

# **Technical Appendix 11.1: Critical Habitat Assessment**

Intended for

**Bugesera Airport Company Limited**

Date

**October 2017**

Project Number

**UK11-24483**

# **NEW BUGESERA INTERNATIONAL AIRPORT**

## **APPENDIX 11.1: CRITICAL HABITAT ASSESSMENT**

## CONTENTS

<b>1.</b>	<b>APPENDIX 11.1: CRITICAL HABITAT ASSESSMENT</b>	<b>1</b>
1.1	Introduction	1
1.2	Gradient of Critical Habitat	2
1.3	Unit of Analysis	3
<b>2.</b>	<b>METHODOLOGY</b>	<b>4</b>
2.1	Criterion 1: Critically Endangered and/or Endangered Species	4
2.2	Criterion 2: Endemic and/or Restricted-Range Species	4
2.3	Criterion 3 Migratory and Congregatory Species	5
2.4	Criterion 4 Highly Threatened and/or Unique Ecosystems	5
2.5	Criterion 5: Key Evolutionary Processes	6
<b>3.</b>	<b>DETERMINATION</b>	<b>8</b>
3.1	Criteria 1 and 2	8
3.2	Criterion 3 Migratory and Congregatory Species	10
3.3	Criterion 4 Highly Threatened and/or Unique Ecosystems	12
3.4	Criterion 5: Key Evolutionary Processes	13
3.5	Criterion 6: Internationally and/or Nationally Recognised Areas	14
3.6	Summary	14

## LIST OF TABLES

Table 1-1: Quantitative Thresholds for Tiers 1 and 2 of Critical Habitat Criteria 1 - 3 .....	2
Table 2-1: IUCN Categories of Extinction Risk .....	4
Table 2-2: Summary of IUCN Ecosystem Redlist Criteria.....	6
Table 3-1: Threatened and Endemic Species Potentially Present in the Project Area.....	8
Table 3-2: Numbers of Species Recorded and Global Population Estimates .....	10
Table 3-3: Screening of Criterion Indicating Highly Threatened and/or Unique Ecosystems ...	12
Table 3-4: Screening of Criterion Indicating Importance for Evolutionary Processes.....	13
Table 3-5: Summary of Critical Habitat within Proposed Project Area.....	14

## LIST OF FIGURES

Figure 3-1: Discrete Management Unit for Critical Habitat Determination for Species .....	9
---	---

# 1. APPENDIX 11.1: CRITICAL HABITAT ASSESSMENT

## 1.1 Introduction

This Critical Habitat Assessment (CHA) provides an assessment of critical habitat applicable to the New Bugesera International Airport (Proposed Project). This appendix is based on the baseline information provided in Chapter 11: Biodiversity. The ESIA Report was informed by an extensive literature review and in-field data collection. This process has completed the first two steps of critical habitat determination, as specified in paragraphs GN67 and GN68 of the IFC's Guidance Note 6<sup>1</sup>. Therefore, the scope of this report is limited to step 3 as defined in paragraph GN79 on Critical Habitat Determination.

### 1.1.1 Definition of Critical Habitat

Critical habitat is defined in Paragraph 16 of the 2012 version of IFC Performance Standard 6 (IFC PS6)<sup>2</sup> as an area with high biodiversity value. This includes areas that meet one or more of following criteria:

- Criterion 1: Critically Endangered (CR) and/or Endangered (EN) species;
- Criterion 2: Endemic and/or restricted-range species;
- Criterion 3: Migratory and/or congregatory species;
- Criterion 4: Highly threatened and/or unique ecosystems; and
- Criterion 5: Key evolutionary processes.

However, as specified by GN56 of the IFC's Guidance Note 6, the determination of critical habitat can include other recognised high biodiversity values which are to be evaluated on a case-by-case basis. GN56 provides the following seven examples:

- Areas required for the reintroduction of CR or EN species and refuge sites for these species (habitat used during periods of stress (e.g. flood, drought or fire));
- Ecosystems of known special significance to EN or CR species for climate adaptation purposes;
- Concentrations of Vulnerable (VU) species in cases where there is uncertainty regarding the listing, and the actual status of the species may be EN or CR;
- Areas of primary/old-growth/pristine forests and/or other areas with especially high levels of species diversity;
- Landscape and ecological processes (e.g. water catchments, areas critical to erosion control, disturbance regimes (e.g. fire, flood)) required for maintaining critical habitat;
- Habitat necessary for the survival of keystone species; and
- Areas of high scientific value such as those containing concentrations of species new and/or little known to science.

