

## ***Appendix B: Critical Habitat Assessment***

**February 2020**

The following report is a summary of ‘Total E&P Uganda Block EA1, EA1A and EA2 North: Critical Habitat Assessment: Interpretation and recommendations for ESIA’ carried out by The Biodiversity Consultancy and Flora and Fauna International in 2017, and hence remains in its original style.

## Appendix O.2: Critical Habitat Assessment – summary of findings

### 1.1 Overview

This Appendix follows provides an up-to-date summary of findings from the Critical Habitat Assessment (CHA) Interpretation carried out in 2017 (TBC & FFI 2017). CHA is an IFC Performance Standard 6 (PS6) process, carried out at the landscape scale, to identify significant biodiversity risks associated with a project. PS6 outlines the requirements for development in areas of Critical Habitat, considering the conservation principles of threat (vulnerability) and geographic rarity (irreplaceability).

This assessment incorporates recent updates for a number of Critical Habitat-qualifying species, based on further interpretation and updates to the IUCN Red List of Threatened Species, Version 2017-3 (IUCN 2017).

### 1.2 Summary of WCS & eCountability CHA

Applying the PS6 criteria and thresholds for Critical Habitat involves the use of ecologically and/or administratively coherent Discrete Management Units (DMUs). WCS & eCountability (2016) identified ten DMUs (terrestrial and aquatic) for the Project landscape (see Glossary), based on the distribution of potentially Critical Habitat-qualifying taxa.

The entire Murchison-Semliki landscape in which the Project is situated is classed as Critical Habitat. A large proportion of this qualifies as Tier 1 Critical Habitat, i.e. of extreme sensitivity for biodiversity. This includes most of the Project area north of the Nile.

The Project is in Critical Habitat for a suite of species. The Critical Habitat-qualifying taxa comprise terrestrial plants, mammals, birds, reptiles, amphibians, butterflies and dragonflies, freshwater fish, freshwater molluscs and freshwater shrimp (see **Section 1.3**).

Parts of the Project landscape qualify as Critical Habitat because of concentrations of Vulnerable species (see **Section 1.4**). These include Budongo, Bugoma and Wambabya Forest Reserves, the escarpment east of Lake Albert, and the Murchison Falls-Nile Delta Ramsar Site.

Seven threatened ecosystems in the project landscape also qualify as Critical Habitat (see **Section 1.5**). Lake Albert is Critical Habitat not only for its threatened and range-restricted species, but because it supports key evolutionary processes (see **Section 1.6**). The project landscape also overlaps with 39 protected areas and internationally recognised areas (see **Section 1.7**).

Critical Habitat-qualifying features are found mainly in areas that are also Natural Habitat, both inside and outside protected areas. Natural Habitat covers over three-quarters (78%) of the Project landscape, and most of this Natural Habitat (69%, or 54% of the total landscape) is classed as transitional habitat (see **Section 1.8**). Transitional habitat shows signs of modification, yet retains a proportion of typical native constituent species and could recover if managed appropriately. Transitional habitat has potential for restoration and may support important ecosystem functions and connectivity. Modified habitats represent a smaller proportion (~21%) of the landscape.

CHA is an iterative process. As the information base is developed, knowledge of the distribution, population/extent and threat status of individual species and habitats may change. Thus, the Critical Habitat-qualifying status of a given species may change in the future.

### 1.2.1 Landscape Contexts

The WCS & eCountability (2016) CHA is a thorough and factual document based on ecological analysis, and has been carried out at a landscape scale appropriate for both the TUOP (EA 2 South) and TEP Uganda (EA1A, EA1 and EA2 North) developments. It identifies that that Project is likely to interact with ~120 Critical Habitat-qualifying species in ten overlapping DMUs, seven threatened ecosystems, six areas with concentrations of Vulnerable species, 39 protected areas and internationally recognised areas, and areas of Natural, transitional and Modified Habitat. It is a complex set of information that practical application from the perspective of the Project.

Therefore, the CHA applies a landscape-scale view of interactions with *all* Critical Habitat-qualifying features, LPAs and IRAs, using a set of landscape contexts with which the Project is anticipated to interact in particular ways. These contexts fully incorporate the ten DMUs identified in WCS & eCountability (2016), but they themselves are not DMUs. Six landscape contexts have been identified:

Context	Name	Description
<b>A</b>	<b>MFPA</b>	<b>Grassland and woodland within the MFPA and to its north.</b> Contains extensive areas of Moist Combretum Savanna and <i>Hyparrhenia</i> Grass Savanna, and a concentration of Vulnerable species in Bugungu Wildlife Reserve. Critical Habitat-qualifying species are concentrated in MFNP north of the Nile and include Rothschild’s Giraffe and Lelwel Hartebeest <sup>1</sup> (Tier 1) and several vulture species (Tier 2). Context A is linked ecologically with Context B, but the management issues in each are different.
<b>B</b>	<b>Savanna corridor</b>	<b>Grassland and open wooded or scrub habitats along a weakly-protected savanna corridor</b> that runs approximately north-south along and below the escarpment. Contains Natural Habitat and transitional habitat, with areas of Moist Combretum Savanna and a concentration of Vulnerable species along the escarpment. Context B includes savanna habitat that is outside the MFPA. This is Critical Habitat for Uganda Kob and Lion (Tier 2), and a small number of other vertebrate species. Context A is linked ecologically with Context B, but the management issues in each are different.
<b>C</b>	<b>Lake Albert, rivers and wetlands</b>	<b>Lake Albert and fringing wetlands</b> , including the Murchison Falls-Albert Delta Wetland System Ramsar Site and Waiga/Waisoke River floodplain, as well as many other smaller rivers and swamps. These are Tier 1 Critical Habitat for many highly threatened and narrowly endemic fish and invertebrates (e.g. Albert Lates and <i>Gabiella walleri</i> ), and Tier 2 Critical Habitat for several bird and reptile species (e.g. Shoebill and Adanson’s Hinged Terrapin). Contains a concentration of Vulnerable species in the Murchison Falls-Albert Delta Wetlands System Ramsar Site.

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<sup>1</sup> Lelwel Hartebeest *Alcelaphus b. lelwel* is a sub-species of Jackson’s Hartebeest *A. buselaphus*.

