities, but this is not a high priority.
15. Educational and/or scientific value	2	Endangered species are researched. The Local Level Government needs to be involved and to receive the information from this research as this will help to convince the politicians of the importance of the conservation area. Education programs are conducted in the schools in the villages. On special days e.g. world environment day, our officers go to the schools and provide information. They give some training to the teachers in the schools to pass on the environmental education.
16. Maintaining culture and tradition on customary land and passing this on to future generations	2	The conservation area is helping us to maintain our traditional customs.

Part 3: What are the threats to the protected area?

Table 4: Threats to the protected area

H **High** significance threats are seriously degrading values. This means they are badly damaging some value –it might be a kind of animal or plant, or your traditional gardens

M **Medium** threats are having some negative impact – they are damaging values but not so badly

L **Low** threats are present but not seriously damaging values

0 **N/A** where the threat is not present in the protected area or where something is happening but is not threatening the values at all

Threat type	**Score** (H,M,L,0)	**Notes**
1.1 Housing and settlement	0	Houses are located outside the conservation area (restricted hunting area), although they are within the Tenkile Conservation Alliance.
1.1a Population increase in the protected area community	H	Population is increasing and pressure is placed on the conservation area in terms of the extraction of timber to build houses. We need to secure funding to maintain family planning and control the growth rate of the population.
1.2 Commercial and industrial areas	0	
1.3 Tourism and recreation infrastructure	0	
2.1 Customary land owner and community gardens and small crops	0	
2.1a Drug cultivation	0	
2.1b Commercial plantations	0	
2.2 Wood and pulp plantations	0	
2.3 Livestock farming and grazing	0	
2.4 Marine and freshwater aquaculture	0	
3.1 Oil and gas drilling	0	
3.2 Mining and quarrying	0	
3.3 Energy generation	0	
4.1 Roads and railroads (include road-killed animals)	0	
4.2 Utility and service lines (e.g. electricity cables, telephone lines)	0	
4.3 Shipping lanes	0	
4.4 Flight paths	0	
5.1 Hunting, killing and collecting terrestrial animals (including killing of animals as a result of human/wildlife conflict)	0	We are trying to control hunting and educate the population (through family planning etc) to reduce the impact on animal resources and we have areas were hunting is not permitted. Several farming projects have been implemented to provide alternative sources of protein (e.g. rabbits, chicken, pig fish) and thus reduce the need to hunt native animals. This is accompanied by appropriate training and assistance.

Threat type	Score (H,M,L,0)	Notes
5.2 Gathering terrestrial plants or plant products (non-timber)	0	
5.3a Logging and wood harvesting for local/customary use	H	This is a problem especially given the increase in population (i.e. timber is extracted for houses and firewood).
5.3b Logging and wood harvesting – commercial logging	H	There is no current logging, but logging represents an ongoing challenge to achieving long-term conservation outcomes, especially when there is political pressure which favours logging.
5.4a Fishing, killing and harvesting aquatic resources for local/customary use	0	
5.4b Fishing, killing and harvesting aquatic resources for commercial use	0	
6.1 Recreational activities and tourism	0	
6.2 War, civil unrest and military exercises	0	
6.3 Research, education and other work-related activities in protected areas	0	
6.4 Activities of protected area managers (e.g. construction or vehicle use)	0	
6.5 Deliberate vandalism, destructive activities or threats to protected area staff and visitors	0	
7.1 Fire and fire suppression (including arson)	0	The area is very cold and bush fires are not common.
7.2 Dams, hydrological modification and water management/use	0	
7.3a Increased fragmentation within protected area	0	
7.3b Isolation from other natural habitat (e.g. deforestation)	0	
7.3c Other 'edge effects' on park values	0	
7.3d Loss of keystone species (e.g. top predators, pollinators etc.)	0	
8.1 Pest plants	L	There is the poison type rope – Bakuk rope, which has been introduced into the area by people. Taka Diwai occurs also when there are landslides and this plant grows in the newly exposed areas – it is transported by birds. This is just starting as a threat and we are looking for ways to overcome this. We are talking to DPI experts to look for solutions (e.g. chemical).
8.1a Pest animals	0	
8.1b Diseases such as fungus or viruses that make native plants or animals sick	0	
8.2 Introduced genetic material (e.g. genetically modified organisms)	0	
9.1 Household sewage and urban waste water	0	
9.1a Sewage and waste water from protected area facilities	0	
9.2 Industrial, mining and military effluents	M	Frieda Mine (West Sepik Province) is to be constructed in the area and they will build dams and pipelines and put slurry on barges which will travel down the Sepik. There is potential impact if it pollutes the Sepik as much of our fish comes from this area and it will affect CA. There are also concerns about the location of the pipeline that may affect our area.
9.3 Agricultural and forestry effluents (e.g. excess fertilizers or pesticides)	0	

