

Name of Protected Area: Ndrolowa Wildlife Management 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	Greg Peterson, SPREP/Protected Area Solutions, 283 Madill Road, Tandur, Q4570, Australia, a.peterson@uq.edu.au, 0414300955
Person 2: Name, Organisation, Address, Email, Phone	Ann Peterson, SPREP/Protected Area Solutions, 283 Madill Road, Tandur, Q4570, Australia, a.peterson@uq.edu.au, 0414300955
Today's Date	15/6/16
Name (or names) of protected area	Ndrolowa Wildlife Management Area
Size of protected area (ha)	5,850
PNG Code or number	
World Database of Protected Areas site code (these codes can be found on www.unep-wcmc.org/wdpa/)	15781
What level or kind of protected area is it? (National Park, Wildlife Management Area, Sanctuary, Reserve, Locally Managed Marine Area etc)	Wildlife Management Area
IUCN Category	
International protected area? e.g. World Heritage or Ramsar?	
Country	Papua New Guinea
Province/s	Manus
District/s	Lorengau
Local level governments	Lorengau Town and Los Negros
Ward/s	1
Nearest big town	Lorengau
Location of protected area (brief description)	The WMA is located on the eastern end of Manus Island. It includes marine and terrestrial areas extending from the shore through swampy land to the coastal hills.
Map references	
When was the protected area gazetted or formally established?	28/3/1985
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. 5 villages and 4 Clans (each two letters in Ndrolowa represent the names of the clans e.g ND – Ndrau, RO – Rosun, LO – Loni, WA- Warambu.

Number of households living in the protected area	>200 households in 5 villages
Population size within the protected area	
Who manages the protected area?(e.g. please enter government, customary landowners [add clan names] management committee [how many and what gender])	The area currently is managed by the clans who own the land in the WMA. The boundary and the WMA were gazetted in 1985, but the rules were not (due to internal disputes about enforcement and penalties).
Total number of staff (this means anyone working on the protected area in paid jobs – whether NGOs, community, rangers or customary landowners	0
<i>Temporary paid workers</i>	0
<i>Permanent paid workers</i>	0
Annual budget (US\$) – excluding staff salary costs	0
Operational (recurrent) funds	0
Project or special funds	0
Reason for park establishment	There was a report was written by the customary landowners about the establishment of the WMA, but this has been misplaced. The prime reason was to protect the marine and terrestrial values and ensure sustainable livelihoods for the community. People were concerned about overharvesting of marine and terrestrial resources and pollution by outboard motors and the outside people who were coming in on boats (every hour there are 4-5 dinghies coming in and this was affecting the mangrove ecosystem).
What are the main values for which the area is designated (Fill this out after data sheet 2)	Marine environment (reefs, fish, dugong, crocodiles), terrestrial environment (forests and mangroves and wildlife, including endemic species), traditional customs and sacred areas
List the primary protected area management objectives (add lines if needed after the most important objectives): <i>Management objective 1</i>	Manage the resources in a sustainable way. There are no available written records of the objectives.
<i>Management objective 2</i>	
<i>Management objective 3</i>	
Number of people involved in answering the assessment questions	3
Name/organisation/contact details of people participating the assessment (<i>Please do not insert return/enter or dot points</i>)	<i>Job Opu</i> , Wildlife Conservation Society, PO Box 64, Lorengau, jopu@wcs.org, 72927618; <i>Polou Papi</i> , Wildlife Conservation Society (as above) and Customary landowner, poroupapi56@gmail.com; <i>Karol Kesokau</i> , Wildlife Conservation Society (as above), karolkesokou@gmail.com, 72669855
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 landowner, NGO (Wildlife Conservation Society)

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

No formal statement from participants.

