

Name of Protected Area: Tonda 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 <i>Person 1: Name, Organisation, Address, Email, Phone</i>	Ann Peterson, SPREP/Protected Area Solutions, 283 Madill Road, Tandur, Q4570, Australia, gregpeterson53@hotmail.com; 0414300955.
<i>Person 2: Name, Organisation, Address, Email, Phone</i>	NIL
Today's Date	24/02/2017
Name (or names) of protected area	Tonda Wildlife Management Area
Size of protected area (ha)	590,000
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)	Wildlife Management Area
IUCN Category	
International protected area? e.g. World Heritage or Ramsar?	Ramsar site
Country	Papua New Guinea
Province/s	Western
District/s	South Fly
Local level governments	Morehead
Ward/s	
Nearest big town	Daru
Location of protected area (brief description)	Tonda is located in the south-west corner of Western Province and shares a border with Wasur National Park (Indonesia) and Kakadu National Park across the Arafura Sea (Australia). It is bordered by the Mai Kussa River in the east and the coastline to the south. It is part of the Trans-Fly savanna and grasslands ecoregion. It consists of wetland, savanna and gallery woodland habitats, grasslands, mangrove, littoral swamp forest, relict monsoon forests and marine habitats in the Torres Strait. The vegetation is similar to that of northern Australia. Three new WMAs are being established with the customary landowners on the northern edge of Tonda (i.e. an additional 720,000ha).
Map references	8 deg 15' - 9deg 15'S, 141 deg 01' -141deg 45'E.
When was the protected area gazetted or formally established?	20/01/1975 (but it has never been registered with the Investment Promotion Authority)
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 (with leasehold land covering the site of a tourist lodge and guesthouses). There are 3 main clans (Bagu, Sagara, Mawaya) and >40 language groups and dialects. Tonda is the main language. The communities in the WMA include Bula, Bondobol, Balamuk, Wando, Korombo, Wearn, Werievere, Mermer, Indorodo, Kandarisa, Tokwa, Wamanevere, lokwa, Rouku, Moreheat station, Garaita, Mata, Pongariki, Derideri, Arufi, Tais, Jarai, Mari (Kunji), Mengete and Mibini.
Number of households living in the protected area	Unknown
Population size within the protected area	14,000 (in 24 villages) (low population density – 0.6 people per km2)
Who manages the protected area? (e.g. please enter government, customary landowners [add clan names] management committee [how many and what gender])	Tonda WMA Committee has 27 members from 24 villages; 7 sub-committees (each village forms a Committee and sends representatives to the Area Sub-Committee). There are no women on the committee.
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 protected area establishment	To control over-hunting and over-fishing and protect the wetlands and also gain income from hunting and fishing permits.
What are the main values for which the area is designated (Fill this out after data sheet 2)	Wetlands, biodiversity, cultural values and water.
List the primary protected area management objectives (add lines if needed after the most important objectives): <i>Management objective 1</i>	No management objectives were known, but those cited in the Draft Resource management Plan included: To preserve and take care of our resources and provide income for resource owners through tourism and small scale businesses.
<i>Management objective 2</i>	
<i>Management objective 3</i>	
Number of people involved in answering the assessment questions	
Name/organisation/contact details of people participating in the assessment	<i>Giboi Waina</i> , District Coordinator (South Fly District), Division of Resource Development, PO Box 05, Daru, Western Province, 73691782; <i>Abia Bai</i> , Chairman Tonda WMA; <i>Siwai Nema</i> , Interim Chariman, Tonda WMA, Tonda WMA; <i>Dain Kuro</i> , Former Conservation Officer/WMA Committee, Tonda WMA, 72465231.
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

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?