Threat type	Score (H,M,L,0)	Notes
9.4 Garbage and solid waste	0	
9.5 Air-borne pollutants	0	
9.6 Excess energy (e.g. heat pollution, lights etc.)	0	
10.1 Volcanoes	0	
10.2 Earthquakes/Tsunamis	L	Cause landslides and people die from these.
10.3 Avalanches/Landslides	M	The area can receive high rainfall and storms and there are often floods and landslides.
10.4 Erosion and siltation/ deposition (e.g. shoreline or riverbed changes)	H	Erosion occurs along the river banks and sediment enters the Sepik – mainly from natural causes. Human removal of vegetation in communities is causing some erosion. There is some training to try to reduce this impact (e.g. training booklets).
11.1 Habitat shifting and alteration	M	We have noticed an increase in temperatures and a change in the seasons and this has made it more difficult to predict when to plant crops. This is quite a frustration. It has also affected the distribution of malaria bearing mosquitoes, which have increased in the area. Everyone knows that climate change is happening (there are no sceptics in the community). Habitats have altered, although there has been little change in the vegetation. There have been some changes in the timing of the planting of crops. Many villagers have participated in climate change courses.
11.2 Droughts	0	
11.3 Temperature extremes	H	There are more hot days (>30 degrees) and this affects our food crops and gardens. In the past people knew the seasons, but now there is confusion about the seasons. Before food grew well, but now some crops fail. Also the dry season has changed and we no longer know when it will begin.
11.4 Storms and flooding	H	There is increased flooding and erosion and damage from storms (e.g. loss of trees), which are now higher in intensity and more common.
11.5 Coral bleaching	0	
11.6 Intrusion by saltwater into gardens etc.	0	
11.7 Sea level rise	0	
Other (please explain)		
12.1 Loss of cultural links, traditional knowledge and/or management practices	H	Local language are being lost as parents are teaching their children to adopt Tok Pisin and English. Traditional communication using the garamut is disappearing and traditional skills (from our ancestors) have been lost.
12.2 Natural deterioration of important cultural site values	0	All sites are respected.
12.3 Destruction of cultural heritage buildings, gardens, sites etc.	0	
Other (please explain)		

Table 5. Worst threats and ways forward

Threat No.	Threat (Most significant first)	Threat number or name (copy no. from Table 4)	Nature of the threat, impact and how to reduce the impact.
1	Future logging	5.3b	Forest management areas overlap the conservation area and several problems come with logging, which is then often changed to oil palm production. All politicians identify logging as a good crop.
2	Population increase	1.1a	The census from 2005-2015 showed an increase in some areas of 17%. Family planning needs to increase and expand. Population increase places pressure on resources.
3	Climate change	11.1, 11.3, 11.4	Plans are in progress to reduce the burning of firewood (we are doing a survey to identify what species are burned); reduce carbon emissions by providing bedding and nets; provide tin roofing material (bush house materials and tin – last three times as long as thatched roofs and this reduces the demand for timber and improves health).

Part 4: What is the management like in the protected area?

