

## Name of Protected Area: YUS 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 <i>Person 1: Name, Organisation, Address, Email, Phone</i>	Gregory Peterson, SPREP/Protected Area Solutions, 283 Madill Road, Tandur, Q4570, Australia, gregpeterson53@hotmail.com; 0414300955.
<i>Person 2: Name, Organisation, Address, Email, Phone</i>	Ann Peterson, SPREP/Protected Area Solutions, 283 Madill Road, Tandur, Q4570, Australia, gregpeterson53@hotmail.com; 0414300955.
Today's Date	22/02/2017
Name (or names) of protected area	YUS Conservation Area
Size of protected area (ha)	78,729 (75,000 in gazettal notice) (The wider YUS landscape is 150,000ha).
PNG Code or number	
World Database of Protected Areas site code (these codes can be found on <a href="http://www.unep-wcmc.org/wdpa/">www.unep-wcmc.org/wdpa/</a> )	NA
What level or kind of protected area is it? (National Park, Wildlife Management Area, Sanctuary, Reserve, Locally Managed Marine Area etc)	Conservation Area
IUCN Category	VI
International protected area? e.g. World Heritage or Ramsar?	NA
Country	Papua New Guinea
Province/s	Morobe and Madang
District/s	Kabwum, Rai Coast, Tawai Siassi
Local level governments	YUS, Wasu, Nayudo
Ward/s	18 wards and 50 villages (on about 6% of the land area).
Nearest big town	Lae and Wasu
Location of protected area (brief description)	YUS CA is located on the north east corner of the Huon Peninsula, about 350kms from Port Moresby. It is named after the Yopno, Uruwa and Som Rivers that flow through the CA. It extends from coral reefs on the northern coast bordering the Bismarck Sea (marine component is about 1km at the widest extent) to the peaks of the western Saruwaged and Finisterre Mountain Ranges at about 4,100m. It contains grassland, lowland rainforest, montane forest (1000-3000m), some limestone forest and at higher altitudes, fragile cloud forests and high alpine grasslands. Nearly 70% of the landscape is covered by an unbroken tract of rainforest. It is a remote landscape with few people and roads. Access is by plane (once weekly), foot travel, or boat on the coast. The forested core zone or tambu area is gazetted as the YUS CA, which is within the wider 'YUS Landscape'.
Map references	
When was the protected area gazetted or formally established?	09/01/2009

Reference for gazetted or Memorandum of Understanding (MoU)	
Who owns the protected area? please enter Government Private Community/ customary landowners, private, Other (name) and include <b>Clan name(s)</b>	Customary landowners: 7 local languages (in addition to English and Tok Pisin)
Number of households living in the protected area	0 (in gazetted PA)
Population size within the protected area	0 (YUS landscape area has 13,000 -15,000 people; low population density ~6/2 people per square kilometre)
Who manages the protected area? (e.g. please enter government, customary landowners [ <b>add clan names</b> ] management committee [ <b>how many and what gender</b> ])	Schedule 1 of the National Gazette of the establishment and appointment of <b>Conservation Area Management Committee (CAMC)</b> members for YUS Conservation Area specifies 9 members representing CEPA, Kabwum District, YUS LLG President, Wasu LLG President, <b>Tree Kangaroo Conservation Program (TKCP)</b> , and Morobe Provincial Government (all have 1 representative) and three Executive Members of the <b>YUS Conservation Organisation (YUS CO)</b> – currently Mrs. Annie Ogate, Mr. Timmy Sowang, Mr. Botty Kwisa. The YUS CO serves as a landowner advisory committee to TKCP. Within YUS CO there is a representative from each ward and at least one female from each zone (Yopno, Uruwa, Som and Nambis) – 21 people in total and they select the three representatives for the CAMC). The customary landowners manage the landscape on a day to day basis.
Total number of staff (this means anyone working on the protected area in <b>paid jobs</b> – whether NGOs, community, rangers or customary landowners	TKCP: 6 full-time staff based in Lae, 6 staff @ 3/4 time based in YUS, 14 terrestrial rangers, 2 marine rangers (1/2 time, i.e. 2 weeks/month) and the Assistant Director; and 2 FT staff at Woodland Park Zoo (WPZ).
<i>Temporary paid workers</i>	Research assistants; 1 seasonal worker helps with coffee production; hire carriers and house workers to manage specific events.
<i>Permanent paid workers</i>	29 in PNG, 2 in USA.
Annual budget (US\$) – excluding staff salary costs	\$90,000 per annum – the YUS Conservation Endowment is used to support management activities and community development (limited funds). \$2.5m held by WPZ, providing about \$90,000 per annum for management activities at YUS.
Operational (recurrent) funds	
Project or special funds	Foundation and grant funding are available: GEF funding (strengthening protected area management) is ~\$500,000 per annum until 2020; Zoos Victoria provides \$50,000 (AUD) per annum to WPZ and YUS; and there is a grant from the Rainforest Trust (US) \$200,000 over 5 years to support management (e.g. rangers, mapping, and the re-gazetted process).
Reason for protected area establishment	The purpose is to “preserve the environment and the national cultural inheritance within the area, and to achieve this through conservation of important biological, topographical, geologic, historic, scientific and social resources” (TKCP 2012). To protect critical habitat of the endangered, endemic Matschie’s tree kangaroo, <i>Dendrolagus matschiei</i> , which was threatened by hunting (the fur is for traditional costumes and headbands, which are used in sing-sings, and the meat is a source of protein). Clan members from 50 villages pledge their commitment to prohibit all hunting, logging and mining within the core Conservation Area and the tree kangaroo serves as the flagship for habitat conservation. Woodland Park Zoo’s Tree Kangaroo Conservation Program (TKCP) supports the customary landowners in their conservation efforts by increasing access to education and improving community health in the villages and assists in building the capacity of local community-based organisations that will be responsible for managing YUS and the livelihoods projects in villages surrounding YUS. A landscape scale approach is used to help to protect a

