Amhara IAIP (Bure) and Mota RTC

Biodiversity Impact Assessment Report

ZGEC

Amhara IAIP (Bure) biodiversity Impact Assessment

1. Introduction

The proposed projects of the Amhara's Region IAIP site, Bure and its extension RTC site, Mota have been located in the area where the forest has already been changed or altered significantly to the agricultural land use for various crop productions. However in the Bure IAIP site there are some remnants of forest vegetation and wetland plant species along the streams, small rivers and scattered of patch of tree species mainly in left side (west side) of the middle part of the proposed IAIP site and the right side (east side) of the middle part of the proposed IAIP site. See Fig 1, rough sketch that indicates these areas.

Although the proposed project is considered as an integrated industrial park, due to its coverage of large areas and having various activities that will be undertaken during construction phase and operational phase, it may have some significant negative impacts on the remnant vegetation, wetland habitats inside the project area, and also affect any sensitive receptors in its vicinity. In order to ensure that there is minimum impact on any important biodiversity area encountered in this project area and its vicinity, if any, a specific Biodiversity Assessment Study has been undertaken by independent consultant so as to provide necessary mitigation measures that can be incorporated into overall Environmental and Social Management Plan (ESMP) of this project.

2. Objectives & Scope of the Assessment

This biodiversity impact assessment aims in identifying potential impacts on flora and fauna and to suggest relevant compensatory and mitigation measures to protect/conserve biodiversity in the likely impacted area inside and around the vicinity of the proposed project due to the project's activities. To achieve this the consultant has carried out a comprehensive study on biological diversity aspects inside and around the proposed project area that limited to affected biodiversity area and assess the potential impacts and risks (direct as well as indirect/ induced) due to the project activities.

Accordingly the consultant has suggest appropriate measures for compensating & mitigating measures for managing the identified and predicted impact that has been could be emanated due to the proposed project's activities. This assessment also describes the biodiversity values present on the development site and the impact of the project activity on these values and also

identify reasonable measures and strategies that can be taken to avoid and minimize impacts on biodiversity.

3. Approach and Methodology of the Study

Consultation with competent authorities & local communities, field survey, and desktop review were major techniques that were deployed to collect data, to analyze and come up with biodiversity assessment reports and associated management plans for this proposed project.

Desktop assessment was also carried out in order to come up with reliable information and as a supporting evidence for the field survey findings on the following pertinent ecological and biodiversity issues under question.

- Identification and characterization of biodiversity and ecological feature of the proposed project area and its vicinity;
- Identification of protected biodiversity sites within 10 km radius of the proposed project;
- Identification of the status of the protected biodiversity sites (i.e. are they internationally, nationally, regionally or locally protected and under what legislation) and provide a brief description of why the sites are protected (i.e. habitat type, red list species etc);
- Identification of non-protected areas within the vicinity of the site that may be sensitive to this proposed project (i.e. watercourses / wetland habitats);
- Identification of all IUCN red list fauna and flora species that could potentially be present on site;
- Identification of potential sensitive biodiversity resources on the site;
- Description of general habitat types located on the proposed project site that including a table outlining typical flora and fauna for each site and the general condition thereof.

The field survey and consultation of relevant stakeholders were also considered as supplementary and for ground proof evidences of the desktop review findings, especially on determining the presence or absence of sensitive species on the site, as well as to confirm the extent of natural/sensitive environments on the site and around project areas.

4. Baseline of the proposed project area

The proposed projects of the Amhara's Region IAIP site (Bure) and its extension RTC site (Mota), even though they are situated far apart, are found in similar agro-ecological zones, which are having more or less similar features in terms of ecological features. However in respect to the degree of alteration of the existing condition of these sites as a result of anthropogenic factors vary from one another. Bure site is less changed or affected and has remnant vegetation and wetland habitats on some part of the proposed project site as compared to Mota RTC site. Mota RTC site is totally changed to agricultural land with no tree vegetation inside and vicinity of the project area, where it is located adjacent to urban area (town). Hence though these sites are found in almost same agro ecological area and near to each others, most of the resource base description represents for Bure IAIP site.