Table 2. Key values of the protected area

No.	Key values	Brief description	Note if endangered species or ecosystem (IUCN)
1	Wildlife resources	The WMA has diverse wildlife covering both the terrestrial and marine areas. The customary landowners are concerned about the depletion of their resources and about the sustainability of these resources, especially in the face of outside people (i.e. not customary landowners) entering their areas and taking resources without consent. "It is about taking care of our environment and how we use the resources ... The purpose [of the WMA] was to show people how to look after their resources, but now the perceptions of the people have changed" (i.e. in relation to the outside people whose numbers are increasing).	
2	Marine life	The marine life is diverse, including important fish species (e.g. mullet, which are important for subsistence livelihoods). There are also coral reefs, seagrass beds (3 main species), dugong, turtles (green, hawksbill and leatherbacks), and some whales.	
3	Protecting traditional values	Customs relating to the Green tree snail (featured in ceremonial dress, appear on provincial flag, sold as jewelry).	
4	Forest and biodiversity	Forests are important for the cus cus; green tree snail (<i>Papustyla pulcherrima</i>), which is endemic to Manus and is used for meat and the shell is used in making necklaces (and it is the provincial emblem); superb pitta (<i>Pitta superba</i>) is endemic to Manus; and the Manus monarch bird (<i>Symposiachrus infelix</i>) (endemic to Admiralty Islands).	
5	Mangroves	Mangroves are extensive and used for building material, provide breeding and nursery grounds for marine life, and coastal protection. There has been some die back in the past, but now they are recovering.	
6	Fish	There are many types of fish (e.g. mullet, parrot). The mullet come through the WMA every month migrating from the north to the south east. We use traditional nets to harvest the mullet. The WMA is important for fish spawning and traditional rules regulate the take of the mullet, e.g. not all fish are harvested – "you just catch enough for yourself and using traditional methods". The fish are not for sale, but if there is excess it is distributed to others.	
7	Dugong	Were uncommon as their seagrass beds were impacted by sediment, but now their numbers are slightly recovering.	
8	Turtles	Mainly green, hawksbill and leatherback turtles.	
9	Endemic species	Superb pitta (<i>Pitta superba</i>), trees – found in lowland forest only on Manus. It has a patchy distribution, with low population densities. Its habitat is declining due to logging and the impacts of population growth and it may be threatened by introduced species (e.g. dogs and cats) and also the brown tree snake (<i>Boiga irregularis</i>). Green tree snail (<i>Papustyla pulcherrima</i>) has important cultural values and lives in trees in forests up to about 110m and is threatened by habitat destruction (loss of forest) and over collection (for meat and trade) (and suspected international trafficking). The Manus monarch bird (<i>Symposiachrus infelix</i>) is endemic to the Admiralty Islands and is found in lowland	Superb pitta (<i>Pitta superba</i>) – endangered; Green tree snail (<i>Papustyla pulcherrima</i>) – near threatened. Manus monarch (<i>Symposiachrus</i>)

	forests and possibly mangrove forest. It is threatened by habitat loss. There are also file snakes [Family <i>Acrochordidae</i>] in the rivers.	<i>infelixi</i>) – near <i>threatened</i> .
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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	
2. Presence of rare, threatened, or endangered species (plants and animals)	2	
3. Ecosystems (e.g. wetlands, grasslands, coral reefs etc) that are rare because they have been cleared or destroyed in other areas	2	
4. Protecting clean, fresh water	2	
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	0	
7. Providing resources for local subsistence (food, building materials, medicines etc.)	2	
8. Providing community development opportunities through sustainable resource use	2	
9. Religious or spiritual significance (e.g. tambu places)	2	
10. Plant species of high social, cultural, or economic importance	2	
11. Animal species of high social, cultural, or economic importance	2	
12. Attractive scenery	2	
13. Tourism now	0	
14. Potential value for tourism in the future	2	
15. Educational and/or scientific value	2	
16. Maintaining culture and tradition on customary land and passing this on to future generations	2	