	greater range of biodiversity (including species and habitats). <b>Additional Information:</b> TKCP has continued to emphasise that no compensation is provided for setting aside land, highlighting the purpose of the CA is for the long term sustainability of YUS natural resources and resultant benefits to local communities (Wells et al 2013).
What are the main values for which the area is designated (Fill this out after data sheet 2)	The values include: Diverse landscapes from mountains to the sea; Endemic species; Forest and grassland; Biodiversity, including the Matchie's tree kangaroo ( <i>Dendrolagus matschiei</i> ) habitat; Rivers (3 main rivers); Sacred sites.
List the primary protected area management objectives (add lines if needed after the most important objectives): <i>Management objective 1</i>	Conserve and maintain montane and lowland rainforest, alpine grasslands and coastal and marine ecosystems.
<i>Management objective 2</i>	Conserve and protect the endangered Matchie's tree kangaroos and other hunted species and their habitats.
<i>Management objective 3</i>	Develop civil society, partnerships and collaboration to support sustainable resource use and management.
Number of people involved in answering the assessment questions	5
Name/organisation/contact details of people participating in the assessment	<i>Mikal Nolan</i> , Tree Kangaroo Conservation (TKCP), PO Box 360, Lae, mikal.nolan@treekangaroo.org, 72500788; <i>Botty Kwisal</i> , YUS customary landowner, PO Box 360, Lae, 79860045; <i>Annie Ogate</i> , YUS customary landowner, PO Box 360, Lae, 70233812; <i>Timmy Sowang</i> , YUS customary landowner, PO Box 360, sowang.jimmy@gmail.com, 70971364; <i>Robin Kiki</i> , Morobe Provincial Government, PO Box 572 Lae, Morobe Province, gkiki.robin@gmail.com, 4131680, 76792467.
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	Customary landowners, Tree Kangaroo Conservation Program, Provincial Government.
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?

YUS is PNG's first national Conservation Area under the country's *Conservation Areas Act 1978*. It extends from the forested mountains and montane grassland to the fringing reefs along the coast of the Bismarck Sea. There is plenty of **forest and the rivers** enter the sea through large grassland areas. The community lives outside the CA in 50 villages found mainly in the Livelihood and Agroforestry land-use zone. There are **four geographic zones** - Yopno, Uruwa, Som and Nambis. We are trying to help the environment. There are **many animals** including diverse bird species, mammals, frogs and reptiles and many species are endemic to the Huon Peninsula. The **flagship species**, the Matchie's tree kangaroo is an important symbol for conservation and is found at elevations above 1000m. In the coastal area there are coral reefs with turtles (leatherback and green), dugong and sea grass (no mangroves), near fringing reef networks, and migratory waders. Each species is valued locally for its utility (e.g. meat for consumption and feathers and skin for cultural purposes) and the act of hunting is firmly embedded in local tradition. The rivers are important and all waterways have a 3m **buffer** on each side and are included in the CA (i.e. no clearing of riparian vegetation in the buffer). The participating communities in the CA consist of those who have **pledged land** for conservation, with the primary purpose being the **long-term sustainable use** of YUS's resources. The TKCP approach offers local communities **access to coffee and cacao markets**, better **healthcare and education to incentivize support** for the CA. Also important is the diverse employment opportunities offered by the TKCP program. YUS's rugged terrain has largely prevented large-scale development (e.g. mining) and its isolation has restricted access to government services, employment and markets. The TKCP is responsible for day to day management, technical support, fund raising and facilitates strategic partnerships with

government and civil society. The YUS Conservation Organisation (YUS CO) gives each clan a representative voice, facilitating **landscape-level decision making** and advises the TKCP.

**Table 2. Key values of the protected area**

No.	Key values	Brief description	Note if endangered species or ecosystem (IUCN)
1	Diverse landscapes from mountains to the sea	The CA includes both terrestrial and marine environments, extending from high elevation forested mountains and alpine grasslands to coastal fringing reefs with coral and also sea grass beds that provide habitat for a diverse array of species and support the livelihoods of the people in the YUS CA. The landscape comprises: montane rainforest (54%); grassland/exposed soil/burned (18%); lowland rainforest (17%); gardens/regrowth (6%); alpine grassland (5%) (TKCP 2012).	
2	Endemic species	The Huon Peninsula has a long history of volcanism and earthquakes and is one of the most rapidly rising areas of the world. The area has high levels of endemism (Freeman et al. 2012) and has its own global ecoregion listing – Huon Peninsula Montane Rain Forests Ecoregion (no. 107) (Wikramanayake et al 2001). <b>Plant endemism</b> is poorly understood, but is believed to be high (Jensen 2012). The faunal species richness is moderate to high, with overall endemism being low to moderate. There have been extensive surveys on avifauna (Freeman et al 2012) indicating <b>high avian species endemism</b> (five species endemic to Huon, one endemic to Huon and Adelberts, 22 endemic subspecies) (TKCP 2012). YUS contains habitat for the endemic endangered Huon tree kangaroo ( <i>Dendrolagus matschiei</i> ).	Bird of paradise ( <i>Paradisea guilielmi</i> ), the endemic endangered Huon tree kangaroo ( <i>Dendrolagus matschiei</i> ) and critically endangered eastern long-beaked echidna ( <i>Zaglossus bartoni</i> ).
3	Forest and grassland	The vegetation is mostly tropical wet evergreen forest (along the coast), with tropical montane forest (1000-3000m), limestone forest, cloud forests (in the higher peaks) and high alpine grasslands. The forests provide timber and non-timber products, including food, construction material, medicinal plants and ornaments. <b>Additional Information:</b> The Huon Peninsula has an estimated 5,000 species of higher plants (Johns 1993).	
4	Biodiversity (mainly fauna)	YUS CA and wider landscape provides habitat for 268 species of <b>birds</b> (palm cockatoo, <i>Probosciger atterimus</i> , dwarf cassowary <i>Casuarius bennetti</i> , Pesquet's parrot, seven birds of paradise [including emperor <i>Paradisaea guilielmi</i> , raggiana and superb], Wahnes's parotia <i>Parotia wahnesi</i> , Vulturine parrot <i>Psitttrichas fulgidus</i> , Huon astrapia, New Guinea Harpy eagle <i>Harpyopsis novaeguineae</i> , Javan woodcock <i>Scolopax saturate</i> and bower birds). There are about 44 species of <b>mammal</b> including eastern long-beaked echidna <i>Zaglossus bartoni</i> , Matschie's tree kangaroo <i>Dendrolagus matschiei</i> , three species of wallaby including the near-threatened small dorcopsis wallaby <i>Dorcopsulus vanheurni</i> , the vulnerable Brown's or New Guinea pademelon <i>Thylogale browni</i> , plush coasted ringtail possum <i>Pseudochirops corinnae</i> , northern water rat <i>Paraleptomys rufilatus</i> , mountain cuscus spotted cuscus and bandicoots. There are 26 known species of <b>frogs</b> as well as 30 <b>reptile</b> species (snakes in lower elevation areas and lizards). There are about 500 species of moths and 111 species of weevils. Threatened and endangered marine species include four species of turtles and the vulnerable dugong. The fauna	Western long-beaked echidna <i>Zaglossus bruijini</i> – critically endangered; Eastern long-beaked echidna ( <i>Zaglossus bartoni</i> )-critically endangered; Matschie's tree kangaroo <i>Dendrolagus matschiei</i> – endangered; northern water rat <i>Paraleptomys rufilatus</i> – endangered; dugong ( <i>Dugong dugon</i> )- vulnerable; four species of