A. General Ecological Feature

The Bure area in general and the IAIP site in particular lays on the dry Evergreen Montane Forest and Evergreen Scrub Ecosystem. The evergreen scrubland vegetation occurs in the highlands of Ethiopia either as an intact scrub, i.e. in association with the dry evergreen montane forest or usually as secondary growth after deforestation of the dry evergreen montane forest. The Dry Evergreen Montane Forest and Evergreen Scrubland vegetations are the characteristic vegetation types of this ecosystem. In Bure IAIP site there are some remnants of forest vegetation, having Evergreen Montane Forest and Evergreen Scrub Ecosystem characteristics, along the streams; small rivers; and scattered of patch of tree species.

Furthermore Bure IAIP site has some closed system and/or channeled wetland habitats (permanent or temporary wetlands) along the streams and small rivers mainly in right side (east side) of the middle part of the proposed IAIP site and the left side (west side) of the middle part of the proposed IAIP site

B. Description of General Habitat and Biodiversity of the Proposed Project Site

Most part of the proposed project area was changed for agricultural land some time ago. Hence only some little remnant dry land and wetland vegetation has left mainly in the right side (east side) of the middle part of the proposed IAIP site of the proposed project, where streams wetlands and seasonal river have been occurring. A scattered and patch of tree species also found

in some part of the proposed project site. The remaining part of the proposed project site is mainly dominated by weedy vegetation, which has been emerged as a result of continuous farming practices and overgrazing.

Regarding the occurrence and status of flora and fauna of the proposed site and its vicinity some common plant species are listed here under table 1, and list of common birds and mammal species are listed in table 2 and table 3 respectively.

Table1. List of plant species in and vicinity of the proposed project area

S.N	**Scientific name**	**Local name (Amharic)**	**Remark (occurrence in and vicinity of the project area)**
1	*Ficus vasta*	Warka	Moderate
2	*Erythrina abssice*	Korch	Common
3	*Alvizia gomifera*	**Sesa**	Common
4	*Vernonia amygobalima*	Girawa	Very common
5	*Spathodea nilotica*	Chisha	Moderate
6	*Crton mycrostatus*	Bisana	Very common
7	*Cordia africana*	Wanza	Moderate
8	*Olia capensis*	Woyra	Moderate
9	*Juniperus procera*	Tid	Rare
10	*Carissa spinarum*	Agam	Common
11	*Syzigium guineense*	Dokima	Common
12	*Ficus patula*	Shola	Moderate
Wetland dependant plant species			
1	*Cyperus alopecuroides*	Ketema	Common
2	*C. rotundus*	Ketema	Common
3	*C. digitatus*	Ketema	Common
4	*C. sesquiflorus*	Ketema	Common
5	*C. laevigatus*	Ketema	Common
6	*Paspalidium geminatum*	Ye Sar Zer	Common
7	*Panicum hygrocharis*	Ye Sar Zer	Common
8	*Leersia hexandra*	Ye Sar Zer	Common
9	*Panicum subalbidum*	Ye Sar Zer	Common
10	*Leptochloa fusca*	Ye Sar Zer	Common
11	*Panicum repens*	Ye Sar Zer	Common
12	*Panicum spicatus*	Ye Sar Zer	Common

Table 2: List of Common Bird Species

S.N	Scientific Name	Common Name	Local Name	Remark	Habitat
1	*Egrettaardesica*	Black Heron	-	rare	Prefers lake margins, river edges, marshes and inundations
2	*Columba guinea*	Speckled pigeon	Ergib		common
3	*Tockus erythrorhynchus*	Red-billed hornbill	Kutu	Common	Dry, wooded and bushed habitats and overgrazed grasslands
4	*Tockus flavirostris*	Yellow-billed hornbill	Kutu	rare	Dry, more or less bushed and wooded habitats
5	*Streptopelia decipiens*	African mourning dove	-	common	Dry wooded habitats with some grass, often near to streams also in gardens
6	*Lamprotornis chalybeus*	Greater blue-earned starling	-	common	more or less bushed and wooded natural and cultivated areas including parks
7	*Egretta garzetta*	Little Egret	-	Common	Shallow fresh water area