Furthermore, GN57 states that in general, internationally and/or nationally recognised areas of high biodiversity value will likely qualify as critical habitat, including the following:

- Areas that meet the criteria of the IUCN 's Protected Area Management Categories Ia, Ib and II, although areas that meet criteria for Management Categories III-VI may also qualify depending on the biodiversity values inherent to those sites;
- UNESCO Natural World Heritage Sites that are recognised for their Global Outstanding Value;

---

<sup>1</sup> IFC, 2012. Guidance Note 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources.

<sup>2</sup> IFC, 2012. Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources.

- The majority of Key Biodiversity Areas (KBAs), which encompass *inter alia* Ramsar Sites, Important Bird Areas (IBA), Important Plant Areas (IPA) and Alliance for Zero Extinction Sites (AZE);
- 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, recognised academic institutions and/or other relevant qualified organisations (including internationally-recognised NGOs); and
- Areas identified by the client as High Conservation Value (HCV) using internationally recognised standards, where criteria used to designate such areas is consistent with the high biodiversity values listed in paragraph 16 of IFC PS6.

## 1.2 Gradient of Critical Habitat

IFC Guidance Note 6 recognises that there are gradients of critical habitat based on relative vulnerability (degree of threat) and irreplaceability (rarity or uniqueness). For Criteria 1-3, listed in Section 1.1 of this Appendix, quantitative thresholds are provided to assign critical habitat into either Tier 1 or Tier 2. Table 1-1 details the relevant thresholds.

Table 1-1: Quantitative Thresholds for Tiers 1 and 2 of Critical Habitat Criteria 1 - 3		
Criterion	Tier 1	Tier 2
1. CR/ EN Species	<p>(a) Habitat required to sustain <math>\geq 10\%</math> 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> 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> but <math>&lt; 95\%</math> 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 judgment.</p>
3. Migratory/ Congregatory Species	<p>(a) Habitat known to sustain, on a cyclical or otherwise regular basis, <math>\geq 95\%</math> of the global population of a migratory or congregatory species at any point of the species' lifecycle where that habitat could be considered a</p>	<p>(b) Habitat known to sustain, on a cyclical or otherwise regular basis, <math>\geq 1\%</math> but <math>&lt; 95\%</math> 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</p>

Table 1-1: Quantitative Thresholds for Tiers 1 and 2 of Critical Habitat Criteria 1 - 3		
Criterion	Tier 1	Tier 2
	discrete management unit for that species.	<p>available and/or based on expert judgment.</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> <p>(d) For species with large but clumped distributions, a provisional threshold is set at <math>\geq 5\%</math> of the global population for both terrestrial and marine species.</p> <p>(e) Source sites that contribute <math>\geq 1\%</math> of the global population of recruits.</p>

Neither IFC Performance Standards nor Guidance Note 6 define what constitutes a nationally/regionally important concentration. However, as Tier 1 critical habitat under Criterion 1 is defined by  $\geq 10\%$  of the global population of a CR or EN species, Tier 2 Critical Habitat has been defined by  $\geq 10\%$  of the national/regional population of a CR or EN species.

### 1.3 Unit of Analysis

The scale at which the critical habitat determination takes place depends on underlying ecological processes for the habitat and species in question and is not limited to the footprint of the Proposed Project. GN65 of IFC's Guidance Note 6 states that for Criteria 1-3, the determination of critical habitat should be based on a "discrete management unit" (DMU) which is an area that has a definable boundary within which the biological communities have more in common with each other than they do with those outside the boundary. GN65 goes on to provide the following additional guidance on the selection of the DMU:

*"A discrete management unit may or may not have an actual management boundary (e.g. legally protected areas, World Heritage sites, KBAs, IBAs, community reserves) but could also be defined by some other sensible ecologically definable boundary (e.g. watershed, interfluvial zone, intact forest patch within patchy modified habitat, seagrass habitat, coral reef, concentrated upwelling area, etc.). The delineation of the management unit will depend on the species (and, at times, subspecies) of concern".*

The DMU at which each species is considered is described in Section 3 of this technical appendix.

## 2. METHODOLOGY

### 2.1 Criterion 1: Critically Endangered and/or Endangered Species

**Chapter 11: Biodiversity** identifies threatened species that have the potential to be present within the Proposed Project Area. This has been completed with reference to the International Union for Conservation of Nature (IUCN) Red List of Threatened Species (RL)<sup>3</sup>. The classification system used by the IUCN RL for representing the extinction risk of species is presented in Table 2-1. Species classified as VU or above on the IUCN RL are often referred to as 'threatened' species.