		provide bush-meat and are important for their feathers/skin and for retaining cultural knowledge and skills related to hunting (Refer TKCP 2012).	turtle are threatened
5	Tree kangaroo	The Matschie tree kangaroo is found largely at elevations above 1000m and is the flagship species for the TKCP and supporting conservation in the area. The tree kangaroo is hunted as bushmeat.	Matschie's Tree kangaroo <i>Dendrolagus matschiei</i> (endangered)
6	Rivers (3 main rivers)	The main rivers are the Yopno, Uruwa and Som, which flow through the CA to the coastline.	
7	Sacred sites	Masalai places and other sacred sites exist throughout the CA.	

**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	We want to protect our environment for sustainable use and preserve for the future.
2. Presence of rare, threatened, or endangered species (plants and animals)	2	There are several endemic species.
3. Ecosystems (e.g. wetlands, grasslands, coral reefs etc) that are rare because they have been cleared or destroyed in other areas	2	There is a diversity of landscapes and ecosystems.
4. Protecting clean, fresh water	2	Water is used for drinking, washing and irrigation.
5. Sustaining important species in big enough numbers that they are able to survive here	2	
6. Providing a source of employment for local communities now	1	It is important and will improve in the future. There are rangers and also people work to sell coffee to earn an income.
7. Providing resources for local subsistence (food, building materials, medicines etc.)	2	There is no take of resources from the gazetted CA. However, in the wider landscape area there is a landscape plan that identifies areas for resource extraction in a sustainable manner. Customary landowners can hunt and take timber for housing construction and other uses from the livelihood zone.
8. Providing community development opportunities through sustainable resource use	2	There is coffee production, which provides income to the producers. The remote location presents some problem in relation to moving the coffee from YUS to the buyer in the USA. There is also production of cacao.
9. Religious or spiritual significance (e.g. tambu places)	2	There are sacred sites that are important to the community.
10. Plant species of high social, cultural, or economic importance	2	The tree nursery project has identified important trees – for house building, for firewood; palm leaf is used in ceremonial activities (head dress, skirts etc).
11. Animal species of high social, cultural, or economic importance	2	Brown cuscus (testicles have a strong perfume that is used in sing sings – i.e. when burned); wallaby have magical power; tree kangaroo fur is used in sing sings and for bride price (black and red) – the animals can be alive or dead.
12. Attractive scenery	2	The CA extends from high mountains to the inshore reefs on the coast and has extensive landscapes that are attractive.
13. Tourism now	0	There is no tourism now.
14. Potential value for tourism in the future	1	People are now talking about having tourism in the future to help to provide income so that we can protect our land. However, transport is difficult at present (only one flight per week and no roads).

15. Educational and/or scientific value	2	The Tree Kangaroo Conservation Program supports research into the tree kangaroo and other species, as well as better understanding of cultural and language. Research on the <b>tree kangaroo</b> includes population distribution and home ranges and food plants. The TKCP facilitates other researchers entering the CA and this forms an important basis for improving the overall management of the CA. Other researchers have studied hunting and gathering, birds of paradise, including <b>bird calls</b> at nesting time and gathering stories about people who used to hunt birds and are now engaged in conservation and why they have made this change. There are <b>language studies</b> (documenting and learning about languages). There has been funding from UNDP to increase the <b>engagement of children in learning about conservation</b> . Emphasis is placed on incorporating environmental education into the school curriculum. <b>Teacher training</b> is supported, with teachers returning to teach in the local schools. Awareness raising throughout the CA is important.
16. Maintaining culture and tradition on customary land and passing this on to future generations	2	The people have strong traditional links with their customary lands and their ancestors. There are important masalai places in the CA.

### 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	L	Housing and settlement occur outside of the gazetted CA. There are areas in the livelihood zone for people to have gardens and to hunt. The settlements are mostly a long way from the CA and their impact is very limited. There are two types of houses – some on stilts and some on the ground with grass all the way to the ground. The houses are dark inside and can be dangerous when there is fire. Fire is commonly the central focus of the home and is used for cooking, light, warmth, pest control in bush material houses, and has cultural importance.
1.1a Population increase in the protected area community	M	In some areas there is increasing population and due to the limited land availability, this will increase the likelihood of gardens expanding into forested areas and may also result in greater timber extraction.
1.2 Commercial and industrial areas	0	The CA is in a very remote location and there are no commercial and industrial areas.
1.3 Tourism and recreation infrastructure	0	There is currently no tourism in the CA.
2.1 Customary land owner and community gardens and small crops	L	The customary landowner depend on subsistence agriculture and this involves small scale forest clearance. This threat is increased as a result of population growth. However in YUS, there are buffer zones adjacent to the CA to minimise the impact of community gardens on the biodiversity of the CA. Livestock and food crops are grown on a subsistence basis and are supplemented by fishing and hunting.
2.1a Drug cultivation	0	
2.1b Commercial plantations	0	The main commercial crops that are grown within the YUS Landscape Area are coffee ( <i>Coffea spp</i> ), cacao ( <i>Theobroma cacao</i> ), betel nut ( <i>Areca catechu</i> ) and copra ( <i>Cocos nucifera</i> ). These are not grown in the CA.
2.2 Wood and pulp plantations	0	