Context	Name	Description
D	<b>Tropical high forest</b>	<b>Forest</b> and <b>forest fragments</b> and <b>corridors</b> , including the large Central Forest Reserves of Budongo and Bugoma; smaller fragments, including Wambabya, between and around these; and gully/riparian forests along rivers and streams running down to Lake Albert. Context D contains several CH-qualifying forest-specialist species, including Nahan's Francolin.
E	<b>Nebbi</b>	Unprotected <b>savanna habitats</b> in <b>Nebbi District</b> (West Nile sub-region), including areas of two threatened ecosystems. This context also potentially contains Critical Habitat for a globally and nationally threatened cycad species. This Context extends beyond the area included in the CHA by WCS & eCountability (2016). This is to ensure that the Project's potential Area of Influence west and north of MFNP is adequately considered.
F	<b>Mixed landscape</b>	This is a 'catch all' context that covers mixed habitats landscape-wide, including agriculture. Two landscape species, African Elephant and Chimpanzee, are wide-ranging across several ecosystems and in Modified Habitat. <b>African Elephants</b> are concentrated in protected areas (especially MFNP) but range over the entire landscape, including agricultural areas, when they move out to feed. Notably, they often range some distance north of MFNP, including in swamps along the Albert Nile north of Pakwach. <b>Chimpanzees</b> range in and around tropical forest, and use many habitats outside the forests, including agricultural areas. Riverine forests are important to Chimpanzees, and corridors of other habitat allowing access to Lake Albert water may be important at times.

The Project footprint is expected to interact with the landscape contexts as follows:

Context	Interaction with the Project footprint
A	Well pads, flow lines and roads in EA1 north of the Nile, and to a smaller extent well pads, flowlines and roads elsewhere in EA1 and EA2
B	Well pads, flow lines and roads, Central Processing Facility and a feeder pipeline towards the refinery and export line (routes not yet confirmed) in Modified and mainly unprotected Natural (including transitional) Habitat around Buliisa, between the Nile and Bugungu Wildlife Reserve;
C	Nile Crossing beneath the Murchison Falls-Albert Delta Wetland System Ramsar Site, facilities for barge crossing of the Nile, and the water extraction facility near the Lake Albert shore.
D	Feeder pipeline
E	No Project footprint anticipated
F	All Project infrastructure

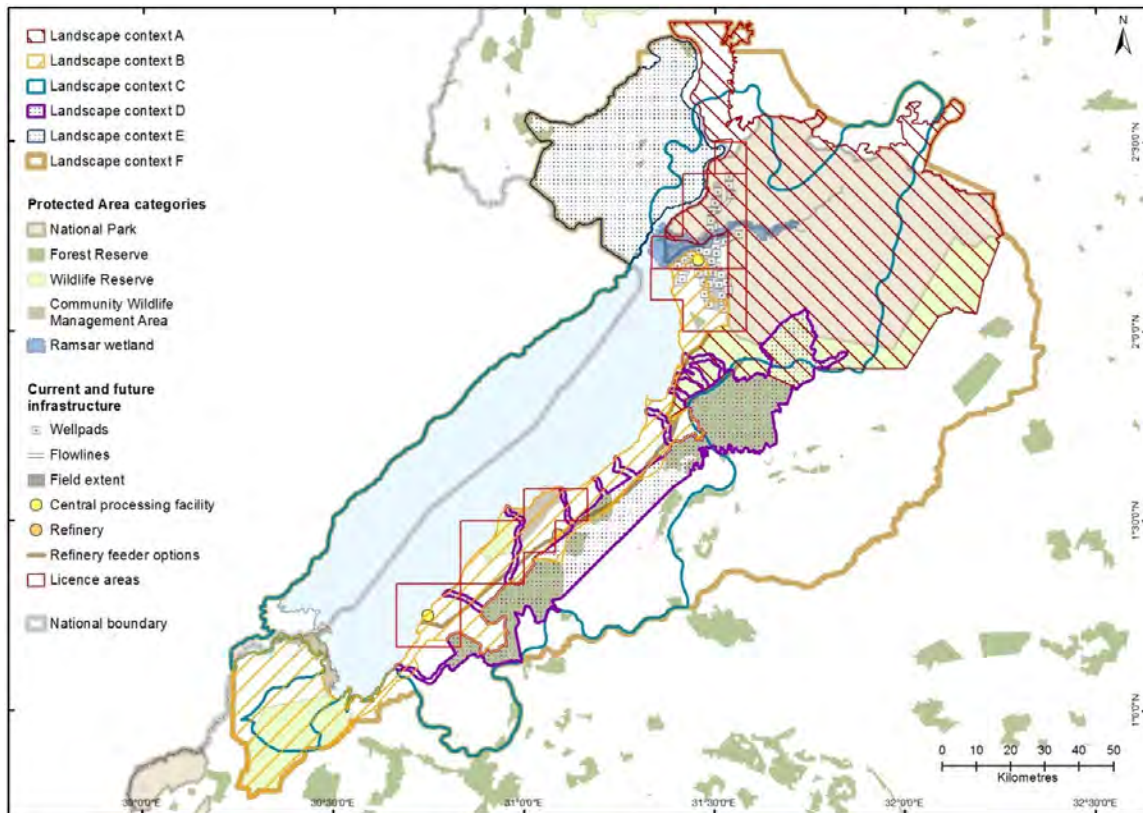


Figure A: Six landscape contexts identified through the CHA interpretation

An evaluation of habitat structure and connectivity shows that the Project footprint overlaps with core grassland habitat, including the largest and most intact area (in context A), and unprotected areas which are already undergoing rapid degradation and conversion (in context B). Large tropical forest patches (context D) in the landscape contain important core habitat, but there is potential for improving connectivity between them. Riverine forest is already fragmented within the landscape. Core areas of woodland habitat exist just south and east of the Project footprint, within MFNP.

### 1.3 Critical Habitat-qualifying features by taxon

The following tables summarise the Critical Habitat-qualifying features, with IUCN global status and Uganda Red List status, where:

- CR = Critically Endangered
- EN = Endangered
- LC – Least Concern
- DD = Data Deficient
- NE = Not Evaluated

### 1.3.1 Mammals

Table 1: Critical Habitat-qualifying mammal species. Grey type indicates that the species may qualify, but data are limited and it has not been possible to map distribution

	Species name		IUCN	Uganda Red List	DMU No.	DMU name	Context	CH criterion	Tier
Carnivora	Spotted Hyena	<i>Crocuta crocuta</i>	LC	CR	7	MFPA	A,B	1e	2
Carnivora	Lion	<i>Panthera leo</i>	VU	CR	2	Savanna corridors	A,B	1e	2
Cetartiodactyla	Lelwel Hartebeest	<i>Alcelaphus buselaphus lelwel</i>	EN	NT	7	MFPA	A,B	1a	1
Cetartiodactyla	Rothschild's Giraffe	<i>Giraffa camelopardalis rothschildi</i>	EN	EN	7	MFPA	A	1ab	1
Cetartiodactyla	Uganda Kob	<i>Kobus thomasi</i>	LC	LC	2	Savanna corridors	A,B	3d	2
Cetartiodactyla	Bohor Reedbuck	<i>Redunca redunca wardi</i>	LC	EN	7	MFPA	A,B	1e	2
Chiroptera	Russet Free-tailed Bat	<i>Chaerephon russatus</i>	VU	DD	Not assigned			Possible 1e	2
Chiroptera	Medje Mops Bat/Congo Free-tailed Bat	<i>Mops congicus</i>	LC	EN	5	Budongo	D	1e	2
Chiroptera	Trevor's Mops Bat/Trevor's Free-tailed Bat	<i>Mops trevori</i>	DD	EN	5	Budongo	D	1e	2

