

# The Ruzizi Congolese Plain, an Important Area for the Conservation of Birds in South Kivu, Democratic Republic of Congo

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## ABSTRACT

The Ruzizi Congolese Plain, an important space for the conservation of birds constitutes the introductory part to our doctoral thesis. It presents the state of the ecosystems of the Ruzizi plain and the Ruzizi Delta from the old outline of the Ruzizi reserve around 1995 to the current situation, after about a quarter of a century 'apparent or virtual occupation by uncontrolled armed groups. The Ruzizi Plain and its delta were the places of entrenchment of the militias and reception of the refugees between 1996 and 2006. About 219 466 refugees, to which must be added an uncontrolled and unregistered number of internally displaced persons, all dependent on natural resources of plant and animal origin. Although the wars were officially ended in 2003-2006, natural resources continue to deteriorate following the non-application of laws relating to the protection of ecosystems. This doctoral thesis aims to provide information on the ecology, conservation and management of birds in order to awaken respect for the laws on the protection of ecosystems and biodiversity in the Ruzizi Delta of DRC and Burundi, in order to prevent natural disasters and pandemics by widening protected spaces.

**Key words:** Ecology, conservation and management of birds; Ruzizi Delta; Wetland areas; Habitat degradation; Water birds.

## INTRODUCTION

Global biodiversity is the measure of biodiversity on planet Earth (Chapman A. D., 2005). It is defined as the total variability of life forms on Earth (Bond & Wignall, 2008); (Eszter, et al., 2018). According to (MacKinney, 1997) more than 99 percent of all species that ever lived on Earth are estimated to be extinct.

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The most important driver affecting biodiversity is habitat change (Pereira, 2012), other drivers relate to overexploitation, pollution, invasive plants or climate change. The estimate number of described extant as of 2009 for chordate is 64788 species, of which birds represent 15.42%, 9990 species in the world (Chapman A. D., 2009).

Bird protection is an area of conservation biology that deals with endangered bird species or declining populations in extinction, which have been observed for several species since the 1850s for multiple reasons (Butchart, Stattersfield, & Collar, 2006). Governments, and many charities, work to protect birds in a variety of ways, such as law, site protection and restoration, public awareness campaigns, and the raising of captive populations with a view to their reintroduction.

The efforts carried out by the various partners made it possible in 2004, that sixteen species of birds which would have disappeared without protective measures, still exist (Butchart, Stattersfield, & Collar, 2006). Habitat

destruction is the process by which a natural habitat becomes incapable of supporting its native species. Habitat destruction by human activity is mainly for the purpose of harvesting natural resources including plants, animals, water, soils and ecosystems for industrial production and urbanization (Sahel, M.J.Benton, & H.J.Falcon-Lang, 2010).

When a habitat is destroyed, habitat loss occurs as the greatest threat to organisms and biodiversity. The plants, animals, and other organisms that occupied the habitat have a reduced carrying capacity so that populations decline and extinction becomes more likely (Pfefferkorn & Thomson, 1982).

### Migrant bird species to protect in the Ruzizi Congolese Plain

Among 254 birds species we identified from the Ruzizi Congolese Plain using direct observation with binoculars and a telescope, transect counts, point counts and Japanese mist netting, 73 are migrant bird species of which 26 (21%) are Migrant (M) non breeding, may spend a short period or the entire winter in the Ruzizi Congolese Plain (RCP); 44 (35%) are Palearctic migrants (P), species that breed in Europe or Asia; Three (2%) species are migrants (p) with at least some Palearctic population (*Milvus migrans* Black Kite/ Milan noir, *Falco tinnunculus* Common Kestrel/ Faucon crécerelle, and *Himantopus himantopus* Black-winged Stilt/ Échasse blanche); 14 (11%) are Nesting species (N) in the RCP but absent part of the year; 13 (10%) are Afrotropical migrant species migrating within Africa; and 26 species (21%) are Wintering species which stay in the RCP while their primary nesting ranges are elsewhere (Bashonga B. , 2013).