Threat type	Score (H,M,L,O)	Notes
2.3 Livestock farming and grazing	0	
2.4 Marine and freshwater aquaculture	L	There is some fish farming with tilapia and carp. This was established in about 2013. As there are no known native fish in the rivers the impact is low.
3.1 Oil and gas drilling	L	The southern landowners on the boundary external to the CA (i.e. Dinangat community) include some people who want to pursue oil exploration and also some who want to pursue conservation. However, oil development is consistent with the Morobe Province and Kabwum District Five Year Development Plans where YUS LLG is a targeted location for establishing an integrated landholder group for petroleum development (refer YUS Landscape Plan, s3.3.1). There is a Petroleum Prospecting License covering the entire Huon Peninsula.
3.2 Mining and quarrying	L	There is potential for limestone mining.
3.3 Energy generation	0	
4.1 Roads and railroads (include road-killed animals)	L	The road network is currently limited due to remoteness, rugged terrain, budgetary constraints and lack of regular maintenance. However, improving access is a goal of all levels of government and there are proposals to expand road construction in the YUS area. There are two proposed roads that would go through the CA (along the coast and from Erap to Gogiok), but the community and CAMC members have negotiated for the road to be redirected to go around the CA. Neither road has been constructed. The road would result in destruction of forest and sediment entering the rivers and coastline. They would also increase traffic (foot and vehicle) and create greater exposure. There are only bush tracks in most of the YUS area. The proposed future roads pose a potential threat.
4.2 Utility and service lines (e.g. electricity cables, telephone lines)	0	
4.3 Shipping lanes	0	
4.4 Flight paths	0	There were aircraft wrecks from WWII and people come in to retrieve them and this may cause some damage to the CA.
5.1 Hunting, killing and collecting terrestrial animals (including killing of animals as a result of human/wildlife conflict)	M	The people depend on biological resources for subsistence. Wildlife is important for protein and fat in highland and remote areas. Wallabies, cuscus and tree kangaroo are hunted for food and ceremonial purposes. Rangers are monitoring the area. The CA is a tambu area where hunting is not permitted and this enables wildlife populations to recover and increase in number – it is like a ‘wildlife bank’. However, there is some hunting by outsiders from other LLGs.
5.2 Gathering terrestrial plants or plant products (non-timber)	0	A wide diversity of plants are gathered to make houses and also for subsistence purposes, but this does not cause a threat to these species.
5.3a Logging and wood harvesting for local/customary use	0	There is no cutting of timber in the CA. Timber can be harvested from the livelihood zone and is used for constructing houses and for firewood. This selective logging may have an impact on the vegetation, but the extent of this impact is unknown and believed to be minimal. Selective harvesting of forests is more of a threat in the lowland forests of the YUS landscape (TKCP 2012).
5.3b Logging and wood harvesting – commercial logging	L	There is a logging company further along the coast (but not on a large scale). The coast is accessible for future logging. It is credible to think that the lowland forest in the YUS Landscape will be targeted for commercial logging operations in the future. The potential for logging may be increased if the planned Saidor-Wasu-Sailum Road is constructed, as this will improve access to the YUS Landscape for commercial logging. There are some walk-about saw mills used by locals along the coast.
5.4a Fishing, killing and harvesting aquatic resources for local/customary use	M	People from outside areas enter the marine area and take marine resources (e.g. fish and turtles and their eggs and some shells that are ground to produce lime). Customary landowners have pledged some reefs for conservation (i.e. tambu areas) and fishing does take place in the areas that have not been pledged for conservation.

Threat type	Score (H,M,L,O)	Notes
5.4b Fishing, killing and harvesting aquatic resources for commercial use	0	There is some extraction of marine resources, but this is not believed to be a threat to the coastal inshore reefs. However, outsiders are known to enter the coastal area and extract resources. The YUS Landscape Plan notes that lime is produced from shells. There is little or no monitoring of this potential threat.
6.1 Recreational activities and tourism	0	There is currently no tourism to the area.
6.2 War, civil unrest and military exercises	0	
6.3 Research, education and other work-related activities in protected areas	L	Research activities take place and this may pose a potential threat. However, currently the staff assisting the researchers and the rangers are trained and the impacts are thought to be low.
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	M	The reef was marked and the markers were taken and people have taken solar panels from CA facilities but were later returned. This happens mainly on the coast where there is greater exposure to outsiders. Staff and visitors have not been specific targets.
7.1 Fire and fire suppression (including arson)	L	Fire has impacted on the buffer zone adjacent to the tambu area (e.g. in the last dry season). There is some research to suggest that fire has played some part in the expansion of grassland in montane areas (i.e. either deliberate or by lightning strike) (Shearman & Bryan 2011). Fire is a potential threat to the montane forests and can cause a permanent conversion to grassland (Shearman et al. 2009).
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	L	There is potential for logging on the eastern boundary and from road development, particularly in the coastal areas.
7.3d Loss of keystone species (e.g. top predators, pollinators etc.)	0	
8.1 Pest plants	M	There is a vine that was introduced in 1975 (locally it is called the Independence vine) and it covers the vegetation. People are trying to remove it by pulling it out and then putting it on a raft to dry out. It is believed to be a significant threat. <i>Piper aduncum</i> (or 'bondo' in YUS), which is in the form of a shrub or small tree, is affecting the ecosystems in the CA (mainly in areas up to 2000m). It is believed to have the potential to cause significant ecological and economic harm and the only way to control it is through physical uprooting or chemical application.
8.1a Pest animals	M	Dogs are a threat as they kill wildlife such as young wallabies. In response some communities have removed dogs. The cocoa borer is also present in coastal areas.
8.1b Diseases such as fungus or viruses that make native plants or animals sick	L	There is a white fungus on the coffee and this fungus is now in the CA. The affected trees are cut and burned to prevent the spread of the fungus.
8.2 Introduced genetic material (e.g. genetically modified organisms)	0	
9.1 Household sewage and urban waste water	0	The communities have pit toilets and there is no impact.
9.1a Sewage and waste water from protected area facilities	0	
9.2 Industrial, mining and military effluents	0	
9.3 Agricultural and forestry effluents (e.g. excess fertilizers or pesticides)	0	No sprays are used as organic coffee and cocoa are produced in the area.

