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KILOMBERO AND LOWER RUFJI WETLANDS ECOSYSTEM MANAGEMENT PROJECT

TECHNICAL ADVISORY
SERVICES FOR BIODIVERSITY
CONSERVATION AND WETLAND
MANAGEMENT IN KILOMBERO
VALLEY RAMSAR SITE

REPORT ON NGAPEMBA AND
TANGANYIKA AREAS



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SUMMARY

Background

This study was carried to confirm the ecological status of the Ngapemba wetland in the south of the RAMSAR Site.

Administratively the area falls into two regions - Morogoro and Ruvuma and into at least four districts (Kilombero and Malinyi in Morogoro and Njombe and Songeo in Ruvuma). The MNRT has issued a hunting block of 1,640 km² and which is comprised of village land (40%) and general land (60%).

The area is part of the Kilombero Basin and drained by the Mnyera, Ruhiji and Pitu rivers. Extensive wetlands are found at Ngapemba and Ndolo, which are fed by the Mnyera, Ruhiji and Mpanga rivers. Elevation increases towards the south with the land becoming very broken and hilly, but the Ruhiji and Pitu have significant valleys.

A major feature of the area are the seasonal and permanent wetlands of the Mnyera and Ruhiji rivers which feed the Ngapemba and Ndolo swamps. On the higher ground miombo woodland predominates. The main vegetation types in the area are Permanent Swamps, Seasonal Swamps, Riverine Forest, Forest and Miombo Woodland. In addition, significant conversion of wetland and woodland to cultivated areas has occurred in the north and east.

The area has significant wildlife populations, especially in the vicinity of the Ngapemba/Ndolo swamps and along the main rivers (Mnyera, Ruhiji and Pitu). Puku are common and are often found in the miombo woodlands. This area can be regarded as one of the strongholds for puku in Tanzania. A range of other species are found in the area and include elephant, buffalo, waterbuck, hartebeest, eland, sable and roan. The protection provided by the hunting company has led to increases in all species in the area. No formal surveys have been carried out but the hunting company has estimates for the major species, especially in the vicinity of the Ngapemba wetland. The area could form the nucleus wildlife population for dispersal and connectivity to adjacent protected areas. However, the connectivity between Ngapemba and the proposed Kilombero GCA has been severely compromised by human activity.

Being a hunting block (s) on village and open land, a full range of activities are occurring in the area. These include farming, livestock keeping and subsistence fishing on the one hand while safari hunting and sport fishing are carried out as well. Most of the Ngapemba swamp falls under an emerging BMU.

Recommendations

Possible options for improving the conservation status of this area were considered (New Game Reserve/ Game Controlled Area, Inclusion into Selous, Wildlife Management Area, Game Ranch, Wetlands Reserves and Areas, Corridors, Dispersal Areas, Species Management Area, Hunting Block).

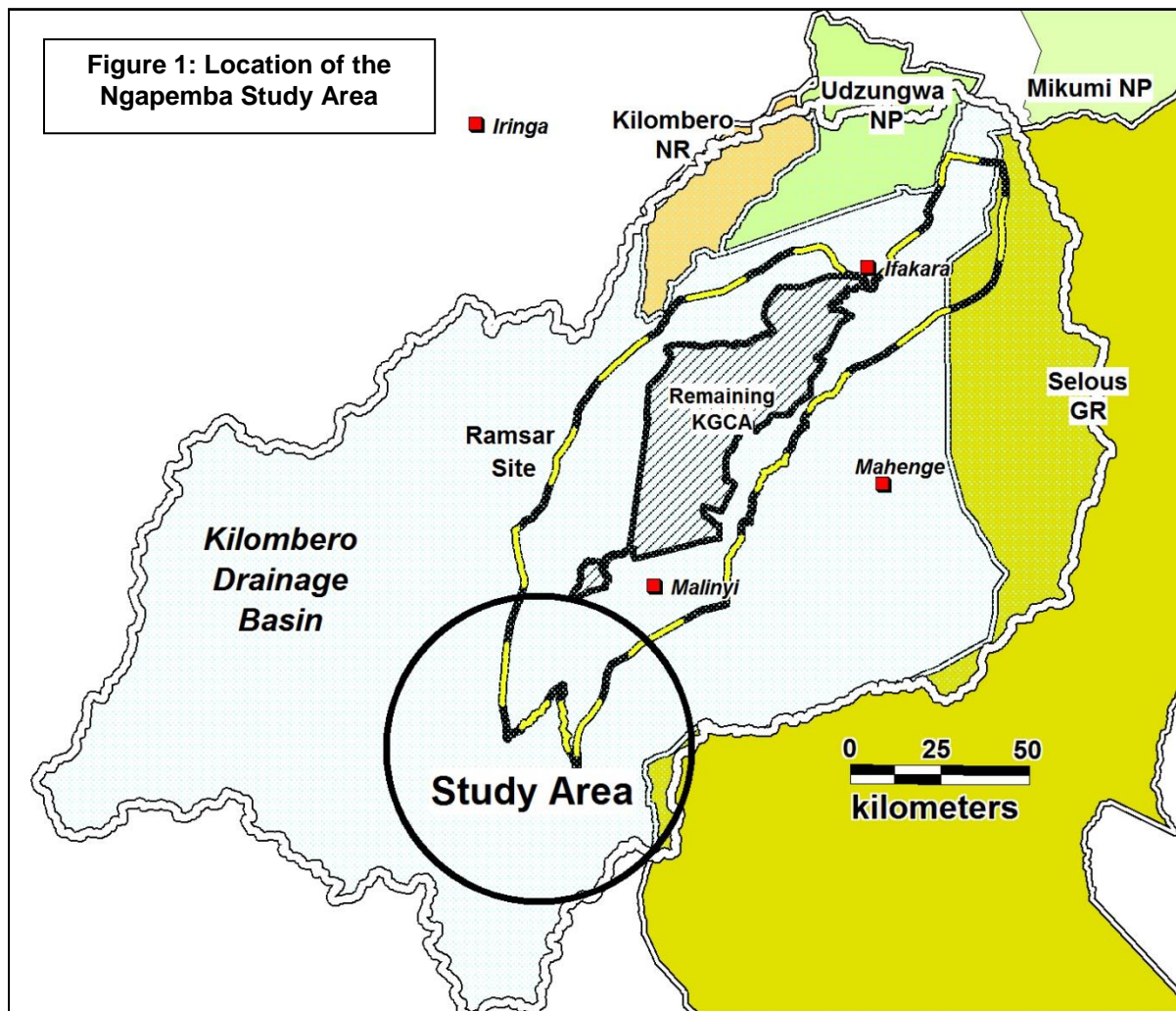
It is recommended that the WMA (or its offshoot the "Game Ranch") be considered as the most viable options for improved protection of the area as they do not involve the alienation of village land (i.e. village land being transferred to reserved land). All options have pros and cons and these need to be considered in the final decision.

As part of the Integrated Management Plan envisaged for the Kilombero Valley work on the wetlands and corridors is envisaged. In addition, whatever type of protected area is considered it will also require a management plan (legal requirement). These activities should be consolidated as far as possible to avoid duplication.

1 METHODOLOGY

1.1 The "Study Area"

The "study area" was initially defined as the area south of the Mpanga and Furuu Rivers and continuing southwards to the Kilombero Basin drainage area boundary. Assessment of this large area would allow us to focus on a smaller area and make recommendations for its protection and utilisation. Recommendations for future work in the larger ecosystem are touched upon in Section 3 but these may be beyond the remit of the KILORWEMP project.



The MNRT has issued a new hunting block in the area of 1,640 km² which is comprised of village land and general land (see section 2.2.6).

1.2 Area Assessment

Assessment of the area consisted of the following:

1. Pre-trip assessment of available imagery
2. Aerial survey of parts of the area with georeferenced photography
3. Ground based assessment of the area with georeferenced photography
4. Interviews with key people involved in the area
5. Post-trip(s) image analysis in conjunction with available imagery
6. Overlay of other data (village boundaries, protected areas, relief, drainage, land use).

These are briefly described below:

Table 1: Area Assessment Methodology	
Component	Detail
Pre-trip assessment of available imagery	Available imagery included <ul style="list-style-type: none"> • Rapid Eye - 2015 • Google Earth Download - Undated • Sentinel 2 - 2016
Aerial survey of parts of the area with georeferenced photography	Four aerial surveys were carried out. These were general valley wide surveys that also covered parts of the study area. On all flights still and video photography was georeferenced
Ground based assessment of the area with georeferenced photography	Two ground based trips were undertaken specifically to the Ngapemba and Pitu areas. As with the aerial surveys, extensive georeferenced photographs were taken on all trips
Interviews with key people involved in the area	Interviews were held with Kilombero North Safaris ground staff and management
Post-trip(s) image analysis in conjunction with photography	Georeferenced photography was overlain on imagery and other GIS datasets to enhance our understanding of the area
Overlay of other data (village boundaries, PAs, relief, drainage, land use)	Other datasets were accessed for the area which included <ul style="list-style-type: none"> • District boundaries • Hunting block boundaries • Protected area boundaries • Rivers • Roads • Landcover • Relief • Drainage basins

Imagery extents and the positions of georeferenced photographs are shown in the annex.

1.3 Report Structure

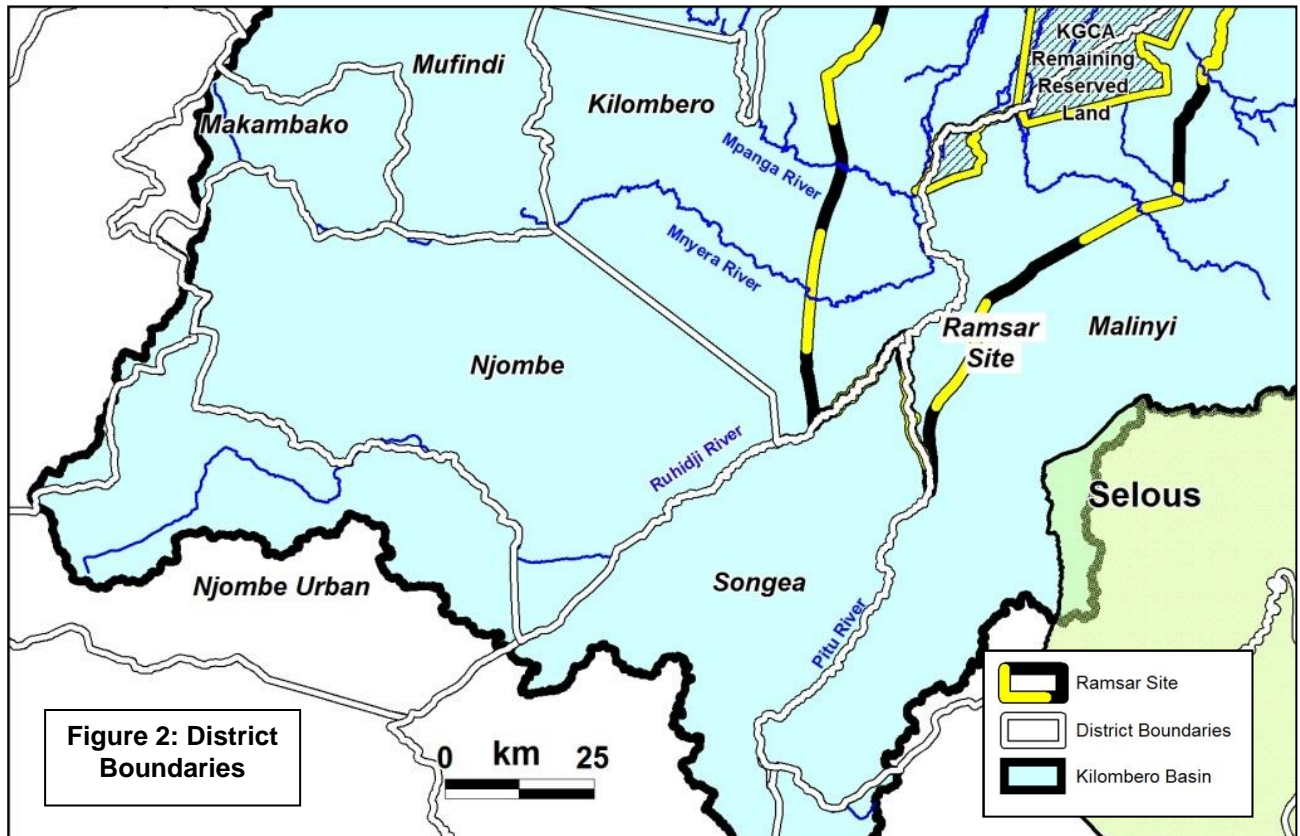
This report is designed to be easily accessible and hence much of it is composed of maps and images that reflect the current known status of the area. Essentially it is divided into an area overview (section 2) and the recommendations and way forward (section 3).