### The Ruzizi Congolese Plain is made of rivers, wetlands and ponds

I conducted bird inventory in the Ruzizi Congolese Plain including the Ruzizi Delta since 2001 up today. During 2010-2011 I did intensive inventory using transect counts, point counts and Japanese mist netting of birds in the area for my Master of Science dissertation in Environment and Natural Resources at Makerere University Kampala Uganda (Bashonga B. , 2013). The areas investigated extended from the Small Ruzizi River Mouth (S 03° 21' /E 029° 12', 782m altitude) to Kafunda (S 02° 42' /E 028° 00', 962 m altitude),

Kamanyola North direction upward the Small Ruzizi River and the Ruzizi River. Investigated sites were: (1) Kilomoni 2 Fishing Beach, (2) Small Ruzizi River Mouth (SRRM), (3) Kyamvubu Pond, (4) Mwaba Pond, (5) Ruzia Pond, (6) Kimuka Pond, (7) Ndunda Pond, (8) Kaberagule, (9) Kivira and (10) Kafunda (Bashonga B. , 2013) (Figure 1).

In such system area of rivers, wetlands and ponds, we identified 254 bird species referring to the following authors: (Gaugris, 1979); (Guggisberg, 1986); (Guggisberg, 1988); (Gaugris & Weghe, 1993); (Dowset & Dowset-Lemaire, 1993); (Zimmerman, Turner, & Pearson, 1999); (Demey & Louette, 2001); (Fishpool & Evans, 2001); (Stevenson & Fanshawe, 2002); (Seyler, Thomas, Mwanza, & Mpoy, 2010); (Lepage, 2020). The taxonomic list of bird species followed (Stevenson & Fanshawe, 2002) and (Lepage, 2020). Water bird species pointed are those that fulfill the Ramsar Criteria (RC) A4i of water bird conservation concern (Fishpool & Evans, 2001) and water bird specialists or life water depending bird species, as the Kingfishers even if they do not fulfill the RC A4i.

### List of water bird species of the Ruzizi Congolese Plain

Table-1 presents 110 waterbird species of which 100 fulfill the Ramsar Criteria A4i of water bird species conservation issues. Ten water bird species that do not fulfill the A4i Ramsar Criterion are: (1) *Eupodotis melanogaster* Black-bellied Bustard, (2) *Ceryle rudis* Pied Kingfisher, (3) *Halcyon albiventris* Brown-hooded Kingfisher, (4) *Megaceryle maxima* Giant Kingfisher, (5) *Halcyon senegalensis* Woodland Kingfisher, (6) *Alcedo cristata* Malachite Kingfisher, (7) *Ispidina picta* African-pygmy Kingfisher, (8) *Alcedo quadribanchys* Shining Kingfisher, (9) *Eurystomus glaucurus* Broad-billed Roller, (10) *Indicator indicator* Great Honeyguide.

### Bird species of more conservation importance in the Ruzizi Congolese Plain

Table-2 presents 27 bird species which relate to IBA (Important Bird Area) definition (Fishpool & Evans, 2001)& (Demey & Louette, Democratic Republic of Congo, 2001) among the list of 254 we inventoried in 2010-2011. Two of them: Black-winged Pratincole (*Glareola nordmanni*) and Great Snipe (*Gallinago media*) fulfill the Ramsar Criteria A1 of global conservation concern; two others: Sharpe's Akalat (*Sheppardia sharpie*) and Tanzania Masked Weaver (*Ploceus reichardi*) fulfill the Ramsar Criteria A2 of restricted-range species whose breeding distributions define an Endemic Bird Area (EBA) or Secondary Important Bird Area (SIA); 16 of them fulfill the Ramsar Criteria A3 of Biome restricted-range species (Bashonga B. , 2013).

The area belongs to the Afro-Highlands Biome in the Albertine Rift; six bird species meet the Ramsar Criteria A4i, of water bird conservation concern; four species fulfill the Ramsar Criteria A4ii of congregatory terrestrial bird species; and five species fulfill the Ramsar Criteria A4iv of migratory species at bottleneck sites conservation concern (Fishpool & Evans, 2001); (Demey & Louette, 2001). Finally, six species present a particular status in the Red List of IUCN: **VU**, Vulnerable: the White-headed Vulture *Trigonoceps occipitalis*; **NT**, Near Threatened, four species

(Corncrake *Crex crex*, Black-winged Pratincole *Glareola nordmanni*, Great Snipe *Gallinago media*, and African Skimmer *Rynchops flavirostris*) and LC, Low risk of conservation concern, one species, the White Stork *Ciconia ciconia* (Seyler, Thomas, Mwanza, & Mpoy, 2010); (Bashonga B. , 2013).

