



# Wof Washa Community Based Eco-Tourism Project Environmental Impact Assessment and Environmental Management Plan



VIEW OF WOF WASHA FOREST (PHOTO: LIZ SPOONER)

Sustainable Natural Resources  
Management Association



**DOCUMENT CONTROL**



**Wof Washa CBET Environmental Impact Assessment and Environmental Management Plan**

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## CONTENTS

<b>Environmental Impact Assessment .....</b>	<b>9</b>
1 Introduction.....	9
2 Proposed development.....	9
Description of Campsites .....	11
3 General Environmental Conditions .....	13
3.1 Climate .....	13
3.2 Soils and Topography.....	13
3.3 Biodiversity.....	14
Flora .....	14
Fauna.....	15
Birds.....	17
4 Campsites .....	18
4.1 Wof Washa Genete .....	18
General description.....	18
Biodiversity .....	23
Sensitive areas .....	24
Human Settlement.....	25
Cultural Heritage.....	25
Operational Water .....	25
Operational Energy .....	26
Access to the site .....	26
4.2 Mescha .....	26
General description.....	26
Biodiversity .....	29
Sensitive areas .....	30
Human Settlement.....	30
Cultural Heritage.....	31
Operational Water .....	31
Operational Energy .....	31

Access to the site .....	31
General description.....	31
Biodiversity .....	34
Sensitive areas .....	36
Human Settlement.....	36
Cultural Heritage .....	37
Operational Water .....	37
Operational Energy .....	38
Fuel for cooking.....	38
Access to the site .....	38
4.4 Gosh Meda .....	38
General description.....	38
Biodiversity .....	40
Sensitive areas .....	41
Human Settlement.....	41
Cultural Heritage .....	41
Operational Water .....	42
Operational Energy .....	42
Fuel for cooking.....	42
Access to the site .....	42
5 Day Camps .....	42
5.1 Anget Mewugia .....	42
General description.....	42
Biodiversity .....	46
Sensitive areas .....	47
Human Settlement.....	48
Cultural Heritage .....	48
Operational Water .....	48
Operational Energy .....	49
Access to the site .....	49
5.2 Meniliki’s Window.....	49
General Description .....	49

Biodiversity .....	51
Human Settlement.....	51
Cultural Heritage.....	52
Operational Water .....	52
Operational Energy .....	52
Access to the site .....	52
<b>Environmental Management Plan.....</b>	<b>53</b>
Campsites .....	53
Wof Washa Genete .....	53
Biodiversity .....	53
Sensitive areas .....	54
Human Settlement.....	54
Cultural Heritage.....	54
Operational water.....	55
Mescha.....	55
Biodiversity .....	55
Sensitive Areas.....	55
Operational water.....	56
Lay Gorobela Kundi.....	56
Human settlement .....	56
Cultural Heritage.....	57
Biodiversity .....	57
Sensitive areas .....	58
Human settlement .....	59
Cultural heritage .....	59
Operational Water .....	59
Gosh Meda.....	60
Biodiversity .....	60
Operational water.....	61
Energy for lighting.....	61
Human settlement .....	61
Day Camps .....	62

Anget Mewugia .....	62
Biodiversity .....	62
Operational water .....	62
Cultural heritage .....	63
Menelik’s Window .....	63
Human Settlement.....	63
Operational water.....	63
<b>Appendix 1 – References .....</b>	<b>64</b>

Photo 1 - Wof Washa Genete: ARea 1 .....	20
Photo 2 - View to North AREa 1 Wof Washa Genete .....	21
Photo 3 - View to West AREa 1 Wof Washa Genete .....	21
Photo 4 -View to east Area 1 Wof Washa Genete.....	21
Photo 5 -View to South area 1 wof washa genete .....	21
Photo 6 - Wof Washa Genete: Area 2 near juniper plantation .....	22
Photo 7 - Wof Washa Genete: Juniper Plantation.....	22
Photo 8 - Wof washa genete: area 2 view to north.....	22
Photo 9 - wof washa genete: area 2 view to west.....	23
Photo 10 - wof washa genete: area 2 view to east.....	23
Photo 11 - Wof washa genete: area 2 view to south .....	23
Photo 12 - Undeveloped spring Wof Washa Genete.....	25
Photo 13 - Aerial photo of mescha site and surrounding area.....	27
Photo 14 - View of north side of Mescha campsite (looking up slope).....	28
Photo 15 - View of south of Mescha site (looking down slope) .....	28
Photo 16 - View to North of Mescha campsite.....	28
Photo 17 - View to West of Mescha Campsite .....	29
Photo 18 - view to east of mescha camp .....	29
Photo 19 - View to south of mescha camp .....	29
Photo 20- Patches of red hot pokers and other flora.....	30
Photo 21 - residence to the east of mescha campsite .....	31
Photo 22 - Aerial photos of Lay Gorobela Campsite and village .....	32
Photo 23 - Kundi campsite: view to north .....	34
Photo 24 - Soil mounds from mole rats.....	35
Photo 25 - Existing undeveloped spring located to the west of Kundi village and south west of campsite.....	38

Photo 26 - Aerial photo: Gosh meda .....	39
Photo 27 - Anget mewugia: Proposed day camp site.....	43
Photo 28 - Anget mewugia: understory in proposed day camp area.....	43
Photo 29 - Anget Mewugia: view of site from above .....	43
Photo 30 – anget mewugia: Proposed location of composting toilet .....	44
Photo 31- Anget Mewugia View to north of site .....	45
Photo 32 - Anget Mewugia: View to West of site .....	46
Photo 33 - Anget mewugia: View to east of site .....	46
Photo 34 - Anget Mewugia: View to South from site .....	46
Photo 35 - Anget mewugia: watercourse and spring to the south west of camp site .....	48
Photo 36 - Aerial photo: menelik's window .....	51

## Acronyms

CPEF	Critical Ecosystem Partnership fund
SUNARMA	Sustainable Natural Resource Management Association
SET	Sustainable Natural Resource Management Association Ethiopia
SUK	Sustainable Natural Resource Management Association United Kingdom



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# ENVIRONMENTAL IMPACT ASSESSMENT

## 1 INTRODUCTION

In collaboration with local communities and local government administrators, Sustainable Natural Resource Management Association (SUNARMA) plans to undertake the development of community based ecotourism enterprises within and adjacent to Wof Washa Natural Forest. These activities are being undertaken as part of the Wof Washa Natural Forest Community Based Ecotourism Project which is being funded by Critical Ecosystem Partnership Fund (CEPF) and SUNARMA UK (SUK). The development of these enterprises includes the establishment of five campsites and a number of trekking routes. Further expansion, comprising of additional treks, day camps and campsites, is also planned for the future.

This assessment identifies the environmental aspects of the proposed campsites, day visit sites and treks and potential impacts associated with their design, construction and operation. Management measures identified in this report are included in Wof Washa Community Based Eco-Tourism Environmental Management Plan (EMP) which will be implemented during the delivery of the project.

The information in this assessment is based on site visits undertaken during December 2013 by Liz Spooner, SUNARMA's Environmental Officer and review of reference materials listed in appendix 1 of the report.

## 2 PROPOSED DEVELOPMENT

Wof Washa Natural Forest is located in the Amhara Region of Ethiopia approximately 130 km north of Addis Ababa. It is Ethiopia's oldest proclaimed state forest and is rich in biodiversity. It is home to a number of plant and animal species that are unique and some that are endemic to Ethiopia and East Africa. Plants such as Tossign (*Thymus serrulatus*), Megfra (*Lobellia rhynchopet*), and Guassa (*Festica spp.*), birds including the Ankober soren and Rupelles chat, and animals such as Menilik dukula, Gelada baboon and Gureza (colobus monkey) are a few of the species that have been identified. The forest area is in the highlands of the region where intensive crop cultivation has been carried out for many centuries. Land is a scarce commodity. It is one of the few remaining forest areas and the only major natural forest in the Amhara region and is considered to be the most threatened forest ecosystem in the region.

The North Shewa Zone of the Amharha Regional State is one of the most intensively cultivated areas due to long time settlement and very high population pressure. In the recent past the demand for agricultural land by an increasing population has removed important vegetation cover to the extent of deforesting areas not suitable for cultivation. A baseline survey carried out by SUNARMA in June 2002 indicated that the natural forest

remnants and woodlands of Wof Washa Forest were being reduced at an alarming rate. The 2002 survey indicated that the natural forest cover was about 8,290 ha, a reduction of nearly 1000 ha from the 9,260 ha that was identified in 1994 forest inventory carried out by North Shewa Zone Agricultural Office. A forest inventory carried out by SUNARM in March 2005, at the end of the interim phase of Wof-Washa Forest and Land Use Management Project, estimated that the natural forest cover had continued to decline down to 8,222 ha.

The factors that are contributing to the loss of Wof Washa Natural Forest and its biodiversity are complex however it is principally threatened by the demand for agricultural land due to population pressure and forest timber based income-generating activities that accelerate severe land degradation. The forest is an integral part of the local people's livelihoods and economy.

SUNARMA's Community Based Ecotourism Project aims to establish a number of business enterprises and infrastructure to support viable and sustainable community based ecotourism in the area. Infrastructure to be developed includes five initial campsites at Wof Washa Genete, Mescha, Lay Gorbella Kundi, Gosh Meda and Lik Marefiya connected by trekking routes along existing local tracks. Day visitor facilities at Anget Meugia and Menilik's Window (also known as The Gap) and two additional campsites at Dense and the Falasha settlement are also planned for the future. Their approximate locations are illustrated in **FIGURE 1**.

FIGURE 1 - LOCATION OF CAMPSITES ON GOOGLE MAP



### DESCRIPTION OF CAMPSITES

Each campsite will consist of three accommodation tukuls (cottages) (approximately 5m in diameter), one dining tukul (approximately 7m in diameter), a kitchen (approximately 5 m in diameter), a guard house/store/office for the community (approximately 7 m in diameter) and a toilet and shower facility (approximately 5 m in diameter). The arrangement of the buildings will differ from site to site to accommodate different site conditions and features however the footprint of most campsites is expected to cover a total of approximately 160 m<sup>2</sup>. Local materials will mostly be used however these will be supplemented with imported materials where needed. To maintain a good guest/host relationship and minimize environmental impacts, tourist groups will be limited to 6 – 8 guests. Detailed design of the facilities will be undertaken as part of the proposed project however the following general design criterion and operational standards has been established.

## **Construction materials**

Many construction materials will be sourced by the local community.

- Timber – will be sourced for existing established eucalyptus woodlots
- Soil – will be sourced from existing adjacent farmland and from footprint of construction site
- Stone – will be sourced for existing adjacent farmland and from footprint of construction site

## **Waste management**

- Human waste – urine separating and composting toilets which generate fertilizer will be installed (the maintenance of the systems and use of composted product will be included in capacity development program)
- Solid waste – carry in carry out policy for all visitors (except compostable materials which will be able to be deposited into composting toilets)
- Waste water (washing, showers) – waste water from showers and washing will be directed away for sensitive areas such as water sources and a simple filtration component will be established at the washing area of each site. Guidelines provided to tourists will also require that any washing liquids, soaps etc used at the camps and on the treks be biodegradable.

## **Energy**

- Heating and cooking – fuel efficient combustion wood stove
- Lighting – alternative energy such as solar and wind will be considered

Firewood will be sourced from established eucalypt wood lots of nearest local community. It is noted that as part of its on-going Land Use Management Project, SUNARMA has been working with the local communities to establish eucalypt woodlots for use as firewood and building materials. Firewood for the use in the lodges will be sourced from these existing woodlots and provide additional income for the local community. A review of the firewood requirements and availability has been undertaken as part this assessment and is subsequently detailed for each site. If the requirements for the lodge are greater than current available supply a fuel woodlot for the lodge will be established (outside of the natural forest area) as part of the project.

## **Water**

- Drinking & cooking water – drinking/cooking water can be carried in by visitors or will be made available for sale to tourist by the local community at the lodge sites.
- Washing water – as part of the services provided by the local community, water will be transported from the closest well/stream/spring and stored on site in tanks.

Consideration will also be given to rainwater harvesting as part of the feasibility study for each lodge site.

An assessment of water requirements and availability has been undertaken as part this assessment and is subsequently detailed for each site.