Table 3: List of common mammal species around project site

S.N	English name	Amharic name	Scientific name	Occurrence around project area
1	Spotted Hyena	Tera Jib	*Curocula curocula*	Common
2	Abyssinian Hare	Tinchel	*Lepus habesinicus*	Common
3	Olive Baboon	Zinjero	*Papio anubis*	Rare

C. Status of Biodiversity in the proposed Project Area

The occurrence of threatened species including IUCN Red list flora and fauna, the presence of protected areas with the radius of 10km from the proposed project site and their status were assessed. Both the desktop review, and field survey together with consultation of stakeholders has insured the following findings (see annexes).

- No protected biodiversity sites within 10 km radius of the proposed project has found;
- Except the watercourses that passes through the proposed project site, no sensitive areas, like wetlands, are found;

- No IUCN red list fauna and flora species are found in this proposed project site;
- No potential sensitive biodiversity resources are found on this proposed project site

5. Impact Prediction and identification on biodiversity

One of the tasks of this biodiversity assessment is to predict and identify possible impacts that could be emanated from the proposed project activities on biodiversity and its habitats. Hence all possible potential impacts were identified. Among list of impacts that has been predicted or identified, those significant impact that need special attention and require mitigation measures are selected for further planning. In order to determine significant level of impact out of all, Consequence of impact matrix, which is the sum total of impact intensity, extent, and duration, was considered. Accordingly the impact analysis also made based on the proposed project lifecycle starting from designing phase up to operational phase of the proposed project, so as to recommend appropriate mitigation measures in each steps as required.

A. Designing Phase

To maintain and implement an effective environmental management system in any proposed project, the designing phase is the most important stage that could prevent or minimize environmental damages. In the designing phase unless and otherwise the biodiversity and its habitat has been considered, all possible impacts will occur in the later phases of the proposed project. The design and on ground observation of Bure IAIP indicate that, some parts of the proposed project, where wetlands, streams and seasonal river pass through and having remnant of vegetation cover, has included or covered in the construction development of the proposed project. Hence this leads for occurrence of negative impact on the existing biodiversity which found in this site and its habitat or a total removal of the vegetation and the habitat loss (ex., total change in wetland habitat, river/stream natural course) will occur. Hence the following recommendations have been forwarded as mitigation measures that have to be undertaken during designing stage. See Fig 1, rough sketch that indicates possible proposed alternatives.

- Shift the already planned buffer zone to area where the streams with its riparian vegetation and wetland patches have situated (Location: for reference and identification of traverse look at sample points for surface water and soil have been made. Surface Water Sample points: along Amhara IAIP-SW5 (out of the boundary of the Park, soil

sample A6 in the middle of park along this traverse, and Amhara IAIP-SW6 far end of the park along this traverse.

- Add one more additional Buffer Zone to area where the streams with its riparian vegetation and wetland patches have situated (Location: for reference and identification of traverse look at sample points for surface water and soil have been made. Surface Water Sample points: along Amhara IAIP-SW3 (out of the boundary of the Park, soil sample A14 in the middle of park along this traverse, and Amhara IAIP-SW4 at middle of the park along this traverse, and Amhara IAIP-SW7 outside the park along this traverse.

The ESIA team has proposed these Buffer Zones taking into account the maintenance and conservation of naturally occurring vegetation patches and wetlands together with its abiotic features such as water (springs, streams) and soil. Hence precautionary measures should be taken in planning, construction and operational phases of this project so as the vegetation, microhabitats along these Buffer Zones not to be damaged or totally cleared and/or the stream lines be blocked by any structures and the IAIP compound fence.