2 STUDY AREA OVERVIEW

2.1 Administration

2.1.1 Provincial and District Administration

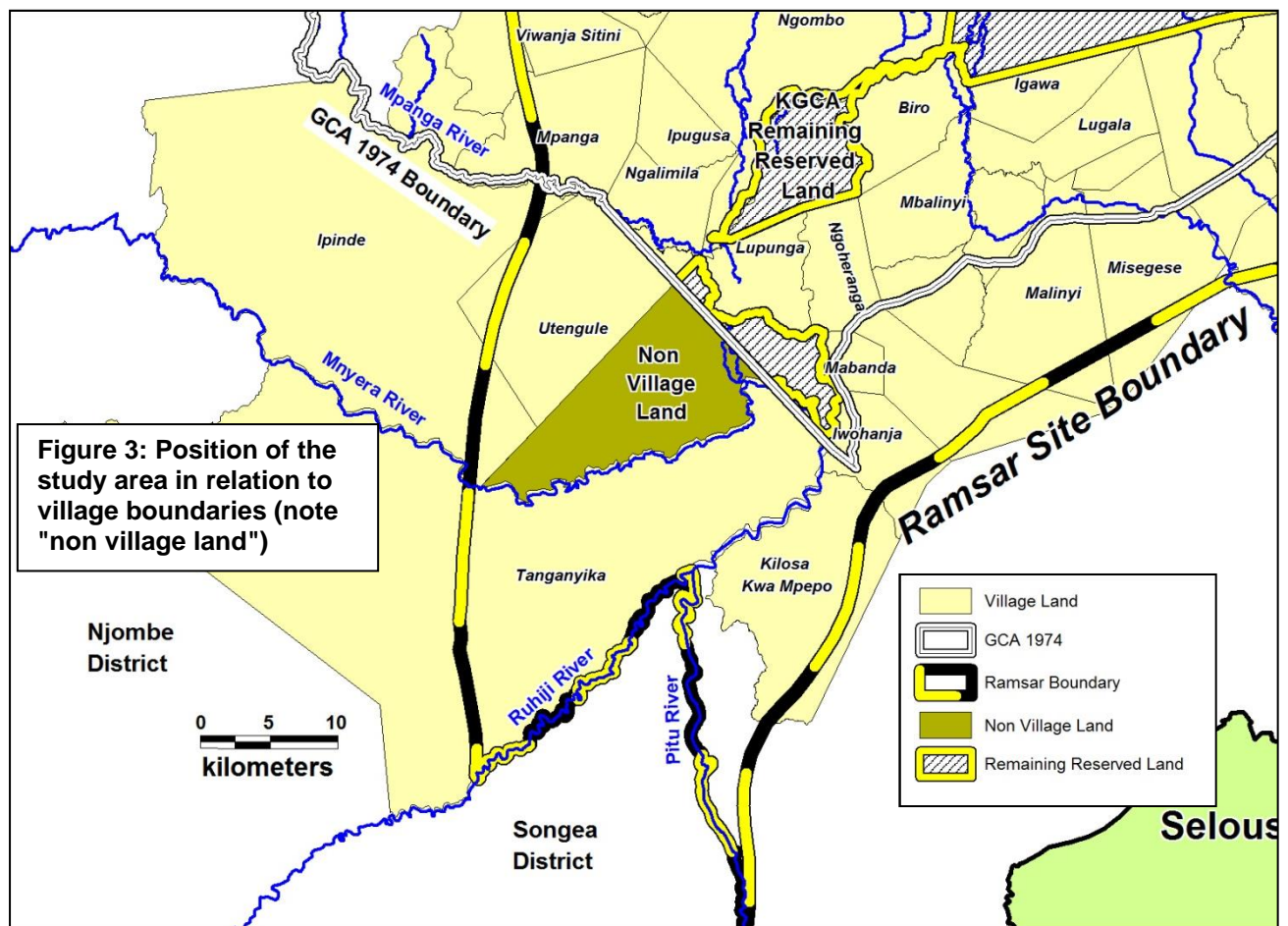
The study area falls into two regions - Morogoro and Ruvuma and into at least four districts (Kilombero and Malinyi in Morogoro and Njombe and Songea in Ruvuma). In the map below the blue area represents the Kilombero drainage basin.



2.1.2 Village Administration

In terms of village land we obtained shapefiles and scanned village survey plans for Kilombero and Malinyi Districts from the Ministry of Lands, Survey Division. As the project was initially focussed on the Kilombero RAMSAR site and the Kilombero GCA the Ruvuma Region village survey plans were only pursued at a later stage. At the time of writing we have not been successful in locating these, although it may be possible that significant parts of this region may still be general land and not yet registered as village land.

Of major importance to this investigation is the presence of a large area of general land (i.e. non-village land and not a designated protected area) within the RAMSAR site boundaries. Significantly this includes much of the Ngapemba and Ndolo wetlands, which are a key focal point for this investigation (detail to be found in section 2.2.4). Villages that will be need to be included in any conservation initiative are Utengule, Ipinde, Tanganyika and Kilosa Kwa Mpepo.

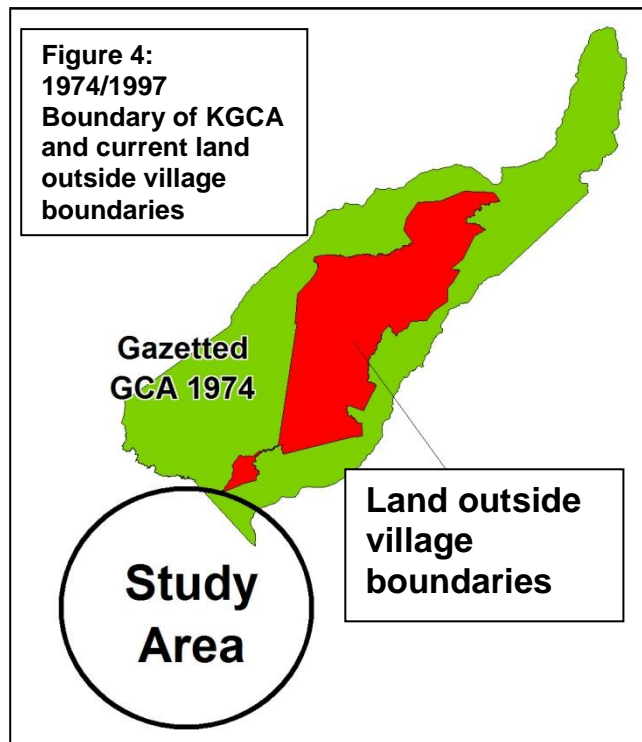


2.2 Current Protection Status in the Vicinity of the Study Area

2.2.1 Kilombero GCA

The Kilombero GCA was established in 1974 and the 1974 Act permitted settlement and cultivation inside its boundaries. The Kilombero floodplain has been a magnet for agriculturalists and pastoralists with significant immigration occurring in the last 10 years. This has led to the complete decimation of the wildlife populations. As of the time of writing numerous villages have been declared within the original GCA boundaries. The legal framework regulating land and resource access within this area is presented under a separate project report (Nielsen and Nshala, 2017)..

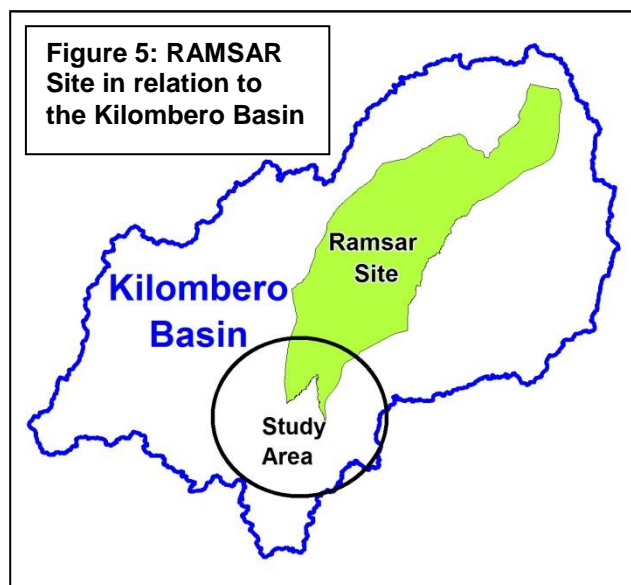
Most of the Ngapemba area was excluded from the 1974 GCA.



2.2.2 RAMSAR Site

The RAMSAR site was declared in 2002. The site is approximately 7,000 km² and parts of the study area fall within its boundaries. It should be noted that the southern boundaries of the RAMSAR site follow the Regional boundary (Ruhiji and Pitu rivers) and do not appear to be based on any ecological considerations.

The north-western boundary of the RAMSAR site follows the Tanzania-Zambia railway line (TAZARA) from Mwaya south of Mangula in the north to Mlimpa in the south, excluding the township of Ifakara and cultivated land adjacent to the town. From Mlimpa the boundary goes south and includes the rapids on the Mnyera River in the west, as well as adjacent swamps to the east of the rapids and touch the Ruhudji River in the south. The boundary then follows the Ruhudji and Pitu Rivers including land in the Kilombero and Ulanga Districts but excluding land in the Somgea District



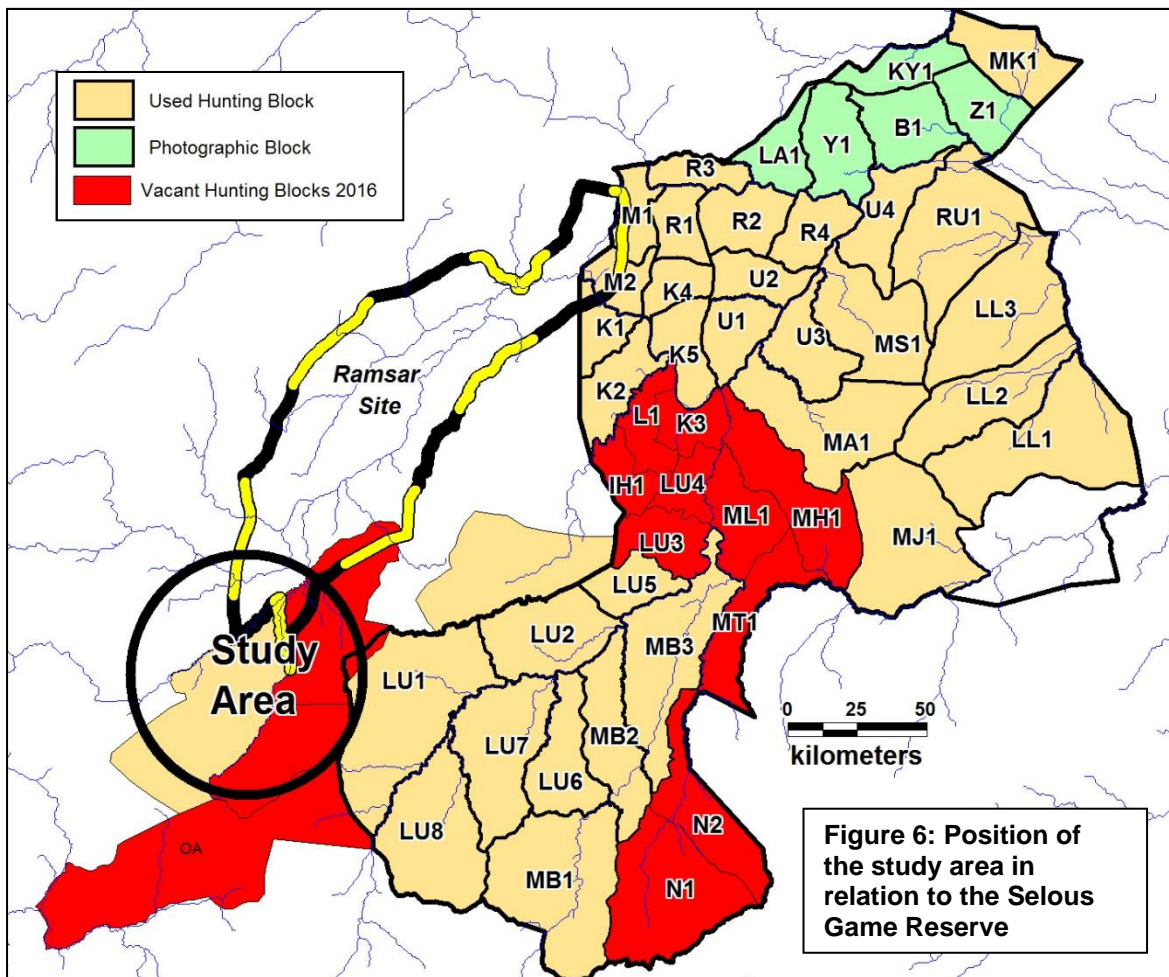
From the eastern side of the Pitu River in the south the boundary goes north to the village of Sofi including the seasonally flooded areas south of Malimyi, On the eastern side of the Kilombero Valley Floodplain the boundary follows the road after Sofi Majiji in the south to reach the village of Lupiro in the northeast. From Lupiro the boundary goes north-east to cross the boundary of the Selous Game Reserve, and later the Kilombero River in the east, at the point where the river leaves the floodplain and goes south-east in a forested area inside the Selous Game Reserve, to later join the Ruaha River and become the Rufiji River. At the point where the boundary crosses the Kilombero River, the RAMSAR boundary goes north to cross the Msolwa River and meeting the railway at Mwaya encompassing the southern part of the Mslowa floodplain.