Tonda was the first WMA declared in PNG and remains the largest. It was listed as a Wetland of International Importance under the Ramsar Convention in 1993. The elevation is generally >45m with tidal rivers, mangroves, grassland, savanna woodlands and monsoon forest. The wetlands include sand beaches, estuarine waters, intertidal forested wetlands, permanent and seasonal rivers, swamps of coastal river floodplains, permanent fresh water lakes and fresh water swamp forests. The WMA is especially important for birds. During drought in northern Australia, Tonda is an important refuge for Australian waterbirds and it is an important resting and feeding area for much of the world's population of Little Curlew, which migrate between Australia and Siberia. The people in Tonda are yam cultivators and store yams in yam houses. Their houses are built of paper bark trees. In 1995 a Tri-Nations Wetlands Program was initiated by WWF, including Tonda, Wasur National Park and Kakadu. A MOU was signed in 2002. In 2006 a proposal was put forward to have the area declared as a World Heritage Site (as part of the Trans Fly complex).

Table 2. Key values of the protected area

No.	Key values	Brief description	Note if endangered species or ecosystem (IUCN)
1	Wetlands	The wetlands are internationally recognized as a Ramsar site. The wetlands contain grassland, savanna woodlands and monsoon forest with a diversity of wildlife, mainly endemic birds and mammals.	
2	Biodiversity	There are many species including: spectacled wallaby; birds (e.g. greater reef heron, bird of paradise, Fly River grass bird, shorebirds [e.g. Little Curlew, <i>Numenius minutus</i>] – over 250 species of birds have been seen in the area); fish e.g. Saratoga fish; Melaleuca ('Warria Warria') – would like commercial production for oil, medicines, and other health products) – found throughout Tonda, orchids and mangroves	
3	Cultural values	There are special animals that are protected – e.g. eagle, kite (associated with initiations) – important bird in the wetlands; tribal groups have local totems (e.g. eagles, plants/trees). Tonda is regarded as part of the family. There are several sacred places - we don't go there or drink water there and pregnant women don't go there. Once we lose everything the new generation will not have the benefit of this knowledge, e.g. they won't know how to use bows and arrows or how to build a canoe. We used to hunt rusa deer with bow and arrow but now they use knives – they blind the deer with a torch and kill it with a knife and this has increased the take of rusa deer and their numbers are in decline (e.g. can kill up to 15 deer in one night).	
4	Water	Fresh water is important for drinking and for maintaining the biodiversity, especially the fresh fish fauna. There used to be fresh water in many areas, but now the salt water is coming through and killing the fish (perhaps due to SL rise). Where I used to live there were fresh water fish, but now they are not there and the water colour has changed and there are invasive water lilies. We are worried about the wildlife. Water is very valuable, especially in the face of increasing development. Water comes from the river and the area needs to be safe for drinking water and for wildlife (e.g. deer).	