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	M	People want to settle on the road and this means on the WMA land along the highway. Then they cut trees to make houses and also make gardens. They are people from outside the Clan (although they are from Manus Island).
1.1a Population increase in the protected area community	M	There are already squatters and there is a possibility of these squatters increasing as their wantoks come to live with them. There is less of a problem within the customary landowning clans.
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	M	Squatter gardens are expanding due to shifting cultivation.
2.1a Drug cultivation	0	
2.1b Commercial plantations	0	
2.2 Wood and pulp plantations	L	There was a bare area along the road and some people came and planted a timber plantation. This was opportunistic and is not widespread.
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)	L	The road that is on the boundary of the WMA is currently being upgraded and widened.
4.2 Utility and service lines (e.g. electricity cables, telephone lines)	L	There are electricity poles along the road.
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)	L	Cus cus is the main species that is hunted and some pigs.
5.2 Gathering terrestrial plants or plant products (non-timber)	L	Palms and canes are the main plant products that are harvested.
5.3a Logging and wood harvesting for local/customary use	L	
5.3b Logging and wood harvesting – commercial logging	0	
5.4a Fishing, killing and harvesting aquatic resources for local/customary use	0	
5.4b Fishing, killing and harvesting aquatic resources for commercial use	M	Outsiders come in and take resources for sale. Fish (rabbit fish, parrot fish – feed on algae and when they are removed it can cause an algal bloom – this has happened in other areas). Illegal spear fishing at night by outsiders.
6.1 Recreational activities and tourism	0	
6.2 War, civil unrest and military exercises	0	

Threat type	Score (H,M,L,0)	Notes
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	
7.2 Dams, hydrological modification and water management/use	0	
7.3a Increased fragmentation within protected area	L	Threat from gardening, which is expanding in the WMA.
7.3b Isolation from other natural habitat (e.g. deforestation)	L	The road divides the WMA on one side from the surrounding bush. This is a potential threat to wildlife that cross the road.
7.3c Other 'edge effects' on park values	L	
7.3d Loss of keystone species (e.g. top predators, pollinators etc.)	L	Top predators are there e.g. brahminy kite, happy eagle, crocodiles. Unsure about the pollinators, although there are butterflies and bees.
8.1 Pest plants	0	
8.1a Pest animals	L	Cane toads are there, but they are not a problem; a few wild cats.
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	0	
9.3 Agricultural and forestry effluents (e.g. excess fertilizers or pesticides)	0	
9.4 Garbage and solid waste	L	People along the highway drop their waste and it enters the WMA.
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	0	
10.3 Avalanches/Landslides	0	
10.4 Erosion and siltation/deposition (e.g. shoreline or riverbed changes)	L	The king tide cause the sediment to shift and bury the mangrove and seagrass beds.
11.1 Habitat shifting and alteration	0	
11.2 Droughts	0	
11.3 Temperature extremes	L	Warmer temperatures that don't get cooler at night.
11.4 Storms and flooding	0	We experience longer wet seasons. The impact is unknown.
11.5 Coral bleaching	0	
11.6 Intrusion by saltwater into gardens etc.	0	
11.7 Sea level rise	L	There is some increase in the high tides, but this is low and has not impacted on where people live or where they grow food. There are lower tides and shallower water over reefs. Some reefs are exposed.
Other (please explain)		

Threat type	Score (H,M,L,0)	Notes
12.1 Loss of cultural links, traditional knowledge and/or management practices	M	When traditional management is not strong, the cultural values start to decline.
12.2 Natural deterioration of important cultural site values	L	
12.3 Destruction of cultural heritage buildings, gardens, sites etc.	0	
Other (please explain)	H	Others speaking on behalf of the community, but without their consent; threats to endemic species.

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	Settlements and population increase	1.1	
2	Someone speaking on behalf of the community but with not with the authority of the landowners	Other	
3	Threats to endemic species' habitats	Other	

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	Legally gazetted.	
1b. Legal status			
2a. Protected area regulations	1	The WMA rules have not been gazetted yet, but the traditional rules are in place. It has been nearly 30 years since the WMA Committee has met – the Committee members died and have not been replaced.	Need to revisit the rules with all the landowners, to raise awareness. Need to re-establish the Management Committee – the Clans should elect their members.
2b. Protected area regulations			
3. Law enforcement	1	No mechanism available to control or plan for the protection of the WMA. There is no capacity, although the customary landowners do play a role in monitoring the WMA and ensuring that traditional rules are followed e.g. chasing away outsiders who enter the marine area.	Need to have meetings with the Clan groups and come up with the rules relating to the control and management of the WMA.
4. Protected area objectives	2	There are no formal rules, but the general objective is to ensure that there is sustainable resource use. The clans work together and use traditional knowledge to use the resources.	
5. Protected area design	2	The WMA was established in areas that were owned by the people/clans. So the design is based on the willingness of the people to support the WMA. As surveying is expensive, the general features in the landscape were used to plan the boundary e.g. along the river. In marine areas – from low tide to 1-2 km from the reef – this is the overall marine area. Families can use certain parts of the marine area. You need to ask permission to enter parts of another person's area.	