2.2.3 Selous Game Reserve

The Selous Game Reserve is approximately 50,000 km² in extent.

Divided into 54 blocks, the majority of which are used for safari hunting. The northern blocks around the Rufiji and Ruaha rivers are used for photographic tourism. In the last few years at least ten hunting blocks inside the Selous have been returned to the MNRT as being unviable.

More concerning, for the status of the Ngapemba area is the fact that three blocks between the Selous and the study area have also been returned to the MNRT - Mwatisi North, Mwatisi South and Litumbandyosi and Gesimasowa Open Area. This has ramifications for any plans looking at the inclusion of this area into the Selous.



2.2.4 General Land

Within the Kilombero District, a pocket of general land exists on the north bank of the Mnyera River and extending to the east of the Ruhiji River (140 km²). This land is classified as General Land as it does not appear as village land on any of the village survey plans accessed from the Ministry of Lands. Some of the area on the east side of the Ruhiji River was part of the 1974 game controlled area (38 km²). This section is not connected to other 1974 GCA that is not formal village land on the valley floor.



In the Njombe District a significant portion of the hunting block appears to be on general land but this needs to be verified.

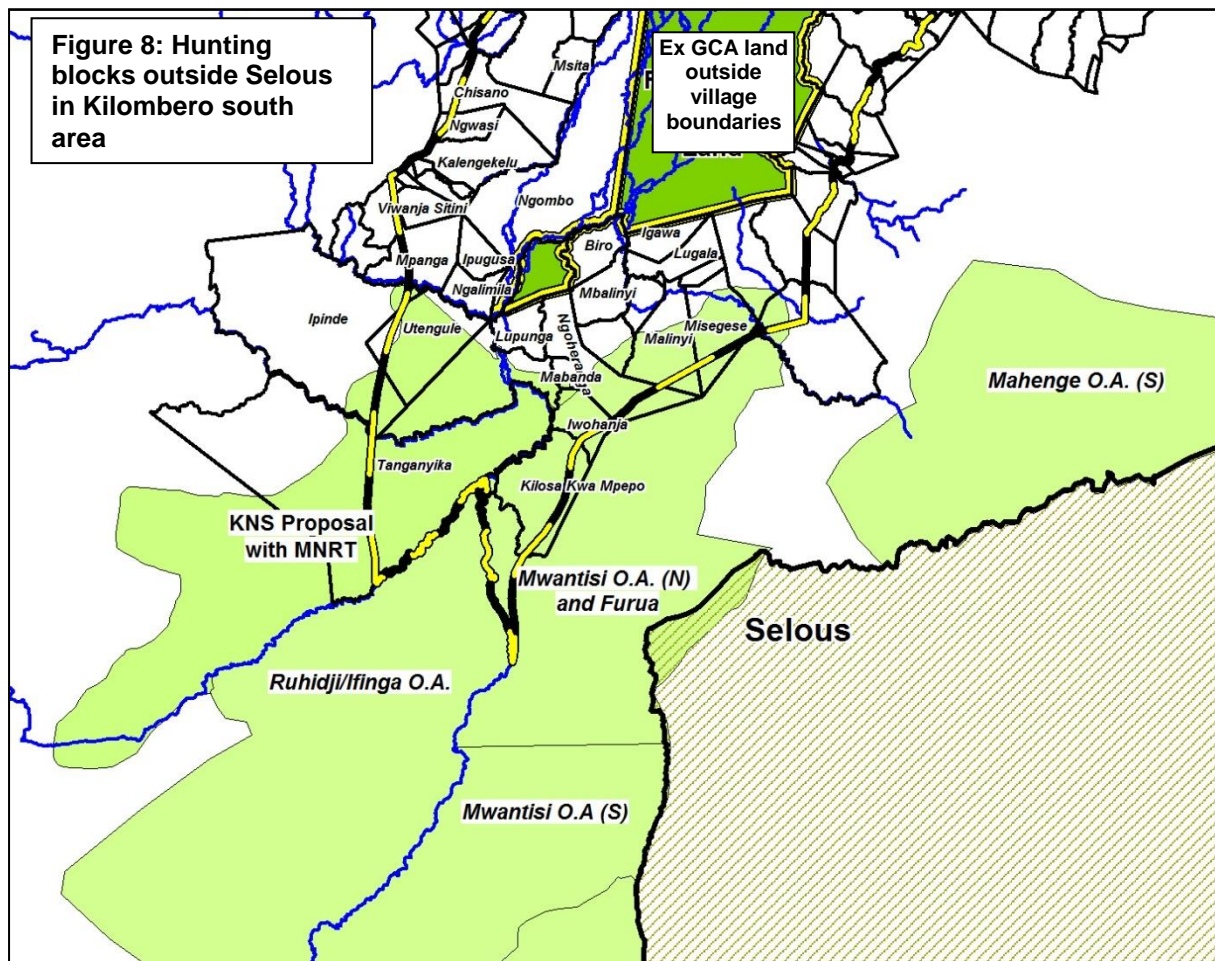
2.2.5 Hunting Blocks Outside Selous GR

The whole of the Kilombero Game Controlled Area was divided into four hunting blocks, three of which have been returned to the MNRT as being unviable. This is due to the influx of pastoralists and the spread of cultivation and settlement. The fourth block (Kilombero Mlimba) is still held by a hunting company but not hunted at present.

In the vicinity of the study area there are four "official hunting blocks -

- Mwatisi Open Area North/Furua - Returned to MNRT
- Mwatisi Open Area South - Returned to MNRT
- Ruhiji/Ifinga Open Area - Currently operational - Wembere Safaris
- Mahenge Open Area - Status unknown

In addition, Kilombero North Safaris is permitted to operate in the area to the north of the Ruhiji River, presumably as part of its lease on the old Kilombero GCA block which is currently unviable. This area forms a significant part of the study area for this report. The company runs protection and conservation activities within this area.



2.2.6 Current Kilombero North Safaris Hunting Block

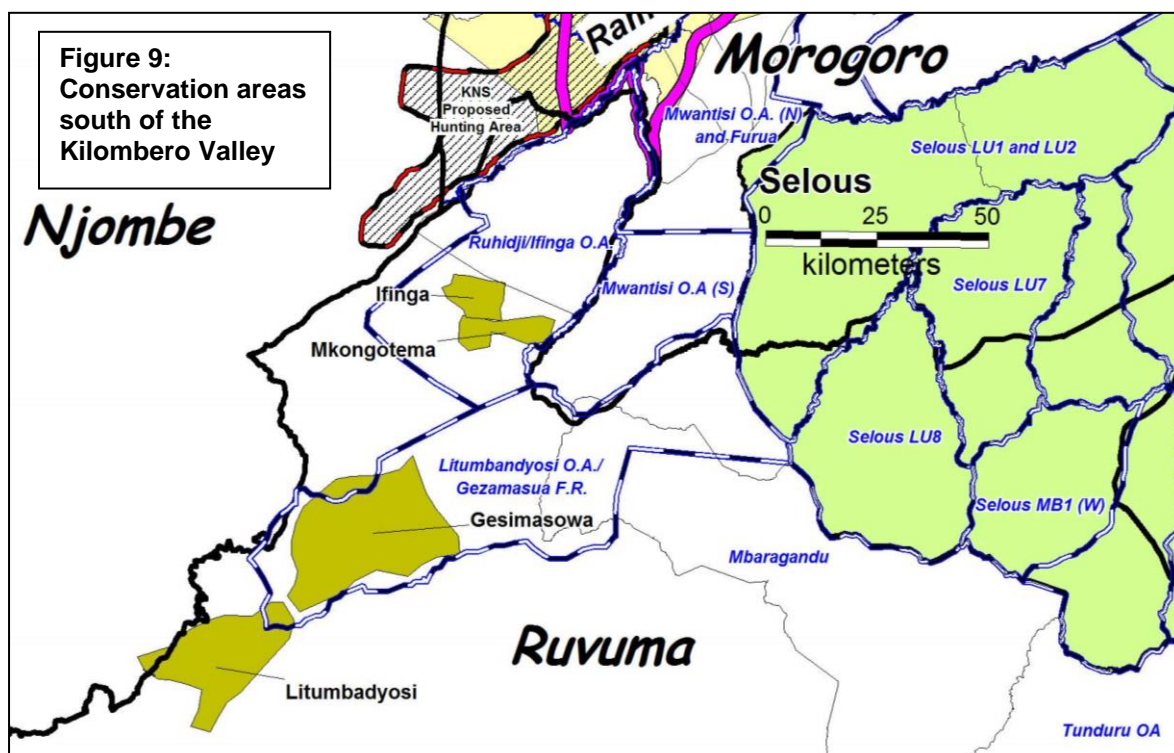
The area currently leased to Kilombero North Safaris north of the Ruhiji River is 1,640 km² and extends across Kilombero and Njombe Districts. Some key statistics are below. Nearly 60% of the currently defined hunting block is on general land while the rest is on village land belonging to Tanganyika, Utengule and Ipinde villages.

Village Land			General Land		
Village	Km ²	Percentage	Area	Km ²	Percentage
Tanganyika	530	33%	General Land Kilombero	140	9%
Utengule	109	7%	General Land Njombe	770	48%
Ipinde	60	4%	Total	910	57%
Total	699	43%			

It is recommended that the block boundary be revised (see Table 6).

2.2.7 Conservation in Songea and Njombe Districts

In addition, although it is probably beyond the scope of the KILORWEMP project, it is recommended that the area south of the RAMSAR site be investigated for its conservation possibilities. Much of this land falls into the Songea and Njombe Districts and appears to be sparsely settled. Several conservation areas (hunting blocks/forest reserves) are found in this area (Ifinga, Mkongotema, Litumbandyosi and Gesimasowa). Both Ifinga and Mkongotema are part of the Ruhiji/Ifinga Open Area which is leased to Wembere Safaris, a sister hunting company to Kilombero North Safaris.