	Species name		IUCN	Uganda Red List	DMU No.	DMU name	Context	CH criterion	Tier
Chiroptera	Savanna (Helios) Pipistrelle Bat	<i>Neoromicia helios</i>	DD	CR	3	Forests and corridors	D	Possible 1e	2
Eulipotyphla	Ugandan Lowland Shrew	<i>Crocidura selina</i>	DD	EN	3	Forests and corridors	D	1e, possible 2b	2
Primates	Uganda Mangabey	<i>Lophocebus ugandai</i>	LC	VU	3	Forests and corridors	D	1e	2
Primates	Chimpanzee	<i>Pan troglodytes</i>	EN	EN	9	Chimpanzee	B,D	GN20, 1abc + 2b	1 & 2
Proboscidea	African Elephant	<i>Loxodonta africana</i>	VU	CR	4	Mixed habitats landscape	A,B,D	1e	2
Rodentia	Charming Thicket Rat	<i>Thamnomys venustus</i>	VU	DD	Not assigned	Forests and corridors	Not assigned	Possible 2b	2

### 1.3.3 Birds

Table 2: Critical Habitat-qualifying bird species. Grey type indicates that the species may qualify, but data are limited and it has not been possible to map distribution

Order	Species name		IUCN	Uganda Red List	DMU	DMU name	Context	CH criterion	Tier
GALLIFORMES	Nahan's Francolin	<i>Francolinus nahani</i>	VU	VU	10	Nahan's Francolin	D	2b	2
GRUIFORMES	Grey-crowned Crane	<i>Balearica regulorum</i>	EN	EN	1	Lake Albert and Wetlands	C	1e	2
OTIDIFORMES	Denham's Bustard	<i>Neotis denhami</i>	NT	CR	7	MFPA	A	1e	2
PELECANIFORMES	Madagascar Pond Heron	<i>Ardeola idae</i>	EN	EN	1	Lake Albert and Wetlands	C	1ce	2
PELECANIFORMES	Shoebill	<i>Balaeniceps rex</i>	VU	EN	1	Lake Albert and Wetlands	C	1e	2
CHARADRIIFORMES	African Skimmer	<i>Rynchops flavirostris</i>	NT	VU	8	Murchison Falls-Albert Delta Wetland System Ramsar Site	C	3, possible 2b	2
CHARADRIIFORMES	Black-rumped Buttonquail	<i>Turnix nanus (synonym T. hottentottus)</i>	LC	EN	2	Savanna corridors	A,B	1e	2
STRIGIFORMES	Pel's Fishing Owl	<i>Scotopelia peli</i>	LC	EN	7	MFPA	A	1e	2



Order	Species name		IUCN	Uganda Red List	DMU	DMU name	Context	CH criterion	Tier
ACCIPITRIFORMES	Pallid Harrier	<i>Circus macrourus</i>	NT	CR	2	Savanna corridors	A,B	1e	2
	White-backed Vulture	<i>Gyps africanus</i>	CR	EN	7	MFPA	A	1ce	2
	Rüppell's Vulture	<i>Gyps rueppelli</i>	CR	EN	4, 7	Mixed habitats landscape and MFPA	A,B,D	1ce	2
	Hooded Vulture	<i>Necrosyrtes monachus</i>	CR	EN	4, 7	Mixed habitats landscape and MFPA	A,B	1c	2
	African Crowned Eagle	<i>Stephanoaetus coronatus</i>	NT	EN	Not assigned		E	1e	2
	White-headed Vulture	<i>Trigonoceps occipitalis</i>	CR	CR	7 (possible 2)	MFPA (and possibly Savanna corridors)	A,B	1c	2
	Lappet-faced Vulture	<i>Torgos tracheliotus</i>	EN	CR	7	MFPA	A	1e	2
FALCONIFORMES	Fox Kestrel	<i>Falco alopex</i>	LC	EN	7	MFPA	A	1e	2

### 1.3.4 Reptiles

Table 3: Critical Habitat-qualifying reptile species. Grey type indicates that the species may qualify, but data are limited and it has not been possible to map distribution

Order	Species name		IUCN	Uganda Red List	DMU	DMU name	Context	CH criterion	Tier
Testudines	Common/Serrated Hinge-backed Tortoise	<i>Kinixys erosa</i>	DD	DD	Not assigned			Possible 2	2
Testudines	Adanson's Hinged Terrapin	<i>Pelusios adansonii</i>	NE	CR	1	Lake Albert and Wetlands	C	1e	2
Testudines	Zaire Hinged Terrapin	<i>Pelusios chapini</i>	NE	CR	8	Murchison Falls-Albert Delta Wetland System Ramsar Site	C	1e	2
Testudines	African Soft-shelled Turtle	<i>Trionyx triunguis</i>	NE	CR	8	Murchison Falls-Albert Delta Wetland System Ramsar Site	C	1e	2
Squamata	Mocquard's African Ground Snake	<i>Goniotophis brussouxi</i>	NE	NE	Not assigned			Possible 2	2
Squamata	Brown File Snake	<i>Hormonotus modestus</i>	NE	NE	Not assigned			Possible 2	2
Squamata	Grass snake species	<i>Psammophylas actus</i>	NE	NE	Not assigned			Possible 2	2
Squamata	Smooth Chameleon	<i>Trioceros laevigatus</i> (synonym <i>Chamaeleo laevigatus</i> )	NE	EN	2	Savanna corridors	A,B	1e	2

### 1.3.5 Amphibians

Table 4: Critical Habitat-qualifying amphibian species. Grey type indicates that the species may qualify, but data are limited and it has not been possible to map distribution