Threat type	Score (H,M,L,O)	Notes
9.4 Garbage and solid waste	L	Some tracks through the CA have some rubbish (plastics). Coastal areas have more rubbish (e.g. as a result of the entry of banana boats). This has impact on wildlife (e.g. turtles and birds).
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	
10.3 Avalanches/Landslides	M	The CA consists of steep sided mountains and there are landslides that occur and impact on the landscape and vegetation.
10.4 Erosion and siltation/ deposition (e.g. shoreline or riverbed changes)	L	There is river erosion (e.g. from the Uruwa and Yopno Rivers), resulting in impacts on the estuary (i.e. changes in its location). There are high levels of silt suspended in the Uruwa River at its mouth. This is a concern to the lowland communities of YUS landscape.
11.1 Habitat shifting and alteration	L	Some birds are moving to higher elevations. Turtle habitat may be reducing due to shoreline erosion (as a result of sea level rise). The grassland in the CA used to be burned, but this no longer happens and the forest is moving into the higher altitude grasslands.
11.2 Droughts	L	The elders talk about a more stable climate. Now the pattern has changed and there is more rain. However, there are more frequent and longer dry periods in the coastal areas. The drought can result in more fires and this spreads through the grasslands and into the forest.
11.3 Temperature extremes	L	The days are hotter and the nights are cooler. Before there was ice on the mountain, but this no longer occurs. Rising temperatures are a threat to species with limited climatic thresholds, including those in high elevation and upper montane forests, or restricted range endemics. This may lead to the spatial isolation of some individuals (e.g. on mountain tops) and migration of lowland species upslope. Changes in temperature can also affect planting regimes and ultimately livelihoods.
11.4 Storms and flooding	M	We experience more rain in higher intensity storms. This can increase runoff into lowland and coastal areas, increase erosion and loss of vegetation, which increase siltation and sedimentation in marine ecosystems. This may impact on the growth of coral and sea grass and threaten livelihoods. We also experience higher intensity winds which cause trees to fall over.
11.5 Coral bleaching	DK	There is no information on this.
11.6 Intrusion by saltwater into gardens etc.	DK	There is no information on this.
11.7 Sea level rise	M	There is a big change in sea level in the community areas. This may lead to increased coastal erosion and an inward migration of coastal ecosystems and also communities.
Other (please explain)		
12.1 Loss of cultural links, traditional knowledge and/or management practices	L	Our culture remains strong. Talks about our culture have been introduced into the elementary school – people come into the school and talk about the old ways and practices. Some of the information from the research undertaken in YUS is brought back into the schools to raise awareness. We promote our culture. Language remains strong. Culture and the surrounding environment is important. The new generation can learn their culture because the environment is conserved. It is very important to have YUS CA to protect our culture.
12.2 Natural deterioration of important cultural site values	M	Landslides have affected some cultural sites. Trees have fallen (due to lightning) and have affected important sites.
12.3 Destruction of cultural heritage buildings, gardens, sites by people	0	
Other (please explain)	M	Bush tracks are in place because the area is remote with no roads. There was a request for a bush track to go through the CA and the LLG agreed to redirect the track away from the CA. The tracks encourage people to enter the area and this may result in damage to the resources.

**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	Climate change (storms and flooding) and landslides	11.4,10.3	The community is experiencing the impacts of changed patterns for storms and flooding and resulting landslides. Local climate adaptation plans are an important mechanism to plan for the future impacts of a wide range of predicted climate change impacts.
2	Pest plants	8.1	Mainly piper tree and an invasive vine. These need to be removed by hand. A threat abatement strategy, as part of the YUS Landscape Plan is needed to establish a strategy to address these threats. Coordinated responses with other communities may be necessary.
3	Population pressure, hunting and fishing	1.1a,5.1,5.4a	Rising population places increased pressure on the extraction of resources. Increased awareness is important to help stabilise populations.
4	Roads and bush tracks	4.1, other (bush tracks)	Roads and tracks have the potential to open the landscape to logging and other destructive activities. Collaboration with the YUS community is needed to ensure the best location for proposed roads.

## 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	3	The CA has been formally gazetted by the national government. The process included engagement with Morobe Provincial Government and this has facilitated ongoing engagement with the provincial level of government throughout the life of the YUS CA. The CA is embedded within the wider YUS landscape.	
1b. Legal status			
2a. Protected area regulations	3	There is a comprehensive YUS Landscape Plan that is agreed by the customary landowners. Clans that pledge parcels of land to the CA agree to designate certain areas as off-limits to hunting (tambu). These areas have become 'wildlife banks' where species can reproduce and thrive and eventually repopulate areas where hunting is allowed. The focus now is also to conserve the marine environment and local communities have pledged to discontinue destructive fishing practices and place signage to identify sensitive reefs and turtle nesting sites. <b>Additional information:</b> "... an owner or occupier of land in [the YUS CA] shall not develop or alter or permit the development or alternation of the existing use of that land except:...in accordance with the terms of the management plan..." (YUS CA, s31).	Continue to develop the CA within the marine environment and expand conservation in priority terrestrial areas, with the consent of the landowners.
2b. Protected area regulations			

Issue	Score (0,1,2,3, NA)	Comment	Next steps
3. Law enforcement	2	Landowner capacity is quite high in terms of law enforcement. There are <b>rangers</b> on the ground and they collect evidence if there are breaches of the regulations. There are <b>by-laws</b> that identify the required rules and outcomes and rangers collect evidence of actions contrary to the by-laws and these are reported to the local Courts. However, while the by-laws may be understood locally, the court officials often fail to punish the offenders. There is also some customary law enforcement. A major deterrent in YUS is that if people break the by-laws they are not able to participate in selling coffee for one year and have to pay a fine. If people are prohibited from receiving economic gain this leads to higher compliance with the required conservation regulations.	More resources should be directed at improving the village court system, including effective training of local court officials. Magistrates are often not aware of how to enforce environmental laws. This is a challenge that needs to be addressed by the Provincial and Local Level Governments. The YUS by-laws also need to be incorporated into the LLG laws.
4. Protected area objectives	3	The YUS Landscape Plan (2013-2015) identifies a vision and 5 targets. Each target identifies several strategies for achieving the target and identifies the various programs that will deliver the outcome. These strategies and targets are monitored and in general are being met.	Revise and update the YUS Landscape Plan.
5. Protected area design	3	The core area is quite large and extends from the mountains to the coast and has corridors with habitat protection and buffers between the tambu area and the livelihood zone. It supports a wide range of biodiversity.	
6. Protected area boundaries	3	The clans pledge their land to conservation and these areas are known by the wider community and also respected. The marine area has signage to indicate the protected areas and all of the terrestrial conservation area is marked by flagging tape. Signage is being prepared to more formally identify the boundaries. However, some people do not respect the boundary of the tambu area. <b>Additional Information:</b> Boundaries must be drawn in close consultation with the landowners and in YUS the landowners sign a land pledge. This is followed by confirmation of the boundaries on foot, using GIS (Wells et al 2013).	Finalise the signage to improve boundary recognition within the community and by outsiders.
7. Management plan	3	The YUS Landscape Plan (2013-15) identifies the management values of YUS, sets long-term targets and goals for these values, and identifies threats to the goals and actions to achieve them. It defines the rules and regulations of the CA. The Plan aligns with government planning processes e.g. five yearly review. The Plan includes a management plan for the protected area and land use plans and guidance on a wide range of activities across the YUS landscape (Wells et al 2013). The activities in YUS are aligned with the PNG Vision 2050, and Provincial and District Five-Year Development Plans.	Review and update the YUS Landscape Plan.