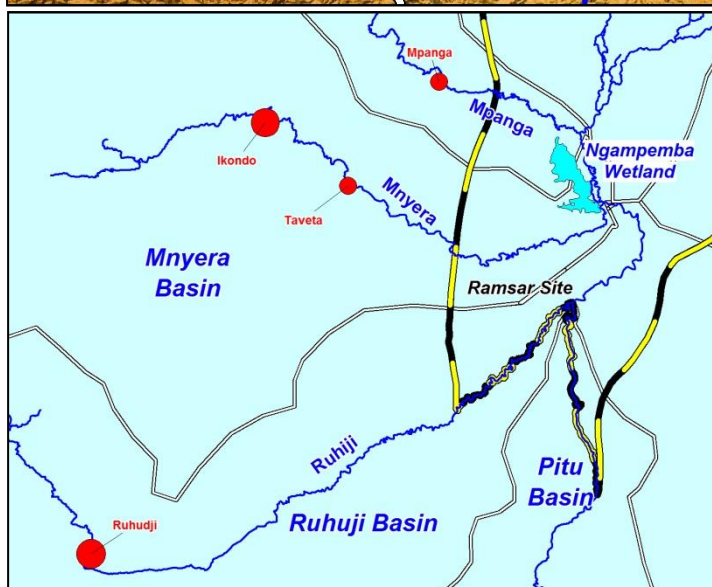
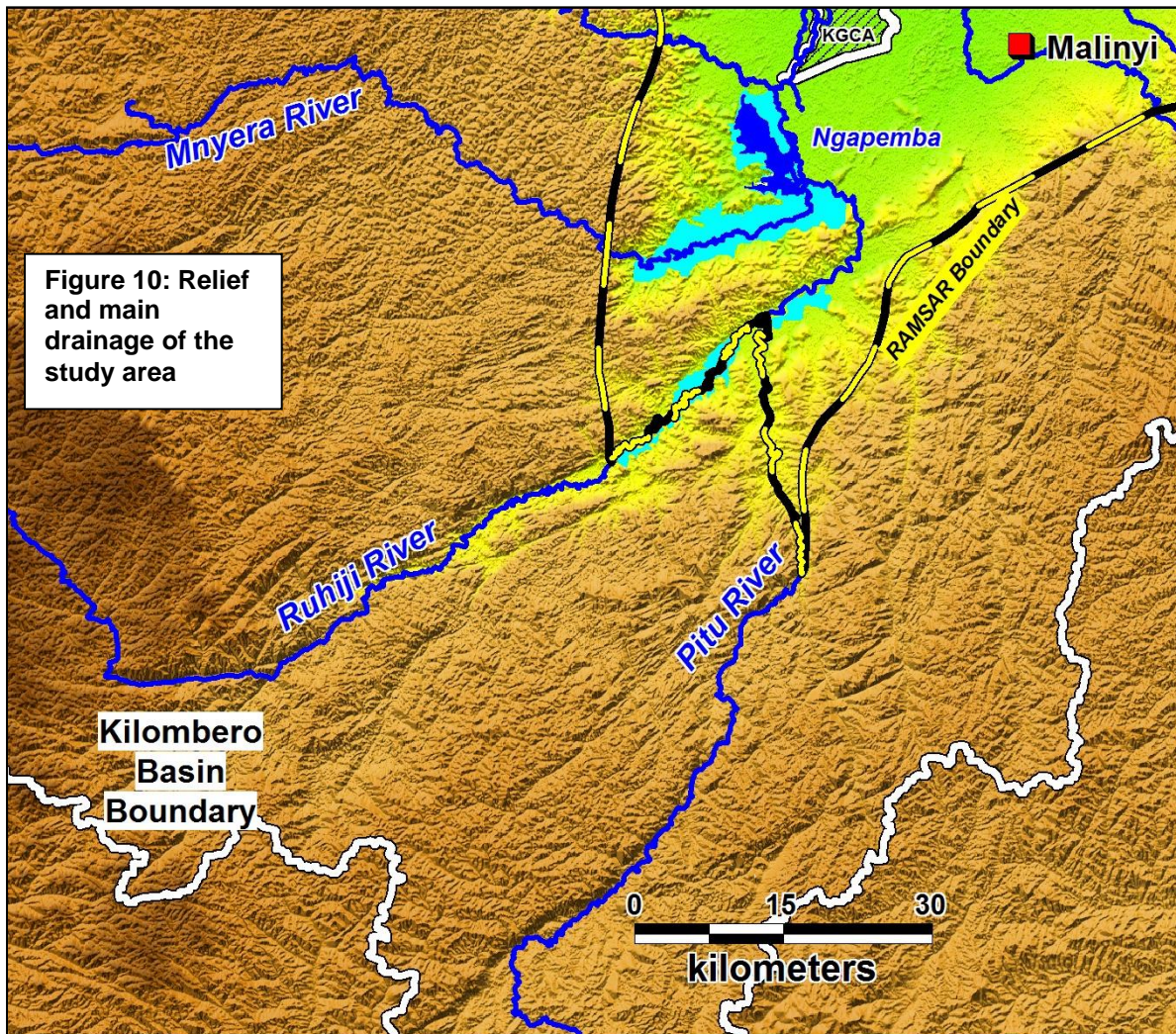


2.3 Preliminary Natural Resource Inventory

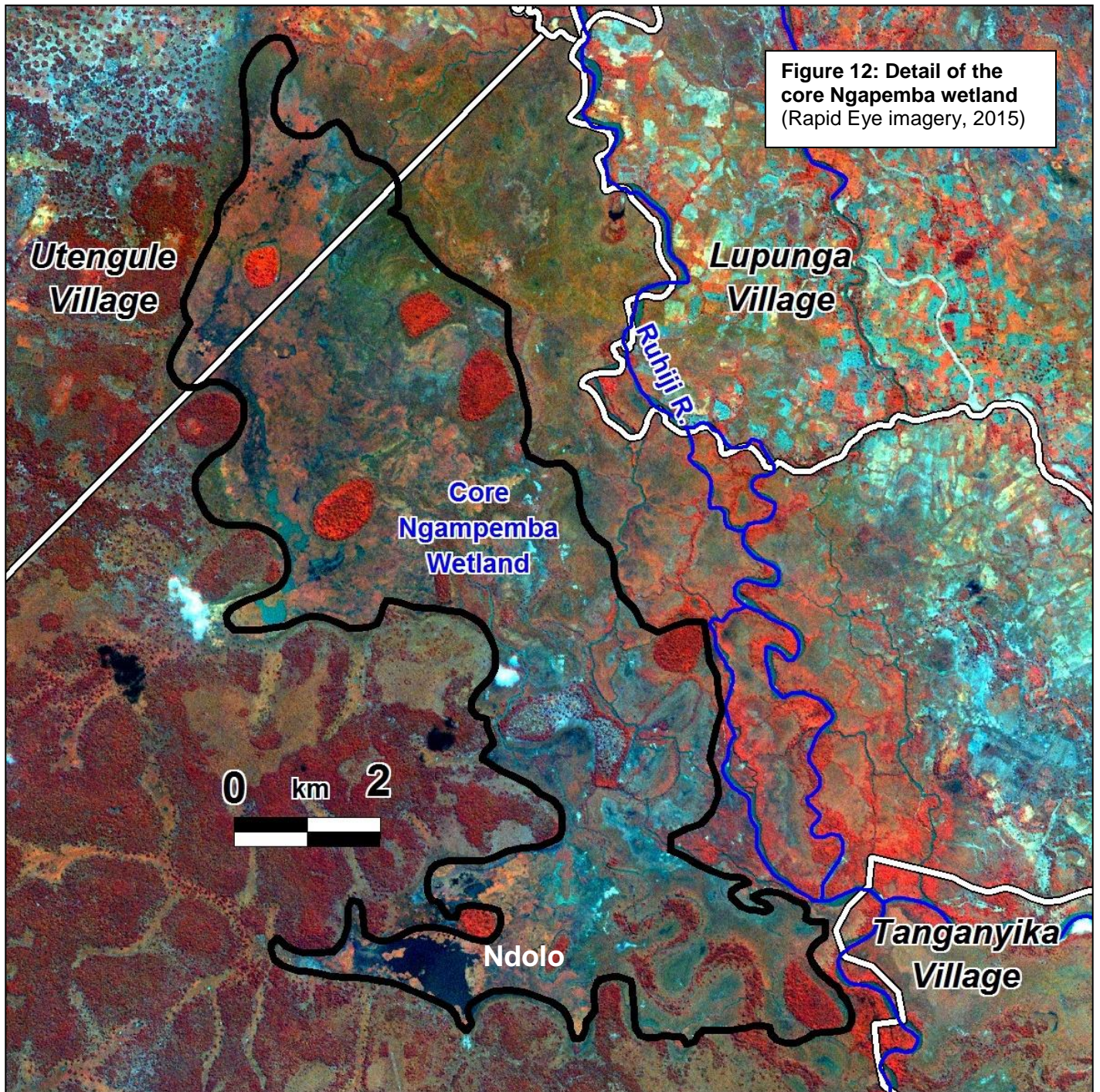
2.3.1 Relief, Hydrology and Drainage

The area is part of the Kilombero Basin

- Drained by Mnyera, Ruhiji and Pitu rivers
- Extensive wetlands at Ngapemba and Ndolo, fed by the Mnyera, Ruhiji and Mpanga rivers
- Elevation increases towards the south with the land becoming very broken and hilly
- Ruhiji and Pitu with significant valleys



Dams (red circles in the figure) are proposed for both the Mnyera and Ruhiji rivers. These are likely to go ahead. In addition, a dam is also proposed for the Mpanga River