Fig 1. Rough sketch of buffer zone and wetland conservation areas of Bure IAIP Landscape Layout

B. During Construction Phase

- Total loss/clearance of vegetation and natural habitats as a result of construction of physical structures in some part of the proposed project area,
- Loss of scattered tree stands in all over the proposed project site,
- Impact on the underneath growth and shift on natural water course by the construction cart away and left over.

C. Significant impacts identified in the operational phase

- Improper waste management will pollute the natural vegetation, wetland habitat and recipients like streams and seasonal rivers that pass through or cross the proposed project site.

6. Mitigation measures

Among the mitigation measures that have to be proposed prevention of impacts by changing design, site or technique is the most reliable approach to mitigation. While control of impacts with operating practices is less reliable, because the practices must be continued after hand- over of the activity. Hence revising the existing design of this proposed project has paramount importance in managing the impact emanates from this proposed project. Hence the following mitigation measures have been proposed.

1. Design change, especially for the transects located on fig 1 (wetland habitats and streams) that has been proposed as an alternative design of the project site, which has significant natural vegetation, wetland and water course habitat, so as this area to be either a buffer zone or a natural recreation area,
2. Maximum effort has to be made for not happen total loss/clearance of vegetation and natural habitats as a result of construction of physical structures in all part of the proposed project area,
3. Prepare a place for damping of construction of cart away before starting earth work,
4. Establish proper waste management especially liquid effluents not to pollute the natural vegetation, habitat and recipients like streams and seasonal rivers that pass through or cross the proposed project site,

5. Plantation of indigenous trees in free spaces or leave some place as a closure site so as the natural vegetation able to regenerate. The following indigenous tree species some among others have been proposed: *Ficus vasta* (Warka), *Ficus patula* (Shola), *Erythrina abssica* (Korch), *Albizia gummifera* (Sesa), *Vernonia amygobalima* (Girawa), *Spathodea nilotica* (Chiva), *Croton macrostachus* (Bisana), and *Cordia africana* (Wanza),
6. Undertake awareness raising campaign on how to maintaining this remnant vegetation and its habitat play great role in stabilizing the microclimate of the proposed project site and surrounding.

Management Plan

The objective of the EMP is to ensure the proposed mitigation measures will be implemented effectively & timely, and to ensure that all activities during the construction and operation phases will comply and adhere to environmental provisions and standard specifications. Hence the summary matrix of EMP and Environmental Monitoring Plan presented hereunder Table 4.

Table 4. Environmental Management Plan (EMP)

S.N	Impacts	Proposed Mitigation Measures	Responsible for implementing the mitigation measures	Responsible for monitoring the implementation of mitigation measures	Time Horizon	Budget for implementation of the Mitigation Measures
1	Total loss/clearance of vegetation and natural habitats as a result of construction of physical structures in the proposed project area	Design change, especially for the wetland area of the project site, so as this area to be retained with a buffer zone or	Proponent and the design of the project in charge	Ministry of Environment, Forest and Climate Change (MEFCC), Amhara Regional Environmental Agency	Completed	Cost for design revision
2	Loss/clearance of vegetation as a result of construction of physical structures in all part of the proposed project area	Maximum effort has to be made not to clear or destroy the scattered tree stands during construction	Proponent and Contractors	Ministry of Environment, Forest and Climate Change (MEFCC), Amhara Regional Environmental Agency and its replica at woreda level	From the beginning of construction	Cost for monitoring
		Plantation of indigenous trees in free spaces or leave some place as a closure site so as the natural vegetation able to regenerate	Proponent and Contractors	Amhara Regional Environmental Agency and its replica at woreda level	From the beginning of construction	Cost for plantation and management
		Undertake awareness raising campaign on how to maintaining this remnant vegetation and its habitat play great role in stabilizing the microclimate of the proposed project site and surrounding	Proponent	Amhara Regional Environmental Agency and its replica at woreda level	From the beginning of construction	Cost for plantation and management
3	Impact on the underneath growth and shift on natural water course by the construction cart away and left over	Prepare a place for damping of construction of cart away before starting earth work	Proponent and Contractors	Amhara Regional Environmental Agency and its replica at woreda level	From the beginning of construction	Cost for preparation of damping site and monitoring
4	Improper waste management or pollution of biodiversity and its habitat	As it has been recommended in waste management section of the document	Proponent and Contractors	Ministry of Environment, Forest and Climate Change (MEFCC), Amhara Regional Environmental Agency	From the beginning of construction	As it has been recommended in waste management section of the document