Order	Species name		IUCN	Uganda Red List	DMU	DMU name	Context	CH criterion	Tier
Anura	Rugege Forest Squeaker Frog	<i>Arthroleptis adolfifriederici</i>	EN	EN	3	Forests and corridors	D	1e, 2b	2
Anura	n/a	<i>Hyperolius langi</i>	LC	DD	Not assigned			Possible 2b	2
Anura	n/a	<i>Hyperolius lateralis</i>	LC	NE	Not assigned			Possible 2b	2
Anura	Rwanda Long Reed Frog	<i>Hyperolius rwandae</i>	NE	DD	Not assigned			Possible 2b	2
Anura	n/a	<i>Leptopelis oryi</i>	LC	NE	Not assigned			Possible 2b	2
Anura	Golden puddle frog	<i>Phrynobatrachus auritus</i>	EN	LC	3	Forests and corridors	D	1e	2
Anura	Christy's grassland frog	<i>Ptychadena chrystyi</i>	DD	VU	4	Mixed habitats landscape	A,B	2	2
Anura	Uganda Clawed Frog	<i>Xenopus ruwenzoriensis</i>	DD	VU	5	Budongo	D	2	2
Anura	Kivu clawed frog	<i>Xenopus vestitus</i>	EN	LC	3	Forests and corridors	D	1e, 2b	2

### 1.3.6 Freshwater fish

Table 5: Critical Habitat-qualifying freshwater fish species. Grey type indicates that the species may qualify, but data are limited and it has not been possible to map distribution

Order	Species name		IUCN	Uganda Red List	DMU	DMU name	Context	CH criterion	Tier
Characiformes	Moon fish	<i>Citharinus citharus</i>	NE	CR	1	Lake Albert and Wetlands	C	1e	2

Order	Species name		IUCN	Uganda Red List	DMU	DMU name	Context	CH criterion	Tier
Characiformes	Moon fish	<i>Citharinus latus</i>	LC	CR	1	Lake Albert and Wetlands	C	1e	2
Cypriniformes	n/a	<i>Mesobola bredoi</i>	NE	NE	1	Lake Albert and Wetlands	C	1e,2a	1 & 2
<i>Cypriniformes</i>	<i>n/a</i>	<i>Micropanchax pelagicus</i>	<i>NE</i>	<i>NE</i>	<i>Likely 1</i>	<i>Lake Albert and Wetlands</i>	<i>C</i>	<i>Not assessed</i>	
Osteoglossiformes	Victoria stonebasher	<i>Marcusenius victoriae</i>	EN	NE	1	Lake Albert and Wetlands	C	1ab, 2b	1
Perciformes	n/a	<i>Haplochromis albertiae</i>	NE	NE	1	Lake Albert and Wetlands	C	2a	1
Perciformes	n/a	<i>Haplochromis loati</i>	DD	EN	1	Lake Albert and Wetlands	C	2a	1
Perciformes	n/a	<i>Haplochromis mahagiensis</i>	NE	EN	1	Lake Albert and Wetlands	C	2a	1
Perciformes	n/a	<i>Haplochromis avium</i>	NE	EN	1	Lake Albert and Wetlands	C	2a	1
Perciformes	n/a	<i>Haplochromis wingatii</i>	DD	EN	1	Lake Albert and Wetlands	C	2a	1

Order	Species name		IUCN	Uganda Red List	DMU	DMU name	Context	CH criterion	Tier
Perciformes	Albert Lates	<i>Lates macrophthalmus</i>	EN	EN	1	Lake Albert and Wetlands	C	1ab, 2a	1
Perciformes	n/a	<i>Oreochromis leucostictus</i>	LC	NE	1	Lake Albert and Wetlands	C	2b	2
Siluriformes	Fischer's Victoria Squeaker	<i>Synodontis afrofisheri</i>	LC	NE	1	Lake Albert and Wetlands	C	2b	2
Siluriformes	Victoria squeaker	<i>Synodontis victoriae</i>	NT	EN	1	Lake Albert and Wetlands	C	1e, 2b	2

### 1.3.7 Freshwater molluscs

Table 6: Critical Habitat-qualifying freshwater mollusc species. Grey type indicates that the species may qualify, but data are limited and it has not been possible to map distribution

Order	Species name		IUCN	Uganda Red List	DMU	DMU name	Context	CH criterion	Tier
Architaenioglossa	<i>Bellamyia rubicunda</i>	Gastropod	NT	NE	1	Lake Albert and Wetlands	C	2a	1
Hygrophila	<i>Biomphalaria stanleyi</i>	Gastropod	DD	NE	1	Lake Albert and Wetlands	C	2b	2
Hygrophila	<i>Ceratophallus bicarinatus</i>	Gastropod	LC	NE	1	Lake Albert and Wetlands	C	2b	2
Hygrophila	<i>Ceratophallus faini</i>	Gastropod	DD	NE	1	Lake Albert and Wetlands	C	2a	1

Littorinimorpha	<i>Gabiella candida</i>	Gastropod	CR	NE	1	Lake Albert and Wetlands	C	1ab, 2a	1
Littorinimorpha	<i>Gabiella humerosa ssp. alberti</i>	Gastropod	EN	NE	1	Lake Albert and Wetlands	C	1ab, 2a	1
Littorinimorpha	<i>Gabiella walleri</i>	Gastropod	NE	NE	1	Lake Albert and Wetlands	C	2a	1
Unionoida	<i>Coelatura bakeri</i>	Gastropod	NT	NE	1	Lake Albert and Wetlands	C	2b	2

### 1.3.8 Freshwater shrimp

Table 7: Critical Habitat-qualifying freshwater shrimp species. Grey type indicates that the species may qualify, but data are limited and it has not been possible to map distribution

Order	Species name	IUCN	Uganda Red List	DMU	DMU name	Context	CH criterion	Tier
Decapoda	<i>Limnocaridella alberti</i>	DD	NE		Lake Albert and Wetlands	C	Possible 2	Possible 2

### 1.3.9 Butterflies

Table 8: Critical Habitat-qualifying butterfly species. Grey type indicates that the species may qualify, but data are limited and it has not been possible to map distribution

Order	Species name	IUCN	Uganda Red List	DMU	DMU name	Context	CH criterion	Tier
Lepidoptera	<i>Acraea alciope</i>	NE	CR	5,6	Budongo, Bugoma	D	1e	2
Lepidoptera	<i>Andronymus caesar</i>	NE	EN	5,6	Budongo, Bugoma	D	1e	2
Lepidoptera	<i>Andronymus gander</i>	NE	EN	3	Forests and corridors	D	1e	2