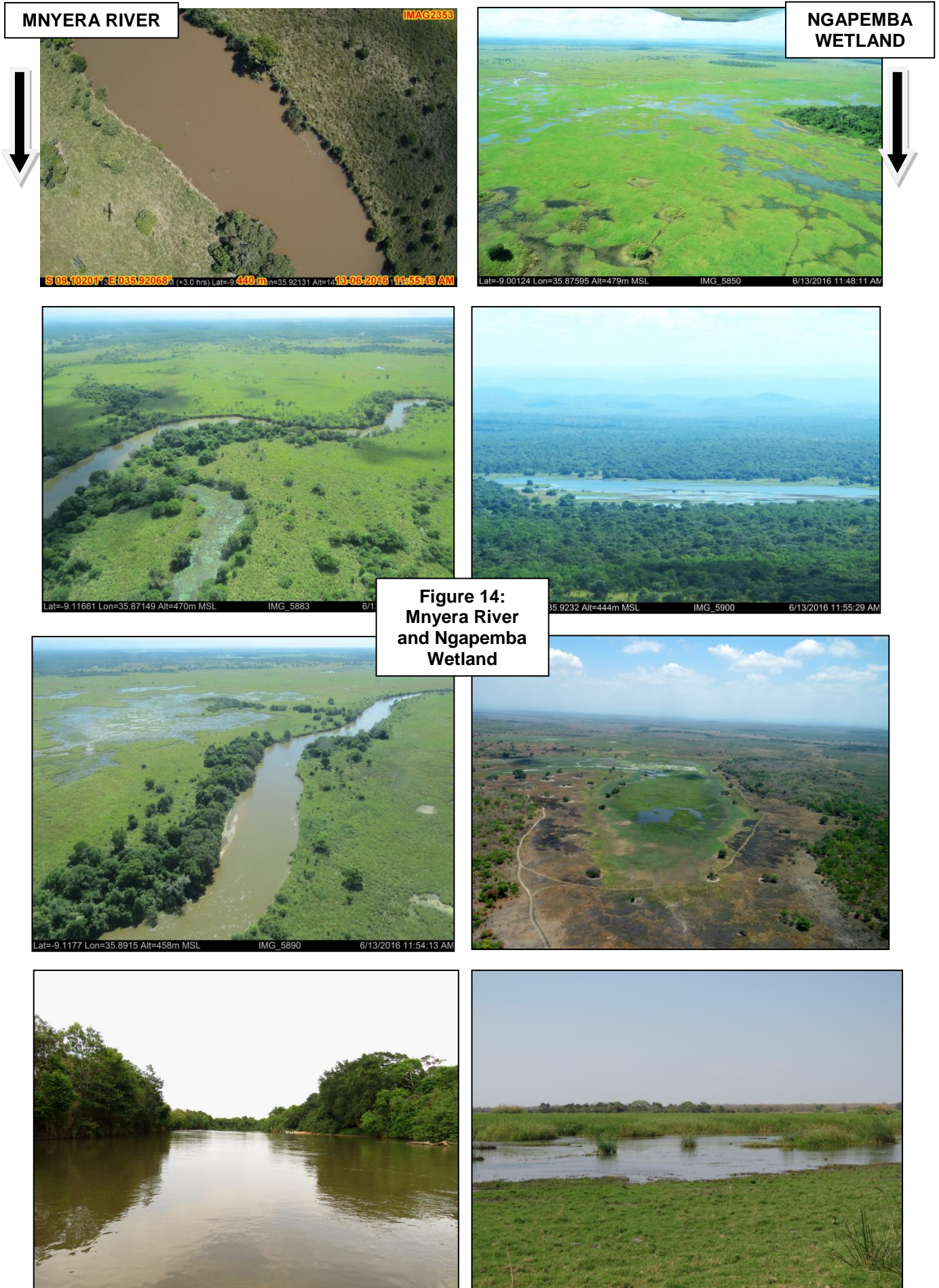


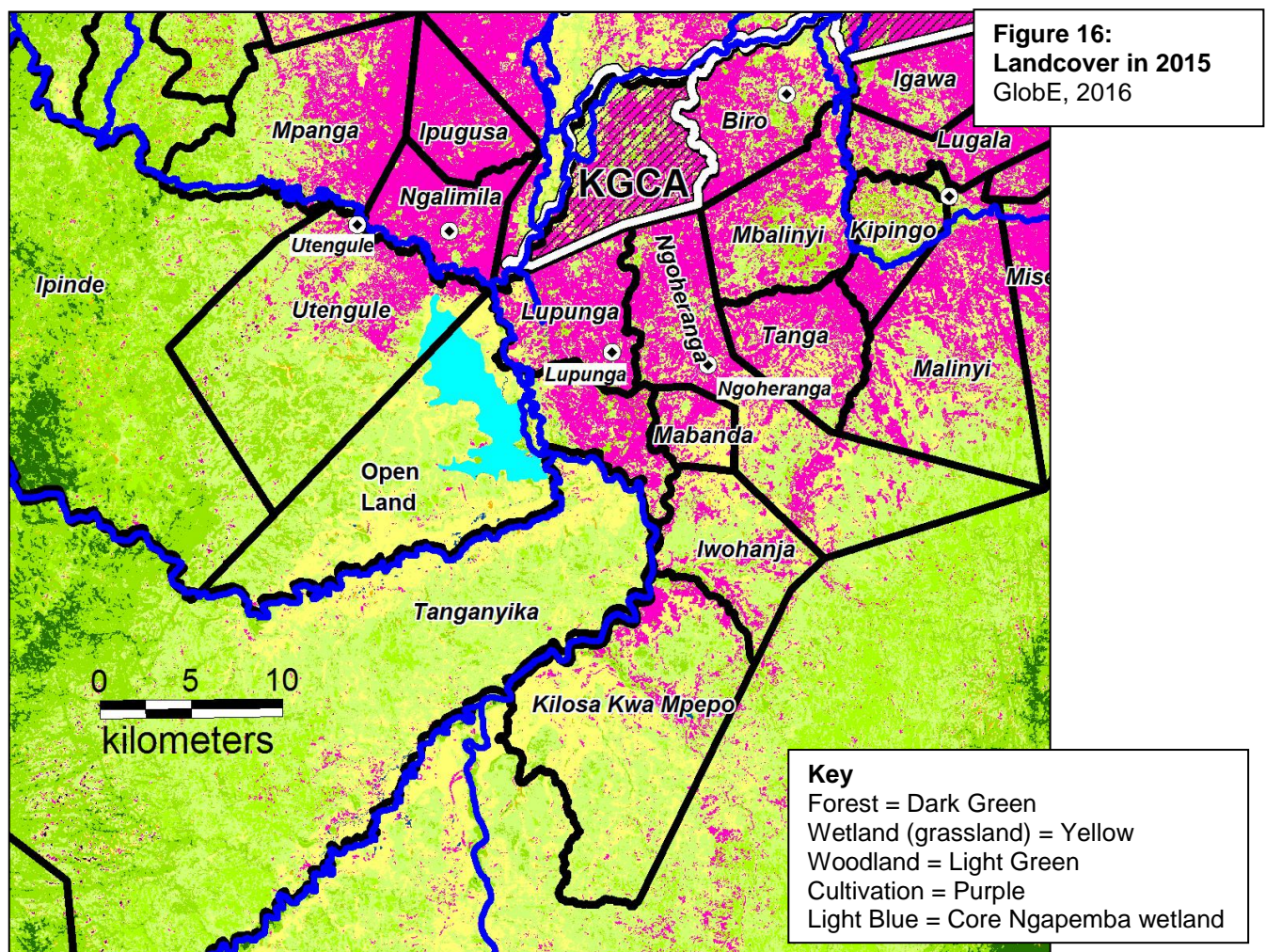


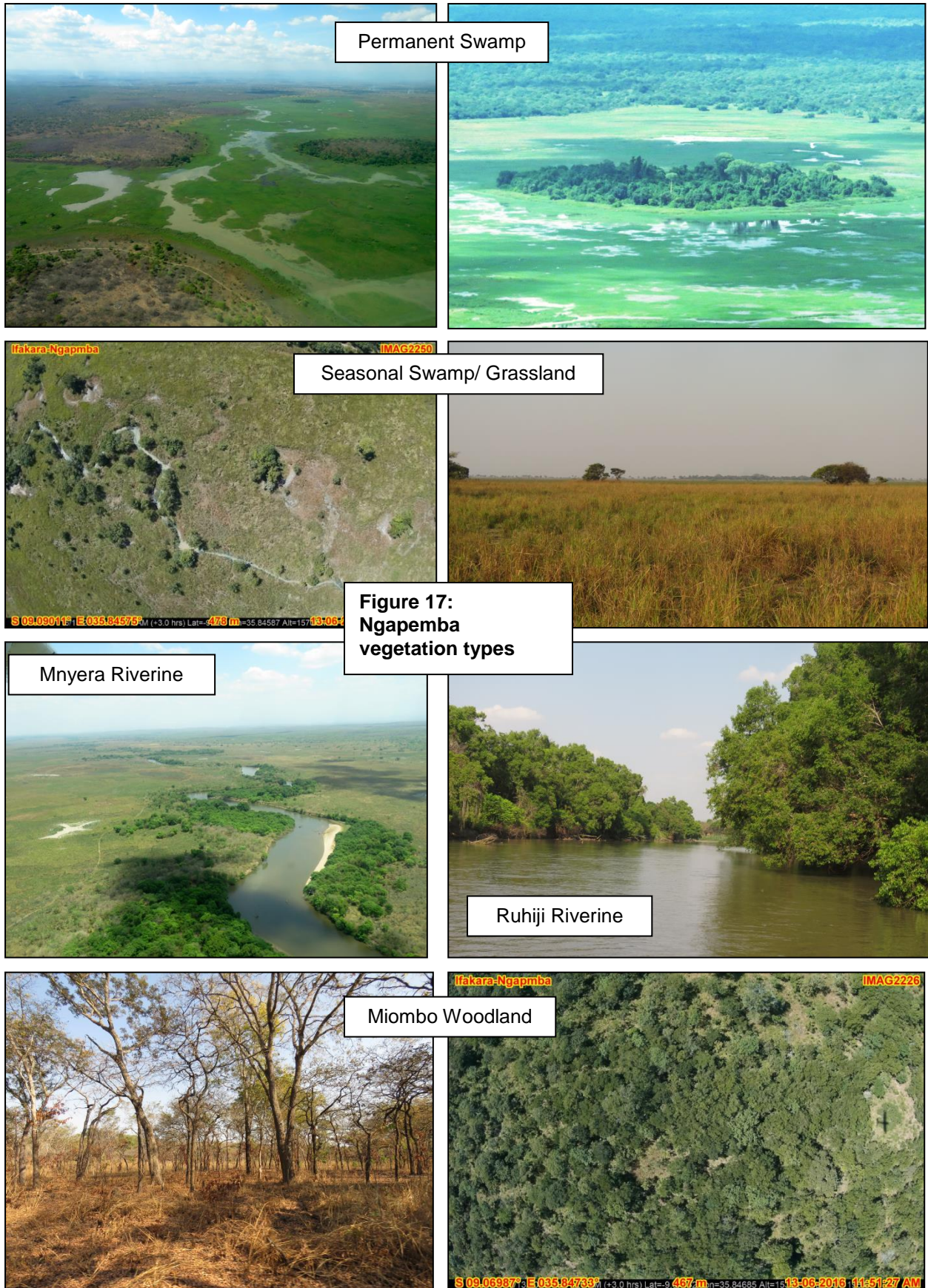
Figure 15: Ngapemba Wetland Areas

2.3.2 Vegetation

A major feature of the area are the seasonal and permanent wetlands of the Mnyera and Ruhiji rivers which feed the Ngapemba and Ndolo swamps. On the higher ground miombo woodland predominates. A brief overview of the vegetation types in the area is shown below.

Table 3: Brief Description of Vegetation Types in the Ngapemba Area	
Vegetation Type	Brief Description
Permanent Swamps	Two main areas of permanent wetland - Ngapemba and Ndolo (see Figure 15)
Seasonal Swamps	Extensive areas along the Mnyera and Ruhiji rivers. Most of this is visible as open grassland and subject to extensive burning during the dry season
Riverine Forest	Thin fringes along the main rivers. Well developed along parts of the Ruhiji
Forest	Several islands in the Ngapemba swamp support forest
Miombo Woodland	The dominant natural woodland on the upper slopes
Disturbed Ground	Meaning cultivation, settlement, pastoralist activities, etc. On the increase with grazing in the wetland areas of Ngapemba





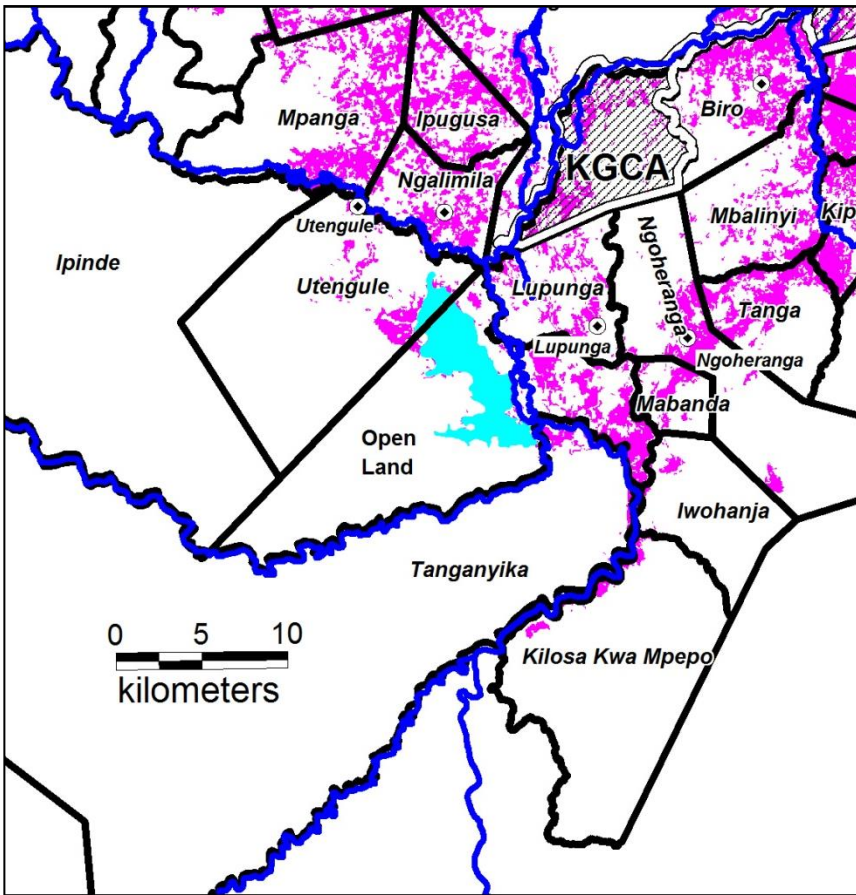


Figure 18:
Estimated extent of cultivation 2005
 SWOS, 2016
 Purple = Cultivation
 Light Blue = Ngapemba wetlands

Main differences 2005-2015

- Significant consolidation of cultivation in all villages to north of Ngapemba
- Increase in cultivation south of Utengule Village. Some new clearing during 2016 (after image date)
- Significant increase of cultivation along Ruhiji river in Kilosa kwa Mpepo village

"Open land" refers to non village land

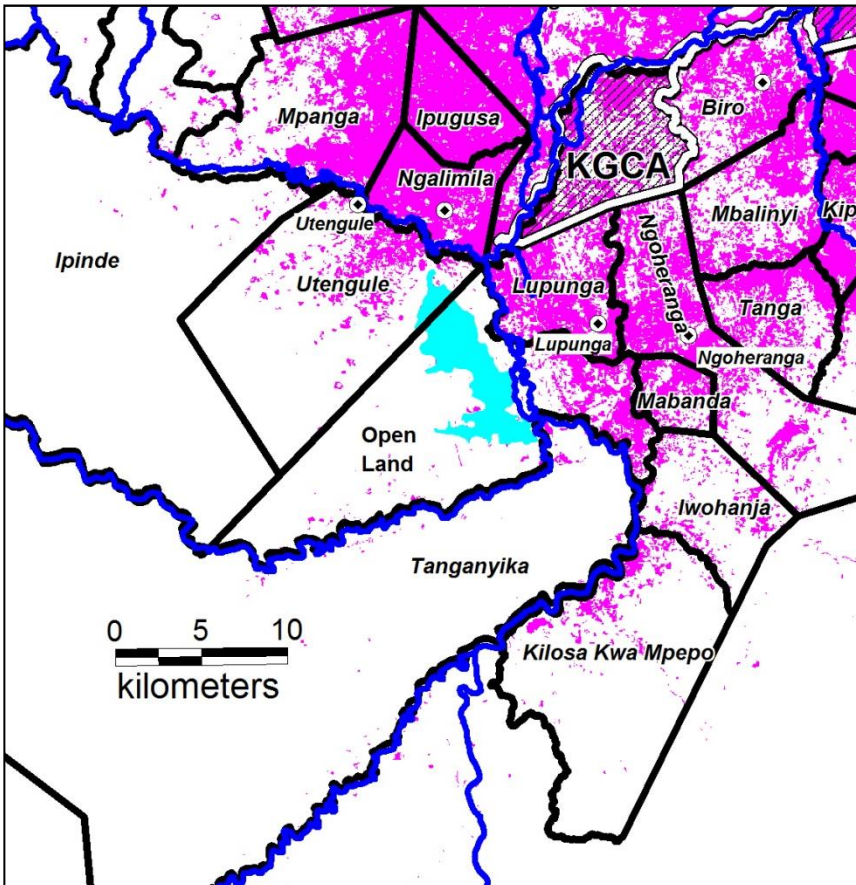


Figure 19:
Estimated extent of cultivation 2015
 SWOS, 2016

2.3.3 Wildlife

The area has significant wildlife populations, especially in the vicinity of the Ngapemba/Ndolo swamps and along the main rivers (Mnyera, Ruhiji and Pitu). Puku are common and are often found in the miombo woodlands. This area can be regarded as one of the strongholds for puku in Tanzania. A range of other species are found in the area and include elephant, buffalo, waterbuck, hartebeest, eland, sable and roan. The protection provided by the hunting company has led to increases in all species in the area (Kilombero North Safaris). No formal surveys have been carried out but the hunting company has estimates for the major species, especially in the vicinity of the Ngapemba wetland.