### Systematic position of the bird species of the Ruzizi Congolese Plain

For educational use, we presented the systematic list of the 254 bird species using their Scientific Names, Common Names and French Names in Appendix 1. These are distributed within 16 Orders and 57 Families (Figure-2)

Table-1. Water bird species in need of protection strategies in the Ruzizi Congolese Plain

Common Name	Species Name	RC	Identification Reference
		A4i	Author
Great White Pelican	<i>Pelecanus onocrotalus</i>	+	Stevenson & Fanshawe, (2002)
Pinck-backed Pelican	<i>Pelecanus rufescens</i>	+	Stevenson & Fanshawe, (2002)
Little Grebe	<i>Tachybaptus ruficollis</i>	+	Stevenson & Fanshawe, (2002)
White-breasted Cormorant	<i>Phalacrocorax carbo</i>	+	Stevenson & Fanshawe, (2002)
Long-tailed Cormorant	<i>Phalacrocorax africanus</i>	+	Stevenson & Fanshawe, (2002)
African Darter	<i>Anhinga rufa</i>	+	Stevenson & Fanshawe, (2002)
Little Bittern	<i>Ixobrychus minutus</i>	+	Stevenson & Fanshawe, (2002)
Dwarf Bittern	<i>Ixobrychus sturmii</i>	+	Stevenson & Fanshawe, (2002)
Black-crowned Night- Heron	<i>Nycticorax nycticorax</i>	+	Stevenson & Fanshawe, (2002)
Cattle Egret	<i>Bubulcus ibis</i>	+	Stevenson & Fanshawe, (2002)
Common Squacco Heron	<i>Ardeola ralloides</i>	+	Stevenson & Fanshawe, (2002)
Rufous-belled Heron	<i>Ardeola rufiventris</i>	+	Stevenson & Fanshawe, (2002)
Striated Heron	<i>Butorides striatus</i>	+	Stevenson & Fanshawe, (2002)
Little Egret	<i>Egretta garzetta</i>	+	Stevenson & Fanshawe, (2002)
Black Heron	<i>Egretta ardesiaca</i>	+	Stevenson & Fanshawe, (2002)
Yellow-billed Egret	<i>Mesophoyx intermedia</i>	+	Stevenson & Fanshawe, (2002)
Great Egret	<i>Cosmerodius albus</i>	+	Stevenson & Fanshawe, (2002)
Goliath Heron	<i>Ardea goliath</i>	+	Stevenson & Fanshawe, (2002)
Purple Heron	<i>Ardea purpurea</i>	+	Stevenson & Fanshawe, (2002)
Grey Heron	<i>Ardea cinerea</i>	+	Stevenson & Fanshawe, (2002)
Black-headed Heron	<i>Ardea melanocephala</i>	+	Stevenson & Fanshawe, (2002)
Homerkop	<i>Scopus umbretta</i>	+	Stevenson & Fanshawe, (2002)
White Stork	<i>Ciconia ciconia</i>	+	Stevenson & Fanshawe, (2002)
Yellow-billed Stork	<i>Mycteria ibis</i>	+	Stevenson & Fanshawe, (2002)
Woolly-necked Stork	<i>Ciconia episcopus</i>	+	Stevenson & Fanshawe, (2002)
African Open-bill Stork	<i>Anastomus lamelligerus</i>	+	Stevenson & Fanshawe, (2002)
Saddle-billed Stork	<i>Ephippiorhynchus senegalensis</i>	+	Stevenson & Fanshawe, (2002)
Marabou Stork	<i>Leptoptilos crumeniferus</i>	+	Stevenson & Fanshawe, (2002)
Sacred Ibis	<i>Threskiornis aethiopicus</i>	+	Stevenson & Fanshawe, (2002)
Hadada Ibis	<i>Bostrychia hagedash</i>	+	Stevenson & Fanshawe, (2002)

...Table-1. Water bird species in need of protection strategies in the Ruzizi Congolese Plain