Table 2-1: IUCN Categories of Extinction Risk <sup>4</sup>	
IUCN Category	Definition
Extinct in the Wild (EXW)	A taxon is Extinct in the Wild when it is known only to survive in cultivation, in captivity or as a naturalised population (or populations) well outside the past range.
Critically Endangered (CR)	Species facing an extremely high risk of extinction in the wild.
Endangered (EN)	Species facing a very high risk of extinction in the wild.
Vulnerable (VU)	Species facing a high risk of extinction in the wild.
Near Threatened (NT)	A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.
Data Deficient (DD)	Inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status.
Least Concern (LC)	A taxon is Least Concern when it has been evaluated against the criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened. Widespread and abundant taxa are included in this category.

### 2.2 Criterion 2: Endemic and/or Restricted-Range Species

IFC's Guidance Note 6 provides the following definitions for Endemic and restricted-range species as follows:

- *"Endemic species: defined as one that has ≥95% of its global range inside the country or region of analysis.*
- *Restricted-range species:*
  - *For terrestrial vertebrates, a restricted-range species is defined as those species which have an extent of occurrence of 50,000 km<sup>2</sup> or less.*
  - *For marine systems, restricted-range species are provisionally being considered those with an extent of occurrence of 100,000 km<sup>2</sup> or less.*
  - *For freshwater systems, standardized thresholds have not been set at the global level. However an IUCN study of African freshwater biodiversity applied thresholds of 20,000 km<sup>2</sup> for crabs, fish, and molluscs and 50,000 km<sup>2</sup> for odonates (dragonflies and damselflies). These can be taken as approximate guidance, although the extent to which they are applicable to other taxa and in other regions is not yet known.*

<sup>3</sup> IUCN, 2013. The IUCN Red List of Threatened Species. Version 2013.2. <<http://www.iucnredlist.org>>.

<sup>4</sup> IUCN, 2012. IUCN Red List Categories and Criteria: Version 3.1. Second edition. Gland, Switzerland and Cambridge, UK: IUCN. iv + 32pp.

- *For plants, restricted-range species may be listed as part of national legislation. Plants are more commonly referred to as “endemic,” and the definition provided in paragraph GN79 would apply.”*

Species listed in Chapter 11: Biodiversity were screened to identify whether they meet the definition of either endemic or range-restricted species. This was completed with reference to published sources and in liaison with experts. Criterion 1 and 2 are addressed at the same time in Section 3 of this appendix.

## 2.3 Criterion 3 Migratory and Congregatory Species

IFC Guidance Note 6 defines migratory and congregatory species in the following way:

- Migratory species:
  - *“any species of which a significant proportion of its members cyclically and predictably move from one geographical area to another (including within the same ecosystem).”*
- Congregatory species:
  - *“species whose individuals gather in large groups on a cyclical or otherwise regular and/or predictable basis;*
  - *Species that form colonies;*
  - *Species that form colonies for breeding purposes and/or where large numbers of individuals of a species gather at the same time for non-breeding purposes (e.g., foraging, roosting);*
  - *Species that move through bottleneck sites where significant numbers of individuals of a species pass over a concentrated period of time (e.g., during migration);*
  - *Species with large but clumped distributions where a large number of individuals may be concentrated in a single or a few sites while the rest of the species is largely dispersed (e.g., wildebeest distributions); and*
  - *Source populations where certain sites hold populations of species that make an inordinate contribution to recruitment of the species elsewhere (especially important for marine species).”*

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 meet the Tier 2 classification for critical habitat. Chapter 11: Biodiversity identifies a number of migratory bird species that have been recorded within the Proposed Project Area.

## 2.4 Criterion 4 Highly Threatened and/or Unique Ecosystems

IFC Guidance Note 6 defines highly threatened or unique ecosystems as:

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

A working group has been established by the IUCN to develop a system of quantitative categories and criteria, analogous to those used for species, for assigning levels of threat to ecosystems at local, regional, and global levels (IUCN, 2016)<sup>5</sup>. Ecosystems that fall within the Proposed Project Area and meet the definition of EN or CR according to IUCN (2016) are assumed to meet Criterion 4 for critical habitat. For many habitat types, data on distribution, quality and functioning are lacking. In these instances estimates have been made based on

<sup>5</sup> Bland, L.M., Keith, D.A., Miller, R.M., Murray, N.J. and Rodríguez, J.P. (eds.), 2016. Guidelines for the application of IUCN Red List of Ecosystems Categories and Criteria, Version 1.0. Gland, Switzerland: IUCN. ix + 94pp.



available evidence, professional judgement and levels of protection (e.g. habitats specifically protected by law, or proportion of habitat types occurring within protected areas).