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Annexes

Annex 1: The red list of endemic trees and shrubs of Ethiopia

Annex 2: Indigenous and exotic breed's biodiversity of each farm animal of Ethiopia

Annex 3: List of Important Bird Areas of Ethiopia in priority order for conservation

Annex 4: Wild Mammals of Ethiopia rated as critically endangered, endangered and vulnerable

ANNEXES

Annex I. The red list of endemic trees and shrubs of Ethiopia

No.	Name of the Species	Status	Distribution in Ethiopian Floristic Region (s)*
1	*Acacia bricchettiana*	CR	HA
2	*Acacia negrii*	VU	GD, WU, GJ, HA, SD
3	*Acacia prasinata*	CR	AF, SU
4	*Acalypha marissima*	CR	WG
5	*Acanthus sennii*	NT	GD, GJ, WG, SU, HA, AR, BA, KF, GG, SD
6	*Argyrolobium schimperianum*	EN	TU, GD, GJ, SU
7	*Barleria longissima*	CR	SD
8	*Becium formosum*	VU	BA
9	*Blepharis cuspidate*	CR	SD
10	*Blepharispermum obovatum*	CR	BA
11	*Boswellia ogadensis*	CR	HA
12	*Boswellia pirottae*	VU	GD, GJ, WU, SU, KF
13	*Cadaba divericata*	VU	SD, HA
14	*Cladostigma nigistiae*	EN	SD
15	*Commiphora monoica*	CR	BA
16	*Crotalaria agatiflora*	NT	SU, HA, IL, AR, GG
17	*Crotalaria exaltata*	EN	SU, BA, KF, SD
18	*Crotalaria intonsa*	VU	GD, SU, KF, SD
19	*Crotalaria rosenii*	NT	SU, AR, BA, KF, SD
20	*Crotalaria sacculata*	CR	SD
21	*Cussonia ostinii*	NT	WU, GD, GJ, WG, IL, AR, KF, GG
22	*Delosperma abyssinica*	CR	TU
23	*Delosperma schimperi*	EN	TU, WU
24	*Dombeya kefaensis*	EN	KF
25	*Dombeya longebracteolata*	VU	KF, GG, SD
26	*Echinops ellenbeckii*	EN	SU, AR, HA
27	*Erythrina burana*	VU	HA, BA?
28	*Erythrococca uniflora*	EN	SD
29	*Euphorbia burger*	CR	HA
30	*Euphorbia dalettiensis*	EN	SD, HA
31	*Euphorbia doloensis*	CR	SD
32	*Euphorbia ellenbeckii*	EN	SD
33	*Erythrophysa septentrionalis*	EN	HA
34	*Euphorbia baleensis*	CR	BA
35	*Euphorbia betulicortex*	CR	SD
36	*Euphorbia fissispina*	EN	SD
37	*Euphorbia makallensis*	CR	TU
38	*Euphorbia nigrispinioides*	VU	SU, HA?

Annex I. The red list of, ...