Issue	Score (0,1,2,3 NA)	Comment	Next steps
6. Protected area boundaries	3	Boundaries are based on natural features so that people can easily recognise the WMA limits. This reflects the traditional understanding and the people agreed to an area that can be managed easily. This is even the case in the marine areas.	
7. Management plan	2	There is an informal management plan which represents the desires of the clans in terms of looking after the resources for today and for the future. There is no written plan.	The Committee needs to be established and endorse the rules, gazette them and develop a Management Plan for the area. NGOs (e.g. TNC) would be able to help in this process. There may also be other external support for this process.
7a. Planning process	1	People see fish stock declining and want to establish tambu areas. Now we are trying to incorporate an ecosystem management approach that requires consideration of breeding areas, feeding areas etc and we need to use this information to better 'zone' areas and thus change traditional practices.	To incorporate more extensive ecosystem planning approaches into the traditional management approach.
7b. Planning process	0		
7c. Planning process	0		This is something that needs to happen within the next 10 years.
8. Regular work plan	0		Need to have the WMA Committee established and working effectively.
9. Resource inventory	1	We have some information.	More information is needed to help with management.
10. Protection systems	1	Traditional systems are in place to control entry to certain areas.	Need to develop capacity in awareness raising, enforcement /patrolling.
11. Research and monitoring	0	There are endemic species (including superb pitta, green tree snails, Manus monarch and file snakes [Family <i>Acrochordidae</i>] in the river) that are important for research and there is no baseline data.	Need a biological survey to establish a baseline for biodiversity.
12. Resource management	0		Need baseline data collection.
13a. Staff numbers	0		
13b. Other people working on the protected area	1	The presence of customary landowners in the WMA is a mechanism to help with managing the protected area. Along the main road from Lorengau, people from other parts of Manus (and who have customary land elsewhere) are intruding into the WMA to cut timber and take sago and they fish and sell produce in the town. When the customary landowners are visible they don't do this.	Need awareness raising e.g. billboards along the roads to minimise the impact of this.
14. Training and skills	0		Need funding to introduce training programs.

Issue	Score (0,1,2,3 NA)	Comment	Next steps
15. Current budget	0		Looking for funding from a diverse range of sources, including government, NGOs, and international organisations.
16. Security of budget	0		
17. Management of budget	NA		
18. Equipment	0		Need a dinghy for enforcement purposes, computer (to assist with planning and operational aspects for the WMA),
19. Maintenance of equipment	NA		
20. Education and awareness	0	When we started there was education and awareness, but there is nothing in place now.	Raise the awareness of politicians and the government; school children; Clan leaders and landowners and use various means via radio, T shirts, and posters.
21. Planning for land use or marine activities	0	There is a plan by the Provincial Government to develop a correctional centre in the middle of the WMA. One member from the WMA Clan agreed to this – he was easy to convince to have the development. This is also the habitat of a threatened species, the superb pitta.	The community will have to take court action to try to stop the development.
22. State and commercial neighbours	0	There is no understanding about integrating decision making with the customary landowners.	
23. Indigenous people/ Customary landowners	2		Need to establish regular meetings with the customary landowners.
24a. Impact on communities	0	There is a lack of communication because of the absence of the WMA Management Committee.	Need to re-establish the WMA Wildlife Management Committee.
24b. Impact on communities	1	There are taboos and these play a role in management.	
24c. Impact on communities	1		
25. Economic benefit	1	The people have gardens and obtain fish and other resources. There is no walk about sawmill, but timber is cut and used for personal use.	Sub-committees need to be established when the Management Committee is established and these can investigate possible plans to create economic benefits. Ecotourism is a potential income earner due to the beautiful scenery and coastal environments. The community should speak with the Manus Tourist Authority.
26. Monitoring and evaluation	1	There is no formal plan, but communities do monitor their areas and make changes, as needed.	
27. Visitor facilities	2	There is a café/shed, which is used by south coast islands who moor their dinghies there. The WMA is a transfer point on Manus, which attracts many travellers.	Would like showering facilities and accommodation for visitors and moorings for boats and a resource centre (map of WMA and other information on the WMA).