<b>Table 2-2: Summary of IUCN Ecosystem Redlist Criteria</b>		
<b>Criterion</b>	<b>CR</b>	<b>EN</b>
A: Reduction in geographic distribution	Reduction in geographic distribution of >80% in any 50 year time period.	Reduction in geographic distribution of >50% in any 50 year time period.
B: Restricted geographic distribution	EOO of <2000 km <sup>2</sup> AOO <2 10x10 km grid cells	EOO of <20,000 km <sup>2</sup> AOO <20 10x10 km grid cells
C: Environmental degradation	Reduction in an abiotic variable affecting more than 80% of ecosystem in 50 year time period.	Reduction in an abiotic variable affecting more than 50% of ecosystem in 50 year time period.
D: Disruption of biotic processes or interactions	Reduction in a biotic variable affecting more than 80% of ecosystem in 50 year time period.	Reduction in a biotic variable affecting more than 50% of ecosystem in 50 year time period.
E: Quantitative analysis that estimates the probability of ecosystem collapse	Quantitative analysis that estimates the probability of ecosystem collapse to be >50% in 50 years.	Quantitative analysis that estimates the probability of ecosystem collapse to be >20% in 50 years.

## 2.5 Criterion 5: Key Evolutionary Processes

Evolutionary processes are often strongly influenced by structural attributes of a region, such as its topography, geology, soil and climate over a period of time. IFC Guidance Note 6 suggests that this criterion is defined by:

- *"the physical features of a landscape that might be associated with particular evolutionary processes; and/or*
- *sub-populations of species that are phylogenetically or morphogenetically distinct and may be of special conservation concern given their distinct evolutionary history."*

For the purposes of this assessment, the Proposed Project Area has been screened against the following factors:

- Level of isolation (e.g. islands, mountaintops, lakes are associated with populations that are phylogenetically distinct);
- Extent of endemism (areas of high endemism often contain flora and/or fauna with unique evolutionary histories);
- Spatial heterogeneity;
- Presence of environmental gradients (ecotones produce transitional habitat which has been associated with the process of speciation and high species and genetic diversity);
- Edaphic interfaces; and
- Connectivity between habitats (e.g. biological corridors).

Criterion 5 is usually considered at a relatively fine scale (TBC and FFI, 2012)<sup>6</sup> and thus the most appropriate unit of analysis is that which may potentially experience direct, primary impacts from the Proposed Project (i.e. the Proposed Project Area).

---

<sup>6</sup> The Biodiversity Consultancy Ltd and Fauna & Flora International. 2012. Oyu Tolgoi LLC: Critical Habitat Assessment: IFC Performance Standard 6/EBRD Performance Requirement 6.

### 3. DETERMINATION

#### 3.1 Criteria 1 and 2

The species identified by the ESIA Report as being likely to be present within the Proposed Project Area have been screened to identify species that are classified as either Critically Endangered or Endangered, as well as endemic or range restricted species (Table 3-1).

Table 3-1: Threatened and Endemic Species Potentially Present in the Project Area				
Species	Presence	IUCN RL	Endemic	Restricted Range
<b>Birds</b>				
Grey Crowned-crane <i>Balearica regulorum</i>	Confirmed during ESIA surveys	EN	No	No
<b>Fish</b>				
<i>Labeo victorinus</i>	Potentially present. Global distribution overlaps with the Proposed Project.	CR	No	No