### 3 GENERAL ENVIRONMENTAL CONDITIONS

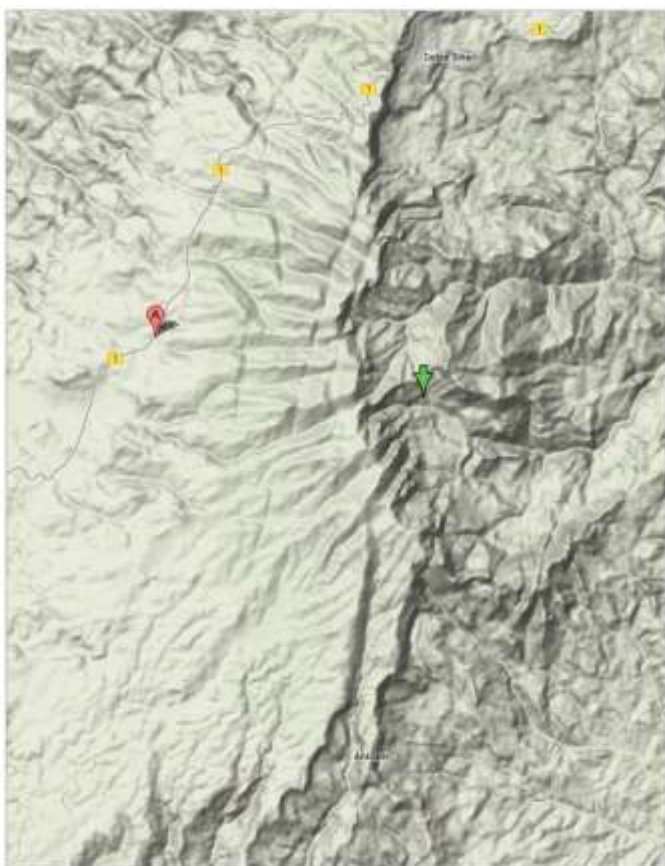
#### 3.1 CLIMATE

Wof Washa Forest area has an average rainfall of approximately 1400 mm per annum. Temperatures range from an average to 11 °C to 20 °C (EWHHS 2010) however due to high elevations temperatures may be lower especially at the top to the escarpment (EWHHS 1996). Cloud and mist cover is common at higher altitudes throughout the year (EWHHS 1996).

Rainfall in the area is highly seasonal. Most of the 1400 mm of rain falls during the Belg (short rainy season), which usually occurs during April/May and the longer Kemit (long rainy season) from mid June to the end of September. To minimize erosion and contamination of waterways by sediment, construction is to be undertaken during the dry season (from November to March).

#### 3.2 SOILS AND TOPOGRAPHY

Soils are volcanic and generally shallow. They are particularly thin on slopes and rock outcrops. The substrate is a mixture of gravel and thin mountain sediments. (EWHHS 2010) Within the forest areas the humus layer is well developed (EWHHS 1996).



### 3.3 BIODIVERSITY

#### FLORA

Wof Washa Forest is a dry montane mixed broad-leaved/conifer forest. Approximately 252 species of plants are believed to be present in the forest. Of these 33 are trees and 18 are shrubs. (EWHHS 2010) Approximately 12% of the plant species in Wof Washa Forest are believed to be endemic to Ethiopia. The following flora species were identified during site visits.

TABLE 1 - FLORA SPECIES WHICH MAY BE PRESENT WITHIN AND/OR ADJACENT TO WOF WASHA NATURAL FOREST AREA

Common Name	Species	Comments	IUCN Red list
<b>Woody trees</b>			
Juniper African Pencil Cedar, African Juniper, East African Cedar <b>Tid (Amharic)</b>	<i>Juniperus procera</i>	<ul style="list-style-type: none"> <li>Altitude range 1,300 m to 3,000 m</li> </ul>	Least Concern
Olea <b>Weira (Amharic)</b>	<i>Olea europaea</i> subsp. <i>cuspidata</i>	<ul style="list-style-type: none"> <li>Higher altitudes</li> </ul>	Taxon has not been assessed
African redwood, East African Rosewood, brayera, cusso, hagenia, or koussou <b>Kosso (Amharic)</b>	<i>Hagenia abyssinica</i>	<ul style="list-style-type: none"> <li>Altitude range 1400 - 2593 meters</li> <li>along streams in montane grassland and forest fringes</li> </ul>	Taxon has not been assessed
common yellowwood, bastard yellowwood, outeniqua yellowwood, African fern pine, weeping yew <b>Zigba (Amharic)</b>	<i>Podocarpus falcatus</i> or <i>Afrocarpus falcatus</i>	<ul style="list-style-type: none"> <li>lower down.</li> </ul>	Least concern

Common Name	Species	Comments	IUCN Red list
	<i>Pouteria (genus)</i>	•	
<b>Imbus (Amharic)</b>	<i>Allophylus abyssinica</i>	<ul style="list-style-type: none"> <li>• lower down.</li> <li>• Submontane forest</li> <li>• Altitude range 1050–2550 m</li> </ul>	Taxon has not been assessed
<b>Shrubs or small trees</b>			
<b>Amija (Amharic)</b>	<i>Hypericum revolutum</i>	• Replaces larger tree species at approximately 3,000m	Taxon has not been assessed
<b>Asta (Amharic)</b>	<i>Erica arborea</i>	• Replaces larger tree species at approximately 3,000m	Taxon has not been assessed
Giant lobelia <b>Jibbra (Amharic)</b>	<i>Lobelia gibberoa</i> <i>Lobelia rhychnopetalum</i>	• Replaces larger tree species at approximately 3,000m	Taxon has not been assessed
<b>Herbs</b>			
<b>Tossign (Amharic)</b>	<i>Thymus serrulatus</i>	Observed in highland grass areas	Taxon has not been assessed
Everlasting flowers	<i>Helichrysum spp.</i>		
Red hot poker <b>Ashenda (Amharic)</b>	<i>Kniphofia foliosa</i>	Observed in highland grass areas	
<b>Grasses</b>			
<b>Guassa (Amharic)</b>	<i>Festuca spp</i>		

As much as possible impacts to flora, especially slower growing trees and shrubs, should be avoided. Developments should be limited as much as possible to existing cleared areas. If vegetation, particularly herbs and shrubs are required to be removed for the construction of facilities and the species is suitable for transplant, consideration should be given to transplanting them to adjacent areas or incorporating them in landscaping of the development when complete.

Trekking paths will be restricted to existing paths and tourists would only account for a small increase in the number of people who currently use these paths therefore the effects of trampling on ground species is expected to be limited. To ensure this is the case operational guidelines for tourists should include the need for and advice on keeping to the path and not unnecessarily walking in undeveloped areas.

#### FAUNA

A review of the IUCN database indicates that the following species may be present within the Wof Washa forest area. It is noted that the list of species provided below is not exhaustive.

TABLE 2 - MAMMAL SPECIES WHICH MAY BE PRESENT WITHIN AND ADJACENT TO WOF WASHA NATURAL FOREST

Common Name	Species	IUCN status
<b>Hares, rabbits and pikas Order: Lagomorpha</b>		
Highland Hare	<i>Lepus starcki</i>	Least Concern
<b>shrews, moles, and soledons (Order: Soricomorpha)</b>		
Bailey's Shrew	<i>Crocidura baileyi</i>	Endangered
<b>Primates</b>		
<b>Old World Monkeys (Family Cercopithecidae)</b>		

Common Name	Species	IUCN status
Gelada Baboons	<i>Theropithecus gelada</i>	Least concern
Hamadryas Baboon, Sacred Baboon	<i>Papio hamadryas</i>	Least concern
Colobus monkey	<i>Colobus guereza</i>	Least concern
Grivet Monkey, Tantalus, Malbrouk Monkey, Green Monkey, Vervet Monkey	<i>Chlorocebus aethiops</i>	Least Concern
<b>Galagos (Family Galagidae)</b>		
Senegal bushbaby	<i>Galago senegalensis</i>	Least concern
<b>Hyraxes</b>		
<b>Family Procaviidae</b>		
Rock Hyrax, yellow spotted hyrax	<i>Procavia capensis</i>	Least concern
Yellow Throated Hyrax, yellow spotted hyrax	<i>Heterohyrax brucei</i>	Least concern
<b>Rodents (order: Rodentia)</b>		
<b>Family Hystricidae</b>		
Crested Porcupine	<i>Hystrix cristata</i>	Least concern
<b>Family Spalacidae</b>		
East African Mole Rat	<i>Tachyoryctes splendens</i>	Least concern
<b>Family Muridae</b>		
Crested Rat	<i>Lophiomyys imhausi</i>	Least concern
Yellow-spotted Brush-furred Rat	<i>Lophuromys flavopunctatus</i>	Least concern
Typical Vlei Rat	<i>Otomys typus</i>	Least concern
Abyssinian grass rat	<i>Arvicanthis abyssinicus</i>	Least Concern
Harrington's Rat	<i>Desmomys harringtoni</i>	Least concern
Mahomet Mouse	<i>Mus Mahomet</i>	Least concern
<b>Antelope</b>		
<b>Family Bovidae</b>		
Klipspriner	<i>Oreotragus oreotragus</i>	Least concern
Common Duiker	<i>Sylvicapra grimmia</i>	Least Concern
Common Bushbuck (kéwel)	<i>Tragelaphus scriptus</i>	Least Concern
<b>Carnivores (order: Carnivora)</b>		
<b>wolves, dogs and foxes (Canidae)</b>		
Ethiopian Wolf	<i>Canis simensis</i>	Endangered
Golden Jackel	<i>Canis aureus</i>	Least Concern
Side Stripped Jackel	<i>Canis adustus</i>	Least Concern
<b>Hyenas (Family Hyaenidae)</b>		
Spotted Hyena	<i>Crocuta crocuta</i>	Least concern
<b>cats (Felidae)</b>		
Leopard	<i>Panthera pardus sub sp. pardus</i>	Near threatened
Wild Cat	<i>Felis silvestris sub sp. lybica</i>	Least Concern
Serval	<i>Leptailurus serval sub sp. tanae</i>	Least Concern
<b>Civets (Viverridae)</b>		
African Civet Cat	<i>Civettictis civetta</i>	Least Concern
Ethiopian Genet	<i>Genetta abyssinica</i>	Least Concern
<b>Mongoose (Herpestidae)</b>		
Slender Mongoose	<i>Herpestes sanguineus</i>	Least Concern



Common Name	Species	IUCN status
Common Dwarf Mongoose	<i>Helogale parvula</i>	Least Concern
Egyptian Mongoose	<i>Herpestes ichneumon</i>	Least Concern
White Tailed Mongoose	<i>Ichneumia albicauda</i>	Least Concern

## BIRDS

The Ankober-Debre Sina Escarpment is classified as an Important Bird Area by Birdlife International. The following birds have been recorded within Ankober Debre Sina Escarpment of which Wof Washa Forest is a part.