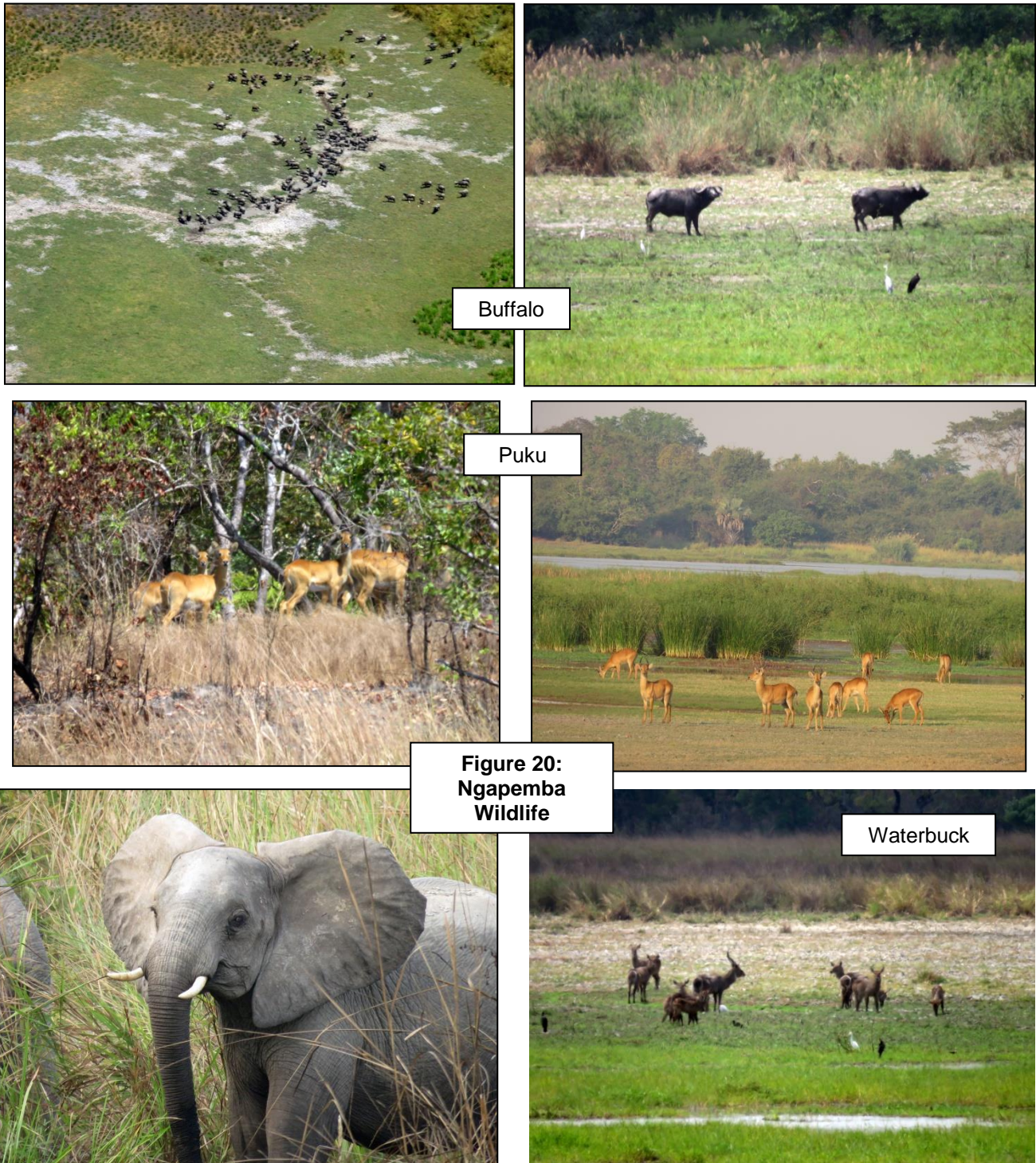
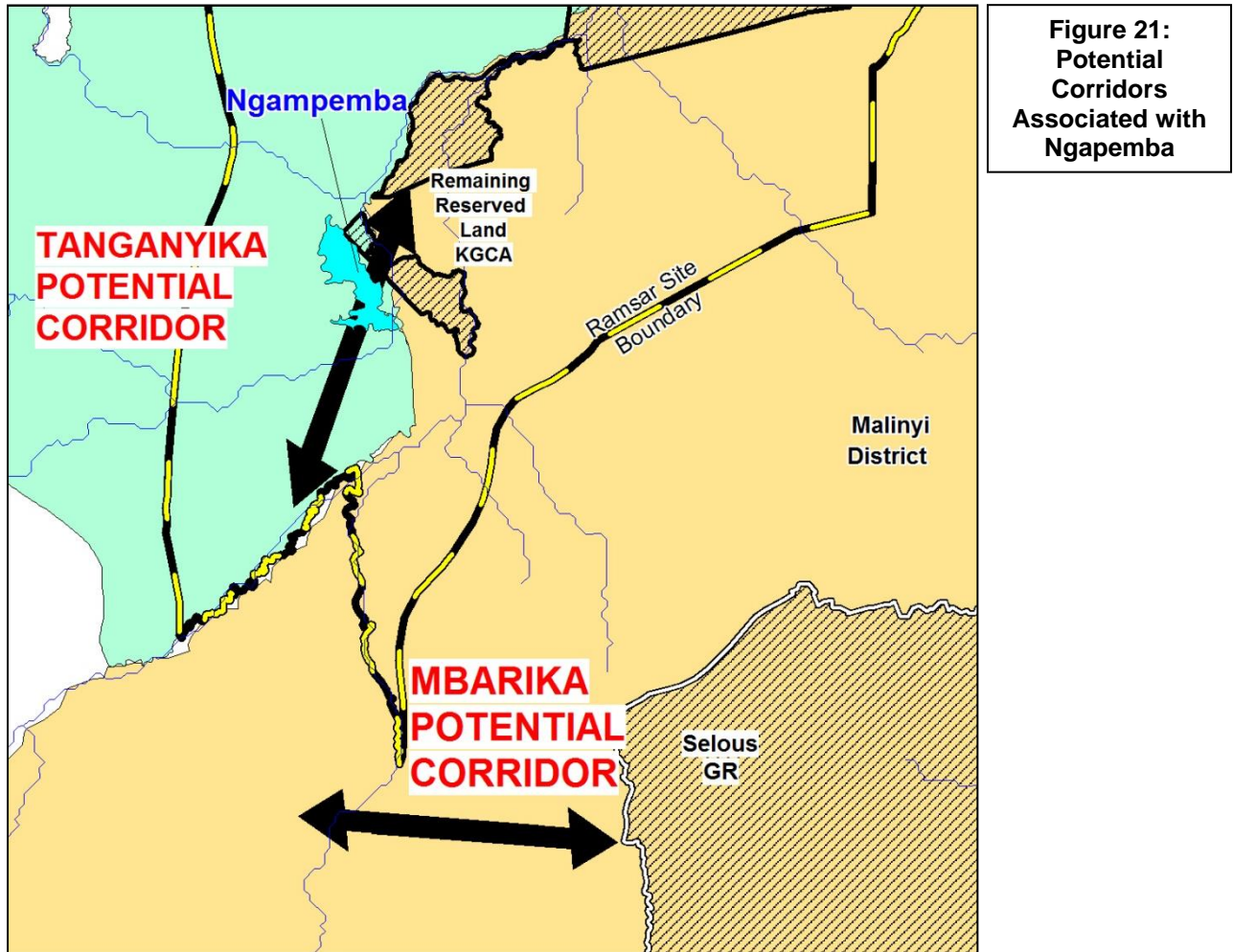


Figure 20:
Ngapemba
Wildlife

2.3.4 Wildlife Corridors

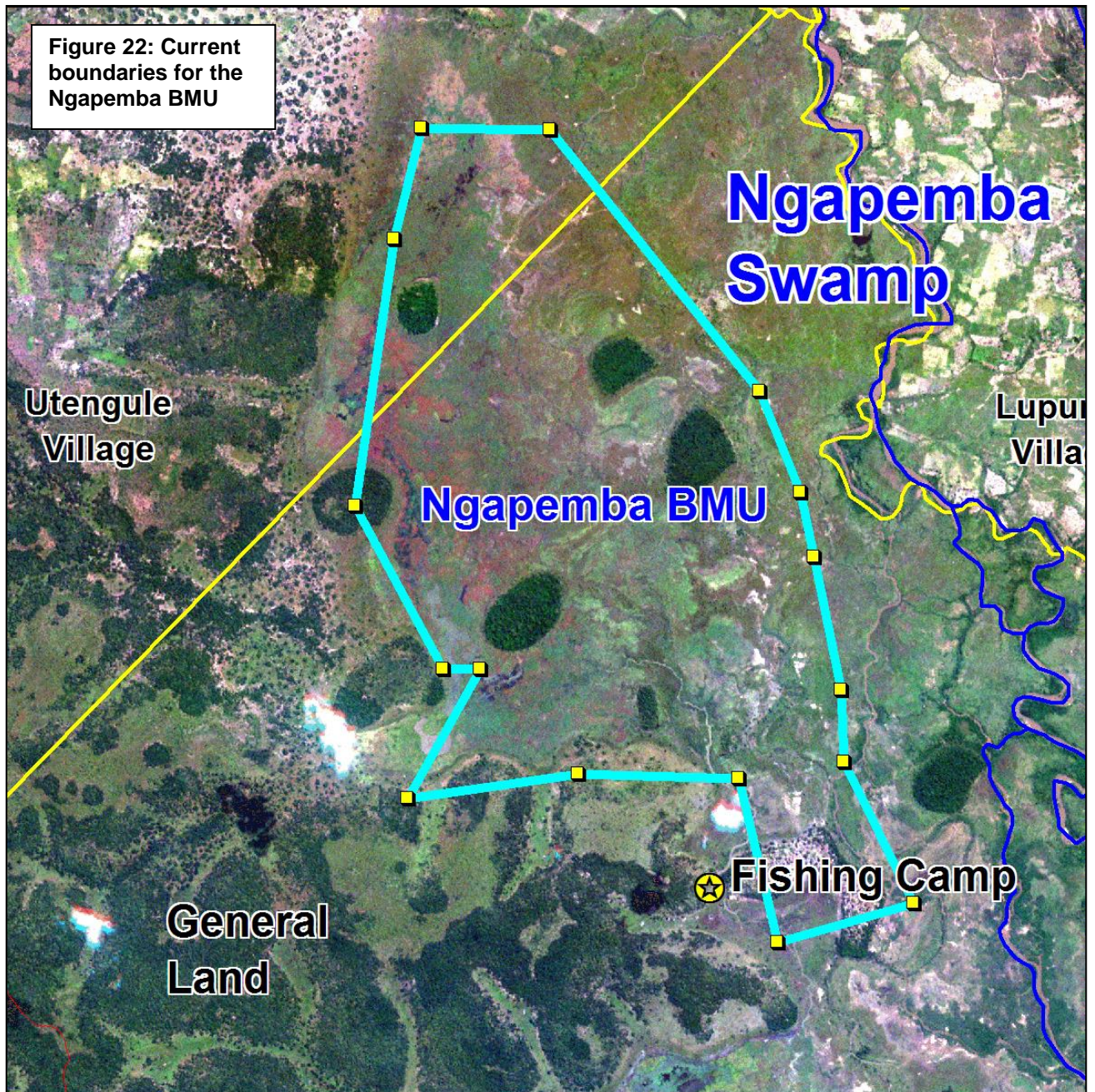
As the Ngapemba area represents one of the last remaining pockets of wildlife in the RAMSAR Site it represents an opportunity to be a source area for wildlife dispersal and connectivity to the proposed GCA on the valley floor and the Selous Game Reserve. However, the connectivity between Ngapemba and the proposed Kilombero GCA has been severely compromised by human activity (see Figure 19). Potential corridors were identified in the Land Diagnostic and these need to be investigated in more detail. As an example, river fringes could be protected under the Environmental Management Act of 2004.