##### 3.1.1 Critical Habitat Determination

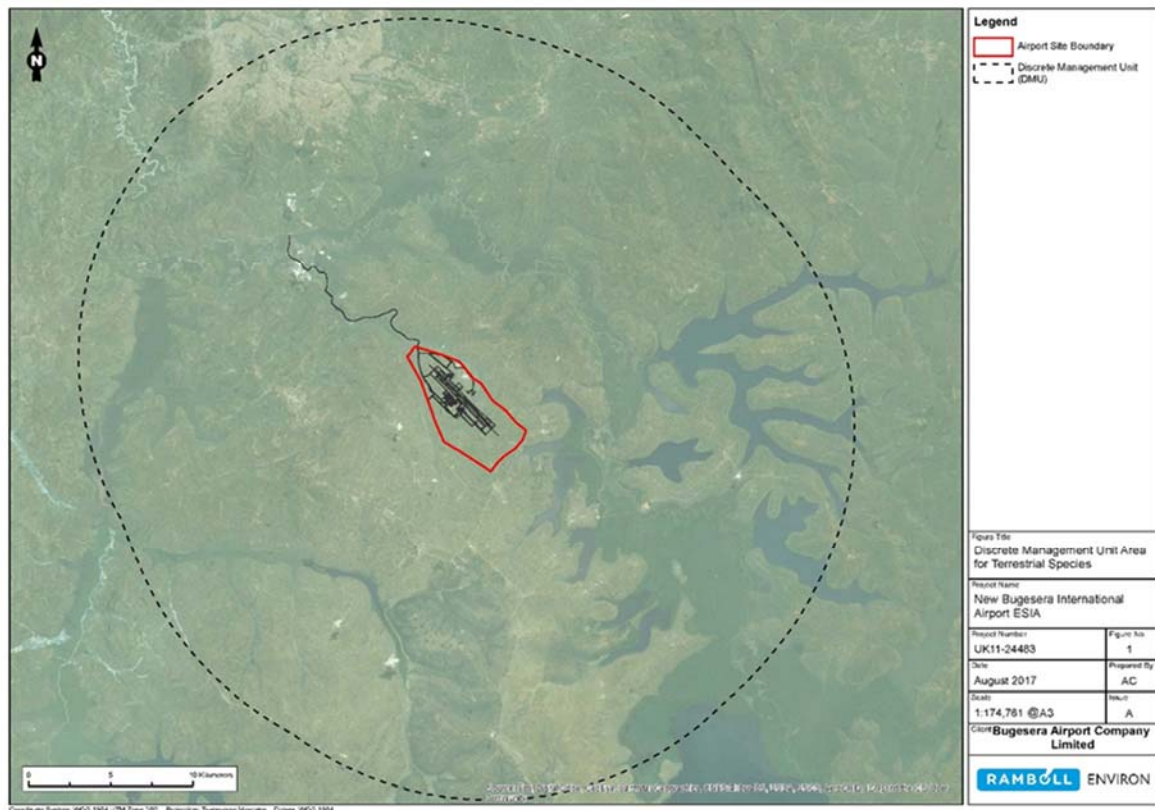
##### 3.1.1.1 Grey Crowned-crane *Balearica regulorum*

Grey Crowned-crane has been classified as Endangered by the IUCN. It is neither endemic nor range-restricted. It has a large range including Democratic Republic of the Congo, Rwanda, Uganda and Kenya south through Tanzania to Mozambique, and the nominate race *B. r. regulorum* is found from Mozambique south through Zimbabwe to South Africa and west in small numbers to Namibia and Angola. It is estimated to have a global population of 17,700-22,300 mature individuals, and a Rwandan population of 300-500. It has a range which includes eastern and southern Africa, with an estimated extent of occurrence of 607,000 km<sup>2</sup>. The population trend is decreasing.

##### 3.1.2 Discrete Management Unit

It is difficult to determine the Discrete Management Unit (DMU) on an ecological basis due to the variety of habitats in the area and the wide ranging behaviour of the Grey Crowned-crane. As the species is likely to have large home ranges and occur at low densities, any unit of analysis must be correspondingly large. As used by the Biodiversity Consultancy (TBC, 2015<sup>7</sup>), a DMU incorporating the Proposed Project Area (including the Expressway) and a 20 km buffer around this, with 10 km from the Expressway, has been used. The total area of the terrestrial DMU is 171,693 ha. This area allows consideration of direct impacts, as well as indirect and cumulative impacts. This DMU area is considered to be an appropriate unit of analysis for the Proposed Project. Impacts within any part of this area have potential to adversely affect Proposed Project species which qualify for critical habitat determination.

<sup>7</sup> TBC, 2015. CBG mine expansion project: Critical Habitat Assessment. Report of The Biodiversity Consultancy, September 2015.



**Figure 3-1: Discrete Management Unit for Critical Habitat Determination for Species**

### 3.1.3 Critical Habitat Determination

The species was identified at the Mwesa Wetland and at the cleared area at the end of the runway.

Based on a peak count of four individuals identified during the survey work, the DMU does not support greater than 10% of the global population of a CR or EN species (17,700), nor a regionally important concentration of a red-listed EN species (Rwandan population of 300 individuals). The DMU represents less than 0.3% of the species range (which totals 607,000 km<sup>2</sup>). Therefore, the DMU does not meet Criterion 1 for critical habitat with respect to Grey Crowned-crane. As the species is not endemic or range restricted, the DMU does not meet Criterion 2 for critical habitat.

#### 3.1.3.1 *Labeo Victorianus*

*Labeo victorianus* has been classified as Critically Endangered by the ICUN, and its global range overlaps with the Proposed Project AOI. It is endemic to the Lake Victoria region. It has undergone severe population declines and shrinkage of its range, due to overfishing and loss and degradation of habitat. A decline of not less than 80% in 10 years is reported by the IUCN. The species occurs in shallow, inshore waters of Lake Victoria and affluent rivers, as well as a number of other lakes in the region.