**TABLE 3 - BIRD SPECIES WHICH MAY BE PRESENT WITHIN AND/OR ADJACENT TO WOF WASHA NATURAL FOREST**

\*Important Bird Area Trigger Species

Common Name	Species	Resident status	IUCN Red list
<b>Ibises and spoonbills (Threskiornithidae)</b>			
Wattled Ibis*	<i>Bostrychia carunculata</i>	Observed during site inspections at Mescha	Least Concern
<b>Ducks and Geese (Anatidae)</b>			
Blue-winged Goose*	<i>Cyanochen cyanoptera</i>	Resident	Vulnerable
<b>Hawks, buzzards and eagles (Accipitridae)</b>			
Bearded Vulture, Lammergeyer, Lammergeier	<i>Gypaetus barbatus</i>		Least concern
Red Breasted Sparrow Hawk	<i>Accipiter rufiventris</i>		Least concern
Mountain Buzzard, Forest Buzzard	<i>Buteo oreophilus</i>		Least concern
<b>Falcons (Falconidae)</b>			
Peregrine falcon	<i>Falco peregrinus</i>		Least concern
<b>Quails and francolins (Phasianidae)</b>			
Erckel's Francolin*	<i>Francolinus erckelii</i>	Resident	Least concern
Moorland Francolin*	<i>Scleroptila psilolaemus</i>	Resident	Least concern
<b>Pigeons and doves (Columbidae)</b>			
White-collared Pigeon*	<i>Columba albitorques</i>	Resident	Least Concern
Pink-breasted (Dusky)Turtle Dove*	<i>Streptopelia lugens</i>	Resident	Least Concern
<b>Parrots and love birds (Psittacidae)</b>			
Black-winged love bird*	<i>Agapornis taranta</i>	Resident	Least Concern
<b>Swifts (Apodidae)</b>			
Scarce Swift*	<i>Schoutedenapus myoptilus</i>	Resident	Least concern
Nyanza Swift*	<i>Apus niansae</i>	Resident	Least concern
<b>Wagtails, pipits and longclaws (Motacillidae)</b>			
Abyssinian Longclaw*	<i>Macronyx flavicollis</i>	Resident (Endemic to Ethiopia)	Near threatened
<b>Thrushes and Chats (Turdidae)</b>			
Alpine (Mooreland) Chat*	<i>Cercomela sordida</i>	Resident	Least Concern
Ruppell's Chat*	<i>Myrmecocichla melaena</i>	Resident	Least Concern
White-winged Cliff Chat*	<i>Thamnolaea semirufa</i>	Resident	Least concern
Ruppell's Robin Chat*	<i>Cossypha semirufa</i>	Resident	Least concern
Blue Rock Thrush	<i>Monticola solitarius</i>	Frequent palearctic winter visitor	Least concern

Common Name	Species	Resident status	IUCN Red list
<b>Crows (corvidae)</b>			
Thick-billed Raven*	<i>Corvus crassirostris</i>	Resident	Least concern
<b>Starlings (sturnidae)</b>			
Slender Billed Starling	<i>Onychognathus tenuirostris</i>		Least concern
White-billed Starling	<i>Onychognathus albirostris</i>		Least concern
<b>Weavers (Ploceidae)</b>			
Baglafaecht Weaver*	<i>Ploceus baglafaecht</i>	Resident	Least concern
<b>Sparrows and petronias (Passeridae)</b>			
Swainson's Sparrow*	<i>Passer swainsonii</i>	Resident	Least concern
Crag Martin	<i>Ptyonoprogne rupestris</i>	Uncommon palearctic visitor	Least concern
<b>Canaries and seedeaters (Fringillidae)</b>			
Black Headed (Ethiopian) Siskin*	<i>Serinus nigriceps</i>	Resident (Endemic to Ethiopia)	Least concern
African (Abyssinain) Citril*	<i>Serinus citrinelloides</i>	Resident	Least concern
Brown-rumped Seedeater*	<i>Serinus tristriatus</i>	Resident	Least concern
Streaky Seedeater	<i>Serinus striolatus</i>		Least concern
Ankober Serin*	<i>Serinus ankoberensis</i>	Resident (Endemic to Forest)	Vulnerable

As the developments will be restricted to existing cleared areas and the scale of the development in each campsite will be small, the impacts to fauna due to the loss of habitat are expected to be limited. The campsite and trekking routes are all within areas that are currently used or frequented by local residents and are therefore already impacted on by human activities. Tourist group sizes will be limited to a maximum of 8 people per group so tourist activities are not expected to significantly increase the level of disturbance to fauna beyond current levels.

Regardless measures should be taken to minimize disturbance of fauna. Operational guidelines should be developed and implemented and include instruction to tourists about minimizing their impact on local species. Clear instructions both written (e.g. signs and guidelines) and verbal should be given to all visitors and include information on

- Limited access to specific areas such as natural forest where species are known or expected to be present
- Prohibitions on feeding or approaching wildlife
- How to view wildlife without disturbing it

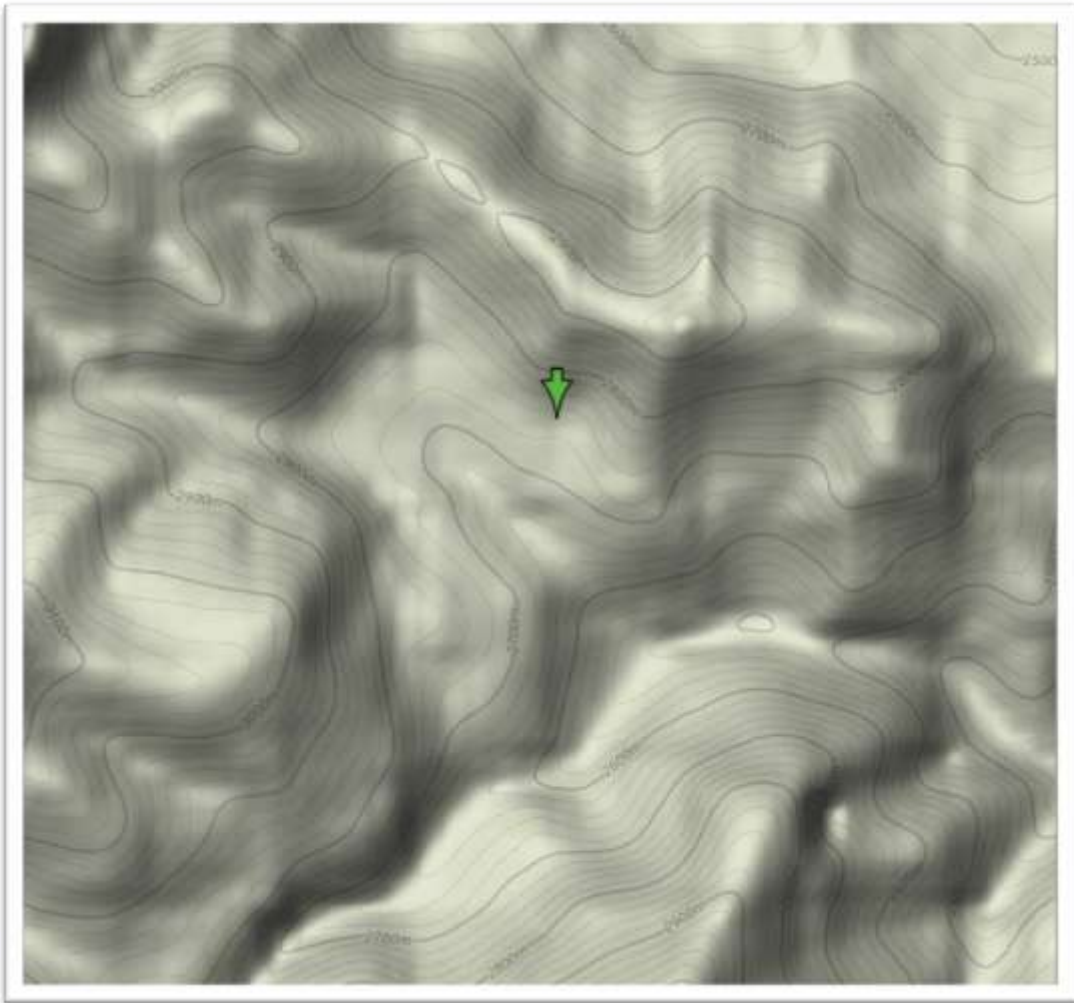
## 4 CAMPSITES

### 4.1 WOF WASHA GENETE

#### GENERAL DESCRIPTION

The campsite is located at N9° 46' 03": E39° 45' 37" in Lay Gorbela Kebele in Ankober Woreda at an altitude of approximately 2745 m. It is situated on a slightly flatter area on the southern side of a mountain (refer to FIGURE 2), which is dominated by natural forest.

FIGURE 2 - GOOGLE MAPS TERRAIN LAYER SHOWING LOCATION OF WOF WASHA GENETE CAMPSITE



Wof Washa Genete is located on the edge of Wof Washa Natural Forest. A plant nursery, currently operated by SUNARMA, has been established in the area for over 20 years. Forest guards and SUNARMA staff occupy an existing compound to the south east of the proposed campsite.

It is proposed that the campsite be established in three areas. The kitchen and dining tukuls would be located in the cleared area to the north of the nursery (area 1) and the three accommodation tukuls would be established within the existing cleared areas located between the natural forest and juniper plantation to the north of the nursery (area 2). The location of the shower and composting toilet is yet to be determined. Refer to Figure 3 below.



**FIGURE 3 - AERIAL PHOTO OF WOF WASHA GENETE**

Area 1 where it is proposed to construct the kitchen and dining tukuls is a predominantly grassed area (refer to Photo 1) and is bound to the north by natural forest (Photo 2), to the west by a small patch of regrowth natural forest (Photo 3), to the east by a grassed area with a drainage line from the natural spring (Photo 4) and to the south by the nursery (Photo 5).

**PHOTO 1 - WOF WASHA GENETE: AREA 1**



**PHOTO 2 - VIEW TO NORTH AREA 1 WOF WASHA GENETE**



**PHOTO 3 - VIEW TO WEST AREA 1 WOF WASHA GENETE**



**PHOTO 4 -VIEW TO EAST AREA 1 WOF WASHA GENETE**



**PHOTO 5 -VIEW TO SOUTH AREA 1 WOF WASHA GENETE**



## AREA 2

It is proposed that the accommodation tukuls be constructed within the grassed clearing between the juniper plantation and natural forest areas.

**PHOTO 6 - WOF WASHA GENETE: AREA 2 NEAR JUNIPER PLANTATION**



**PHOTO 7 - WOF WASHA GENETE: JUNIPER PLANTATION**



As shown in photos Photo 8 on the following page, the site is bounded to the north by a small juniper outcrop and a slight depression which may become waterlogged during the rainy season. To the west (Photo 9) and south (Photo 11) by the juniper plantation and to the east is a small patch of regrowth natural forest to (Photo 10).

**PHOTO 8 - WOF WASHA GENETE: AREA 2 VIEW TO NORTH**



PHOTO 9 - WOF WASHA GENETE: AREA 2 VIEW TO WEST



PHOTO 10 - WOF WASHA GENETE: AREA 2 VIEW TO EAST



PHOTO 11 - WOF WASHA GENETE: AREA 2 VIEW TO SOUTH



#### BIODIVERSITY

There are no trees or shrubs within of the footprint of proposed development in area 1. However there are a number of juniper saplings in the western edge of Area 2. Juniper trees and natural forest also surround area 2 and there is natural forest to the north and west of Area 1.

Clearing of trees species, including saplings, for the construction of camp facilities is to be avoided. To avoid impacting on the root zones of exiting trees, facilities should be established outside the drip line of existing trees.

The proposed development is to be contained within existing grassed areas however these areas are in close proximity to the natural forest and juniper plantations. Care should therefore be taken to ensure that vegetation is not impacted on during construction of the development. Prior to commencing construction, vegetation protection zones (areas demarcated and signed as areas which are not to be disturbed or impacted on during construction) should be established around any areas of vegetation including the natural forest area and juniper plantation.

Colobus monkeys were observed in the natural forest area approximately 300 m from the proposed camp area during the site visit. Local community members who were interviewed during the site visit reported that the following fauna have been observed on or in proximity to the proposed campsite:

- Menelik's dukala were reported to have been observed in the natural forest areas early morning and evening.
- Hyenas (species unknown) move through the general area at night and have been known to take stock
- Leopard (*Panthera pardus sub sp. pardus*) was reported to have been observed within the natural forest area

No nesting sites or nesting birds were observed on or within 100 m of the proposed campsite.

Due to its proximity to native forest and the reported presence of wildlife it is possible that increased human activities adjacent to the forest, especially in the early mornings and at dusk, may disturb some species. As the area is currently frequented on a regular basis by the local community and the size of the tourist groups is to be limited to a maximum of 8 guests these impacts are not expected to be significant however the following actions should be taken to minimize the disturbance of local fauna particularly shy species such as Menelik's dukala.

Tukuls should be designed and constructed in a manner that allows visitors to view the forest area without disturbing any wildlife that may be present (e.g. screens on windows or fences that allow views out but restrict views in).

As detailed in section 3 operational guidelines should include instruction to tourists about minimizing their impact on local species. Specifically for this site clear instructions both written (e.g. signs) and verbal should be given to all visitors and include information on limited access to natural forest area especially at dawn and dusk.

#### SENSITIVE AREAS

As detailed in Figure 3 an undeveloped spring (refer to Photo 12) is located approximately 200 m to the north of area 1 and area 2. Camp facilities including the shower and composting toilet are located down slope from the spring and are therefore unlikely to pollute this area.