Order	Species name	IUCN	Uganda Red List	DMU	DMU name	Context	CH criterion	Tier
Lepidoptera	<i>Anthene ituria</i>	VU	VU	Possible 3	Forests and corridors	D	1e, possible 2b	2
Lepidoptera	<i>Bicyclus procura</i>	NE	EN	5,6	Budongo, Bugoma	D	1e	2
Lepidoptera	<i>Euphaedra paradoxa</i>	NE	EN	3	Forests and corridors	D	1e	2
Lepidoptera	<i>Hypocopelates mera</i>	NE	CR	5,6	Budongo, Bugoma	D	1e	2
Lepidoptera	<i>Iridana marina</i>	NE	EN	%	Budongo	D	1e	2
Lepidoptera	<i>Lachnocnema magna</i>	NE	EN	5,6	Budongo, Bugoma	D	1e	2
Lepidoptera	<i>Leptosia marginea</i>	NE	EN	5,6	Budongo, Bugoma	D	1e	2
Lepidoptera	<i>Leptosia medusa</i>	NE	EN	3	Forests and corridors	D	1e	2
Lepidoptera	<i>Liptena hapale</i>	NE	EN	4	Mixed Habitats Landscape	D	1e, possible 2b	2
Lepidoptera	<i>Liptenara hiendlmayri</i>	VU	VU	Possible 3	Forests and corridors	D	1e, possible 2b	2
Lepidoptera	<i>Liptena undina</i>	NE	EN	5	Budongo	D	1e	2
Lepidoptera	<i>Micropentila bunyoro</i>	DD	EN	5	Budongo	D	1e	2
Lepidoptera	<i>Milothrus hylara</i>	NE	NE	3	Forests and corridors	D	1e	2
Lepidoptera	<i>Thermoniphys togara</i>	NE	EN	5	Budongo	D	1e	2
Lepidoptera	<i>Uranothauma heritsia</i>	NE	EN	3	Forests and corridors	D	1e	2
Lepidoptera	<i>Xanthodisca vibius</i>	NE	EN	5	Budongo	D	1e	2

### 1.3.10 Dragonflies

Table 9: Critical Habitat-qualifying dragonfly species. Grey type indicates that the species may qualify, but data are limited and it has not been possible to map distribution

Order	Species name		IUCN	Uganda Red List	DMU	DMU name	Context	CH criterion	Tier
Odonata	Orange-bellied Flasher	<i>Aethiothemis coryndoni</i>	LC	VU		Not assigned	D	1e, possible 2b	2
Odonata	Albertine Jewel	<i>Chlorocypha schmidti</i>	VU	NE		Not assigned	D	Possible 1e	2
Odonata	Black Threadtail	<i>Elatoneura nigra</i>	LC	EN	3	Forests and corridors	D	1e	2
Odonata	Pale Duskhawker	<i>Heliaeschna trinervulata</i>	LC	CR	3	Forests and corridors	D	Possible 1e	2

### 1.3.11 Terrestrial plants

Table 10: Critical Habitat-qualifying terrestrial plant species. Grey type indicates that the species may qualify, but data are limited and it has not been possible to map distribution

Species name		IUCN	Uganda Red List	DMU	DMU name	Context	CH criterion	Tier
n/a	<i>Afrothismia winkleri</i>	CR	EN	3	Forests and corridors	D	1ab, 2b	1 & 2
Afzelia	<i>Afzelia africana</i>	VU	EN	7	MFPA	A	1e	2



Species name		IUCN	Uganda Red List	DMU	DMU name	Context	CH criterion	Tier
Albizia	<i>Albizia ferruginea</i>	VU	EN	3	Forests and corridors	D	1e	2
<i>Antrocaryon</i>	<i>Antrocaryon micraster</i>	VU	CR	5	Budongo	D	Possible 1e	2
n/a	<i>Brachylaena huillensis</i>	NT	CR	7	MFPA	D	Possible 1e	2
n/a	<i>Brazzeia longipedicellata</i>	EN	EN	5	Budongo	D	1ab, 2b	1 & 2
n/a	<i>Chytranthus atroviolaceus</i>	NE	EN	3	Forests and corridors	D	1e	2
n/a	<i>Citropsis articulata</i>	NE	VU	3	Forests and corridors	D	2b	2
Drum Tree, West African Cordia	<i>Cordia millennii</i>	LC	EN	3	Forests and corridors	D	1e	2
n/a	<i>Dialium excelsum</i>	EN	EN	3	Forests and corridors	D	1b, 1e	1 & 2
n/a	<i>Efluensia montana</i>	NE	VU	3	Forests and corridors	D	2b	2
Cycad	<i>Encephalartos macrostrobilus</i> (see Annex F)	EN	EN	Not assessed in WCS & eCountability 2016 <sup>2</sup>		E	1c	2
Cycad	<i>Encephalartos septentrionalis</i>	NT	EN	Not assessed in WCS & eCountability 2016 <sup>2</sup>		E	1e	2

<sup>2</sup> The West Nile region was not included in the screening undertaken by WCS & eCountability (2016).

Species name		IUCN	Uganda Red List	DMU	DMU name	Context	CH criterion	Tier
Sapele	<i>Entandrophragma angolense</i>	VU	EN	3	Forests and corridors	D	1e	2
Sapele	<i>Entandrophragma cylindricum</i>	VU	EN	3	Forests and corridors	D	1e	2
Sapele	<i>Entandrophragma utile</i>	VU	EN	3	Forests and corridors	D	1e	2
Light Bossé, Scented Guarea	<i>Guarea cedrata (same as L. cedrata)</i>	VU	EN	3	Forests and corridors	D	1e, 2b	2
False Rubber Tree	<i>Holarrhena floribunda</i>	LC	CR	3	Forests and corridors	D	1e	2
African Mango/Bush Mango	<i>Irvingia gabonensis</i>	NT	EN	3	Forests and corridors	D	1e	2
African Mahogany; White Mahogany	<i>Khaya anthotheca</i>	VU	EN	3	Forests and corridors	D	1e	2
Large leaved Mahogany	<i>Khaya grandifoliola</i>	VU	EN	3	Forests and corridors	D	1e	2
African Mahogany; Dry Zone Mahogany	<i>Khaya senegalensis</i>	VU	EN	7	MFPA	A	1e	2
Brown Mahogany; Kilimanjaro Magongany	<i>Lovoa swynnertonii</i>	NT	EN	3	Forests and corridors	D	1e	2

Species name		IUCN	Uganda Red List	DMU	DMU name	Context	CH criterion	Tier
African walnut	<i>Lovoa trichilioides</i>	VU	EN	3	Forests and corridors	D	1e	2
n/a	<i>Milicia excelsa</i>	NT	EN	3	Forests and corridors	D	1e	2
n/a	<i>Milletialacus alberti</i>	VU	CR	5	Budongo	D	2b	2
n/a	<i>Psilotrichum axilliflorum</i>	EN	VU	5	Budongo	D	1b, 2b	1
n/a	<i>Uvariadendron magnificentum</i>	EN	VU	5	Budongo	D	1be	1 & 2