Issue	Score (0,1,2,3, NA)	Comment	Next steps
7a. Planning process	1	Customary landowners have input into the management plan and can influence it. <b>Additional information:</b> The Tree Kangaroo Conservation Program is a partnership between the Woodland Park Zoo TKCP and TKCP-PNG (a site based NGO with 26 staff, 20 of whom are local landowners). The <i>YUS Conservation Organisation (YUS CO)</i> comprises 21 landowner representatives and is in partnership with <i>TKCP</i> . It serves as an advisory board to ensure community voices are represented in TKCP. This ensures that each clan pledging land to the CA has a voice in landscape-level management and the YUS CO representatives make communal decisions, e.g. development of the YUS CA bylaws. When a clan pledges land to the CA that clan collaborates with other clans in the ward to nominate a representative to the YUS CO. Clans aggregate on a ward level and nominate representatives to each of the three YUS CO committees: Conservation, Education, and Healthy Community Development. Additional seats on each committee are reserved for female representatives from each of the YUS wards (Wells et al. 2013). YUS CO is represented on the <i>YUS Conservation Area Management Committee (YUS CAMC)</i> which was established in accordance with the PNG CA Act. Voting members include 3 executive members from the YUS CO, a representative from TKCP and government representatives from national, provincial and local levels. It provides long-term strategic planning and overall management for the YUS CA. Together these three groups (TKCP, YUS CO, YUS CAMC) provide integrated services to ensure the conservation and development needs of communities are addressed with the full inclusion of local stakeholders.	
7b. Planning process	1	There is a five yearly plan review process in line with the government review processes.	
7c. Planning process	1	Research is integrated into planning.	
8. Regular work plan	2	There is a work plan and most things are implemented and if not, the particular action rolls over to the next year. Strategic guidance of TKCP comes from the 5-yearly Landscape Plans (TKCP 2012).	
9. Resource inventory	3	YUS has undertaken research and there is information to assist with management. This includes extensive research on tree kangaroos as well as birds, mammals, reptiles and vegetation.	More information is needed on the marine environment and the alpine grasslands and information to assist with threat abatement plans (e.g. pest plants and adaptation to climate change impacts).
10. Protection systems	2	The rangers monitor the CA and patrol the area. The customary landowners are also observing activities in the area and can report these to the rangers and others. The rangers are also controlling outsider entry into the area. YUS's remoteness helps to limit the number of people who illegally enter the area and extract resources. The coastal area is more difficult to control.	The placement of signage will help to inform others of the CA and the relevant rules and penalties.

Issue	Score (0,1,2,3, NA)	Comment	Next steps
11. Research and monitoring	3	<p>The main focus of ecological research is towards the <b>Huon tree kangaroo</b>. Woodland Park Zoo has been sponsoring long-term research into tree kangaroo ecology and has mapped the area with YUS landowners to identify critical habitat areas for preservation. Several studies of tree kangaroos have been undertaken, including home range, distribution, food plants and a hunting survey. A <b>database</b> of known species has been created as well as <b>socio-economic data and mapping</b> information on YUS, and the testing of field methods for long-term tracking of indicator species such as tree kangaroos. It has a <b>community based ecological monitoring</b> program for which includes 12 transects across the landscape and an elevational transect. There has been consultation between the community and James Cook University to identify what is locally important to monitor in the CA, buffer and livelihood zone e.g. populations of cassowary, tree kangaroo, cuscus and echidna – to better understand whether the CA is working to conserve biodiversity. There was also collaboration with JCU in relation to estimating <b>carbon stocks</b>. The <b>coffee gardens</b> are also monitored to identify the benefits of this activity to conservation. There has been mapping of the <b>vegetation</b> types in YUS and the YUS <b>languages</b> (including the link between language and conservation) and clan and village boundaries. The research assists in developing a knowledge base of species, ecosystems, carbon stocks and drivers of deforestation. The <b>Crittercam</b> project radio tracked some species (e.g tree kangaroo) to better understand their feeding behaviour and daytime activities and the project developed radio tracking methods to be trialled and implemented in the dense forests of YUS. <b>Traditional knowledge</b> is used to assist in naming of species (plants and animals). A <b>climate change survey</b> was undertaken with a focus on gardening activities (crop changes) and changes over time. Research data is usually returned to the community and used to raise awareness e.g. researchers made a CD with <b>bird calls</b> with scientific and local names. TKCP also partners with other research institutions (e.g. documentation of the songs of birds in the CA). Local communities are involved in research through a ranger program – each ranger is a local landowner nominated by their communities.</p>	<p>Further research is needed in the marine environment. There is a research protocol to identify research priorities – external researchers assist with answering the questions that are collectively identified. Other researchers however are welcome and must get community support.</p>

Issue	Score (0,1,2,3, NA)	Comment	Next steps
12. Resource management	2	A list of specific birds, trees, plants and other animals has been prepared. The traditional owners, rangers and others walk through the landscape with a list of priority species and identify the location of animals and their signs and this information is used to assist with management, including the location of corridors. Open monitoring occurs every month while the closed ecological monitoring along transects occurs at least on 5 yearly basis. Land-use planning workshops and activities collect information from landowners on a ward-level. Landowners identify priority species (both animal and plant) and resources and indicate if there are plenty, few, or no evidence in the various land-use zones.	
13a. Staff numbers	2	TKCP has 6 full-time staff based in Lae, 6 staff @ 3/4 time based in Lae, 14 terrestrial rangers, 2 marine rangers (1/2 time, i.e. 2 weeks/month) and the Assistant Director; and 2 FT staff at Woodland Park Zoo (WPZ). The rangers are nominated and selected locally and are YUS landowners who patrol within and around their own land. The rangers have the full support of their communities and receive relevant training (TKCP 2012).	Investigate avenues for increasing the ranger presence within the YUS Landscape.
13b. Other people working on the protected area	2	People have their own CAs and work in their own areas. Rangers monitor all the CAs and there are others who also help. There are many volunteers, but these numbers can be increased to improve management outcomes.	Raise awareness and encourage greater engagement of the customary landowners in the management of the YUS CA.
14. Training and skills	2	Diverse training has been undertaken, including basic computer training for field staff; training in Spatial Monitoring And Report Tool (SMART) software and application; first aid; population health and environment; and training local research assistants (e.g. bird trapping, sound recording, how to monitor species and sample collection). Projects, where possible are built on capacity building. The Coffee Industry Corporation of PNG has provided technical training to local farmers in coffee husbandry and post-production management, thus improving coffee quality and yields.	Ranger training and awareness raising within the community (e.g. using cyber tracking and analysis). Training in the species and habitats within the CA; advocacy skills; facilitation skills at the local level; public speaking; maintenance skills; wilderness first aid (especially in the marine area); office and computer literacy; financial management; proposal writing skills; report writing.
15. Current budget	3	There is a sufficient budget to meet the current management needs. The <b>YUS Conservation Endowment Fund</b> is used to support management activities and community development, although these funds are limited funds. US\$2.5m is held by Woodland Park Zoo and we receive about \$90,000 per annum for management activities. This was started as a matching fund under the Conservation International's Global Conservation Fund (GCF). Conservation International matched the funds raised by WPZ, which held a fundraising effort (raised \$1million for the starter fund, making a \$2million Endowment fund). There has been no subsequent fundraising, but we hope to set up more fundraising efforts in the future.	Continue to explore a wide range of funding options.