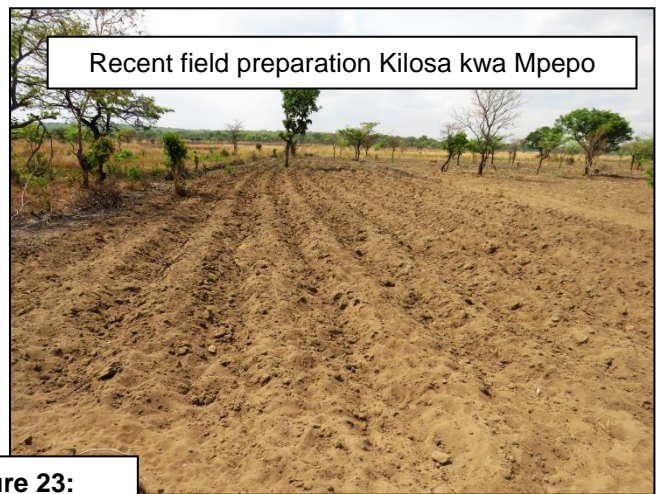
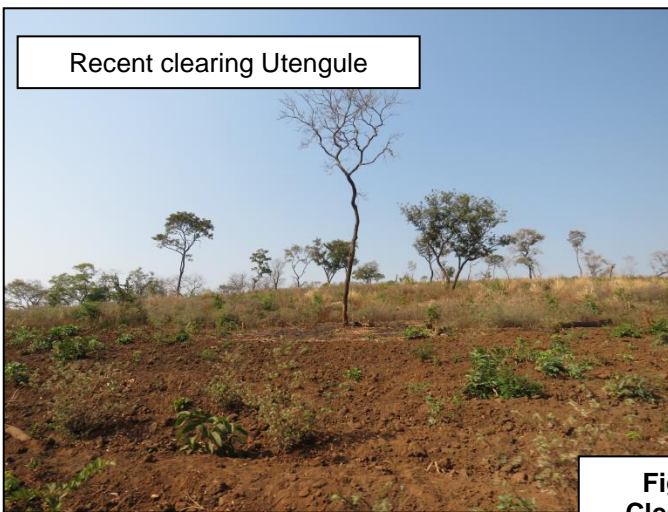
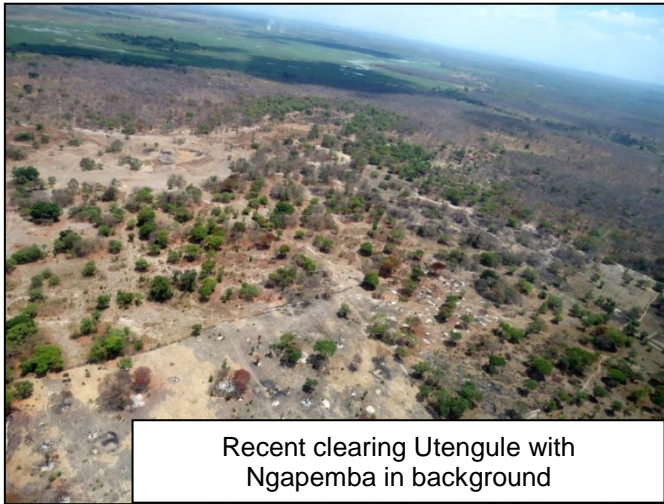


2.3.5 Current Utilisation

The table below summarises the use of the Ngapemba area.

Table 4: Current Utilisation of the Ngapemba Area	
Activity	Brief Description
Subsistence Fishing	<ul style="list-style-type: none"> • Ngapemba, a permanent fishing camp, was established in 1976 (location unknown, unless it the same as the one in Figure 16). • Fishers claim that KNS safaris were asked to remove cattle from the area in 2000 (KILOWEMP BMU Minutes 2013, 2014) and have since then prohibited fishing in the Ngapemba/Ndolo "Dam" area so currently there is no "legal" fishing in the swamp although there is "illegal" fishing • The area is part of a BMU under development (see Figure 16). • Although fishermen claim that the Ndolo area is an important fishing ground and a sacred area it is not part of the proposed BMU • Strong feelings at village level that the area should not to be a hunting area but be managed under CBNRM/BMU principles and used for fishing. They believe that the general land area (i.e. that not designated as any village) is part of Utengule village (KILOWEMP BMU Minutes 2013, 2014).
Farming	<ul style="list-style-type: none"> • Most farming activities are concentrated in the villages to the north and east Ngalimila, Lupunga and Mbanda • Clearing of areas for farming is recent and ongoing, especially in Utengule, Iwohanga and Kilosa Kwa Mpepo • Ngalimilia and Kilosa Kwa Mpepo are areas considered for irrigation in the future through the SAGCOT programme.
Livestock Grazing	<ul style="list-style-type: none"> • Livestock grazing occurs over much of the area, especially in the dry season. • Cattle distribution in dry season limited by water levels and KNS protection activities
Safari Hunting	<ul style="list-style-type: none"> • Although officially utilised under the Kilombero North Mlimba hunting area, there is little wildlife left in the Mlimba area (which follows the boundaries of the 1974 Kilombero GCA). • WD/TAWA have permitted utilisation of the General Land/Open area in Ngapemba by Kilombero North Safaris • Hunting block also extends over village land (Utengule, Ipinde and Tanganyika) • Company actively protects the area which may be the only reason for the continuance of the wildlife populations
Sport Fishing	<ul style="list-style-type: none"> • Carried out from two camps by Kilombero North Safaris - Dhala Camp (main camp on the Mnyera River) and Samaki Camp (on the Ruhudji River) mainly for Tiger Fish. • Approximately 120 km of river accessible, with 7 km of rapids • Average fish weight 8 lbs but some specimens of 20 lbs, which is considered remarkable in the sport fishing industry. • All fishing is catch and release





**Figure 23:
Clearing and
Settlement**





Figure 24:
Commercial
utilisation of the
area



3 OPTIONS AND RECOMMENDATIONS

3.1 Options Assessment

3.1.1 Protection Options

The possible options for providing improved legal and practical protection for the Ngapemba are outlined below.

Option	Background	Pros	Cons
New Game Reserve/ Game Controlled Area	<ul style="list-style-type: none"> • Can be declared under Part IV (Sections 14 and 16) of the 2009 WCA • Restrictions on use outlined in the Act (no cultivation; grazing under permit) • Income is directly to TAWA with specified sharing options for adjacent villages 	<ul style="list-style-type: none"> • Under direct control of TAWA/MNRT 	<ul style="list-style-type: none"> • Will require taking of village land and compensation for this • Will require staff and management structure
Inclusion into Selous	<ul style="list-style-type: none"> • The possibility of inclusion of this area into the Selous GR could be considered 	<ul style="list-style-type: none"> • Under direct control of TAWA/MNRT 	<ul style="list-style-type: none"> • Will require taking of village land and compensation for this • Stretching an already overburdened management structure • Planned upgrade of the road between Malinyi and Songea may render this option unviable.

Table 5: Legal Options for Improved Protection of the Ngapemba Area

Option	Background	Pros	Cons
Wildlife Management Area	<ul style="list-style-type: none"> • A Wildlife Management Area is an area of communal land set aside exclusively as habitat for wildlife by member villages. Villages need to be willing to establish the WMA • Can be declared under Part V (Sections 31 to 33) of the 2009 WCA. (see text box next page for procedure summary). • WMAs may be established in areas which are (i) outside of core protected areas; (ii) used by local community members; and (iii) within village land. • Hunting rights are usually put out to tender 	<ul style="list-style-type: none"> • Does not require alienation of village land • Only a few villages involved so process may be simpler • Likely high financial viability due to existing hunting/fishing operation by Kilombero North Safaris • Donor support easier • Increased conservation incentives from nearby villagers due to revenue stream from concession 	<ul style="list-style-type: none"> • Establishment of WMAs can be time consuming • Lower revenues to Government as income to be split between WMA, LGA and TAWA as per WMA regulations
Game Ranch	<ul style="list-style-type: none"> • A game ranch is defined as a fenced or non-fenced wildlife area of extensive multiform utilisation of wildlife species where a wide range of complementary wildlife management practices are professionally managed so as to render them compatible, including sport hunting, cropping, sale of live animals, tourism and fishing (Wildlife Conservation (Non-Consumptive Wildlife Utilization) Regulations, 2007). • Villages with land in the conservation area would need to grant derivative rights to the project proponent. The basis of derivative rights lies in the Village Land Act (Cap. 114/2002; Section 32).. • The project proponent would need to apply for user rights for the area from WD/TAWA in terms of the Wildlife Management Area Regulations, the Non-Consumptive Regulations and the Tourist Hunting Regulations, depending on the activities that it will undertake in the area. 	<ul style="list-style-type: none"> • Partnership between land holders and commercial entity. And possibly much simpler and quicker to establish than a WMA. 	<ul style="list-style-type: none"> • Relatively untested form of protection

Table 5: Legal Options for Improved Protection of the Ngapemba Area

Option	Background	Pros	Cons
Wetlands Reserves and Areas	<ul style="list-style-type: none"> • Can be declared under Part IV (Section 16) of the 2009 WCA (although the wording of Section 16 is weak in this regard) • Regulations can be made in conjunction with Minister of Environment (Sect 16(3)) • Wetland Reserves can also be declared under Section 56 of the 2004 Environmental Management Act. Regulations for wetlands can be defined through the Environmental Management (Sustainable Management Of Wetlands) Regulations, 2015) 	<ul style="list-style-type: none"> • Multiple use permitted • Management could be entrusted to TAWA from Vice Presidents office 	<ul style="list-style-type: none"> • Regulations and use restrictions not yet gazetted, although in process. Details of this unclear. • New type of protected area so some suspicion
Corridors, Dispersal Areas etc	<ul style="list-style-type: none"> • Can be declared under Part IV (Section 22) of the 2009 WCA • Dispersal area is "an area habitually used by wild animal species for feeding, laying, storing eggs, rearing of feeding young and includes breeding places" • Regulations for these areas will need to be defined under the Act (Sect 22(3)) 		<ul style="list-style-type: none"> • No regulatory definition for a "corridor" • Regulations and use restrictions not yet gazetted. Not sure what these will be or how long they will take to be promulgated.
Species Management Area	<ul style="list-style-type: none"> • Can be declared under Part IV (Section 23) of the 2009 WCA • "Area subject to active intervention for management purposes in order to ensure the maintenance of habitat or to meet the requirements of specific species", • No specific regulations required under the Act 		<ul style="list-style-type: none"> • Regulations and use restrictions not yet gazetted. Not sure at what stage these are

Table 5: Legal Options for Improved Protection of the Ngapemba Area

Option	Background	Pros	Cons
Hunting Block	<ul style="list-style-type: none"> • Under the Act is "any area with game animals delineated or set aside and approved by the Director for trophy hunting". Such as the current status for Ngapemba • Conceivably any area defined as a protected area outside national parks and the Ngorongoro Conservation Area can also become a hunting block 	<ul style="list-style-type: none"> • Already existing 	<ul style="list-style-type: none"> • Conflict issues with adjacent villages • Settlement and land conversion on general land is permitted. New villages could be declared on general land

Summary of Steps for the Declaration of a WMA

- Village Assembly meeting or meetings in the relevant village or villages must decide to form a WMA on the village lands.
- Once this has happened the villages must form a CBO to represent the community members and manage the WMA. This CBO must have a constitutions, rules of membership, qualifications of office bearers, financial management procedures, etc
- The CBO is to prepare Land Use Plans (LUPs) for the relevant villages. These LUPs should show where the proposed WMA will lie in the village or villages' lands, they should follow the procedures laid out by the National Land Use Planning Commission
- The CBO must form a General Management Plan, or alternatively as an interim measure (for up to five years) can compose a more basic Resource Management Zone Plan providing for the zonation of resource uses in the proposed WMA
- After completing the above prerequisites, the CBO can apply to the Director of Wildlife for the Minister to declare for the CBO to become an AA and gazette the WMA. If the application is approved by the Director, and the WMA is gazetted, the CBO becomes an Authorized Association (AA), which then applies for a user right

3.1.2 Recommendations

1. As the Ngapemba wetland and its associated game rich areas is on general and village land it would make sense to pursue an option that takes this into account. The two main options are
 - Establishment of a WMA
 - Establishment of a Game Ranch
2. Both of these options have pros and cons. WMA establishment has a time-consuming procedure that has to be followed. The process can take years. Game Ranches are a relatively untested form of wildlife conservation and utilisation area in Tanzania (One has been established at Makao). The procedure for establishment could be more straightforward and take less time than that for WMAs. The past performance of other WMAs has attracted scrutiny with regard to their conservation effectiveness. In this case the risk of this may be mitigated by the small number of villages involved and the current effective use of the area as a tourism area.
3. The possibility of establishing a new game reserve, or of including this area into the Selous could be considered. However, alienation of village land to form a protected area will require acquisition of land with the attendant compensation liabilities. In addition, the Malinyi to Songea road runs between Ngapemba and Selous and development along this road is expected to increase, especially once the planned road upgrade becomes a reality.
4. Decisions on the way forward need to be taken by the MNRT and implemented as soon as possible. Delays in the legal consolidation of this wildlife area could have deleterious effects on its conservation status.
5. Work on defining the potential corridors and recommendations for their consolidation needs to be undertaken. This is part of a larger study for the integrated management plan but of particular interest here are the "Tanganyika" and "Mbarika" corridors.
6. Work on a "wetland management plan" for the Ngapemba area is considered as part of the integrated management plan process (along with some other areas). This will be separate from any management plan for the new WMA/ protected area.
7. Whatever protected area option is chosen it will legally require a management plan. This, and the work on the corridors and wetlands should be consolidated as far as possible to avoid duplication.
8. In addition, although it is probably beyond the scope of the KILORWEMP project, it is recommended that the area south of the RAMSAR site be investigated for its conservation possibilities. Much of this land falls into the Songea and Njombe Districts and appears to be sparsely settled. Several conservation areas (hunting blocks/forest reserves) are found in this area (Ifinga, Mkongotema, Litumbandyosi and Gesimasowa). Both Ifinga and Mkongotema.
9. The redefinition of the RAMSAR boundary in this southern area should be considered. This would allow the wetland areas associated with the Ruhiji and Pitu rivers in the Songea District to be included. This possibility would require some work on the definition of the wetland boundary based on a more detailed ecological and land tenure assessment.