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	Tonda has been declared as a significant wetland under the Ramsar Convention. There is high endemism. The monsoon forest is important. There are >250 species of resident and migratory water birds (e.g. brolga, little curlew), birds of paradise, cassowary, eagles and kites. There are about 56 fish species, 50 mammals, and numerous reptiles.
2. Presence of rare, threatened, or endangered species (plants and animals)	2	Unique paperbark forests, endemic marsupial cat and flying possums. Over 50% of PNG's total bird populations are found in this ecoregion and include 80 species endemic to New Guinea.
3. Ecosystems (e.g. wetlands, grasslands, coral reefs etc) that are rare because they have been cleared or destroyed in other areas	2	Wetlands are of international significance.
4. Protecting clean, fresh water	2	This is important for drinking and also for the plants and animals that depend on fresh water.
5. Sustaining important species in big enough numbers that they are able to survive here	2	Tonda is very large and supports a wide diversity of plant and animal life and ecosystems.
6. Providing a source of employment for local communities now	0	There is a tourist lodge (foreign owned). There is not much employment provided to the local people.
7. Providing resources for local subsistence (food, building materials, medicines etc.)	2	There is hunting of wallaby, deer, cassowary, pigs, fish, shellfish and crocodiles, as well as the use of timber, bamboo, sago leaves and paper bark (for oil and medicines).
8. Providing community development opportunities through sustainable resource use	2	There is very little development - not much is happening.
9. Religious or spiritual significance (e.g. tambu places)	2	There are several sites of spiritual significance.
10. Plant species of high social, cultural, or economic importance	2	Kwila, melaleuca and sago are very important.
11. Animal species of high social, cultural, or economic importance	2	There are several species of fish, wallaby and birds that are important.
12. Attractive scenery	2	There is amazing scenery. Tourists come in for fishing and they have said that Tonda is "the remains of the Garden of Eden". In the wet there are waterlilies, birdwatching, game fishing, magpie geese and pelicans – when it is wet these species come from Australia. Hunters come in for trophy hunting.
13. Tourism now	2	Eco-tourism provides income for the communities, as well as eco-forestry and the production of herbal medicines. However, there are few tourists now.
14. Potential value for tourism in the future	2	Eco-tourism is important to our future, to provide additional income.
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	H	In the time of our fathers people lived in a village, but now people are moving out of the villages to create their own settlements throughout the WMA (i.e. bush camps) and this is a problem especially with the expansion of gardens and hunting. This also creates disputes over land ownership. The government is not assisting us in solving these problems. Poachers (West Papuans and Indonesians) are also coming in. There are refugees who live here and they take our resources and sell them in Indonesia. River fishing occurs right on the border – they come in with big nets and catch the large female fish. This will impact on our tourism income, as this is the area where the main tourist lodge is located and where tourists come to do game fishing. The Saratoga fish have been taken out of the area. This poaching causes a lot of disputes in the communities. The poachers also hunt rusa deer and some populations have been lost in the border areas. They also go in with dogs to hunt. The construction of houses also causes destruction of the forest and the expansion of gardens into the forest results in loss of forest.
1.1a Population increase in the protected area community	H	Increasing population poses a threat to the take of the WMA's resources. There are refugees and others coming into the WMA. It also causes loss of forest through construction of houses and gardens.
1.2 Commercial and industrial areas	0	
1.3 Tourism and recreation infrastructure	L	There is only one main lodge in the WMA.
2.1 Customary land owner and community gardens and small crops	L	There are community gardens that are important for subsistence. The forest has been cut and then regrows and the impact is low for the customary landowners. The main impact is from the refugees and poachers.
2.1a Drug cultivation	L	There is drug cultivation on both sides of the border with Indonesia. Kava is grown in the forest. This is causing social problems especially with young people who cultivate the drugs. Drugs also come in from Indonesia and from the highlands.
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	H	There is exploration and surveys being undertaken. We fear that once they put the mine in there may be oil spills and other environmental problems and this will affect our fresh water.
3.2 Mining and quarrying	H	There is erosion of river banks and sediment and health impacts. We are feeling the impacts of the Ok Tedi mine (e.g. cyanide and heavy metals in the water, soil, fish and other wildlife). People call this the genocide of our people. People are experiencing deformities, abnormalities, birth defects, joint pain and growths over their bodies.
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	