## 1.4 Vulnerable species that might qualify the area as Critical Habitat

Order	Species	
<b>Birds</b>		
ACCIPITRIFORMES	Ayres's Hawk Eagle	<i>Hieraaetus aynesii</i>
ACCIPITRIFORMES	Secretary Bird	<i>Sagittarius serpentarius</i>
ANSERIFORMES	White-backed Duck	<i>Thalassornis leuconotus</i>
APRIMULGIFORMES	Mottle-throated Spinetail	<i>Telacanthura ussheri</i>
BUCEROTIFORMES	Forest Wood Hoopoe, Forest Scimitarbill	<i>Rhinopomastus castaneiceps</i>
CAPRIMULGIFORMES	Cassin's Spinetail	<i>Neafrapus cassini</i>
CAPRIMULGIFORMES	Scarce Swift	<i>Schoutedenapus myioptilus</i>
CHARADRIIFORMES	Rock Pratincole	<i>Glareola nuchalis</i>
CHARADRIIFORMES	Great Snipe	<i>Gallinago media</i>
CICONIIFORMES	Woolly-necked Stork	<i>Ciconia microscelis</i>
CICONIIFORMES	Saddle-billed Stork	<i>Ephippiorhynchus senegalensis</i>
CORACIIFORMES	Shining-blue Kingfisher	<i>Alcedo quadibrachys</i>
FALCONIFORMES	Greater Kestrel	<i>Falco rupicoloides</i>

Order	Species	
GALLIFORMES	Ring-necked Francolin	<i>Francolinus streptophorus</i>
GRUIFORMES	Corncrake	<i>Crex crex</i>
GRUIFORMES	African Finfoot	<i>Podica senegalensis</i>
PASSERIFORMES	Ituri Batis	<i>Batis ituriensis</i>
PASSERIFORMES	Red-billed Oxpecker	<i>Buphagus erythrorhynchus</i>
PASSERIFORMES	Green-breasted Pitta	<i>Pitta reichenowi</i>
PASSERIFORMES	African Pitta	<i>Pitta angolensis</i>
PELECANIFORMES	Goliath Heron	<i>Ardea goliath</i>
PELECANIFORMES	Black Heron or Black Egret	<i>Egretta ardesiaca</i>
PICIFORMES	Black-breasted Barbet	<i>Pogonornis rolleti</i>
PICIFORMES	Martial Eagle	<i>Polemaetus bellicosus</i>
PSITTACIFORMES	Grey Parrot	<i>Psittacus erithacus</i>
STRIGIFORMES	Marsh Owl	<i>Asio capensis</i>
STRIGIFORMES	Red-chested Owlet	<i>Glaucidium tephronotum</i>
SULIFORMES	African Darter	<i>Anhinga rufa</i>
<b>Dragonflies</b>		
Odonata	n/a	<i>Aethiothemis coryndoni</i>
<b>Amphibians</b>		

Order	Species	
Anura	Mottled Squeaker	<i>Arthroleptis poecilonotus</i>
Anura	Kivu Tree-frog	<i>Leptopelis kivuensis</i>
Anura	Golden-bellied Rocket Frog	<i>Ptychadena chrysogaster</i>
<b>Reptiles</b>		
Squamata	Western Forest File-snake	<i>Gonionotophis poensis</i>
Squamata	Cape File Snake	<i>Gonionotophis capensis</i>
Squamata	Smyth's African Water-snake	<i>Grayia smythii</i>
Squamata	Tholloni's Water-snake	<i>Grayia tholloni</i>
Squamata	Black-lined Green-snake	<i>Hapsidophrys lineatus</i>
Squamata	Uganda House Snake, Yellow Forest-snake	<i>Hormonotus modestus</i>
Squamata	Egyptian Cobra	<i>Naja haje</i>
Squamata	Thirteen-scaled Green-snake	<i>Philothamnus carinatus</i>
Squamata	Eastern Snake-eater	<i>Polemon christyi</i>
<b>Terrestrial plants</b>		
n/a	<i>Afzelia bipindensis</i>	
n/a	<i>Beilschmiedia ugandensis</i>	
n/a	<i>Chrysophyllum albidum</i>	
n/a	<i>Chrysophyllum muerense</i>	
n/a	<i>Chrysophyllum perpulchrum</i>	
n/a	<i>Citropsis articulata</i>	
n/a	<i>Craterosiphon scandens</i>	
n/a	<i>Dalbergia melanoxydon</i>	
n/a	<i>Dioscorea baya</i>	
n/a	<i>Disperis aphylla</i>	

Order	Species
n/a	<i>Erythrophleum suaveolens</i>
n/a	<i>Fagaropsis angolensis</i>
n/a	<i>Fleroya stipulosa</i>
n/a	<i>Mondia whitei</i>
n/a	<i>Nauclea diderrichii</i>
n/a	<i>Secamone racemosa</i>
n/a	<i>Turraeanthus africana</i>
n/a	<i>Warburgia ugandensis</i>

## 1.5 Criterion 4: Highly threatened and/or unique ecosystems

### 1.5.1 PS6 criteria

Highly Threatened and/or Unique Ecosystems are defined in IFC GN6 (paragraph GN90) as:

- Those at risk of significantly decreasing in area or quality;
- Those with a small spatial extent; and/or
- Those containing unique assemblages of species including assemblages or concentrations of biome-restricted species.

Areas determined to be irreplaceable or of high priority/significance based on systematic conservation planning techniques carried out at the landscape and/or regional scale by governmental bodies, recognized academic institutions and/or other relevant qualified organizations (including internationally-recognized NGOs) or that are recognized as such in existing regional or national plans, such as the National Biodiversity Strategy and Action Plan (NBSAP), also qualify as critical habitat per Criterion 4 (IFC 2012b, paragraph GN90).

### 1.5.2 Qualifying ecosystems

Using the [WWF Global 200 Ecosystems Assessment](#), the IUCN Red List of Ecosystems Criterion A1 (Rodríguez-Clark *et al.* 2015), and the classification of Langdale-Brown, 1964, the CHA (WCS & eCountability 2016) identified **seven ecosystems** as Endangered or Vulnerable (Figure 1). More detail on the criteria for assessing threatened ecosystems is given in Annex E.

Under Criterion A1, an Endangered ecosystem is which in which there has been a reduction in habitat extent of  $\geq$  50% over the past 50 years. For Vulnerable ecosystems, this reduction is  $\geq$  30% over the past 50 years.

The Endangered and Vulnerable ecosystems in the Project study area are (Figure 1):

- Endangered ecosystems:





## 1.6 Criterion 5: Key evolutionary processes

### 1.6.1 PS6 criteria

This criterion is defined by the physical features of a landscape that might be associated with particular evolutionary processes, and/or subpopulations of species that are phylogenetically or morphogenetically distinct and may be of special conservation concern given their distinct evolutionary history (IFC 2012b, paragraph GN95).