Table 6. Management effectiveness scores, comments, next steps

Issue	Score (0,1,2,3, NA)	Comment	Next steps
1a. Legal status	2	In the process of being gazetted under the new Protected Area legislation. A submission has been made (2015) under the new format.	
1b. Legal status			
2a. Protected area regulations	2	Some gaps.	Rewriting conservation manual and improving policy to improve management of the protected area.
2b. Protected area regulations			
3. Law enforcement	3	8 research officers and 100 rangers (all casually employed, with certainty for the next four years and when the endowment fund is established, this employment will be for much longer); 18 full time local staff; significant training with each village and each has a conservation area committee (8-14 representatives), with a minimum of 25% women. All villages have rules and regulations on their special management area. Enforcement depends on the village (how long they have been in the program and their level of understanding). Some villages have taken people to the village court as a result of breaches of the rules and agreed penalties have been applied.	Over the next four years there is GEF funding, which will help to address law enforcement issues. We need regular meetings with the committees, rangers and research officers and permanent project officers and training in relation to policy, legislation, and enforcement. We need to do more mapping to define areas (e.g. we have mapped most of the special management areas, but need to complete this in each village). It is important to identify the boundaries with the people first and then use the GPS to map it and identify markers on the ground. This reduces conflict and land disputes. We will also use GPS to identify other land use areas (e.g. gardens).
4. Protected area objectives	3	There are five management objectives. Training is undertaken to make people aware of the objectives.	
5. Protected area design	2	The boundaries are in the process of being extended to include one more Local Level Government.	
6. Protected area boundaries	3	These are mapped and known by the people.	
7. Management plan	3	A plan is in place.	Further training of committees and rangers to strengthen their capacity to manage.
7a. Planning process	1	The community discusses issues with the sub-committee and they report to the full committee.	
7b. Planning process	1	The plan is reviewed every year. The last review was in 2014.	Need to seek funds to review the plan.
7c. Planning process	1	Sub-committees and the committee conduct monitoring and evaluation at the village level and provide information for improved planning.	

Issue	Score (0,1,2,3, NA)	Comment	Next steps
8. Regular work plan	2	The main problem with implementation of the work plan is a lack of funding.	
9. Resource inventory	2	We have completed a population census (2005 and 2015); conducted research on tree kangaroos (population numbers through camera traps) and identified other rare species.	Need training to enable local rangers to undertake the research and information gathering. Currently the officers are working in isolation. We need the capacity to travel elsewhere to learn new approaches and to implement what is relevant to our protected area.
10. Protection systems	2	Need to issue a permit to foreign researchers that clearly identifies what they are able to do in the PA. There are no identified problems with illegal access.	The Local Level Government should develop a legal policy that explains clearly to outsiders what is expected and they should meet these requirements and fee arrangements.
11. Research and monitoring	1	Landowners are aware of the species in their areas. Distance sampling is used to estimate the density of tree kangaroo populations at 14 research sites. This has been undertaken since 2003. This is undertaken by the local research officers and distance sampling officers or rangers who work with the local villages. Partnerships have been formed with several Australian universities. Camera traps have been used since 2011 (as a result of crowd source funding) to identify the diversity of species in the area.	Need to raise awareness with people outside the protected area so that they are aware of the conservation area and the management needs of particular species.
12. Resource management	2		
13a. Staff numbers	2	There are sufficient staff for administration purposes.	For management we need more at the committee level e.g. more rangers who are full-time employees.
13b. Other people working on the protected area	3	People help because incentives are being distributed – they are active helpers to manage the conservation area.	We are trying to develop more incentive programs e.g. funds to purchase timber for each household, rice growing project to help with diet – we are buying a rice milling machine, this will enable the sale of some rice to earn further income.
14. Training and skills	2		Training of committee members (e.g. financial administration, writing applications, land survey, IT, leadership, conflict resolution), rangers (formal ranger course, exchange/learning from others).
15. Current budget	2	The budget is over five years and is sufficient to meet our current needs. Contract with UNDP.	We are seeking small grants to strengthen the conservation plan (e.g. UK) and thinking of establishing a trust fund with input from external donors.
16. Security of budget	1	The budget is only for 5 years.	We need long term secure funding, which may be provided if we manage to establish an endowment/trust fund for conservation and community development purposes.