An unnamed watercourse is located approximately 300 m down slope from Area 2 where the accommodation tukuls will be established and Area 3 where the composting toilet and shower will be established. Wastewater from the shower facility should be treated using a simple filtration system then directed towards vegetated areas to maximize absorption and filtration.



#### HUMAN SETTLEMENT

Approximately 13 households (average 5 people per household) live within the Wof Washa Genete area. The closest residence is located within the existing compound to the east of the proposed development (refer to Figure 3). The local communities currently use the proposed campsite areas as free range grazing areas for their livestock.

The local community has been previously consulted regarding the establishment of a campsite for tourists in this area and is supportive of the development, as it will provide employment and income. To ensure that the community continue to support the development they should be further consulted once more detailed plans have been developed.

#### CULTURAL HERITAGE

No areas of cultural heritage were identified within or adjacent to the proposed campsites. The nursery site, while not of high cultural significance, plays an important role (both in the past and currently) in the preservation of the natural forest, improvement in agricultural practices and economic development of the area. It is therefore an important part of recent local history and is likely to be of interest to tourists. A tour of the nursery and information on its role in natural resource management should be developed as part of the tourism features of the site.

#### OPERATIONAL WATER

As noted previously an undeveloped spring is located within the edge of the natural forest area approximately 600 m to the north east of the proposed campsite. Refer to Photo 12 below. This spring is used by the local community and has not been known to run dry. To protect the spring and ensure that water quality is maintained this spring should be developed as part of the campsite development.

PHOTO 12 - UNDEVELOPED SPRING WOF WASHA GENETE



#### OPERATIONAL ENERGY

There is no electricity available at the site.

#### ENERGY FOR LIGHTING

As noted previously the site is on the southern side of a mountain and sheltered on a number of sides by closed forest. The site is therefore receives limited direct sunlight for much of the day. The use of solar power systems are therefore considered to be of limited value especially given their expense and are not recommended.

#### FUEL FOR COOKING

An established commercial eucalyptus wood lot is located in close proximity to the site. Wood from this lot is available for purchase and use by the campsite.

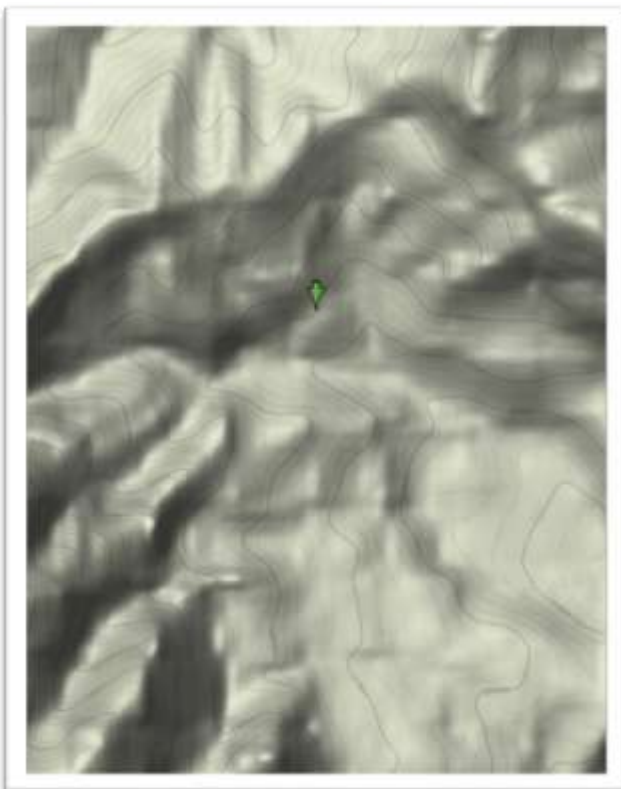
#### ACCESS TO THE SITE

The site is approximately 16 km from the nearest road access in Debre Sina and more than 22 km from the nearest road access at Kundi. Any nonlocal construction materials and equipment will be required to be transported by donkey or carried by people from Debre Sina.

## 4.2 MESCHA

#### GENERAL DESCRIPTION

The campsite is located at N9° 43' 21": E 39° 45' 1 in Mescha Kebele in Ankober Woreda at an altitude of approximately 2804 m. The site is at the base of a mountain and is bounded by natural forest to the north and farmland to the south.



It is approximately a 60-minute walk from the site to Mescha Village which is located to the south of the site. Refer to PHOTO 13.

PHOTO 13 - AERIAL PHOTO OF MESCHA SITE AND SURROUNDING AREA



The site is a moderate to steep slope with some flat areas. It slopes to the south and is a predominantly grassed area with patches of red hot poker (*Kniphofia foliosa*) and other unknown herbaceous flora. The area is currently used by the local community for free range grazing of livestock.

**PHOTO 14 - VIEW OF NORTH SIDE OF MESCHA CAMPSITE (LOOKING UP SLOPE)**



**PHOTO 15 - VIEW OF SOUTH OF MESCHA SITE (LOOKING DOWN SLOPE)**



Natural forest is located to the north and west of the site. An unnamed watercourse is located at the base of the slope to the west of the site. Cultivated farmland is located to the south and east of the site. Refer to Photo 16, Photo 17, Photo 18 and Photo 19.

**PHOTO 16 - VIEW TO NORTH OF MESCHA CAMPSITE**



PHOTO 17 - VIEW TO WEST OF MESCHA CAMPSITE



PHOTO 18 - VIEW TO EAST OF MESCHA CAMP



PHOTO 19 - VIEW TO SOUTH OF MESCHA CAMP



#### BIODIVERSITY

There are no trees within the proposed camp site however natural forest forms the northern boundary of the site. If the development is likely to come close to the natural forest areas then vegetation protection zones (as detailed in section 4.1) should be established.

The site contains patches of red-hot poker (*Kniphofia foliosa*) and other unidentified grasses and herbaceous flora (refer to Photo 20). Some of these patches may have to be cleared to accommodate for the construction of campsite buildings. To minimize loss of these plants and enhance the visual aesthetics of the campsite it is recommended that any red-hot poker and other herbaceous plants cleared during construction be retained and replanted around the buildings upon completion of works.

PHOTO 20- PATCHES OF RED HOT POKERS AND OTHER FLORA



No fauna were observed during the site visit. Local SUNARMA staff interviewed during the site visit reported that the following fauna have been observed on or in proximity to the proposed campsite:

- Monkeys (species unknown) in trees of the natural forest to the north of the site.
- Hyenas (species unknown) reported to move through the area at night.

No birds were observed during the site visit and no nesting sites or nesting birds were observed on or within 100 m of the proposed campsite.

#### SENSITIVE AREAS

Two unnamed watercourses are within close proximity to the site. An unnamed watercourse at the bottom of the slope approximately 300 m to the south-west of the site and another intermittent watercourse approximately 250 m to the north-east of the site which was dry at the time of the site inspection.

Cropping land to the east of the camp may be susceptible to pollution from wastewater. It is therefore recommended that the shower facility and composting toilet be located in the western portion of the site and after filtration, waste water from the shower be dispersed towards the vegetated area to the west of the proposed development site.

#### HUMAN SETTLEMENT

The closest residence is located approximately 300 m to the east of the site. Local SUNARMA staff reported that this residence is government owned but is currently occupied a local farmer. Mescha village is located approximately 2 km to the south east of the campsite.

PHOTO 21 - RESIDENCE TO THE EAST OF MESCHA CAMPSITE



#### CULTURAL HERITAGE

No cultural heritage was reported by local SUNARMA staff.

#### OPERATIONAL WATER

Water from the unnamed watercourse to the south east of the site may be able to be pumped up the hill for use at the campsite.

#### OPERATIONAL ENERGY

Mains electricity is not available.

#### ENERGY FOR LIGHTING

The site is generally fairly exposed and should receive good uninterrupted sunlight for the majority of the day. It was observed that a number of buildings in Mescha village use solar power systems for lights and appliances indicating that it is feasible to transport simple solar power systems into this area. Therefore the feasibility of installing photovoltaic energy system and installing solar hot water for use in the showers should be investigated and utilized if economically feasible.

#### FUEL FOR COOKING

A number of eucalypt wood lots are located in close proximity to the site. Wood fuel for cooking should be sourced from these wood lots.

#### ACCESS TO THE SITE

The site is approximately 5 hours walk (at a tourists pace) from the Ankober – Debre Birhan Road.

### 4.3 LAY GOROBELA KUNDI

#### GENERAL DESCRIPTION

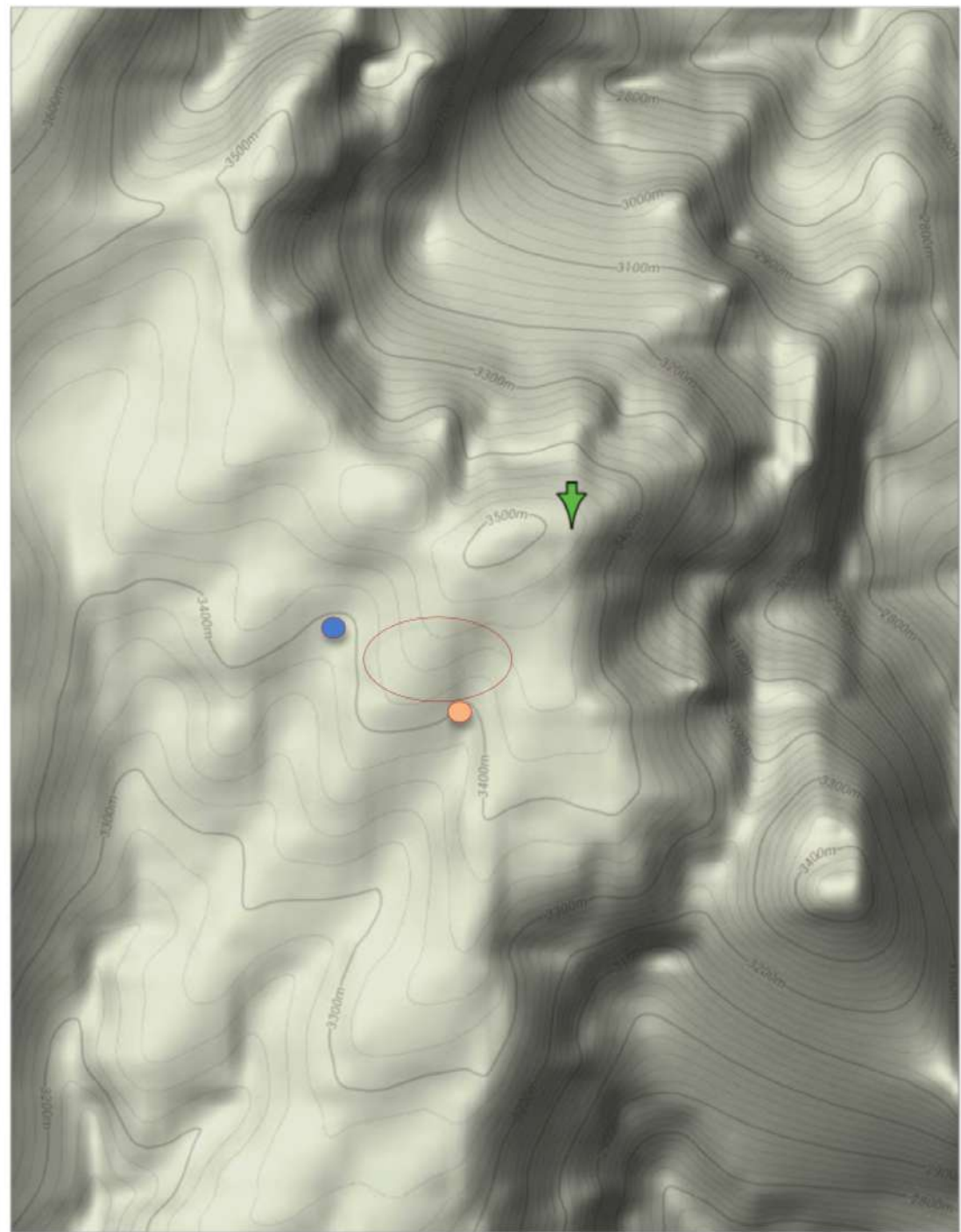
The campsite is located at N 9° 40' 32" E 39° 45' 09" in Lay Gorbela Kebele in Ankober Woreda at an altitude of approximately 3500 m. The proposed campsite is on the top edge of the Ankonber-Debre Sina escarpment (refer to Figure 4), which forms the western boundary of the Wof Washa Natural Forest area. The area is predominantly grassed with rocky outcrops to the north of the site. The area is located approximately 300 m north-east of Lay Gorobela Kundi village (refer to Photo 22) and is currently used for free range grazing of livestock by the local community.