Threat type	Score (H,M,L,O)	Notes
5.1 Hunting, killing and collecting terrestrial animals (including killing of animals as a result of human/wildlife conflict)	H	There is poaching of local resources e.g. birds of paradise, white cockatoo, cassowary (feathers for ceremonies) etc. This is mainly by local people who harvest and sell wildlife resources to merchants in Indonesia. This includes deer meat, wallabies, antlers, candlenut, plastra of freshwater turtles, shark fins, Saratoga fingerlings, and the dried swim bladders of certain fish. The increasing demand for cash income by local people is placing greater pressure on these resources.
5.2 Gathering terrestrial plants or plant products (non-timber)	0	
5.3a Logging and wood harvesting for local/customary use	L	Logging is a threat due to increasing population numbers. However, there is a lot of forest to provide resources and the impact is currently low.
5.3b Logging and wood harvesting – commercial logging	0	
5.4a Fishing, killing and harvesting aquatic resources for local/customary use	L	Local communities are dependent on marine resources for their livelihoods and their impact is low.
5.4b Fishing, killing and harvesting aquatic resources for commercial use	M	Outsiders from Indonesia take our fish – they come in with large nets that take a diverse array of species.
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	There has been some research e.g. from CSIRO in relation to melaleuca oil extraction, but this does not have impacts.
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	H	Poachers follow the border track and enter the WMA and cause destruction – they use trail bikes and make camps. They bring large ice boxes and load all the deer carcasses into them.
7.1 Fire and fire suppression (including arson)	H	Fire poses a threat to the wetlands. People (e.g. poachers) light fires and these escape into the wetlands. Fire has resulted in the loss of crocodile nests and affected other species. This has changed the vegetation (e.g. it has destroyed the floating grass mats where people would go to obtain fresh water and seafood).
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	H	On the western boundary with Indonesia there are poachers and refugees entering Tonda. There is agriculture on the western border and it uses a lot of fertilisers and pesticides and this may affect the fish in our wetland. These problems are predicted to increase in the future without effective management.
7.3d Loss of keystone species (e.g. top predators, pollinators etc.)	M	Crocodiles have been lost in the area – a fisherman hunted crocodiles in the Bensback, Moorehead and Wasikusa Rivers within the WMA and the crocodile numbers have fallen. Tourists want to come and see these species and they are not so prevalent in some rivers – this will affect our future income earning potential. Our people also hunt the large crocodiles and sell the skin (this is a restricted take).
8.1 Pest plants	M	Introduced species are a threat due to the increased movement of people from Indonesia to the border town of Sota posing a threat from introduction of water hyacinth (not here yet – but may come if careless) and mimosa pigra. Melaleuca is encroaching into grassland areas – the shorebirds need these grasslands for feeding. Melaleuca trees have always been in Tonda and scientists are not sure why they

Threat type	Score (H,M,L,O)	Notes
		are spreading into areas where they did not growth before. This may be due to the introduction of Rusa deer that have caused changes in swamp vegetation, pigs rooting up wetlands and changes in rainfall and wetlands drainage, or perhaps changes in the way people burn their land (wildfires now sweep across the landscape rather than burning in the ways of the old people). Water lilies (introduced) have entered our rivers (like those in Kakadu). It affects the water system. There are roads with cars picking up seeds and they are spread more easily.
8.1a Pest animals	M	There is grazing pressure from the rusa deer which enter the wetlands. They were introduced in the 1940s from Taiwan and then to Indonesia and into PNG. This can result in seed dispersal and overgrowth of Melaleuca. Anabass (climbing perch) fish have killed the snakes (many species of snakes have disappeared). There are wild dogs, wild cats and pigs (eat tubers and dig up vegetation and their populations are increasing). There is also fruit fly. Sweet potatoes and oranges are affected by weevils. Snakehead fish
8.1b Diseases such as fungus or viruses that make native plants or animals sick	H	Taro leaf blight is already in Western Province – it burns the leaf of the taro and affects the tubers.
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	H	Ok Tedi mine has effluent that enters the WMA. This causes health complications (e.g. birth defects and deformities and skin growths). There is a gas that comes up through the river (it bubbles) – it smells and kills prawns – we don't know what it is. There needs to be a water management plan in place to minimise the impacts.
9.3 Agricultural and forestry effluents (e.g. excess fertilizers or pesticides)	0	
9.4 Garbage and solid waste	0	
9.5 Air-borne pollutants	H	TB is present through Western Province and is an airborne disease. There is no drug treatment available for this disease and it can cause serious problems to human health.
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)	H	Boats go down and up the river every day and cause river erosion. Floods can cause erosion and result in a build-up of sediment at the river mouths.
11.1 Habitat shifting and alteration	H	There have been changes in vegetation patterns and the movements of some wildlife. This may be related to climate change.
11.2 Droughts	H	The droughts are longer (sometimes up to 9 months). Droughts cause the vegetation to die and some animals have had to move. This causes more fire which alters habitat.
11.3 Temperature extremes	M	There are more frequent hotter days – you can't stay in the house anymore. The hot period is longer. The coconuts and sago die and also many other plants. This is affecting the whole area. People are starting to question and say 'What next'. The coconuts are not going into flower.
11.4 Storms and flooding	M	There are more serious storms now, especially those from the west and they destroy vegetation. Before there were seasons, but now everything is out of season. Storms and flooding can come at any time – unexpectedly. Increased flood heights may cause the deer to move. The floods can remove riparian vegetation which is the roosting site