3.2 Follow On Work

Follow on work should concentrate on ensuring that the Ngapemba area attains a more secure conservation status. The steps to ensure this are outlined below

Table 6: Follow on work for Ngapemba		
#	Task	Description
1	Resource Inventory "Ngapemba Block" and surrounding villages	Ngapemba to include General Land and Village Land. Detailed mapping and definition of wildlife area taking into account dispersal areas and village land uses. Sociological assessment of neighbouring villages, land use and resource access practices <i>Local consultants with international input for vegetation, wildlife and sociological aspects to prepare the way for a land use plan/ management plan (required for all options - Pesambili/Mombo/Games)</i>
2	Detailed mapping and GIS	Detailed mapping wetland areas - Ngapemba, Ndolo. Ruhiji. Also pursued under Integrated Management Plan Mapping of recent clearing - Utengule, Tanganyika Update of GIS - Songea data (Game Reserves, Village Boundaries) <i>Imagery and Drone mapping Digitising of roads, rivers etc. Collection of existing data from Songea</i>
3	More detailed investigation of corridors	Songea District to Litumbandyosi O.A./Gezamasua F.R. Mbarika Corridor to Selous. Tanganyika corridor to north of Ngapemba. See also Corridor Report.. Also pursued under Integrated Management Plan <i>More detailed analysis and ground truthing. Village consultations</i>
4	Conservation options feasibility	More focussed assessment and consultation for preferred options including consultations with concerned villages and quantification of cost/benefits of priority options. Harmonization with management instruments (VLUPs, BMU) of neighbouring areas. Identification of proposed boundary taking into account conservation and resource access components.
5	Decision	Decision taken by TAWA/WD in consultation with LGA and villages on the type of protection option to pursue
6	Follow-on establishment process	Depending on the conservation measures eventually agreed upon, these would require pursuing the steps foreseen under the relevant legal and regulatory framework, i.e, WMA establishment (WC Act 2009 and WMA regulation 2012); or GR establishment with acquisition of land (Village Land Act; Land Acquisition Act) with associated need for resettlement process framework.
7	Management Plan	Whatever option is pursued for protection a management plan will be required. The inputs for this will be produced under (1) above

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Rapid Eye imagery, 2015

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ANNEX: AVAILABLE IMAGERY AND PHOTOGRAPHY

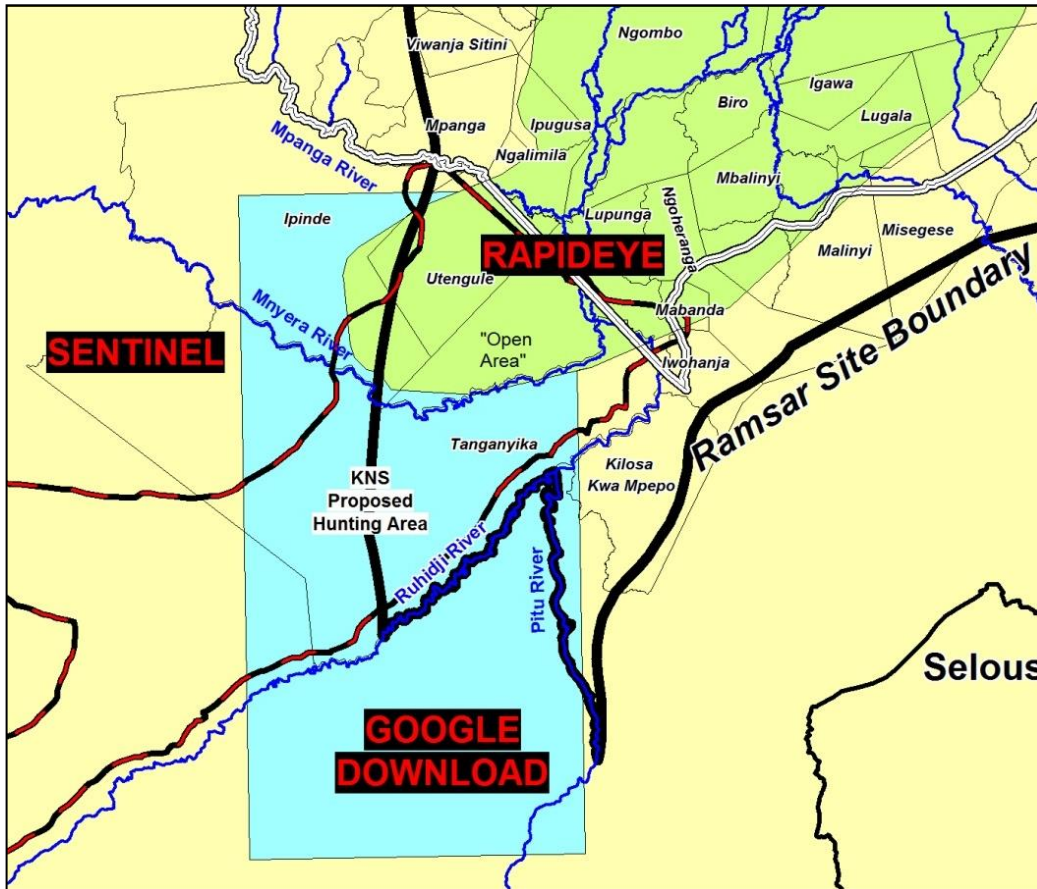


Figure 25: Outline of imagery available for the study area

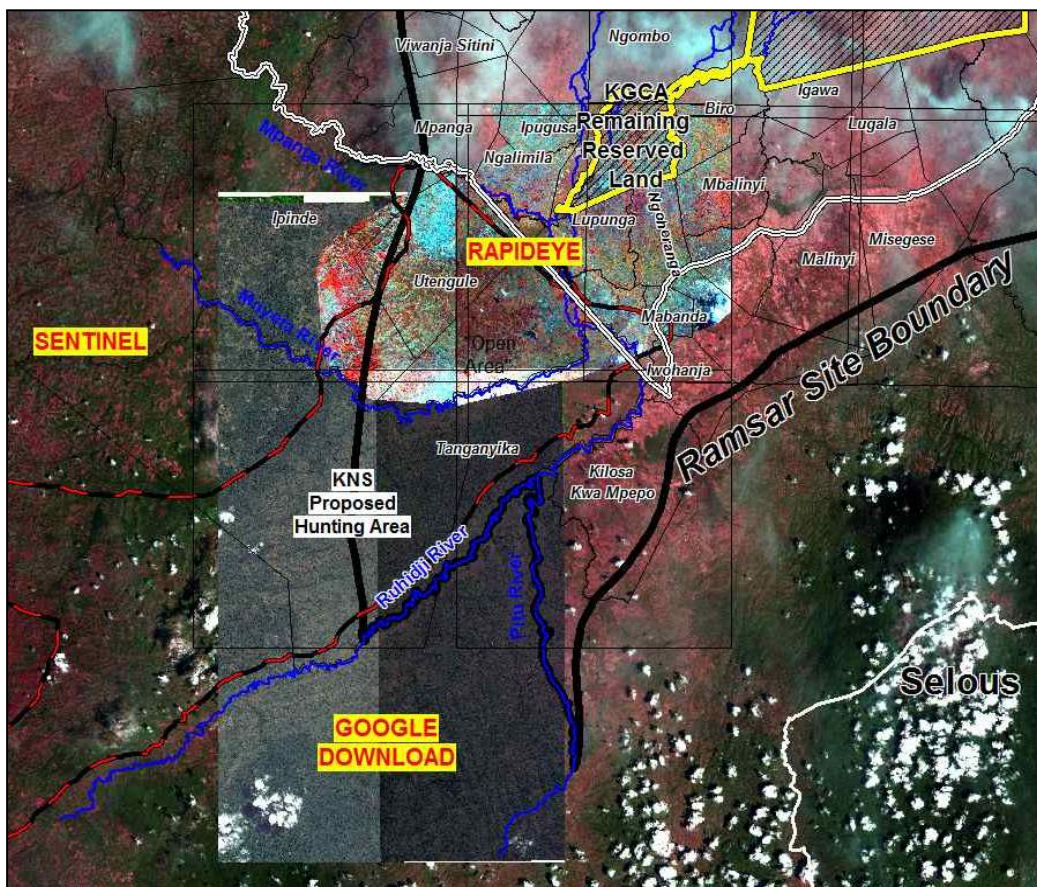


Figure 26: Imagery available for the study area

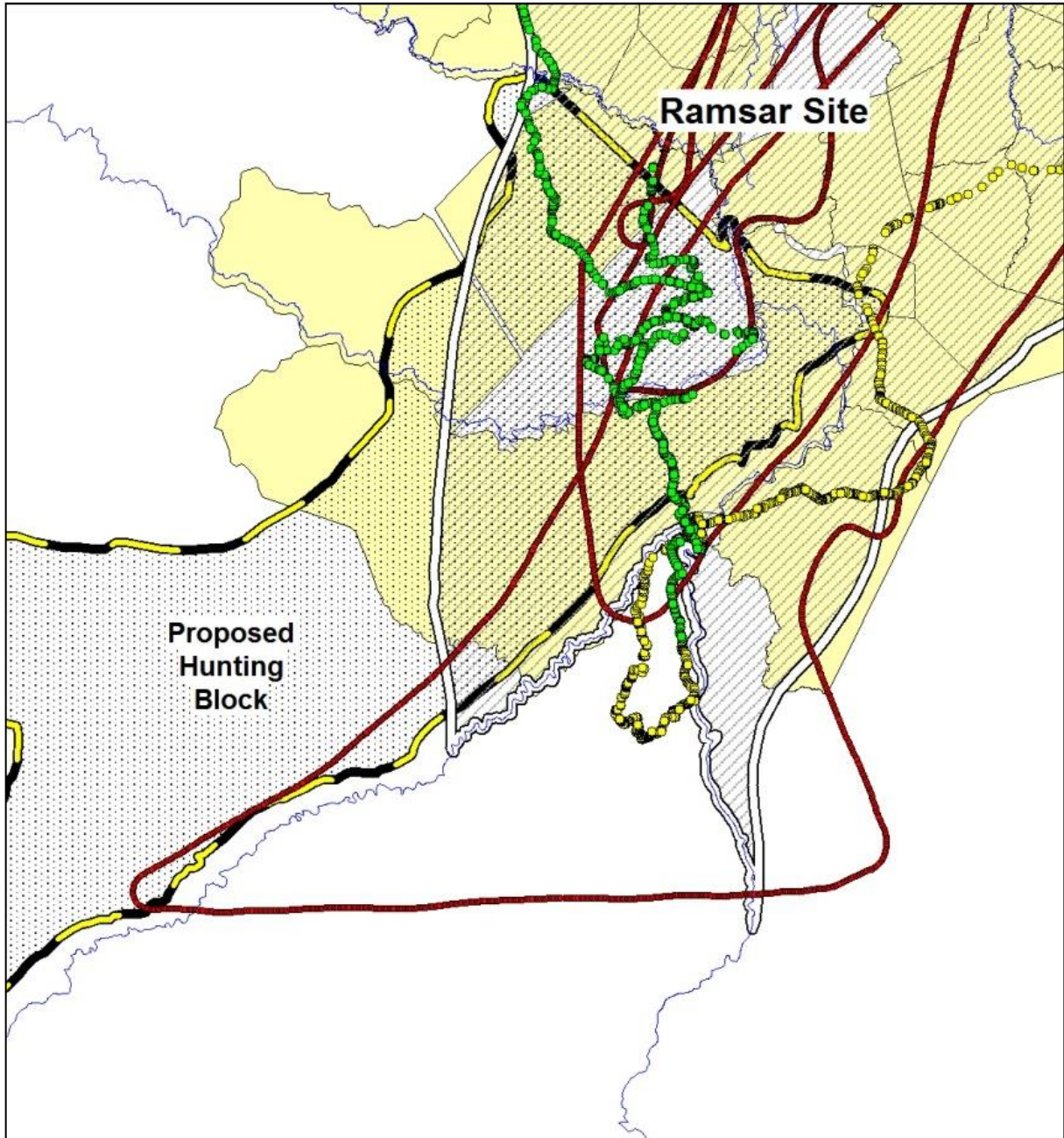


Figure 27:
Georeferenced
photography
available for the
study area