No.	Name of the Species	Status	Distribution in Ethiopian Floristic Region (s)*
39	*Euphorbia ogadenensis*	CR	BA, HA
40	*Euphorbia somalensis*	CR	HA
41	*Euphorbia tetracantha*	CR	BA
42	*Euphorbia uniglans*	EN	SD
43	*Euryops pinifolius*	VU	WU, GJ, SU
44	*Hildebrandtia aloysii*	VU	HA, BA
45	*Hildebrandtia diredawaensis*	EN	HA
46	*Hybanthus puberulus*	CR	SD
47	*Ficus ruspolii*	VU	SD, KF
48	*Helichrysum elephantium*	VU	BA, GG, SD
49	*Helichrysum horridum*	EN	GD, SD
50	*Hybanthus puberulus*	CR	SD
51	*Hypericum gnidiifolium*	VU	TU, SU
52	*Indigofera curvirostrata*	CR	SD
53	*Indigofera ellebenbeckii*	CR	HA
54	*Hibiscus boranensis*	VU	SD
55	*Indigofera kelleri*	CR	HA
56	*Indigofera rothii*	EN	SU, HA
57	*Inula arbuscula*	CR	GD
58	*Inula confertiflora*	NT	WU, SU, HA, BA, AR
59	*Kanahia carlsbergiana*	EN	AR, BA
60	*Lantana kisi*	EN	TU
61	*Lindenbergia awashensis*	EN	AF, SU
62	*Maerua boranensis*	CR	SD
63	*Maytenus addat*	NT	SU, AR, SD, GG
64	*Kirkia burger*	VU	SD, BA, HA
65	*Kleinia gypsophila*	CR	HA
66	*Kleinia negrii*	EN	WU, HA, SD
67	*Kotschya recurvifolia*	VU	BA, HA, KF, SD
68	*Maytenus cortii*	CR	GD
69	*Maytenus harenensis*	CR	BA
70	*Monadenium shebeliensis*	CR	HA
71	*Moringa rivae* subsp. *longisiliqua*	VU	SD, BA, HA
72	*Phyllanthus dewildiorum*	EN	WG, KF
73	*Phyllanthus limmuensis*	VU	GD, GJ, WG, IL, KF
74	*Polyscias farinose*	VU	TU, GD, GJ, SU, KF
75	*Polysphaeria aethiopica*	EN	SD, BA
76	*Otostegia tomentosa* subsp. *steudneri*	VU	GD, WU
77	*Phyllanthus borenensis*	CR	SD
78	*Pseudoblepharispermum bremeri*	CR	HA

Annex I. The red list of, ...

No.	Name of the Species	Status	Distribution in Ethiopian Floristic Region (s)*
79	*Rhynchosia erlangeri*	EN	HA
80	*Rhynchosia splendens*	CR	GD
81	*Rinorea friisii*	EN	IL, KF
82	*Rubus aethiopicus*	EN	SU, GD
83	*Rubus erlangeri*	EN	BA, SD
84	*Sparmannia macrocarpa*	NT	GD, GJ, WU, SU, AR, WG, KF, GG, HA
85	*Stomatanthes meyeri*	CR	KF
86	*Tacazzea venosa*	EN	TU, GD, GJ
87	*Taverniera abyssinica*	CR	TU, SU
88	*Ruellia boranica*	EN	SD
89	*Satureja unguentaria*	EN	GD
90	*Sesbania melanocaulis*	EN	KF, WG
91	*Tephrosia dichroocarpa*	EN	TU, GD, GJ
92	*Terminalia hararensis*	DD	BA, HA
93	*Terminalia hecistocarpa*	DD	BA
94	*Tragia abortive*	VU	GG
95	*Tragia negeliensis*	VU	SD, BA
96	*Verbascum arbusculum*	CR	SU
97	*Wellstedia filtuensis*	CR	SD
98	*Wendlandia arabica* subsp. *aethipica*	EN	SU
99	*Verbascum arbusculum*	CR	SU
100	*Vernonia cylindrical*	VU	TU, GD, GJ, WG
101	*Vernonia dalettiensis*	CR	HA
102	*Vernonia tewoldei*	EN	KF, BA
103	*Vernonia thulinii*	CR	WG

*Distribution in Ethiopian Floeristic Region(s): BA (Bale), GD (Gonder), GG (Gamo Gofa), GJ (Gojam), HA (Harerge), IL (Iluababor), KF (Kafa), SD (Sidamo), SU (Shewa), TU (Tigray), WG (Walesa) and WU (Well).