Threat type	Score (H,M,L,O)	Notes
		for birds, which then have to find new habitat. In recent times, people have tried to plant the food gardens and the floods came down. They did this three times, but their crops were destroyed. We are experiencing these changes.
11.5 Coral bleaching	0	
11.6 Intrusion by saltwater into gardens etc.	M	Saltwater is intruding into the wetlands. It is going into new areas and the saltwater fish are following them. Saltwater now comes 6-7 kms upstream (in the past it was only 2-3km upstream). There are also changes in the colour of the water – the water becomes greenish (it may be mining impacts or from the melaleuca). The native fish are almost gone (no prawns) and the birds that eat them are gone –this is due to the change in fresh to salt water and the change in colour of the water. Villages are inundated with salt water.
11.7 Sea level rise	M	There are higher high tides and king tides. The villages on the coast now flood on the high tides.
Other (please explain)		
12.1 Loss of cultural links, traditional knowledge and/or management practices	H	Loss of culture is taking place. In the past in the yam season we had cultural practices and ceremonies e.g. exchange of goods (exchange yam in return for pig or sugar or meat). That is now dying out. Other lifestyles are taking over e.g. western culture. Initiation has died out. There are secrets that the women don't know. The practices of the old people – things that are a secret for men and a woman must not know these secrets – but now everybody knows – it is exposed. There are killer diseases (e.g. AIDS) and everybody talks about sex and it is not only among married people – it has changed our traditional life. Traditions relating to mourning periods for women have changed (they used to wear a covering over their head and a bangle to signify a death). There used to be tambu areas for hunting for a short time, but not now. That makes us sad. Ceremonial dressings have been lost. Modern education is changing this. Christianity has also influenced this. We have lost such a lot. We have changed the way we hunt pigs – we don't use the loop, but now use dogs and spears. Women still retain the weaving of traditional baskets and are making money by selling these. Men maintain the design on spears and kundu drums.
12.2 Natural deterioration of important cultural site values	M	We had a swamp with floating grass and cool water under – now these are solid ground. Crocodiles used to live under the floating grass and we could easily catch the crocodiles and also get fresh clean water. Now these are really salty. This is more common on the plains – we are losing the lagoon environments and fresh water can't stay here.
12.3 Destruction of cultural heritage buildings, gardens, sites by people	0	
Other (please explain)		Lack of funding and resources; and lack of meetings.

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	The edge effects from the Indonesian border	8.1, 8.1a	Poaching wildlife and invasive pest plants are a threat. Quarantine services need to be established along on the western border. This must include people on boats and roads and any means of entry into the WMA.
2	Fires	7.1	These are destroying the crocodile nesting areas (e.g. Bensback River). This is mainly caused by poachers. We need to raise awareness about the impacts of fire and encourage local villagers to better control these fires.
3	Airborne pollutants (e.g. Tuberculosis)	9.5	This affects all the people – health is very important. There needs to be increased awareness of this danger and how to minimise the spread of the disease (e.g. through sharing the chewing of beetle nut etc).