PHOTO 22 - AERIAL PHOTOS OF LAY GORBELA CAMPSITE AND VILLAGE



FIGURE 4 - GOOGLE MAPS TERRAIN LAYER OF LAY GORBELA KUNDI SITE





- Approximate location of well 1 (N 9 40' 21" E 39 45' 00")
- Approximate location of undeveloped spring (N 9 40' 27" E 39 44' 52")
- Approximate location of Lay Gorobela Kundi

The site is bound by a rocky outcrop to the north, the escarpment to the east and open grazing land to the south and west.

PHOTO 23 - KUNDI CAMPSITE: VIEW TO NORTH



KUNDI CAMPSITE: VIEW TO WEST



KUNDI CAMPSITE: VIEW TO EAST



KUNDI CAMPSITE: VIEW TO SOUTH



#### BIODIVERSITY

There are no trees or shrubs within 300 m of the proposed campsite. No nesting sites or nesting birds were observed on or within 100 m of the proposed campsite.

No fauna were observed during the site visit. However soil mounds from mole rats (Amharic name - Felfel) (refer to Photo 24) were present in the vicinity of the site and Gelada baboons were heard. Local community members who were interviewed during the

site visit reported that the following fauna have been observed on or in proximity to the proposed campsite:

- Gelada Baboons (*Theropithecus gelada*) shelter on the cliffs of the escarpment and move onto the grassed areas at the top of the escarpment including the proposed campsite areas to graze on regular basis.
- Porcupines (Amharic name – Jart, species not confirmed but most likely to be *Hystrix cristata*) are regularly seen in the general vicinity of the site.
- Rabbits/hares (species not confirmed but most likely to be the Highland Hare *Lepus starcki*) are regularly seen in the general vicinity of the site
- Monkeys (species unknown) are in trees of the forest in the escarpment to the north of the site
- Hyenas (species not confirmed but most likely to be *Crocuta crocuta*) regularly move through the area
- Ethiopian Wolves (*Canis simensis*) were reported to have been observed in the forest approximately 2 km to the south east of the proposed development site

PHOTO 24 - SOIL MOUNDS FROM MOLE RATS



The mounds are possibly from the East African Mole Rat (*Tachyoryctes splendens*), the mole species most likely to be encountered in this area. It is noted that no porcupine or hare burrows were observed during the site visit. While no obvious burrows from any species were observed within the proposed camp area, burrowing animals may still be present and may be impacted on by construction. During construction care should be taken when undertaking any excavations. If any animals are encountered they should not be handled and should be allowed to move off of their own accord.

Local residents reported that Gelada Baboons are known to forage grass and move through in this area. Due to the limited size of the campsite, the loss of grazing area available to local baboon populations will be limited however the disturbance created by regular human occupation of the campsite may create an increased zone of disturbance. To minimize the area of potential disturbance the campsite footprint should be kept as small as practical. To minimize disturbance of any baboons on the escarpment cliff face, potentially noisy areas such as the kitchen and dining tukuls should be located away from the edge of the escarpment. The campsite and tukuls should be designed to allow any nearby baboons to be observed from within the camp (e.g. screened windows that allow tourists to look out but limit the ability of wildlife to see the people.) Consideration could also be given to constructing screens or a fence, which restrict views into the camp at access points around the camp.

Operational guidelines and signage detailed in section 3.3 should include specific information on limited access to escarpment edge between dusk and dawn when baboons are likely to sleeping on ledges of cliffs. Consideration could also be given to constructing a simple viewing hide on a vantage point that gives good views of the escarpment so that tourists can view any animals on the escarpment including Gelada Baboons with limited disturbance.

#### SENSITIVE AREAS

The Ayrara River is located in a valley approximately 1.5 km to the west of the site.

Two fresh water springs which are the only water source for Kundi village are located more than 400 m to the west and on the other side of a ridge from the proposed campsite. The campsite is up hill from both of the springs.

Due to its location up hill from the springs it is possible that wastewater from showers and cooking at the campsite may if not carefully managed, contaminate ground water which flows into these springs. To minimize the risk of contaminated the groundwater in the area, water from the showers should be filtered as detailed in the general requirements section above and should be directed towards vegetated areas near the escarpment.

#### HUMAN SETTLEMENT

As noted previously the proposed development site and surrounding areas are used as free range grazing land for community livestock. Lay Gorobela Kundi village is located approximately 400m to the south west of the campsite. The village is not visible from the campsite and the undeveloped campsite is not visible from the village. It is possible that when constructed the campsite buildings may be visible from the village. It is also possible that noise generated from the campsite may be heard in the village.

The buildings to be constructed will be in the style of local buildings so it is unlikely that the local community will view the completed development as aesthetically intrusive. Regardless residents should be consulted about the design of the campsite buildings and their inputs

should be considered and addressed as relevant. To enhance the visual aspect of the development consideration should also be given to planting native plant species such as giant lobelia along the western boundary of the campsite (i.e. along the boundary between the campsite and Kundi Village). To minimize potential impacts from tourists during operation of the campsite local residents should be consulted regarding requirements, if any, should be addressed in operational guidelines for tourists.

#### CULTURAL HERITAGE

Approximately 300 m to the south west of the campsite is the site of the palace of the Shoan King, Zeray Yacob who ruled the area in the 14th Century. No buildings or other known archeological features are present on the site however local residents are knowledgeable about its location and history. King Zeray is believed to have been buried in St Georges Church in Lay Gorobela Kundi Village.

Due to the lack of archeological features and distance from palace site the proposed development is unlikely to have a physical impact on this cultural heritage site. However the cultural heritage features of the palace site should be acknowledged and community members and any relevant historical organisations should be consulted regarding measures that should be put in place to preserve the site and its history. During construction of the campsite, the palace site should be identified and demarcated as an area that in not to be impacted on (directly or indirectly through activities such as collection of stones soil etc) by the construction works. Signage and other information should be prepared and installed to inform tourists and other visitors of the location of the palace, its associated history and cultural aspects of the site and any actions they should take to preserve the site and its history.

#### OPERATIONAL WATER

An existing water well is available in Kundi Village at approximately N9 40; 21" E 39 45' 00" (refer to Photo 25). It was reported by community members that this well runs dry for approximately 2 months per year. During dry periods the village relies on undeveloped spring approximately 50 m to the west of the village (photo 2 & 3 below). To ensure that there is sufficient water available for community and to supply the proposed camp this spring should be developed into a usable well as part of the eco-tourism project.

PHOTO 25 - EXISTING UNDEVELOPED SPRING LOCATED TO THE WEST OF KUNDI VILLAGE AND SOUTH WEST OF CAMPSITE



#### OPERATIONAL ENERGY

Mains power is available approximately 500 m away for the site in Kundi village.

#### ENERGY FOR LIGHTING

Due to its close proximity and ease of access consideration should be given to connecting the campsite to mains power.

#### FUEL FOR COOKING

An established commercial eucalyptus wood lot is located in close proximity to the site. Wood from this lot is available for purchase and use by the campsite.

#### ACCESS TO THE SITE

The campsite is located less than 1 km from the Debre Birhan to Ankober road. There is an established stone lined track (suitable for 4WD) from the main road up to Kundi Village. This road then becomes a walking track that leads to open grazing areas near the proposed campsite. Current site access is sufficient to allow the transport of large items such as water tanks, combustion stoves and other materials.

Currently access to the campsite is through and/or immediately adjacent to village. During the initial consultation and development phase of the project, community members should be consulted regarding their willingness to let tourists regularly walk around or through their village. If the community is not happy with this arrangement an alternative trekking route that does not pass directly through their village should be established.

## 4.4 GOSH MEDA

#### GENERAL DESCRIPTION

The campsite is located at N 9° 42' 18 E 39° 44' 01 in Basodongora Kebele in Basona Woreda at an altitude of approximately 3675 m. The proposed campsite is on the top edge of the Ankonber-Debre Sina escarpment. The area is predominantly grassed and is bounded by

the escarpment to the north and east, cropping land to the west and open grazing land to the south. The area is currently used for free range grazing of livestock by the local community.

PHOTO 26 - AERIAL PHOTO: GOSH MEDA

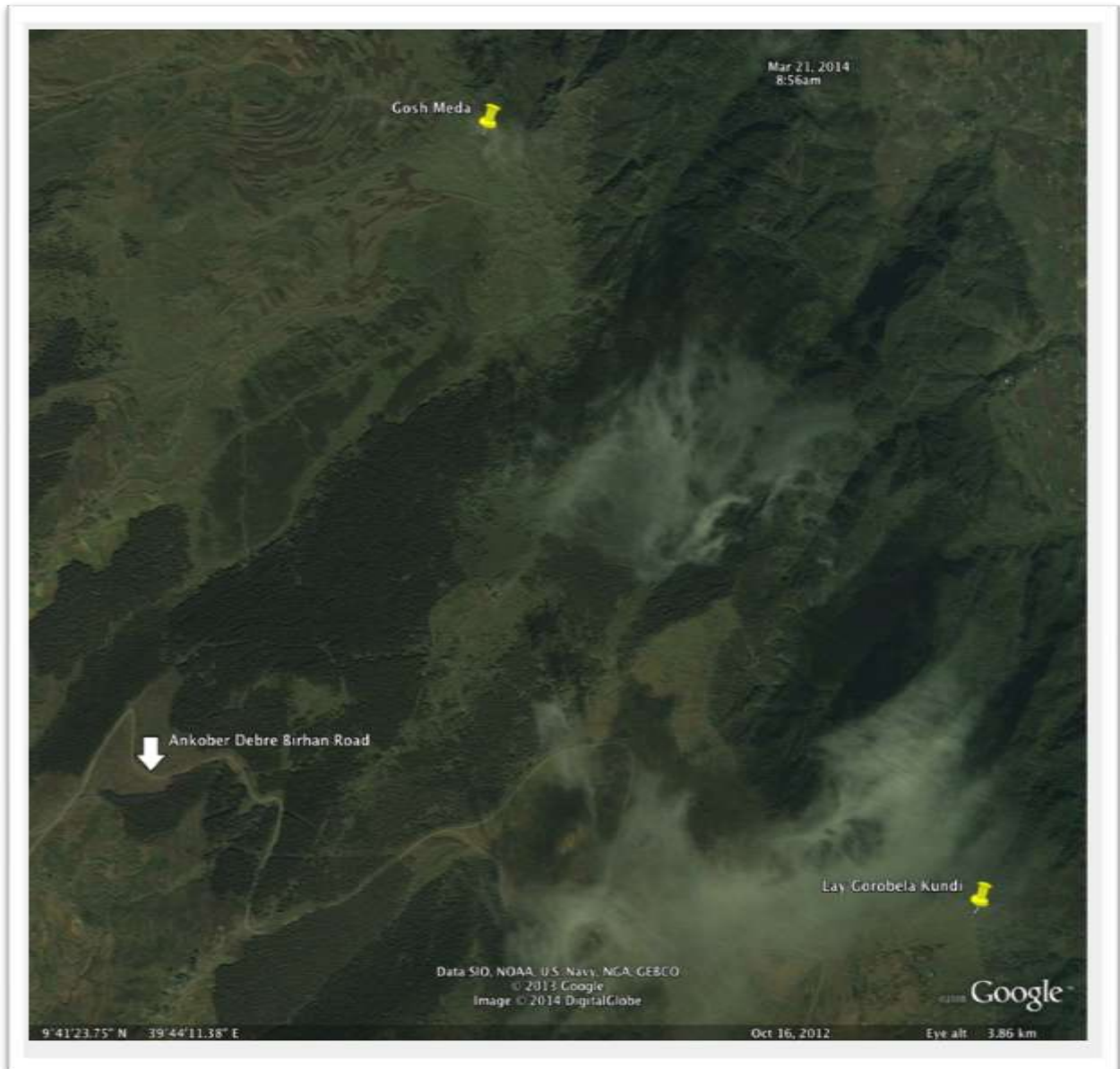
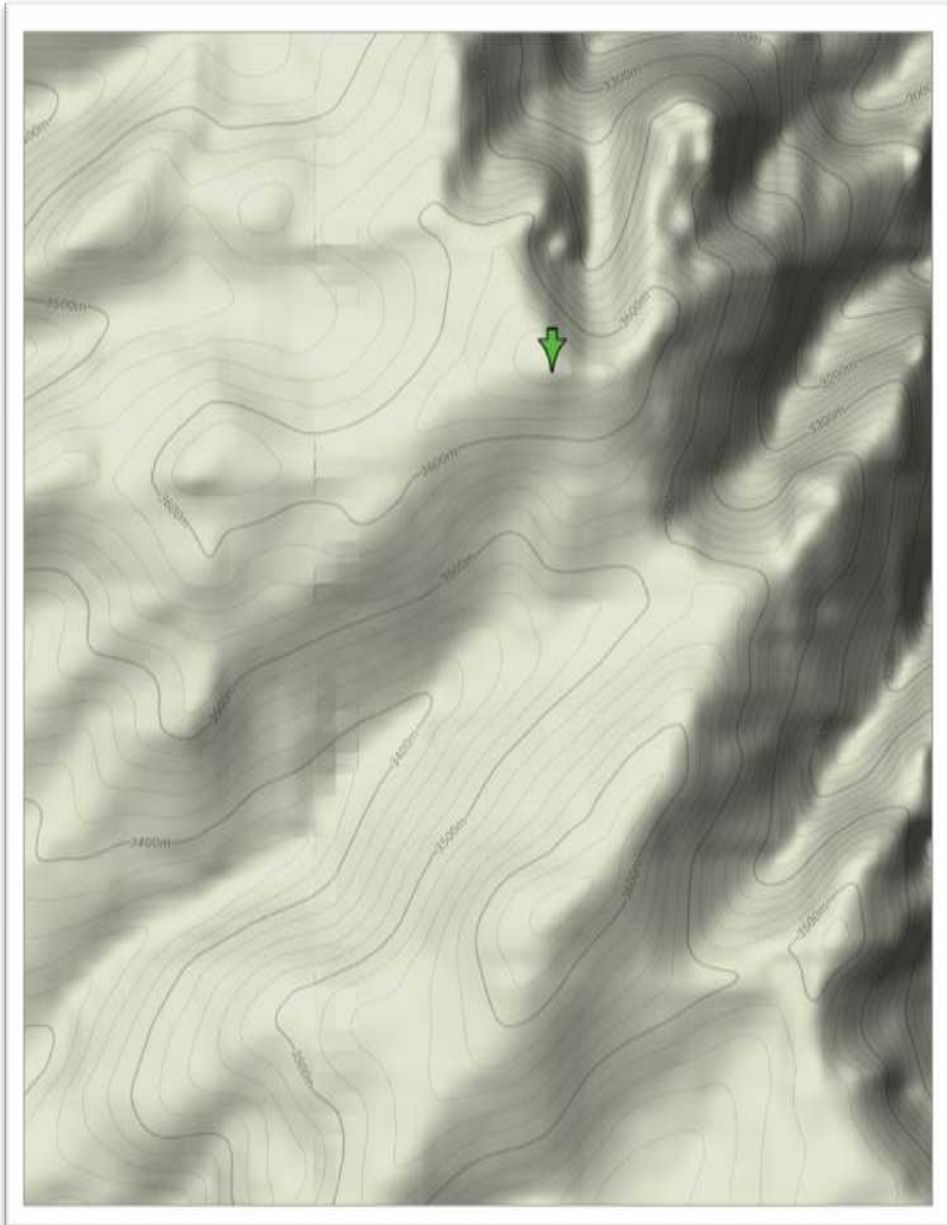