Issue	Score (0,1,2,3, NA)	Comment	Next steps
17. Management of budget	3	All the budget is distributed according to the work plan/activity plan. Money for livelihood products goes to the supplier and then the product is distributed to the people. External auditors conduct an audit twice a year.	
18. Equipment	2	Good office equipment – laptops for each committee; GPS. The TCA base in Lumi contains a range of facilities e.g. training centre with office, generator, solar power, wireless internet, data projector, freezer, septic toilets, shower block, water tanks, accommodation blocks, guest house.	Transport e.g. car, torches, boots/clothing, and more GPS.
19. Maintenance of equipment	2	GPS some are not working. Equipment is well maintained over long periods; internet system is working well and is maintained.	
20. Education and awareness	2		Need to work with the government and work with the community to help promote our outcomes (rather than logging outcomes).
21. Planning for land use or marine activities	2	Villagers outside want to be a part of our program, but we don't have the funds to include them.	
22. State and commercial neighbours	2	There are very few commercial operators, except for Frieda Mine – there has been some consultation.	The mining company needs to understand our program and minimise their impacts on our area. This requires regular communication and meetings, particularly in relation to the placement of the pipe line.
23. Indigenous people/ Customary landowners	3	Directly participate through their elected representatives and sub-committees.	
24a. Impact on communities	1		Need improved engagement with CEPA i.e. communication, networking, and visitation.
24b. Impact on communities	1		Capacity building training is needed.
24c. Impact on communities	1		
25. Economic benefit	2		Community development projects that address poverty and ensure sustainable livelihoods; build capacity with vanilla and spices, sugar palm, cocoa (may start a project with the World Bank to further develop this).
26. Monitoring and evaluation	3		
27. Visitor facilities	2	Some facilities at the community level.	There is no desire to expand on the visitation levels that are currently experienced.
28. Commercial tourism operators	0	Some researchers ($200 per day) and volunteers ($100 per day) and a few visitors.	If this did eventuate there would need to be a process to ensure that the benefits are spread equitably.

Issue	Score (0,1,2,3, NA)	Comment	Next steps
29. Fees	2	Several researchers come through (e.g. orchids, climate change, cultural resource use etc).	Landowners need to be consulted and to approve researchers entering their land; and to have an equitable share of the research fees and an upfront payment (e.g. 500k)
30. Condition of values	3		
30a.Condition of values	1		
30b. Condition of values	1	Specific targeting of threats e.g. potential of future logging.	
30c. Condition of values	1		

Part 5: Condition and trends of protected area values

Table 7. Values, condition and trend

Key value (from Table 2)	Condition Score (VG, G, F, P, DK)	Trend Score (I, S, D, DK)	Information source and justification for Assessment and HOW the condition can be IMPROVED
Tree kangaroo	G	I	Exclusion zones for hunting and the establishment of the conservation area have resulted in an increase in the numbers of tree kangaroo.
Endemism / unique species	G	I	The mountains provide habitat for a range of endemic species and due to restrictions on hunting and collecting their numbers are increasing.
Traditional culture	VG	S	People are still maintaining their culture and sites and still respect these sites. The conservation area helps with the retention of culture and also through the implementation of many development project. Churches have tried to change the traditions, but the CA has strengthened our customs and traditions. The main issue is that the education system is not currently integrating our traditional practices.
Lifestyle/livelihoods	G	I	Now there is a conservation income and projects and traditional values are being valued in the community.
Water and rivers	VG	S	Protecting river banks will help to reduce erosion and sedimentation.
Forest habitat	VG	S	No destruction of forest; it is stable.

Table 8. Recommendations and ways forward

1.	2.	3.	4.
Capturing the interest of the customary landowners in conservation – need continued funding to provide permanent housing (to avoid use of bush materials).	Staff and villagers need more capacity building and training to maintain and sustain the conservation area. We need champions in the community who can continue the process of conservation.	Gender opportunities in relation to education and training. There should be equal representation of women on the management committee. In traditional society women are often not heard. The women need training in skills development to improve their leadership skills and this needs to include men to ensure that the needs of women are considered.	There needs to be a trust/endowment fund established to provide sustainable funding for conservation and livelihood improvement.

Table 9. Strengths and challenges (facilitator/recorder synthesis)

	Strengths	Challenges
1	Important funding sources have enabled the ongoing provision of development projects which are tied to various conservation outcomes. When the people have seen and benefited from the development (e.g. tanks) and observed the conservation returns they are more likely to support the ongoing conservation and management program.	Securing long-term funding to further the links between community development and conservation outcomes.
2	Strong leadership and also widespread engagement of the customary landowners.	Addressing population growth which is placing pressure on the extraction of resources.
3	The site remains very important for biodiversity, particularly the tree kangaroo and several other endemic species.	Maintaining strong leadership, especially among the customary landowners, as there are many challenges in establishing and maintaining the conservation area.
4	A diverse array of education and training services are provided to facilitate conservation outcomes.	Improving linkages among all levels of government with the protected area.