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 WMA was the first declared in PNG.	
1b. Legal status			
2a. Protected area regulations	1	Not all the rules are gazetted. There are traditional rules that are not written down. The main issue is that at the time of gazettal, not all the landowners were involved and some did not like the rules or agree with them. Tonda is a big area and the main problems are with the landowners who don't agree with the WMA rules. Land use is a problem and land uses in the WMA have major weaknesses. The old rules allowed for the issuing of licences (commercial, tourist and individual), restricted the use of guns, set limits on the size and sex of fauna taken and established areas within which hunting was restricted. There is a set licence and royalty fees on hunted animals. However, currently there is no office and no process of accounts to collect fees etc. It is not monitored correctly.	There needs to be land mediation to get agreement on the rules. New rules have been developed and we aim to gazette the proposed new rules for the WMA. The on-ground rangers can help with this process, but resources are needed to help facilitate the process. There needs to be close monitoring of the WMA as it has been neglected for a long time.
2b. Protected area regulations			
3. Law enforcement	1	Enforcement is the responsibility of the committee. There are no rangers on the ground.	We need to develop a ranger program and train rangers. This will require adequate funding. We need gazettal of the rules relevant to the current situation. There is a need for technical advice in developing the relevant rules.
4. Protected area objectives	1	A resource management plan is in place that has some objectives, but the overall rules have only been agreed to by some landowners.	We need to develop an implementation plan to help us to develop our actions to achieve the objectives.
5. Protected area design	3	The area is very big, but it has been divided into sub-areas to assist with management. Other adjacent areas have proposed to extend the Tonda WMA i.e. Weriaver and Aramba	

Issue	Score (0,1,2,3, NA)	Comment	Next steps
6. Protected area boundaries	1	The boundary is well defined and recognised by individual clans. The boundary is closely linked to Wasur National Park (Indonesia) and to two proposed WMAs (Wereaver and Aramba) in Western Province. The boundary is not respected by the poachers who enter from Indonesia or by some landowners within Tonda.	Funding is needed to develop the ranger program so that on-ground rangers can patrol and monitor the boundaries, especially the western boundary with Indonesia. The new proposed WMAs on our boundary need to be gazetted.
7. Management plan	0	There is no Management Plan, but there is a Resource Management Plan. There is a Management Committee in place, but on-ground management is undertaken at the sub-committee level. This is mainly due to the large distances/remoteness and the cost of travel.	Develop the Management Plan, and provide assistance to develop the plan. Funding is needed to enable the whole Committee to meet regularly throughout the year. Benefit sharing arrangements need to be established and agreed.
7a. Planning process	1	Customary landowner input is through the sub-committees, which then take the issues that have been raised to the executive board.	
7b. Planning process	0		
7c. Planning process	0		
8. Regular work plan	0	There was a work plan in the past, but it is not working now.	Need to re-establish a Work Plan and appropriately fund it.
9. Resource inventory	1	No current resource inventory.	We need information on the WMA's resources e.g. biodiversity, ecosystems, threats.
10. Protection systems	0		Rangers are needed as well as the introduction of an effective permit system for tourists and hunters/fishers. The courts must be informed of the issues and ensure effective punishment/fines. The magistrates in the District and Village Courts need some training. Stronger penalties are needed.
11. Research and monitoring	0		Research is needed on wildlife, in particular fish, the spread of melaleuca, and fire management.
12. Resource management	0	The WMA had a resource management plan. However, due to lack of resources this has not been implemented.	Rangers are needed. The committees need to be more effective and enforce rules and to raise awareness.
13a. Staff numbers	0	No paid staff or rangers on the ground.	Rangers are needed to initiate some actions in the WMA.
13b. Other people working on the protected area	1	There are insufficient landowners working in the WMA.	
14. Training and skills	2	Limited training has been undertaken in the past.	We need training in organisational and financial management, enforcement, office administration, ranger training, report writing, monitoring, computer, proposal writing, and land mediation.