Issue	Score (0,1,2,3, NA)	Comment	Next steps
16. Security of budget	3	The YUS Conservation Endowment provides support for management of YUS CA in perpetuity. There is money that covers field staff, rangers and those who participate in the management of the CA.	
17. Management of budget	3	The budget is effectively managed.	
18. Equipment	2	Equipment is generally satisfactory.	Housing could be expanded for staff. Rangers need more equipment (e.g. tracking devices) and computers would be useful.
19. Maintenance of equipment	3	Equipment is well maintained. However, field offices are difficult to maintain due to remoteness e.g. if the solar system fails it is very expensive to repair the equipment as there are only weekly flights into the area.	
20. Education and awareness	2	Education has been a foundation of the TKCP. Community based conservation has to be based on local ownership and the prioritisation of development needs as well as conservation needs. Education is a major community concern - in 1998 TKCP (and later CI) sponsored a community education project, which provided teacher training scholarships for YUS students and annual teacher training workshops for existing local teachers (Wells et al 2013). The education program in local schools (from kindergarten to Year 8) uses local teachers and educators from various zoos who raise conservation awareness and the programs include conservation oriented curricula for village schools. There is a <b>junior ranger</b> program (pre kindy, primary and post-primary) and we developed the curriculum for this program in 2016 – the aim is to increase environmental knowledge and awareness, preserve traditional knowledge and create future environmental leaders. It is based on the YUS Landscape plan (with related activities) and will be implemented in one community in March 2017. There is a training manual that is based on two villages. We need to scale this up to the wider communities. Rangers receive training in species identification, tracking and research methods. Rangers educate residents about the CA boundaries and its rules and check for violations. <b>Additional Information:</b> YUS landowners have travelled to other WMAs to network and learn key lessons that may be relevant to YUS (Wells et al 2013).	Teachers should more frequently include information about conservation in their classrooms. As a result of intermarriage the new people need information on conservation relevant to YUS. There needs to be greater engagement of women in the conservation process. We need to complete the gender program, which aims to train staff to have a more gender inclusive approach. We need to develop the primary curriculum in 2017 and related training to implement the junior ranger program.
21. Planning for land use or marine activities	2	Provincial administration and planning agencies know about YUS and try to assist in achieving our conservation outcomes. At the ward level some wards may not know about YUS. The problem is when districts do their development plans and sometimes these may impinge on YUS. However, when the road was proposed the authorities did listen and rerouted the road. Remoteness makes contact with the District Office difficult (and expensive) – it is difficult for government to deliver services.	

Issue	Score (0,1,2,3, NA)	Comment	Next steps
22. State and commercial neighbours	2	There are no large corporate enterprises adjacent to the PA. The TKCP liaises between the CA and all levels of government (e.g. most recently in relation to road construction and alignment).	
23. Indigenous people/ Customary landowners	3	The customary landowners are engaged in conservation efforts within YUS. The selection of local rangers helps to reinforce community support for conservation. <b>Additional information:</b> "the model has been to view the CA as a wildlife bank providing sustainable hunting for local landowners" (Wells et al. 2013).	
24a. Impact on communities (open communication)	1	The YUS Conservation Organisation was established and it is a landscape wide community representative body that serves as a landowner advisory body to the TKCP. Biannual meetings of the YUS CAMC are held and this brings together LLG and landowner representatives and NGO partners. However, communication is not so open at the District Level.	Communication at the District level needs to be improved.
24b. Impact on communities (welfare programs)	1	Several programs are being implemented to improve landowners' welfare while conserving protected area resources. For example Conservation International (Global Conservation Fund) has provided >\$1 million to support work with communities and landholders; Woodland Park Zoo has helped to establish a Conservation Trust that will provide long-term financing for YUS. Villages, schools and health centres are within the CA. There are efforts to expand the community health work – collaboration with provincial and district Health Departments (e.g. provide Village Birth Attendant training in YUS villages; family planning, child care, health, hygiene and nutrition; sponsor health patrols – doctors and dentists visit YUS). The YUS approach has been to address/provide services that have not been met by the various levels of government. The program aims to fill the gaps and strengthen the links between YUS and all levels of government, particularly the Provincial Government. <b>Additional information:</b> In 2005 TKCP initiated a community health project in collaboration with Morobe Provincial Government and YUS communities (e.g. training workshops for midwives, immunisation project based on establishing solar refrigerators).	
24c. Impact on communities (community support)	1	The landowners actively support the CA.	

Issue	Score (0,1,2,3, NA)	Comment	Next steps
25. Economic benefit	3	<p>The community directly benefits from the CA, even though compensation is not paid for pledging land for conservation. <b>The community grows premium conservation coffee beans</b> which are purchased by Seattle's Caffe Vita, a US coffee roaster committed to sourcing socially and environmentally responsible coffee. Over 400 families are participating in the Conservation Coffee Project. The YUS Conservation Coffee and Cocoa Cooperative was established. This provides a long-term commitment of support to the customary landowners and provides for local employment. The growers receive a guaranteed premium price for coffee beans, a price that is significantly more than they would receive from selling coffee in local markets. Remoteness limits the benefits that can be achieved from trade of products produced in YUS. Higher elevation areas are unable to grow coffee. The coffee project enhances habitat and wildlife conservation while providing local farmers a source of income that can be invested in other areas (e.g. education, health etc). TKCP is trying to replicate this with cacao farmers in the coastal areas. Cacao has been sold to a chocolate company based in Port Moresby and TKCP is working with the PNG Cocoa Board and chocolatiers to improve the quality and flavour of the cacao. The employment of <b>local rangers</b> provides a source of income into local communities. <b>Additional information:</b> The project emphasises that there is no compensation for land pledges for conservation. The major benefits of the CA related to sustainable natural resources, opportunities for employment as staff, and opportunistic responses to communal development priorities in partnership with government. The project seeks to harness opportunities to promote local development and improve livelihoods.</p>	Eco-tourism may provide value to the community in the future, but the landowners need to discuss this possibility.
26. Monitoring and evaluation	3	Monitoring and evaluation are undertaken and inform planning and management. Rangers spend one week each month patrolling and monitoring the landscape, recording the presence or absence of key species selected for research by the communities. Information is kept in the YUS CA record book.	
27. Visitor facilities	2	There is a research house. There is not a focus on visitors to YUS and hence the facilities are adequate.	
28. Commercial tourism operators	NA		
29. Fees	2	There are no visitor fees. Researchers are required to pay a fee to undertake research in YUS, some of which is returned directly to the landowners and to YUS CO. The fees are not substantial. Some landowners are employed to work for the researchers.	