FIGURE 5 - GOOGLE MAPS TERRAIN LAYER: GOSH MEDA



#### BIODIVERSITY

There are no trees or shrubs within 300 m of the proposed campsite. No nesting sites or nesting birds were observed on or within 100 m of the proposed campsite.

The site provides similar habitat to that found in at Lay Gorobela Kundi. The following fauna have been observed on or in proximity to the proposed campsite:

- Gelada Baboons (*Theropithecus gelada*) shelter on the cliffs of the escarpment and move onto the grassed areas at the top of the escarpment including the proposed campsite areas to graze on regular basis.
- Porcupines (Amharic name – Jart, species not confirmed but most likely to be ) are regularly seen in the general vicinity of the site.



- Rabbits/hares (species not confirmed but most likely to be the Highland Hare *Lepus starcki*) are regularly seen in the general vicinity of the site
- Monkeys (species unknown) are in trees of the forest in the escarpment to the north of the site
- Hyenas (species not confirmed but most likely to be *Crocuta crocuta*) regularly move through the area
- Ethiopian Wolves (*Canis simensis*) were reported to have been observed in the forest approximately 2 km to the south east of the proposed development site

The same measures as recommended for Lay Gorobella Kundi should be undertaken for this site. While no obvious burrows from any species were observed within the proposed area, burrowing animals may still be present and may be impacted on by construction. During construction care should be taken when undertaking any excavations. If any animals are encountered they should not be handled and should be allowed to move off of their own accord.

Gelada Baboons are known to forage grass and move through in this area. Due to the limited size of the campsite, the loss of grazing area available to local baboon populations will be limited however the disturbance created by regular human occupation of the campsite may create an increased zone of disturbance. To minimize the area of potential disturbance the campsite footprint should be kept as small as practical. To minimize disturbance of any baboons on the escarpment cliff face, potentially noisy areas such as the kitchen and dining tukuls should be located away from the edge of the escarpment. The campsite and tukuls should be designed to allow any nearby baboons to be observed from within the camp (e.g. screened windows that allow tourists to look out but limit the ability of wildlife to see the people.) Consideration could also be given to constructing screens or a fence, which restrict views into the camp at access points around the camp.

Operational guidelines and signage detailed in section 3.3 should include specific information on limited access to escarpment edge between dusk and dawn when baboons are likely to be sleeping on ledges of cliffs. Consideration could also be given to constructing a simple viewing hide on a vantage point that gives good views of the escarpment so that tourists can view any animals on the escarpment including Gelada Baboons with limited disturbance.

#### SENSITIVE AREAS

There are no springs or watercourses in close proximity to this site.

#### HUMAN SETTLEMENT

The surrounding area is used for cultivation but there are no houses in close proximity to the site.

#### CULTURAL HERITAGE

No areas of cultural heritage significance have been reported for this area.

#### OPERATIONAL WATER

There are no sources of water in close proximity to the site. A tank will have to be established on site and consideration should be given to using iron roofing on the kitchen/dinning tukuls and harvesting rainwater for use. Additional water will have to be transported by pack animals to the site as needed.

#### OPERATIONAL ENERGY

Mains power is not available.

#### ENERGY FOR LIGHTING

The site is very exposed and should receive good uninterrupted sunlight for the majority of the day. Therefore the feasibility of installing photovoltaic energy system and installing solar hot water for use in the showers should be investigated and utilized if economically feasible.

#### FUEL FOR COOKING

An established commercial eucalyptus wood lot is located in close proximity to the site. Wood from this lot is available for purchase and use by the campsite.

#### ACCESS TO THE SITE

The campsite is more than 3 km from the Debre Birhan to Tarmaber road. The site is only accessible by walking. All construction materials and operational water and fuel will have to be carried in by people or pack animals.

Currently access to the campsite is through and/or immediately adjacent to cultivated fields and farmland. During the initial consultation and development phase of the project, community members should be consulted regarding their preferred trekking path for tourists.

## 5 DAY CAMPS

### 5.1 ANGET MEWUGIA

#### GENERAL DESCRIPTION

The campsite is located at approximately N9° 47' 53" : E39° 45' 20" in Debreameaza Kebele in Tarmaber Woreda (refer to & 2) at an altitude of approximately 2600 m.

The proposed site is within an existing mature eucalypt planting (refer to Photo 27). The understory is mainly grass with patches of red hot poker and other unidentified herbaceous flora (refer to Photo 28). The site slopes to the north.

PHOTO 27 - ANGET MEWUGIA: PROPOSED DAY CAMP SITE



PHOTO 28 - ANGET MEWUGIA: UNDERSTORY IN PROPOSED DAY CAMP AREA



PHOTO 29 - ANGET MEWUGIA: VIEW OF SITE FROM ABOVE



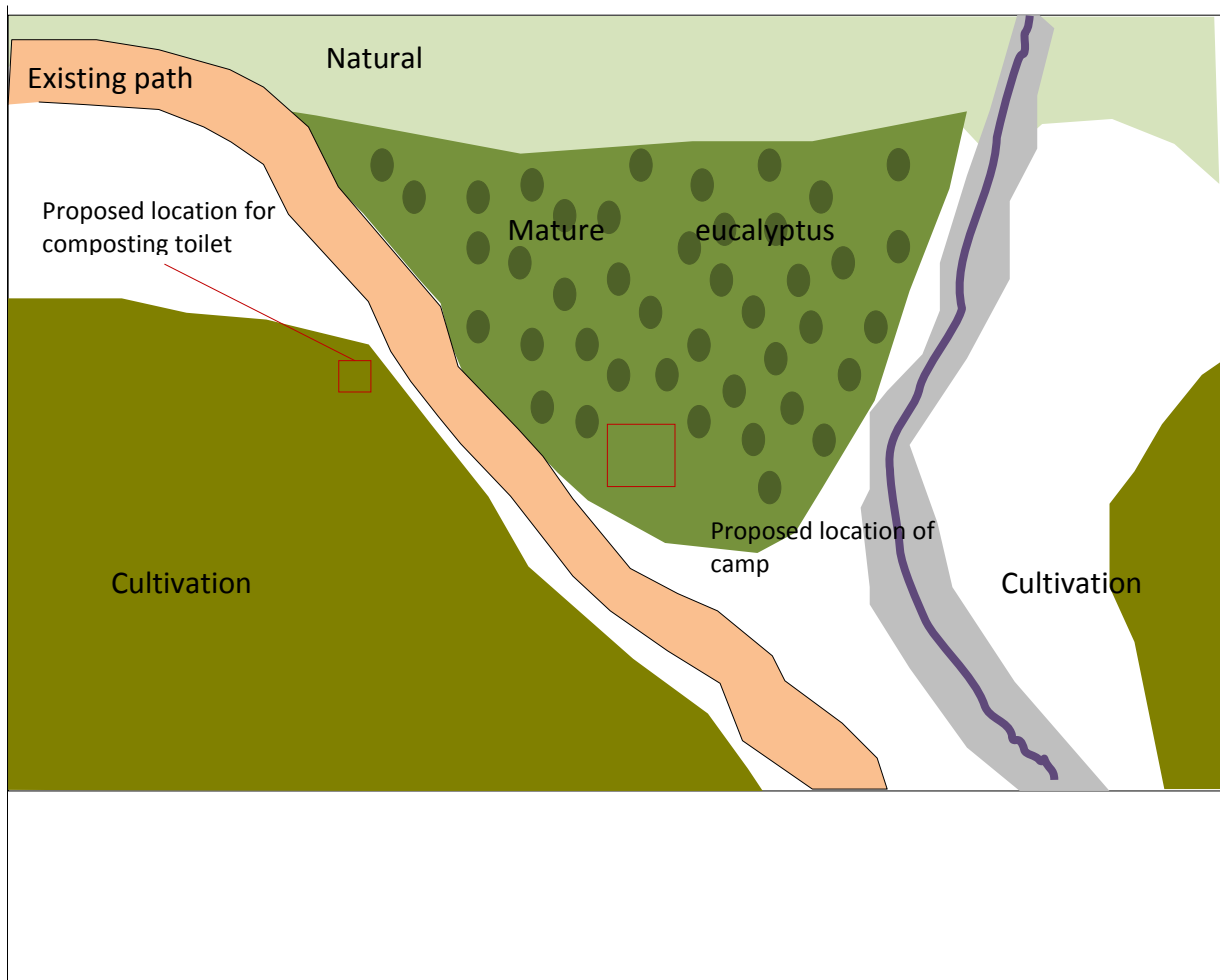
It is proposed to locate a composting toilet in a small area of land currently ploughed and used for cultivation on the other side of the walking track to the east of the camp site (refer to Photo 30 below).