### 1.6.2 Qualifying features

In the Project landscape, this criterion is likely to apply to Lake Albert and its associated fringing wetlands (including the Murchison Falls-Albert Delta Wetland System Ramsar site), with a significant level of endemism in fish and invertebrate species. Lake Albert and associated wetlands are also Critical Habitat-qualifying under Criterion 1 to 3.

## 1.7 Protected areas

### 1.7.1 PS6 criteria

IFC PS6 paragraph 20 addresses project activity in Legally Protected Areas<sup>3</sup> (LPAs) and Internationally Recognised Areas<sup>4</sup> (IRAs). Where a Project is within an LPA or IRA, the client should meet the requirements of paragraphs 13 to 19 of PS6 (paragraphs 13-15 relate to Natural Habitat, and paragraphs 16-19 to Critical Habitat) (IFC 2012a). In addition, the client should:

- 'Demonstrate that the proposed development in the LPA/IRA is legally permitted;
- Act in a manner consistent with any government recognized management plans for such areas;
- Consult Protected Area sponsors and managers, Affected Communities, Indigenous Peoples and other stakeholders on the proposed project, as appropriate; and
- Implement additional programs, as appropriate, to promote and enhance the conservation aims and effective management of the area'.

### 1.7.2 Qualifying features

The project landscape intersects with a large number (39) of LPAs and IRAs. Figure 2 shows the most significant sites in the study area.

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<sup>3</sup> IFC PS6 footnote 16 defines an LPA as: 'A clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values'.

<sup>4</sup> IFC PS6 footnote 17 defines IRAs as: 'UNESCO Natural World Heritage Sites, UNESCO Man and the Biosphere Reserves, Key Biodiversity Areas, and wetlands designated under the Convention on Wetlands of International Importance (the Ramsar Convention)'.

Table 11: Legally Protected and Internationally Recognised Areas in the landscape

Protected Area	Category	IUCN criteria	Designation
Murchison Falls	National Park	II	National
	Important Bird Area	A1, A3, A4i	International
Murchison Falls-Albert Delta Wetland System	Ramsar Wetland/Important Bird Area	-	International
Budongo	Forest Reserve	-	National
	Important Bird Area	A1, A3	International
Bugoma	Forest Reserve		National
	Important Bird Area	A1, A3	International
Bugungu	Wildlife Reserve	III	National
Bujawe	Forest Reserve	-	National
Hoima	Forest Reserve	-	National
Kabwoya	Wildlife Reserve	III	National
Kaiso Tonya	Community Wildlife Management Area	IV	National
Karuma	Wildlife Reserve	-	National
Kasongire	Forest Reserve	-	National
Kijubya	Forest Reserve	-	National
Kyahaiguru	Forest Reserve	-	National
Kyamugongo	Forest Reserve	-	National
Maseege	Forest Reserve	-	National
Mukihani	Forest Reserve	-	National
Nyabyeya	Forest Reserve	-	National
Nyamakere	Forest Reserve	-	National
Rwensama	Forest Reserve	-	National
Wambabya	Forest Reserve	-	National

Protected Area	Category	IUCN criteria	Designation
Toro-Semliki	Wildlife Reserve	III	National
Rwengara	Community Wildlife Management Area	VI	National
Semliki reserves	Important Bird Area	A1	International
Kibeka	Forest Reserve	-	National
Kaduku	Forest Reserve	-	National
Masindi Port	Forest Reserve	-	National
Kigulya Hill	Forest Reserve	-	National
Masindi	Forest Reserve	-	National
Kirebe	Forest Reserve	-	National
Kasokwa	Forest Reserve	-	National
Sirisiri	Forest Reserve	-	National
Nyakunyu	Forest Reserve	-	National
Kitonya Hill	Forest Reserve	-	National
Fumbya	Forest Reserve	-	National
Nsekuro Hill	Forest Reserve	-	National
Musoma	Forest Reserve	-	National
Kandanda - Ngobya	Forest Reserve	-	National
Ibamba	Forest Reserve	-	National
Kahurukobwire	Forest Reserve	-	National