Common Name	Species Name	RC	Identification Reference
		A4i	Author
Glossy Ibis	<i>Plegadis falcinellus</i>	+	Stevenson & Fanshawe, (2002)
Spot-breasted Ibis	<i>Bostrychia rara</i>	+	Stevenson & Fanshawe, (2002)
African Spoonbill	<i>Platalea alba</i>	+	Stevenson & Fanshawe, (2002)
Egyptian Goose	<i>Alopochen aegyptiacus</i>	+	Stevenson & Fanshawe, (2002)
Spur-winged Goose	<i>Plectropterus gambensis</i>	+	Stevenson & Fanshawe, (2002)
Knob-billed Duck	<i>Sarkidiornis melanotos</i>	+	Stevenson & Fanshawe, (2002)
African Pygmy-goose	<i>Nettapus auritus</i>	+	Stevenson & Fanshawe, (2002)
White-faced Duck	<i>Dendrocygna viduata</i>	+	Stevenson & Fanshawe, (2002)
Fulvous Duck	<i>Dendrocygna bicolor</i>	+	Stevenson & Fanshawe, (2002)
Hartlaub's Duck	<i>Pteronetta hartlaubii</i>	+	Stevenson & Fanshawe, (2002)
Red-billed Teal	<i>Anas erythroryncha</i>	+	Stevenson & Fanshawe, (2002)
Three-banded Plover	<i>Anas hottentota</i>	+	Stevenson & Fanshawe, (2002)
White-backed Duck	<i>Thalassornis leuconotus</i>	+	Stevenson & Fanshawe, (2002)
Yellow-billed Duck	<i>Anas undulata</i>	+	Stevenson & Fanshawe, (2002)
Garganey	<i>Anas querquedula</i>	+	Stevenson & Fanshawe, (2002)
Southern Pochard	<i>Netta erythrophthalma</i>	+	Stevenson & Fanshawe, (2002)
African Fish Eagle	<i>Haliaeetus vocifer</i>	+	Stevenson & Fanshawe, (2002)
Palm-nut Vulture	<i>Gypohierax angolensis</i>	+	Stevenson & Fanshawe, (2002)
Osprey	<i>Pandio haliaetus</i>	+	Stevenson & Fanshawe, (2002)
White-headed Vulture	<i>Trigonoceps occipitalis</i>	+	Stevenson & Fanshawe, (2002)
African Marsh Harrier	<i>Circus ranivorus</i>	+	Stevenson & Fanshawe, (2002)
African Crake	<i>Crex egregia</i>	+	Stevenson & Fanshawe, (2002)
Corncrake	<i>Crex crex</i>	+	Stevenson & Fanshawe, (2002)
Spotted Crake	<i>Porzana porzana</i>	+	Stevenson & Fanshawe, (2002)
Black Crake	<i>Amaurornis flavirostris</i>	+	Stevenson & Fanshawe, (2002)
Puple Swampphen	<i>Porphyrio porphyrio</i>	+	Stevenson & Fanshawe, (2002)
Allen's Gallinule	<i>Porphyrio alleni</i>	+	Stevenson & Fanshawe, (2002)
African Water Rail	<i>Rallus caerulescens</i>	+	Stevenson & Fanshawe, (2002)
Common Moorhen	<i>Gallinula chloropus</i>	+	Stevenson & Fanshawe, (2002)
Lesser Moorhen	<i>Gallinula angulata</i>	+	Stevenson & Fanshawe, (2002)
Africana Jacana	<i>Actophilornis africanus</i>	+	Stevenson & Fanshawe, (2002)

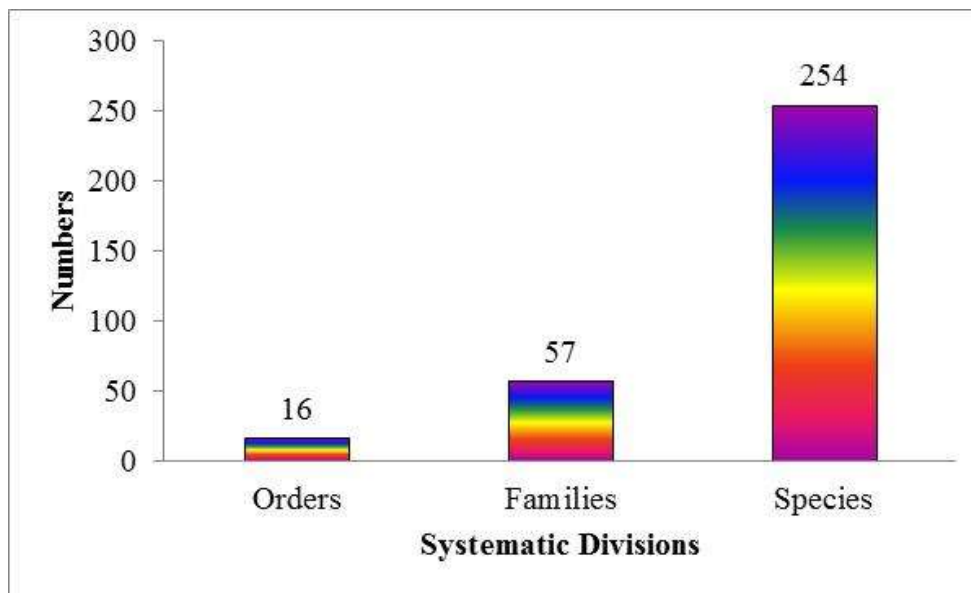
...Table-1. Water bird species in need of protection strategies in the Ruzizi Congolese Plain