Source: Jose L., Ensermu Kelbessa and Sebsebe Demissew (2005)

Annex II. Indigenous and exotic breeds' diversity in each farm animal species of Ethiopia

Species	Breeds names and number			
	Indigenous breed names	No	Exotic	No
Cattle	Arsi, Begait, Ogaden, Borena, Goffa, Arado, Nuer, Gurage, Jidu, Karayu, Afar, Harar, Horro, Simada, Fogera, Mursi, Raya-Azebo, Adwa, Jem-Jem, Sheko, Ambo, Jijiga, Bale, Hammer, Medenece, Irob, Abergelle and Begaria	28	Holstein-Friesian, Jersey, Brown Swiss, Hereford, Brahman, Angus and Simmental	7
Sheep	Simien, Short-fat-tailed, Washera, Horro, Arsi-Bale, Bonga, Afar, Black head Somali, Gumuz	9	Awassi, Hampshire, Blue-demain, Merino, Romney, Corriedale and Dorper	7
Goat	Arsi-Bale, Gumuz, Keffa, Woyto-Guji, Abergelle, Afar, Highland Goats and the Somali Goats.	8	Anglo-Nubian, Toggenberg and Boer goats	3
Camel	Jijiga, Geleb, Shinile, Amibara, Mile, Hur and Liben	7	---	
Donkey	Abyssinian, Afar, Haraghe, Omo/Hamer, Ogaden and Sinnar	6	---	
Horse	Abyssinia, Bale (pony), Borena, Horro, Keffa-Sheka (giant), Kundudo, Ogaden/Aware/Wilwal and Selale/Oromo	8	---	
Mule	Sinnar and Wollo	2	---	
Chicken	Horro, Jarso, Tililli/Mandura, Tepi/Sheko, Konso and Cheffe,Farta	7	Rhode Island Red, White Leghorn, Lawman Brown, Cobb-500, Fayoumi, Bovans Brown, Arob Acre, Bubcocks, Potcheftsroom Koekoek, Dominant Brown D102, Lahhman Silver, Hubbard Classic, Hubbard JV and ISA Brown	14

Source: (IBC, 2012c; 2004)

Annex III. List of Ethiopian Important Bird Areas in Priority Order for Conservation

Site Code	Site Name	Region
016	Bale Mts. Nat. Park	4
011	Awash Nat. Park	4,2
059	Simen Mts. Nat.Park	3
007	Ankober/Debre Sina Escarpment	3
064	Yabello Sanctuary	4
040	Guassa (Menz)	3
055	Nechisar Nat. Park	7
002	Abijatta-Shalla Lakes Nat. Park	4
008	Arero Forest	4
012	Awash Valley	2
037	Genale River	4
052	Metu-Gore Tepi Forests	4
003	Aba Samuel Wetlands	4
044	Koka Dam/Gelila Lake	4
013	Awi Zone	3
015	Bahir Dar Lake-Tana	3
021	Bogol Manyo	5
035	Gambella Nat. Park	12
049	Mankubsa-Welenso Forest	4
061	Sululta Plains	4
062	Tiro Boter-Becho Forest	4
070	Chilimo Forest	4
073	Senkelle Sanctuary	4
024	Chelekleka Swamp	4
006	Anferera Forest	4
023	Boyo Wetland	7
027	Dawa- Wachille	4
031	Denkoro Forest	3
036	Gefersa Reservoir	14
042	Jemma/Jara Valleys	3
048	W/Shebelle River/Warder	5
051	Menagesha Forest	4
053	Mid-Abbay River Basin	3
025	Chew Bahir Lake	7
032	Entoto Natural Park	14
033	Fincha'a-Chomen Swamps	4
046	Langano Lake	4
047	Liben Plain-Neghelle Woodlands	4
066	Yegof Forest	3
017	Baro River	12