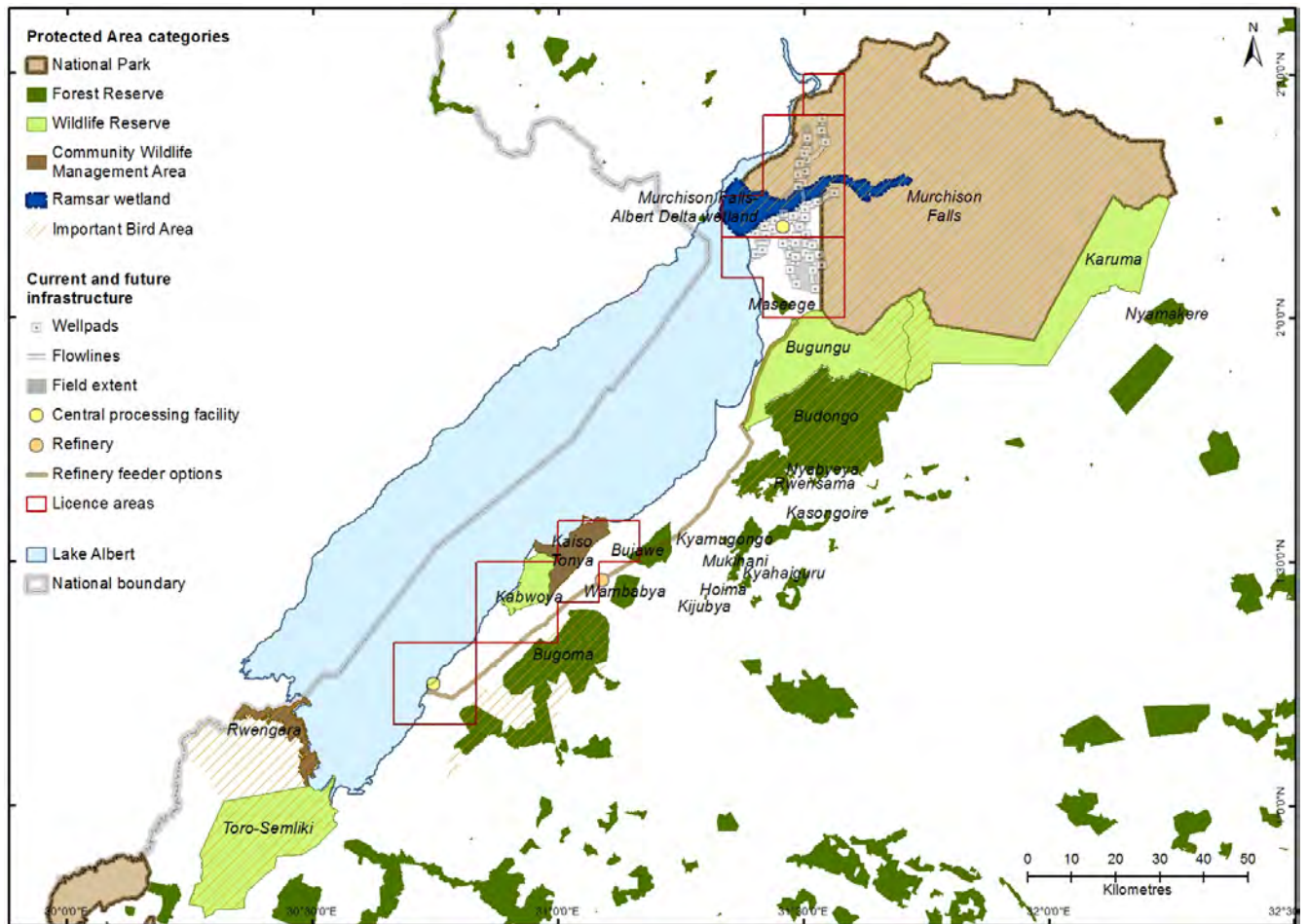


Figure 2: Protected areas in the Project landscape.

## 1.8 Natural and Modified Habitat

### 1.8.1 PS6 criteria

PS6 outlines the requirements for development in Natural and Modified Habitats. The Project should not significantly convert or degrade Natural Habitats, unless it can be demonstrated that there are no viable alternatives in Modified Habitat, consultation has been carried out and any conversion/degradation is mitigated according to the mitigation hierarchy. In Modified Habitats with significant biodiversity value, the Project should minimise impacts on biodiversity and implement mitigation measures as appropriate. In the Project landscape, some areas of Modified Habitat may be important as actual or potential corridors connecting areas of Natural Habitat and allowing dispersal and gene flow within metapopulations.

### 1.8.2 Presence of Natural and Modified Habitat in the Project landscape

Analyses led by WCS in respect of the EA2 development (WCS & eCountability 2016) indicate the following:

- The Project footprint overlaps with areas of Natural, transitional and Modified Habitat;
- The majority (~54%) of the study area is transitional habitat. Transitional habitat is that which shows signs of modification, yet retains a proportion of typical native constituent species and could recover if managed appropriately
- Approximately 24%, remains entirely natural. Most Natural Habitat in the landscape is within Protected Areas; and
- Approximately 21% is Modified.

## 1.9 IFC PS6 Criteria 1-3

Table 12: Quantitative thresholds for PS6 Criteria 1-3 for identifying Tier 1 and Tier 2 CH (PS6 GN6 (IFC 2012b))

Criteria	Tier 1	Tier 2
1. Critically Endangered (CR)/ Endangered (EN) Species	<p>(a) Habitat required to sustain <math>\geq 10</math> percent of the global population of a CR or EN species/subspecies where there are known, regular occurrences of the species and where that habitat could be considered a discrete management unit for that species.</p> <p>(b) Habitat with known, regular occurrences of CR or EN species where that habitat is one of 10 or fewer discrete management sites globally for that species.</p>	<p>(c) Habitat that supports the regular occurrence of a single individual of a CR species and/or habitat containing regionally- important concentrations of a Red-listed EN species where that habitat could be considered a discrete management unit for that species/ subspecies.</p> <p>(d) Habitat of significant importance to CR or EN species that are wide-ranging and/or whose population distribution is not well understood and where the loss of such a habitat could potentially impact the long-term survivability of the species.</p> <p>(e) As appropriate, habitat containing nationally/regionally important concentrations of an EN, CR or equivalent national/regional listing.</p>
2. Endemic/ Restricted Range Species	<p>(a) Habitat known to sustain <math>\geq 95</math> percent of the global population of an endemic or restricted-range species where that habitat could be considered a discrete management unit for that species (e.g., a single-site endemic).</p>	<p>(b) Habitat known to sustain <math>\geq 1</math> percent but <math>&lt; 95</math> percent of the global population of an endemic or restricted-range species where that habitat could be considered a discrete management unit for that species, where data are available and/or based on expert opinion.</p>
3. Migratory/ Congregatory Species	<p>(a) Habitat known to sustain, on a cyclical or otherwise regular basis, <math>\geq 95</math> percent of the global population of a migratory or congregatory species at any point of the species' lifecycle where that habitat could be considered a discrete management unit for that species.</p>	<p>(b) Habitat known to sustain, on a cyclical or otherwise regular basis, <math>\geq 1</math> percent but <math>&lt; 95</math> percent of the global population of a migratory or congregatory species at any point of the species' lifecycle and where that habitat could be considered a discrete management unit for that species, where adequate data are available and/or based on expert opinion.</p> <p>(c) For birds, habitat that meets BirdLife International's Criterion A4 for congregations and/or Ramsar Criteria 5 or 6 for Identifying Wetlands of International Importance.</p>

Criteria	Tier 1	Tier 2
		<p>(d) For species with large but clumped distributions, a provisional threshold is set at <math>\geq 5</math> percent of the global population for both terrestrial and marine species.</p> <p>(e) Source sites that contribute <math>\geq 1</math> percent of the global population of recruits.</p>

## 1.10 References

IFC (2012a) Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources. International Finance Corporation, Washington DC, USA.

IFC (2012b) Guidance Note 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources. International Finance Corporation, Washington DC, USA.

IUCN (2017) IUCN Red List of Threatened Species Version 2017-3. <http://www.iucnredlist.org/>

Rodríguez-Clark, K.M., Keith, D.A., Rodríguez-Clark, K.M., Murray, N.J., Nicholson, E., Regan, T.J., Miller, R.M., Barrow, E.G., Bland, L.M., Boe, K., Brooks, T.M., Oliveira-Miranda, M.A., Spalding, M. & Wit, P. (2015) A practical guide to the application of the IUCN Red List of Ecosystems criteria. *Philosophical Transactions of the Royal Society B* 370.

TBC & FFI (2017) Total E&P Uganda Block EA1, EA1A and EA2 North: Critical Habitat Assessment - Interpretation of results and provision of recommendations for ESIA. (Report on behalf of Total E&P Uganda.). The Biodiversity Consultancy and Flora and Fauna International, Cambridge, UK.

WCS & eCountability (2016) Phase 2 Biodiversity Study Natural and Critical Habitat Assessment (Confidential unpublished report for Tullow Uganda Operations Pty).

WCS & eCountability (2016) Phase 2 Biodiversity Study Land Cover Analysis Report Final Draft (Report prepared for Tullow Uanda Operations Pty).