PHOTO 30 – ANGET MEWUGIA: PROPOSED LOCATION OF COMPOSTING TOILET



The proposed location of the camp facilities are detailed in Figure 7.

FIGURE 6 - ANGET MEWUGIA: SKETCH OF SITE (NOT TO SCALE, VERY APPROXIMATE)



The site is bounded by farmland to the north, west and east and natural forest to the south. The natural forest area extends very steeply to the south up the escarpment.

PHOTO 31- ANGET MEWUGIA VIEW TO NORTH OF SITE



PHOTO 32 - ANGET MEWUGIA: VIEW TO WEST OF SITE



PHOTO 33 - ANGET MEWUGIA: VIEW TO EAST OF SITE



PHOTO 34 - ANGET MEWUGIA: VIEW TO SOUTH FROM SITE



#### BIODIVERSITY

As noted previously the proposed site is within an existing mature stand of eucalypts that were planted as part of a government agroforestry development. This area has some patches of red hot poker (*Kniphofia foliosa*) and other unidentified herbaceous species.

No fauna were observed during the site visit. Local SUNARMA staff who work in the area and local community members who walk through the area regularly, reported that the following fauna have been observed on or in proximity to the proposed day camp site:

- Hyenas (species unknown) – seen at night
- Menilik's dukala – observed in the early mornings and evening in natural forest areas to the south of the site. Animals retreat into natural forest areas when disturbed by people.

No nests were observed in the trees within the proposed day camp site.

The site is approximately 3 hours walk (for tourists) from Debre Sina and is to be used as a day stop only. The local community may also use the facility as a refreshment stop during the day. The site's use will most likely be limited to the middle of the day and early afternoon. Human activity associated with the use of the day site by tourists is therefore unlikely to disturb wildlife such as Meniliks' dukala which may utilize/move through the site at dusk and dawn or hyenas which are nocturnal.

Trees are not to be cleared for the development, which should be located within the existing cleared area in the northern portion of the site. To limit impacts on the existing vegetation, minimize disturbance of the site and minimize impacts from overland flow of rainwater during the wet season it is recommended that the camp facility be limited to a size that can accommodate a maximum of 10 people and constructed as a raised timber platform supported on posts (to allow water to flow beneath the structure). If the size of the structure exceeds the cleared area then it should be built around the trees.

#### SENSITIVE AREAS

An unnamed watercourse, which flows from the top of the mountain range, flows past the western side of the proposed site. Any wastewater should be directed away from this watercourse. It is noted that the proposed composting toilet is located on the other side of the ridge and is unlikely to impact on this watercourse.

There is also an undeveloped spring on the hill to the west of the site. The spring is approximately 800m to the south-west above the proposed campsite. The spring is upslope of the site and some distance away so it is not expected to be impacted on by the development.

PHOTO 35 - ANGET MEWUGIA: WATERCOURSE AND SPRING TO THE SOUTH WEST OF CAMP SITE



#### HUMAN SETTLEMENT

The nearest residences are approximately 500 m to the north and 1000m to the north-west of the camp site. The proposed site is not used on a regular basis by the local community although mature eucalypt trees may be harvested for timber in the future. As the site is only to be used for short stay day visits and visiting groups will be no greater than 10 people it is not expected that its use will generate significant noise or other disturbances that will have a significant impact on adjacent residents.

#### CULTURAL HERITAGE

No areas of cultural heritage were reported within the proposed area of the day camp site. SUNARMA staff reported that the name Anget (neck) Mewugia (stab) refers to a section of the track that crests a ridge approximately 500m further along the trekking path to the south of the day camp site. This crest got its name because in the past warring groups would ambush and attack each other by sheltering behind the crest and throwing stones or spears at the approaching enemy. This cultural heritage should be about this area should be included in tourist information.

#### OPERATIONAL WATER

Water for use at the site could be gravity feed from an existing undeveloped spring that is located in grazing lands uphill and to the west of the site (refer to Photo 35). If it is determined that water is necessary for the development the spring should be developed as part of the project.



#### OPERATIONAL ENERGY

Mains electricity is not available.

#### ENERGY FOR LIGHTING

Day use only no lighting required.

#### FUEL FOR COOKING

As a day camp it is expected that the need for fuel for cooking will be limited to that needed for the preparation of tea and coffee. It is expected that any charcoal that may be required would be purchased from nearby villages or towns. There are a number of eucalyptus woodlot plantations within close proximity to the site from which fuel wood can be purchased.

#### ACCESS TO THE SITE

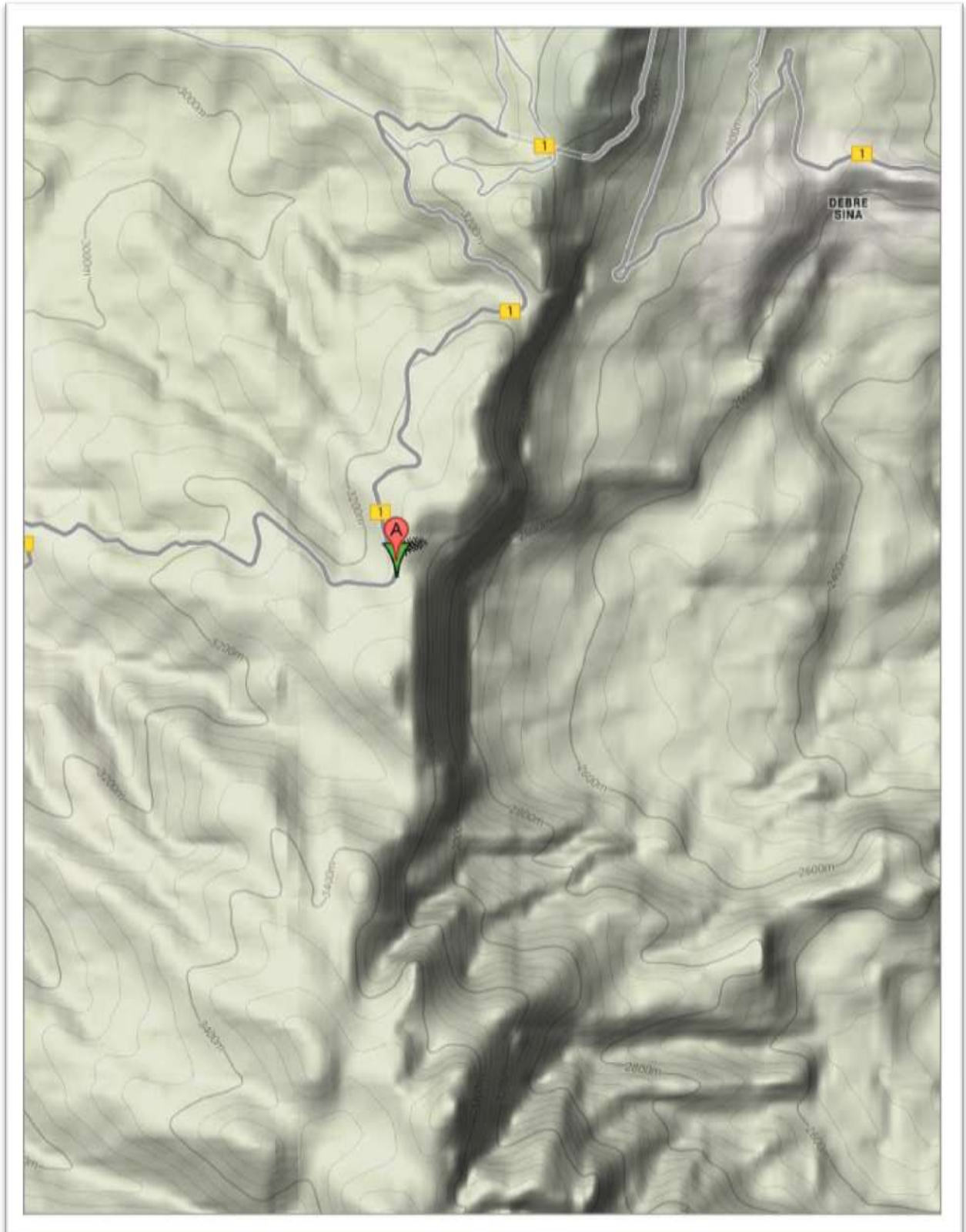
The site is approximately 8 km from the nearest road access at Debre Sina. All imported materials would be required to be bought using pack animals or carried.

## 5.2 MENILIKI'S WINDOW

#### GENERAL DESCRIPTION

The campsite is located at N 9 ° 49' 11" E 39° 44' 01" in Gudoberet Kebele in Basonaworana Woreda at an altitude of approximately 3250 m.

FIGURE 7 - GOOGLE MAPS TERRAIN LAYER MENELIK'S WINDOW



The site provides picturesque views to the east over the Debre Sina Escarpment with views of Wof Washa Forest. It is a popular tourist stop along the Debre Birhan to Debre Sina Road and a number of local youth currently sell a number of souvenirs to passing tourists.

PHOTO 36 - AERIAL PHOTO: MENELIK'S WINDOW



#### BIODIVERSITY

The area has been previously cultivated and is currently used for grazing. The area is predominantly grassed.

Gelada baboons and hyrax (species not confirmed) have been observed during site visits. As this is an exiting tourist site human disturbance is already a feature of the site.

#### HUMAN SETTLEMENT

The nearest residences are approximately 800 m to the west of the site and are not visible from the site. As the site is already utilized by tourists and is not visible to surrounding residents it is not expected that the establishment of a tourist facilities will have a significant impact on surrounding residents.

Local leaders and youth who currently sell souvenirs at this site should be consulted regarding the type of facilities that should be provided.

#### CULTURAL HERITAGE

No areas of cultural heritage were reported within the proposed area of the day camp site.

#### OPERATIONAL WATER

There is no water available in close proximity. As a day camp it is expected that the need for water will be limited to hand washing and cleaning. Consideration should be given to installing a rain fed tank for this purpose. If this does not provide sufficient water then it can be trucked in as necessary.

#### OPERATIONAL ENERGY

Mains electricity is not available.

#### ENERGY FOR LIGHTING

Day use only no lighting required.

#### FUEL FOR COOKING

As a day camp it is expected that the need for fuel for cooking will be limited to that needed for the preparation of tea and coffee. It is expected that any charcoal that may be required would be purchased from nearby villages or towns. There are a number of eucalyptus woodlot plantations within close proximity to the site from which fuel wood can be purchased.

#### ACCESS TO THE SITE

The site is on the Debre Birhan to Debre Sina Road. All imported materials could be transported to the site by truck.