#### 3.1.4 Discrete Management Unit

As for Grey Crowned-crane, a DMU incorporating the Proposed Project Area (including the Expressway) and a 20 km buffer around this, with 10 km from the Expressway, has been used, with all wetland within this comprising the DMU. The total area of the DMU is 171,693 ha. This area allows consideration of direct impacts, as well as indirect and cumulative impacts. This DMU area is considered to be an appropriate unit of analysis for the Proposed Project. Impacts

within any part of this area have potential to adversely affect Proposed Project Area species which qualify for critical habitat determination.

### 3.1.5 Critical Habitat Determination

The DMU is likely to represent less than 1% of the global range of this species. Therefore, it is concluded that does not meet the threshold for Tier 1 critical habitat as it does not sustain  $\geq 10\%$  of the global population of a Critically Endangered or Endangered species. As this species is Critically Endangered, if present in the AOI it is likely to trigger Tier 2 Critical Habitat under Criterion 1.

## 3.2 Criterion 3 Migratory and Congregatory Species

A number of migratory bird species were recorded during the bird surveys of the Proposed Project Area, and further migratory species are likely to make use of the area at other times of the year. None of these have been recorded (or are likely to be present) in numbers that represent greater or equal to one percent of the global population. Table 3-2 provides the numbers of each species recorded, as well as their global population estimates (where known). For some species, there is uncertainty in the global population level. However, given the low number of individuals recorded, it is considered extremely unlikely that greater than or equal to 1% of the global population is present. All the species are classified as IUCN Least Concern, with the exception of Pallid Harrier which is IUCN Near-threatened.

Table 3-2: Numbers of Species Recorded and Global Population Estimates				
Scientific name	Habitat & R-Status*	IUCN Status	No. recorded in AOI	Global Population No. (%)
African Open-Billed Stork ( <i>Anastomus lamelligerus</i> )	A,w,G	LC	1	Unknown, but likely to be less than 1%
Black-winged Kite ( <i>Elanus caeruleus</i> )	p,A	LC	5	European population 2,200-5,300. Global unknown, but likely to be less than 1%
Pallid Harrier ( <i>Circus macrourus</i> )	R-NT,G-NT,P,G	NT	1	18,000 (0.01%)
Montagu's Harrier ( <i>Circus pygargus</i> )	R-NT,P	LC	0	266,000 (<0.01%)
Eurasian Marsh Harrier ( <i>Circus aeruginosus</i> )	P,w	LC	3	415,000 (0.001%)
Lesser Spotted Eagle ( <i>Aquila pomarina</i> )	P	LC	1	44,900 (0.003%)
Steppe Eagle ( <i>Aquila rapax</i> )	P,G	LC	1	Unknown, but likely to be less than 1%
Levaillant's Cuckoo ( <i>Oxylophus levaillantii</i> )	A,f	LC	3	Unknown, but likely to be less than 1%
Black Cuckoo ( <i>Cuculus clamosus</i> )	A,f,FF	LC	1	Unknown, but likely to be less than 1%

<b>Table 3-2: Numbers of Species Recorded and Global Population Estimates</b>				
<b>Scientific name</b>	<b>Habitat &amp; R-Status*</b>	<b>IUCN Status</b>	<b>No. recorded in AOI</b>	<b>Global Population No. (%)</b>
African Palm Swift ( <i>Cypsiurus parvus</i> )	Ae	LC	0	Unknown, but likely to be less than 1%
Woodland Kingfisher ( <i>Halcyon senegalensis</i> )	A	LC	3	Unknown, but likely to be less than 1%
White-Headed Saw-Wing ( <i>Psalidoprocne albiceps</i> )	R-RR,f,Ae	LC	0	Unknown, but likely to be less than 1%
Sand Martin ( <i>Riparia riparia</i> )	P,W,Ae	LC	0	10,000,000 (<0.001%)
Lesser Striped Swallow ( <i>Hirundo abyssinica</i> )	Ae	LC	104	Unknown, but likely to be less than 1%
Angola Swallow ( <i>Hirundo angolensis</i> )	w,Ae	LC	10	Unknown, but likely to be less than 1%
Blackcap <i>Sylvia atricapilla</i>	P,F	LC	1	101,000,000 (<0.001%)
Cardinal Quelea ( <i>Quelea cardinalis</i> )	R-RR,A	LC	4	Unknown, but likely to be less than 1%

### 3.2.1 Discrete Management Unit

As for Grey Crowned-crane, a DMU incorporating the Proposed Project Area (including the Expressway) and a 20 km buffer around this, with 10 km from the Expressway, has been used. The total area of the terrestrial DMU is 171,693 ha. This area allows consideration of direct impacts, as well as indirect and cumulative impacts. This DMU area is considered to be an appropriate unit of analysis for the Proposed Project. Impacts within any part of this area have potential to adversely affect Proposed Project species which qualify for critical habitat determination.