Common Name	Species Name	RC	Identification Reference
		A4i	Author
Black-belled Bustard	<i>Eupodotis melanogaster</i>	-	Stevenson & Fanshawe, (2002)
Black-winged Stilt	<i>Himantopus himantopus</i>	+	Stevenson & Fanshawe, (2002)
Pied Avocet	<i>Recurvirostra avosetta</i>	+	Stevenson & Fanshawe, (2002)
Painted Snipe	<i>Burhinus capensis</i>	+	Stevenson & Fanshawe, (2002)
Spotted Tchick-knee	<i>Burhinus vermiculatus</i>	+	Stevenson & Fanshawe, (2002)
Water Tchick-knee	<i>Glareola pratincola</i>	+	Stevenson & Fanshawe, (2002)
Collared Pratincole	<i>Glareola nordmanni</i>	+	Stevenson & Fanshawe, (2002)
Black-winged Pratincole	<i>Vanellus spinosus</i>	+	Stevenson & Fanshawe, (2002)
Spur-winged Lapwing	<i>Vanellus crassirostris</i>	+	Stevenson & Fanshawe, (2002)
Long-toed Lapwing	<i>Vanellus coronatus</i>	+	Stevenson & Fanshawe, (2002)
Crowned Plover	<i>Charadrius pecuarius</i>	+	Stevenson & Fanshawe, (2002)
Kittlitz's Plover	<i>Charadrius marginatus</i>	+	Stevenson & Fanshawe, (2002)
White-fronted Plover	<i>Charadius tricollaris</i>	+	Stevenson & Fanshawe, (2002)
Three-banded Plover	<i>Charadrius forbesi</i>	+	Stevenson & Fanshawe, (2002)
Forbe's Plover	<i>Charadrius hiaticula</i>	+	Stevenson & Fanshawe, (2002)
Common Ringed Plover	<i>Charadrius dubius</i>	+	Stevenson & Fanshawe, (2002)
Little-ringed Plover	<i>Pluvialis flava</i>	+	Stevenson & Fanshawe, (2002)
Pacific Golden Plover	<i>Philomachus pugnax</i>	+	Stevenson & Fanshawe, (2002)
Ruff	<i>Tryngites subrificollis</i>	+	Stevenson & Fanshawe, (2002)
Ruff-breasted Sandpiper	<i>Actitis hypoleucos</i>	+	Stevenson & Fanshawe, (2002)
Common Sandpiper	<i>Tringa glareola</i>	+	Stevenson & Fanshawe, (2002)
Wood Sandpiper	<i>Tringa nebularia</i>	+	Stevenson & Fanshawe, (2002)
Greenshank	<i>Tringa stagnatilis</i>	+	Stevenson & Fanshawe, (2002)
Marsh Sandpiper	<i>Tringa erythropus</i>	+	Stevenson & Fanshawe, (2002)
Spotted Redshank	<i>Tringa tetanus</i>	+	Stevenson & Fanshawe, (2002)
Little Stint	<i>Calidris minuta</i>	+	Stevenson & Fanshawe, (2002)
Temminck's Stint	<i>Calidris temminckii</i>	+	Stevenson & Fanshawe, (2002)
Curlew Sandpiper	<i>Calidris ferruginea</i>	+	Stevenson & Fanshawe, (2002)
Dunlin	<i>Calidris alpina</i>	+	Stevenson & Fanshawe, (2002)
Black-tailed Godwit	<i>Limosa liomosa</i>	+	Stevenson & Fanshawe, (2002)

Table-2. Birds species of more conservation importance in the Ruzizi Plain including the Ruzizi Congolese Delta