# ENVIRONMENTAL MANAGEMENT PLAN

Aspect/Issue	Management Measures		
	Design and Planning	Construction	Operation
<b>CAMPSITES</b>			
WOF WASHA GENETE			
BIODIVERSITY			
<p>There are no trees or shrubs within of the footprint of proposed development in area 1. However there are a number of saplings in the western edge of Area 2. Juniper trees and natural forest also surround area 2 and there is natural forest to the north and west of Area.</p>	<p>To avoid impacting on the root zones of exiting trees, facilities should be located outside the drip line of existing trees.</p>	<p>Clearing of trees species, including saplings, for the construction of camp facilities is to be avoided. Prior to commencing construction, vegetation protection zones (areas demarcated and signed as areas which are not to be disturbed or impacted on during construction) should be established around any areas of vegetation including the natural forest area and juniper plantation.</p>	
<p>Due to its proximity to native forest and the reported presence of wildlife it is possible that increased human activities adjacent to the forest, especially in the early mornings and at dusk, may disturb some species.</p>	<p>Tukuls should be designed and constructed in a manner that allows visitors to view the forest area without disturbing any wildlife that may be present (e.g. screens on windows or fences that allow views out but restrict</p>		<p>As detailed in section 3 operational guidelines should include instruction to tourists about minimizing their impact on local species. Specifically for this site clear instructions both written (e.g. signs) and verbal should</p>

Aspect/Issue	Management Measures		
	Design and Planning	Construction	Operation
	views in).		be given to all visitors and include information on limited access to natural forest area especially at dawn and dusk.
<b>SENSITIVE AREAS</b>			
An unnamed watercourse is located approximately 300 m down slope from Area 2 where the accommodation tukuls will be established and Area 3 where the composting toilet and shower will be established.	Wastewater from the shower facility should be treated using a simple filtration system then directed towards vegetated areas to maximize absorption and filtration.		
<b>HUMAN SETTLEMENT</b>			
Approximately 13 households (average 5 people per household) live within the Wof Washa Genete area. The closest residence is located within the existing compound to the east of the proposed development. The local communities currently use the proposed campsite areas as free range grazing areas for their livestock.	To ensure that the community continue to support the development they should be further consulted once more detailed plans have been developed.		
<b>CULTURAL HERITAGE</b>			
The nursery site, while not of high cultural significance, plays an important role (both in			A tour of the nursery and information on its role in natural

Aspect/Issue	Management Measures		
	Design and Planning	Construction	Operation
<p>the past and currently) in the preservation of the natural forest, improvement in agricultural practices and economic development of the area. It is therefore an important part of recent local history and is likely to be of interest to tourists.</p> <p>OPERATIONAL WATER</p> <p>an undeveloped spring is located within the edge of the natural forest area approximately 600 m to the north east of the proposed campsite.</p>			<p>resource management should be developed as part of the tourism features of the site.</p>
<p><b>MESCHA</b> BIODIVERSITY</p> <p>The site contains patches of red-hot pokers (<i>Kniphofia foliosa</i>) and other unidentified grasses and herbaceous flora. Some of these patches may have to be cleared to accommodate for the construction of campsite buildings.</p> <p>SENSITIVE AREAS</p> <p>Two unnamed watercourses are within close proximity to the site. An unnamed watercourse at the bottom of the slope</p>		<p>spring should be developed as part of the campsite development</p>	<p>To minimize loss of these plants and enhance the visual aesthetics of the campsite it is recommended that any red-hot pokers and other herbaceous plants cleared during construction be retained and replanted around the buildings upon completion of works.</p>
	<p>the shower facility and composting toilet be located in the western portion of the site and after filtration, waste water from</p>		

Aspect/Issue	Management Measures		
	Design and Planning	Construction	Operation
<p>approximately 300 m to the south-west of the site and another intermittent watercourse approximately 250 m to the north east of the site which was dry at the time of the site inspection.</p> <p>Cropping land to the east of the camp may be susceptible to pollution from wastewater.</p> <p>OPERATIONAL WATER</p> <p>Water from the unnamed watercourse to the south east of the site may be able to be pumped up the hill for use at the campsite.</p>	<p>the shower be dispersed towards the vegetated area to the west of the proposed development site.</p> <p>A water pump should be included in site plans</p>		
<b>LAY GOROBELA KUNDI</b>			
<p><b>HUMAN SETTLEMENT</b></p> <p>Kundi village is located approximately 400m to the south east of the proposed campsite. When constructed campsite buildings may be visible from the village and noise generated from the campsite may be heard in Kundi Village.</p> <p>Currently access to the campsite is through and/or immediately adjacent to village.</p>	<p>During the initial consultation and development phase of the project community members should be consulted regarding their wiliness to let tourist regularly walk around or through their village. If the community is not happy with this arrangement an alternative trekking route that does not pass directly through their village should be established.</p>	<p>To form a visual boundary between the village and the campsite, consideration should be given to planting native plant species such as giant lobelia along the western boundary of the campsite (i.e. along the boundary between the campsite and Kundi Village).</p>	<p>Tourists should be advised of any activities or actions required to minimize their impact on residents of Kundi village when travelling to or from the campsite and during their stay.</p>



Aspect/Issue	Management Measures		
	Design and Planning	Construction	Operation
<p>CULTURAL HERITAGE</p> <p>Approximately 300 m to the south west of the campsite is the site of the palace of the Shoan King, Zera Yacob who ruled the area in the 14th Century. No buildings or other known archeological features are present on the site however local residents are knowledgeable about its location and history.</p>	<p>Community members and any relevant historical organisations should be consulted regarding measures that should be put in place to preserve the site and its history.</p>	<p>The palace site should be identified and demarcated as an area that is not to be impacted on (directly or indirectly through activities such as collection of stones soil etc) by the construction works.</p>	<p>Signage and other information should be prepared and installed to inform tourists and other visitors of the location of the palace, its associated history and cultural aspects of the site and any actions they should take to preserve the site and its history.</p>
<p>BIODIVERSITY</p> <p>Giant mole rat mounds are located in the vicinity of the proposed campsite. Other burrowing animals may also be present and may be disturbed during construction of the facilities.</p>		<p>Care should be taken during construction to avoid injury or death of burrowing animals during construction.</p> <p>If any animals are encountered they should not be handled and should be allowed to move off of their own accord.</p>	
<p>Gelada Baboons are known to forage grass and move through in this area.</p>	<p>To minimize the area of potential disturbance the campsite footprint should be kept as small as practical. To minimize disturbance of any baboons on the escarpment cliff face, potentially</p>		<p>Operational guidelines and signage detailed in section 3.3 should include specific information on limited access to escarpment edge between dusk and dawn when</p>

**Aspect/Issue**

**Management Measures**

**Design and Planning**

noisy areas such as the kitchen and dinning tukuls should be located away from the edge of the escarpment. The campsite and tukuls should be designed to allow any nearby baboons to be observed from within the camp (e.g. screened windows that allow tourists to look out but limit the ability of wildlife to see the people.) Consideration could also be given to constructing screens or a fence, which restrict views into the camp at access points around the camp.

**Construction**

**Operation**

baboons are likely to sleeping on ledges of cliffs. Consideration could also be given to constructing a simple viewing hide on a vantage point that gives good views of the escarpment so that tourists can view any animals on the escarpment including Gelada Baboons with limited disturbance.

**SENSITIVE AREAS**

Two fresh water springs which are the only water source for Kundi village are located more than 400 m to the west and on the other side of a ridge from the proposed campsite. The campsite is up hill from both of the springs.

To minimize the risk of contaminated the groundwater in the area, water from the showers should be filtered as detailed in the general requirements section above and should be directed towards vegetated areas near the escarpment.

Due to its location up hill from the springs it is possible that wastewater from showers and cooking at the campsite may if not carefully managed, contaminate ground water which flows into these springs.

Aspect/Issue	Management Measures		
	Design and Planning	Construction	Operation
<b>HUMAN SETTLEMENT</b>			
Lay Gorobela Kundi village is located approximately 400m to the south west of the campsite. The village is not visible from the campsite and the undeveloped campsite is not visible from the village. It is possible that when constructed the campsite buildings may be visible from the village. It is also possible that noise generated from the campsite may be heard in the village.	residents should be consulted about the design of the campsite buildings and their inputs should be considered and addressed as relevant.	To enhance the visual aspect of the development consideration should also be given to planting native plant species such as giant lobelia along the western boundary of the campsite (i.e. along the boundary between the campsite and Kundi Village).	To minimize potential impacts from tourists during operation of the campsite local residents should be consulted regarding requirements, if any, should be addressed in operational guidelines for tourists.
<b>CULTURAL HERITAGE</b>			
Approximately 300 m to the south west of the campsite is the site of the palace of the Shoan King, Zeray Yacob who ruled the area in the 14th Century. No buildings or other know archeological features are present on the site however local residents are knowledgeable about its location and history. King Zeray is believed to have been buried in St Georges Church in Lay Gorobela Kundi Village.	Cultural heritage features of the palace site should be acknowledged and community members and any relevant historical organisations should be consulted regarding measures that should be put in place to preserve the site and its history.	The palace site should be identified and demarcated as an area that in not to be impacted on (directly or indirectly through activities such as collection of stones soil etc) by the construction works.	Signage and other information should be prepared and installed to inform tourists and other visitors of the location of the palace, its associated history and cultural aspects of the site and any actions they should take to preserve the site and its history.
<b>OPERATIONAL WATER</b>			
Water for the campsite will be sourced from an existing water well in Kundi Village which	To ensure that there is sufficient water available for community and to supply		

Aspect/Issue	Management Measures		
	Design and Planning	Construction	Operation
runs dry for approximately 2 months per year. During dry periods the village relies on undeveloped spring approximately 50 m to the west of the village (photo 2 & 3 below).	the proposed camp this spring should be developed into a usable well as part of the eco-tourism project.		
Mains power is available approximately 500 m away for the site in Kundi village.	Due to its close proximity and ease of access consideration should be given to connecting the campsite to mains power.		
<b>GOSH MEDA</b>			
<b>BIODIVERSITY</b>			
burrowing animals may also be present and may be disturbed during construction of the facilities.		Care should be taken during construction to avoid injury or death of burrowing animals during construction.  If any animals are encountered they should not be handled and should be allowed to move off of their own accord.	
Gelada Baboons are known to forage grass and move through in this area.	To minimize the area of potential disturbance the campsite footprint should be kept as small as practical. To minimize disturbance of any baboons on the escarpment cliff face, potentially noisy areas such as the kitchen and dinning tukuls should be located away		Operational guidelines and signage detailed in section 3.3 should include specific information on limited access to escarpment edge between dusk and dawn when baboons are likely to sleeping on ledges of cliffs. Consideration could

Aspect/Issue	Management Measures		
	Design and Planning	Construction	Operation
	<p>from the edge of the escarpment. The campsite and tukuls should be designed to allow any nearby baboons to be observed from within the camp (e.g. screened windows that allow tourists to look out but limit the ability of wildlife to see the people.) Consideration could also be given to constructing screens or a fence, which restrict views into the camp at access points around the camp.</p>		<p>also be given to constructing a simple viewing hide on a vantage point that gives good views of the escarpment so that tourists can view any animals on the escarpment including Gelada Baboons with limited disturbance.</p>
<p>OPERATIONAL WATER</p> <p>There are no sources of water in close proximity to the site</p>	<p>A tank will have to be established on site and consideration should be given to using iron roofing on the kitchen/dinning tukuls and harvesting rainwater for use.</p>		<p>Additional water will have to be transported by pack animals to the site as needed.</p>
<p>ENERGY FOR LIGHTING</p> <p>Mains power is not available. The site is very exposed and should receive good uninterrupted sunlight for the majority of the day.</p>	<p>the feasibility of installing photovoltaic energy system and installing solar hot water for use in the showers should be investigated and utilized if economically feasible.</p>		
<p>HUMAN SETTLEMENT</p> <p>Currently access to the campsite is through and/or immediately adjacent to cultivated fields and farmland.</p>	<p>During the initial consultation and development phase of the project, community members should be</p>		

Aspect/Issue	Management Measures		
	Design and Planning	Construction	Operation
	consulted regarding their preferred trekking path for tourists		

## DAY CAMPS

### ANGET MEWUGIA

#### BIODIVERSITY

The proposed site is within an existing mature stand of eucalypts and is sloping.

Trees are not to be cleared for the development, which should be located within the existing cleared area in the northern portion of the site. To limit impacts on the existing vegetation, minimize disturbance of the site and minimize impacts from overland flow of rainwater during the wet season it is recommended that the camp facility be limited to a size that can accommodate a maximum of 10 people and constructed as a raised timber platform supported on posts (to allow water to flow beneath the structure). If the size of the structure exceeds the cleared area then it should be built around the trees.

#### OPERATIONAL WATER

Water for use at the site could be gravity feed from an existing undeveloped spring that is located in grazing lands uphill and to the west

If it is determined that water is necessary for the development the spring should be

Aspect/Issue	Management Measures		
	Design and Planning	Construction	Operation
of the site	developed as part of the project.		
<p>CULTURAL HERITAGE</p> <p>SUNARMA staff reported that the name Anget (neck) Mewugia (stab) refers to a section of the track that crests a ridge approximately 500m further along the trekking path to the south of the day camp site. This crest got its name because in the past warring groups would ambush and attack each other by sheltering behind the crest and throwing stones or spears at the approaching enemy.</p>			This cultural heritage should be about this area should be included in tourist information.
<b>MENELIK'S WINDOW</b>			
<p>HUMAN SETTLEMENT</p> <p>The site is a popular tourist stop along the Debre Birhan to Debre Sina Road and a number of local youth currently sell a number of souvenirs to passing tourists.</p>	<p>Local leaders and youth who currently sell souvenirs at this site should be consulted regarding the type of facilities that should be provided.</p>		
<p>OPERATIONAL WATER</p> <p>There is no water available in close proximity.</p>	<p>Consideration should be given to installing a rain fed tank for this purpose.</p>		<p>Additional water can be trucked in as necessary.</p>

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