### 3.2.2 Critical Habitat Determination

No species are represented in numbers greater or equal to 1% of their global populations within the DMU, and therefore no critical habitat is present for migratory species. With exception of Pallid Harrier, all of the species are IUCN Least Concern and have large global populations. Pallid Harrier is IUCN Near-threatened, although still has a large global population. Its extent of occurrence is estimated at 8,440,000 km<sup>2</sup>. The DMU represents less than 0.005% of the wintering population area of this species (0.002%).

The Nyabarongo Wetland Important Bird Area (IBA) is designated for the presence of globally threatened species and biome-restricted species, and not for congregations of migratory (or other) birds. Therefore, for migratory bird species, there is no likelihood that the populations supported by the DMU would approach greater than or equal to one percent of the global population of any migratory species. Therefore, the DMU does not meet Criterion 2 with respect to migratory bird species.

### 3.3 Criterion 4 Highly Threatened and/or Unique Ecosystems

One natural habitat occurs within the Proposed Project Area: Swamp and aquatic vegetation. The East African geographical extent of papyrus wetlands have previously been estimated to cover approximately 40,000 km<sup>2</sup> (Hughes & Hughes, 1992<sup>8</sup>). Papyrus swamp is decreasing in size across east Africa due to agricultural pressure, with large areas of swamp being drained for subsistence crop production. The *papyrus Cyperus papyrus* plant itself is categorised as Least Concern by the IUCN, with a widespread range including invasive properties in countries it is not native too, although it is considered to be potentially declining in parts of its range. Changes in Papyrus cover at three IBAs in the Kenyan sector of Lake Victoria have occurred, with losses of 34% to 50% recorded between 1969 and 2000 (Owino and Ryan, 2007<sup>9</sup>). Rates of papyrus swamp drainage have been found to be almost four times higher than that of wetland habitat as a whole in areas of Uganda, Rwanda and Kenya (Maclean et al., 2013<sup>10</sup>). Between 1984–1987 and 1999–2001 the areal extent of papyrus declined by 6.7 % in this area. In some regions of Uganda, Rwanda and DRC, more than 75% of wetlands were drained between the early 1980s and 2001 (Maclean et al. 2013<sup>11</sup>). It has been suggested that low-intensity use of papyrus wetlands by people is compatible with the conservation of specialist bird species, with small-scale traditional human activities of some benefit to conservation (Donaldson et al., 2016<sup>12</sup>).

All other habitats present within the Proposed Project Area have been heavily modified by agricultural activities. These habitats are generally degraded in terms of biological diversity and importance compared to the natural habitats that they replaced. These habitats are not threatened within Rwanda. The natural and modified habitats within the Proposed Project Area do not meet the criteria for EN or CR ecosystems as detailed by IUCN, 2015. Therefore, the critical habitat is not triggered under criterion 4 of IFC PS6.

Table 3-3: Screening of Criterion Indicating Highly Threatened and/or Unique Ecosystems		
Criterion Indicating Highly Threatened and/or Unique Ecosystems	Relevance to Proposed Project Area	Critical Habitat Triggered?
A: Reduction in geographic distribution	Papyrus swamp has suffered high rates of decline in some areas, but has not likely declined by 50% or more during across the whole of its geographic range over the past 50 years.	No
B: Restricted geographic distribution	More than 20,000 km <sup>2</sup> of papyrus swamp habitat exists.	No
C: Environmental degradation	Not enough data exists to quantify abiotic degradation. Papyrus swamp could potentially be undergoing more than 30% decline over 70% of its range, which would make it Near Threatened.	Possible
D: Disruption of biotic processes or interactions	Not enough data exists to quantify biotic degradation. It is unlikely that disruption of biotic processes of papyrus swamp would occur to an extent to trigger Critical Habitat.	No

<sup>8</sup> Hughes RH, Hughes JS, 1992. A Directory of African Wetlands. IUCN, Gland, Switzerland and Cambridge, UK/UNEP, Nairobi, Kenya/WCMC, Cambridge, UK.

<sup>9</sup> Owino, A.O. & Ryan, P.G. Wetlands Ecol Manage, 2007. 15: 1. <https://doi.org/10.1007/s11273-006-9001-y>

<sup>10</sup> Maclean, I. M. D.; Bird, J. P.; Hassall, M. 2013. Papyrus swamp drainage and the conservation status of their avifauna. Wetlands Ecology and Management.

<sup>11</sup> Maclean, I. M. D.; Bird, J. P.; Hassall, M. 2013. Papyrus swamp drainage and the conservation status of their avifauna. Wetlands Ecology and Management.