038	Green Lake	4
005	Aliyu Amba/Dulecha	3,2
028	Desa'a Forest	1
029	Dilu Meda (Tefki)	4
034	Fogera plains	3
060	Sof Omar	4
066	Yangudi Rassa Park	2
072	Jibat Forest	4
009	Ashenge Lake	1
064	Turkana Lake/Omo Delta	7
001	Lake Abbe	2
018	Berga Floodplains	4
039	Gudo Plains	4
043	Koffe Swamp	4
054	Mugo Highlands	7
070	Zuqualla Mt.	4
010	Lake Awassa	7
004	Alemaya/Adele Lakes	4
014	Babille Elephant Sanctuary	4
019	Bishoftu Lake	4
020	Bisidimo	4
022	Bonga Forest	7
026	Choke Mountains	3
045	Konso-Segen Valley	7
056	Mago Nat. Park	7
057	Omo National Park	7
061	Shiek Hussien	4
069	Zeway Lake	4
041	Hugumburda/Grat Kahsu Forest	1
058	Shire Lowlands	1
050	Melka Wakena	4
068	Yerer Forest	4
030	Dindin Arba Gugu Forest	4

Annex IV. Wild mammals of Ethiopia rated as critically endangered, endangered or vulnerable

Critically Endangered	Endangered	Vulnerable
African Wild Ass (*Equus africanus*)	Grevy's Zebra (*Equus grevyi*)	African Elephant (*Loxodonta africana*).
Bilen Gerbil (*Gerbillus bilensis*)*	Mountain Nyala (*Tragelaphus buxtoni*)*	Ammodile (Gerbil Family) (*Ammodillus imbellis*)
Black Rhinoceros (*Diceros bicornis*)	Nubian Ibex (*Capra nubiana*)	Bailey's Shrew (*Crocidura baileyi*)*
Ethiopian Wolf (Simien Jackal) (*Canis simensis*)*	Wild Dog (*Lycaon pictus*	Bale Shrew (*Crocidura bottegoides*) *
Guramba Shrew (*Crocidura phaeura*)*		Beira Antelope (*Dorcatragus megalotis*)
Harenna Shrew (*Crocidura harenna*)*		Cheetah (*Acinonyx jubatus*)
MacMillan's Shrew (*Crocidura macmillani*) *		Dibatag (*Ammodorcas clarkei*)
Walia Ibex (*Capra walie*) *		Dorcas Gazelle(*Gazella dorcas*)
		Glass's Shrew(*Crocidura glassi*) *
		Large-eared Free-tailed Bat(*Otomops martiensseni*)
		Lesser Horseshoe Bat(*Rhinolophus hipposideros*)
		Lion(*Panthera leo*)
		Moorland Shrew(*Crocidura lucina*) *
		Morris's Bat(*Myotis morrisi*)
		Mouse-tailed Bat Species(*Rhinopoma macinnesi*)
		Natal Free-tailed Bat(*Mormopterus acetabulosus*)
		Nikolaus's Mouse(*Megadendromus nikolausi*) *
		Patrizi's Trident Leaf-nosed Bat(*Asellia patrizii*)
		Red-fronted Gazelle(*Gazella rufifrons*)
		Rupp's Mouse(*Myomys ruppi*)*
		Scott's Mouse-eared Bat(*Myotis scotti*)
		Soemmerring's Gazelle(*Gazella soemmerringii*)
		Speke's Gazelle(*Gazella spekei*)
		Spotted-necked Otter(*Lutra maculicollis*)
		Stripe-backed Mouse(*Muriculus imberbis* *

* Endemic to Ethiopia; Source: IUCN (2004)

Fig 2. Some part of wetland habitat near to streams and the overgrazed part

Fig 3. Typical wetland vegetation of some part of the wetland habitat