Common Name	Species Name	Ramsar Criteria						IUCN
		A1	A2	A3	A4i	A4ii	A4iv	Status
Great White Pelican	<i>Pelecanus onocrotalus</i>	-	-	-	+	-	+	-
Spot breasted Ibis	<i>Bostrychia rara</i>	-	-	+	-	-	-	-
White Stork	<i>Ciconia ciconia</i>	-	-	-	+	-	+	LC
Black Kite	<i>Milvus migrans</i>	-	-	-	-	-	+	-
Common Kestrel	<i>Falco tinnunculus</i>	-	-	-	-	-	+	-
White-headed Vulture	<i>Trigonoceps occipitalis</i>	-	-	-	-	-	+	VU
Corncrake	<i>Crex crex</i>	-	-	-	+	-	-	NT
Black-winged Pratincole	<i>Glareola nordmanni</i>	+	-	-	+	-	-	NT
Great Snipe	<i>Gallinago media</i>	+	-	-	+	-	-	NT
African Skimmer	<i>Rynchops flavirostris</i>	-	-	-	+	-	-	NT
White-headed Mousebird	<i>Colius leucocephalus</i>	-	-	+	-	-	-	-
European Bee-eater	<i>Merops apiaster</i>	-	-	+	-	+	-	-
Fisher's Sparrow-Lark	<i>Eremopterix leucopareia</i>	-	-	+	-	-	-	-
Barn Swallow	<i>Hirundo rustica</i>	-	-	-	-	+	-	-
Sand Martin	<i>Riparia riparia</i>	-	-	-	-	+	-	-
White-headed Saw-wing	<i>Psalidoprocne albiceps</i>	-	-	+	-	-	-	-
Yellow Wagtail	<i>Motacilla flava</i>	-	-	+	-	+	-	-
Sharpe's Akalat	<i>Sheppardia sharpei</i>	-	+	+	-	-	-	-
Grey-capped Warbler	<i>Eminia lepida</i>	-	-	+	-	-	-	-
Cassin's Grey Flycatcher	<i>Muscapa cassini</i>	-	-	+	-	-	-	-
Red-chested Sunbird	<i>Cinnyris erythrocerca</i>	-	-	+	-	-	-	-
Long-tailed Fiscal	<i>Lanius cabanisi</i>	-	-	+	-	-	-	-
Tanzania Masked Weaver	<i>Ploceus reichardi</i>	-	+	+	-	-	-	-
Baglafecht Weaver	<i>Ploceus baglafecht</i>	-	-	+	-	-	-	-
Cardinal Quelea	<i>Quelea cardinalis</i>	-	-	+	-	-	-	-
Zanzibar Red Bishop	<i>Euplectes nigroventris</i>	-	-	+	-	-	-	-
African Citril	<i>Serinus citrinelloides</i>	-	-	+	-	-	-	-
<b>Total</b>	<b>27</b>	<b>2</b>	<b>2</b>	<b>16</b>	<b>6</b>	<b>4</b>	<b>5</b>	<b>6</b>

**Legend:** IUCN, International Union for Conservation of Nature and Natural Resources; LC, Least Conservation concerned; VU, Vulnerable; NT, Near Threatened; A1, Ramsar Criterion of global conservation concern; A2, Ramsar Criterion of restricted-range species whose breeding distributions define an Endemic Bird Area (EBA) or Secondary Important Bird Area (SBA); A3, Ramsar Criteria of Biome restricted-range species, A4i, Ramsar Criterion of water bird conservation concern; A4ii, Ramsar Criterion of congregatory terrestrial bird species; A4iv, Ramsar Criterion of migratory bird species at bottleneck sites conservation concern (Fishpool & Evans, 2001); (Demey & Louette, 2001). **Sources:** Our fieldwork of 2010-2011 and (Fishpool & Evans, 2001); (Demey & Louette, 2001); (Seyler, Thomas, Mwanza, & Mpoy, 2010); (Bashonga B. , 2013).

**Figure-1. Systematic positions of the bird species of the Ruzizi Congolese Plain**

Source: Our fieldwork of 2010-2011 (Bashonga B. , 2013).