<sup>12</sup> Donaldson L, Woodhead AJ, Wilson RJ, Maclean IMD, 2016. Subsistence use of papyrus is compatible with wetland bird conservation. Biol Conserv 201:414–422.



<b>Table 3-3: Screening of Criterion Indicating Highly Threatened and/or Unique Ecosystems</b>		
<b>Criterion Indicating Highly Threatened and/or Unique Ecosystems</b>	<b>Relevance to Proposed Project Area</b>	<b>Critical Habitat Triggered?</b>
E: Quantitative analysis that estimates the probability of ecosystem collapse	Not enough data exists to quantitatively model the likelihood of ecosystem collapse over the next 50 years. However, it is considered unlikely that there is a 20% or higher probability that the ecosystem would collapse within the next 50 years.	No

### 3.4 Criterion 5: Key Evolutionary Processes

The importance of the Proposed Project Area from an evolutionary perspective is assessed by screening its features against factors that indicate importance for evolutionary processes. Table 3-4 details the factors considered likely to indicate importance for evolutionary processes and their relevance to the Proposed Project Area. In summary, there is no indication that the Proposed Project Area is important for evolutionary processes and therefore critical habitat is not triggered under Criterion 5 of IFC PS6.

<b>Table 3-4: Screening of Criterion Indicating Importance for Evolutionary Processes</b>		
<b>Criterion Indicating Importance for Evolutionary Processes</b>	<b>Relevance to Proposed Project Area</b>	<b>Critical Habitat Triggered?</b>
Level of isolation (e.g., islands, mountaintops, lakes are associated with populations that are phylogenetically distinct)	The Proposed Project Area lacks the extreme topography required to isolate populations.	No
Extent of endemism (Areas of high endemism often contain flora and/or fauna with unique evolutionary histories)	The Albertine Rift has a high degree of endemism, and is designated as an Endemic Bird Area by BirdLife International. Two further major biogeographical regions occur in Rwanda, the Central African rainforest and the East African savanna. However, these biogeographical regions cover a wide area and the area immediately surrounding the project area itself has a limited extent of endemism.	No
Spatial heterogeneity	The habitats present in the Proposed Project Area are relatively homogenous and largely modified.	No
Presence of environmental gradients (ecotones produce transitional habitat which has been associated with the process of speciation and high species and genetic diversity)	The habitats present in the Proposed Project Area are relatively homogenous and lack marked ecotones that could drive evolutionary processes. Although lake edges could be considered ecotones, they are not of a nature likely to facilitate speciation.	No
Edaphic interfaces	The habitats present in the Proposed Project Area are relatively homogenous and lack	No



<b>Table 3-4: Screening of Criterion Indicating Importance for Evolutionary Processes</b>		
<b>Criterion Indicating Importance for Evolutionary Processes</b>	<b>Relevance to Proposed Project Area</b>	<b>Critical Habitat Triggered?</b>
	marked edaphic interfaces that could drive evolutionary processes.	
Connectivity between habitats (e.g. biological corridors).	The habitats within the Proposed Project Area do not provide significant connectivity between other nearby habitats known to be of evolutionary importance.	No

### 3.5 Criterion 6: Internationally and/or Nationally Recognised Areas

The Proposed Project Area includes parts of one internationally recognised areas: Nyabarongo Wetlands IBA. Surveys completed during 2017 have confirmed the continued presence of many of the qualifying features and, in accordance with IFC PS6, these areas are confirmed to be critical habitats.

### 3.6 Summary

This Technical Appendix provides an assessment of critical habitat applicable to the Proposed Project. Critical habitat is defined by IFC Performance Standard 6 (PS6) as areas with high biodiversity value. This includes areas that meet one or more of following criteria:

- Criterion 1: Critically Endangered (CR) and/or Endangered (EN) species;
- Criterion 2: Endemic and/or restricted-range species;
- Criterion 3: Migratory and/or congregatory species;
- Criterion 4: Highly threatened and/or unique ecosystems;
- Criterion 5: Key evolutionary processes; and
- Criterion 6: Internationally and/or nationally recognised areas.

Table 3-5 below summarises the critical habitats confirmed to be present in the Proposed Project Area.

<b>Table 3-5: Summary of Critical Habitat within Proposed Project Area</b>			
<b>Feature</b>	<b>PS6 Criterion</b>	<b>Rationale</b>	<b>Critical Habitat</b>
<i>Labeo victorinus</i>	Criteria 1	IUCN Critically Endangered species	Yes (Tier 2)
Nyabarongo + A2:D6 Wetlands KBA and IBA	Criteria 6	Internationally and/or nationally recognised area	Yes