Issue	Score (0,1,2,3, NA)	Comment	Next steps
15. Current budget	0	There is no budget, although the small amount of money raised from tourism enables the committee to meet.	Tourism can provide some income (through guest houses, fishing etc), and also from the extraction of melaleuca oil. Funding is required to kick start the improved management of Tonda.
16. Security of budget	0		
17. Management of budget	NA		
18. Equipment	0	There is no equipment.	Funding is needed for a boat and motor (to help with the melaleuca production and management and to assist with tourism). A car is needed for land transport to assist the committee and to manage this large WMA.
19. Maintenance of equipment	NA		
20. Education and awareness	0	There is no education and awareness raising.	Develop education and awareness programs for the local community (e.g. WMA regulations, information on values and importance).
21. Planning for land use or marine activities	0	This does not happen.	We need the external levels of government and industry to be aware of the values of Tonda and ensure that these are not affected by planning decisions.
22. State and commercial neighbours	0		There needs to be improved communication with all levels of government and any commercial neighbours.
23. Indigenous people/ Customary landowners	3		
24a. Impact on communities	1		
24b. Impact on communities	0		
24c. Impact on communities	1	Most people support the WMA, but there are some landowners who have never supported the WMA and there is land use conflict.	
25. Economic benefit	2	Royalties are paid from hunting and fishing (very small).	Identify a range of potential income generating activities, including expanded tourism opportunities.
26. Monitoring and evaluation	0		Monitoring and evaluation are needed to improve management outcomes.
27. Visitor facilities	1	We are opening up new facilities. There is a big lodge for tourists.	We need to create more activities for the tourists (not only hunting and fishing).
28. Commercial tourism operators	0	Commercial tour operators work with the Lodge and we have no contact with them.	There needs to be improved communication between the landowners and the lodge owner and tourist operators.
29. Fees	0	There is a fee structure, but fees are not collected.	The Management Plan needs to be developed to enable the fees to be collected.
30. Condition of values	0	The condition of the values is poor due to a wide range of threats that are not being managed.	
30a. Condition of values	0		

Issue	Score (0,1,2,3, NA)	Comment	Next steps
30b. Condition of values	0		
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
Wetlands	F	D	There are some serious concerns with the wetlands related to invasive pest plants and animals and the impact of fire and salt water intrusion.
Biodiversity	F	D	There are threats from hunting, fire and invasive species.
Cultural values	P	D	Cultural values have been lost, including traditional skills and practices.
Water (fresh)	F	D	Some areas have intrusion of salt water and it is not capable of being drunk.

Table 8. Recommendations and ways forward

1.	2.	3.
We need an environment and conservation officer based in Western Province – South Fly District - because of the presence of Tonda and Maza and their importance to PNG and global biodiversity conservation.	Equipment is needed for land and sea (boat and car) to help generate some small enterprises and to monitor the border.	Training programs are needed to improve the skill levels of the Committee and the suggested rangers.

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

	Strengths	Challenges
1	A large protected area that contains a wide diversity of fauna, flora and ecosystems.	Stemming the impacts of a range of threatening processes that originate on the western border with Indonesia.
2	An internationally recognized wetland with linkages to Indonesian and Australian wetlands.	Developing effective threat abatement plans in the face of limited funding and resourcing.
3	Potential for the development of tourism enterprises based on the diverse array of biodiversity, landscapes and scenery.	Enhancing integrated management in such a remote location with limited internal infrastructure or communication.
4	Important educational and scientific values.	Re-gazetting the WMA through comprehensive engagement of the traditional owners to ensure that there is agreement to the WMA and its rules.

References

World Wildlife Fund (WWF) & Department of Environment and Conservation, 2001. Tonda Wildlife Management Area Resource Management Plan, WWF & DEC, Port Moresby.
 WWF, 2001. Traditional burning in Bensback area of Tonda WMA. WWF np.