Issue	Score (0,1,2,3, NA)	Comment	Next steps
30. Condition of values	3	The condition of the values remains largely intact. The YUS approach is a landscape approach, which aims to protect species and habitats within tambu areas, provide for connectivity across YUS and include landscapes along an elevational gradient from the coast to the interior high mountains.	
30a. Condition of values	1	There is both scientific research and traditional knowledge used to assess the values.	
30b. Condition of values	1	There are several strategies to address threats: (a) <b>YUS CA management</b> (has 8 programs e.g. rangers, enforcement, ecosystem resilience and biodiversity conservation, ecological monitoring, signage mapping and awareness, fire management and invasive species reporting); (b) <b>Research</b> (7 programs e.g. research collaboration, hunted species, terrestrial ecosystems, marine and aquatic ecosystems, social/anthropology, sustainability, climate change); (c) <b>sustainable resource use and environmental services</b> (2 programs based on long-term planning for resource use and enhancing the ability of communities to access benefits from ecosystem services – land use planning, environmental services); (d) <b>Community services, livelihoods and healthy families</b> (developing leadership, economic livelihoods – quality and markets, responding to local needs); (e) <b>Implementation and management</b> (stakeholder linkages and an effective workforce, monitoring and assessing effectiveness, financing) (TKCP 2012).	
30c. Condition of values	1	Activities to maintain key biodiversity, ecological and cultural values are a routine part of park management.	

## 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 <b>HOW the condition can be IMPROVED</b>
Diverse landscapes from mountains to the sea ('reef to ridge')	VG	I	The environment is in a good condition and because of the CA the environment is improving.
Endemic species	VG	I	Endemic species are plentiful and improving.
Forest and grassland	G	I	Before the forest was in a poor condition, but now it is much improved. The grassland is also improving.
Biodiversity	VG	I	No take of species in the CA; increasing numbers in the CA and livelihood zone.
Tree kangaroo	VG	I	There are many more tree kangaroos observed as a result of the conservation efforts.
Rivers (3 main rivers)	G	D	Gardening occurs close to the rivers and in the upper catchment and this results in increased erosion, landslides and sediment to enter the rivers. Population increase results in garden expansion and further impacts on the rivers. There is also a change in the time of river flooding. There is awareness raising to reduce the impact of gardening on the catchment.
Sacred sites	G	S	These sites are affected by natural disasters, but the members of the community still retain their culture and respect these sites.

**Table 8. Recommendations and ways forward**

1.	2.	3.
<p>Keep the existing beneficial aspects of YUS, but facilitate further development. This may include support from the LLG to provide extra school rooms (e.g. one per year for the 16 primary schools) and a foot bridge over some of the rivers. We need to build permanent buildings (e.g. in the primary schools) to reduce the reliance on removing timber and grasses from the conservation area. Walkabout sawmills in the community could be used to supply the timber for the required structures.</p>	<p>Safeguard the community from the external influences that may detrimentally impact on YUS.</p>	<p>Providing greater support for the coffee/cocoa project and improve enforcement for the CA. Landowners want the rules enforced as they pledge land and they want people who hunt or engaged in activities contrary to the rules to be prosecuted for the offences.</p>

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

	Strengths	Challenges
1	<p><b>Strong leadership</b> - TKCP plays a pivotal role in assisting communities in their organization, administration, project/skills development and achieving production and conservation outcomes. There is growing leadership capability at all levels in the community. In partnership with YUS CO (landowner advisory group) and YUS CAMC.</p>	<p>Addressing the increasing population which is resulting in the expansion of gardens and greater pressure on extractive activities such as hunting and fishing.</p>
2	<p><b>Good biodiversity outcomes</b> - values remain in good condition and are improving as a result of the conservation efforts, which focus on a landscape approach that includes the core/tambu area, wildlife corridors, buffers and livelihood areas. This approach also protects cultural practices and sustainable resource use.</p>	<p>Achieving greater engagement with all levels of government, in particular the district level and national level.</p>
3	<p><b>Secure funding and long-term support</b> - the YUS Conservation Endowment provides a substantial and secure budget to support management and implement community development projects, training and education program.</p>	<p>Remoteness is a challenge to expanding coffee production and introducing other viable economic activities.</p>
4	<p><b>Conservation is linked with production activities</b> (mainly shade-grown organic coffee production) to achieve effective outcomes for both biodiversity and the customary landowners. Growers have a guaranteed price with a US-based buyer and receive training to ensure a high quality product.</p>	<p>Ensuring the communication is good among all the stakeholders (e.g. among customary landowners, TKCP, all levels of government) – this particularly relates to the benefits of conservation and the roles and responsibilities of each stakeholder.</p>
5	<p><b>Effective benefit-sharing mechanism</b> by which government or NGO partners can channel incentives to landowners. Benefits from conservation and management responsibilities are directly linked to the people who pledge land to the CA and produce the conservation benefits</p>	
6	<p><b>Community development projects</b> which address health and hygiene, family planning, poverty, education and training, and sustainable livelihoods underpin the landowners' conservation efforts.</p>	
7	<p><b>Strong community support and economic benefits</b> - a strong ethic of community engagement with conservation; local employment</p>	
8	<p><b>Threat abatement plans are prioritized</b> - identify and minimize threatening processes.</p>	

9	<p><b>Education, research and community-based ecological monitoring</b> are important elements of the YUS program of activities. The CA supports both terrestrial and marine rangers and a junior ranger program.</p>	
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