Issue	Score (0,1,2,3 NA)	Comment	Next steps
28. Commercial tourism operators	0	There are tourists who visit the area and undertake scuba diving; workers from the Asylum Centre use their kayaks in the WMA. These people make no contribution to the WMA.	
29. Fees	NA	A fee was proposed, but it never eventuated.	
30. Condition of values	2		
30a. Condition of values	1	Every day the people are looking at their marine and terrestrial resources – where people are fishing, but in the more remote areas of the WMA this is difficult.	
30b. Condition of values	0	This is the whole idea of having the area declared as a WMA. It is the landowners who undertake management actions, but there are no specific management plans.	
30c. Condition of values	0		

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
Wildlife resources (trees, superb pitta etc – all wildlife in general)	F	D	As population is increasing, this will have an impact on wildlife (e.g. making houses, gardens and using wildlife). Thus the trend is likely to be decreasing, but there is limited information to know if this is correct. It is important to make the community more aware of the situation e.g. radio programs etc. Many of these people are outsiders coming into the WMA. The community is waiting for legal advice to formally remove or evict these people.
Marine life	VG	S	Seagrass, coral and mangroves are very healthy. With climate change there are a lot of impacts that have taken place (e.g. bleaching, acidification). There has been a closed season on sea cucumbers (to work out the viability of taking the species). Saltwater crocodiles can be hunted for their skins (of the required size – not too big or small). We have viable populations and so harvesting is permitted. There is a waterfall in the sea where they go. Currently there is no harvesting of crocodiles in the WMA.
Protecting traditional values (sacred sites)	G	S	The elders raise the awareness of our clans and this helps to maintain the resources. There is a strong 'house boy' tradition and this needs to continue.
Forest	G	S	In the early 1960s they were harvesting forest for timber. This was done by selective logging. The forest is recovering now.
Mangroves	F	I	Mangroves are extensive. There has been mangrove die back (perhaps anthropogenic e.g. a stream that was blocked from the coast and the water became stagnant).
Fish	VG	S	
Dugongs	DK	I	Only a few sightings; there has been a smothering of the sea grass a few years ago and they are coming back now.
Turtles (hawksbill)	G	S	Turtles are still hunted (there are plenty in the market place – K500 for a big one and used often in customary ceremonies); turtle eggs are taken and used for household purposes. If fishing is difficult (e.g. rough weather), then people stay at home and collect turtles and eggs and clams.
Endemic to Manus (e.g. Green tree snail)	P	D	Endemic species are threatened. They are harvested for their meat. The dark green colour of the snail is fading and the community are unsure why this is happening.

Table 8. Recommendations and ways forward

1.	2.	3.
Form the Management Committee and have the rules of the WMA formally gazetted.	Land use mapping to get the correct boundaries of the WMA and base line surveys of the WMA.	Education and awareness raising.

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

	Strengths	Challenges
1	Biodiversity in relatively good condition. Several important endemic species that need increased conservation effort.	Addressing the impacts flowing from population growth (mainly resulting from outsiders entering the WMA along the road to Lorengau).
2	Strong cultural values and a desire to pass these onto future generations.	Overcoming the lack of investment from all sources in the WMA.
3	Traditional knowledge is used to manage the WMA and customary landowners are supportive of the WMA.	Over harvesting of WMA resources (e.g. loss of forest, taking of green tree snails and fish, expansion of gardens etc).
4	High recreational, educational and scientific values.	