### Distinguish bird species of the Ruzizi Congolese Plain and the Ruzizi Delta

The Chapter one presents water bird species and other important birds for conservation which fulfil the Ramsar Criteria: A1, two species (*Glareola nordmanni* & *Gallinago media*); A2 two species (*Sheppardia sharpei* & *Ploceus reichardi*); A3 16 species; A4i 101 water bird species of which six species fulfil other Ramsar Criteria; A4ii four species (*Merops apiaster*, *Hirundo rustica*, *Riparia riparia* & *Motacilla flava*); and the Ramsar Criterion A4iv five species (*Pelecanus onocrotalus*, *Ciconia ciconia*, *Milvus migrans*, *Falco tinnunculus* & *Trigonoceps occipitalis*). The doctoral research focusing on bird ecology, conservation and management in the Ruzizi Delta of Burundi and DRC will as well update the checklists of bird species of Ruzizi Delta in Burundi and in DRC (Bashonga B. , 2013).

### The bird species of Ruzizi Congolese Plain with an IUCN Status

Six bird species of the Ruzizi Congolese Plain display a particular IUCN Status. These are: *Ciconia ciconia* LC (Low conservation Concern), *Trigonoceps occipitalis* VU (Vulnerable), and four species NT (Near Threatened): *Trigonoceps occipitalis*, *Crex crex*, *Glareola nordmanni*, *Gallinago media*, and *Rynchops flavirostris* (Bashonga B. , 2013).

### New bird records and Ramsar criteria they meet in the Ruzizi Congolese Plain

Following are sixteen new bird records (Table-3) from the Ruzizi Congolese Plain following our fieldwork of 2010-2011 for our Master dissertation at Makerere University Kampala Uganda, College of Agriculture and Environmental Sciences (Bashonga B. , 2013). Further ornithological studies are needed in the Ruzizi Congolese Plain for more new bird records, the behavior of migrant bird species and the periodicity of migrants in the area. The number of bird species now known from the Ruzizi Congolese Plain is 254.

### Constraints of the study

Constraints to the management of birds in the Ruzizi Congolese Delta are mainly due to the poor land distribution policy and non-compliance with laws on wetlands and biodiversity. These are given from the following extract of law no 011/2002 (Kabila, 2003).

**Extract from the Congolese forest code (Joseph Kabila, 2003. Forest Code, Law no 011/2002 of August 29, 2002. Official Journal of the Democratic Republic of Congo, 39 pages)**

Among the five innovations, the law on the forest code introduces the following innovation: Three categories of forests are now provided for by this law, namely: classified forests, protected forests and permanent production forests. These are withdrawn from the protected forests following a public inquiry with a view to their concession. The Ruzizi Congolese Plain and the Ruzizi Congolese Delta are part of the category of

**Table-3. New bird records from the Ruzizi Congolese Plain and Ramsar Criteria they meet**

Species Name	Common Name	French Name	RC
<i>Tryngites subrificollis</i>	Ruff-breasted Sandpiper	Bécasseau roussâtre	-
<i>Sterna hirundo</i>	Common Tern	Sterne pierregarin	A4i
<i>Centropus cupreicaudus</i>	Coppery-tailed Coucal	Coucal des papyrus	A3
<i>Centropus anelli</i>	Gabon Coucal	Coucal du Gabon	A3
<i>Colius leucocephalus</i>	White-headed Mousebird	Coliou à tête blanche	A3
<i>Sheppardia sharpei</i>	Sharpe's Akalat	Rougegorge de Sharpe	A2,A3
<i>Anthus cinnamomeus</i>	African (Grassland) Pipit	Pipit africain	-
<i>Bradypterus baboecala</i>	Little Rush Warbler	Bouscade caquetteuse	-
<i>Cinnyris (Nectarinia) mariquensis</i>	Marico Sunbird	Souimanga de Mariqua	-
<i>Lanius cabanisi</i>	Long-tailed Fiscal	Pie-grièche à longue queue	-
<i>Lanius ferrugineus</i>	Southern Boubou	Gonolek boubou	A3
<i>Ploceus taeniopterus</i>	Northern Masked Weaver	Tisserin du Nil	-
<i>Ploceus reichardi</i>	Tanzania Masked Weaver	Tisserin de Reichard	A2,A3
<i>Quelea cardinalis</i>	Cardinal Quelea	Travailleur cardinal	-
<i>Euplectes afer</i>	Yellow-crowned Bishop	Euplecte vorabé	-
<i>Euplectes nigroventris</i>	Zanzibar Red Bishop	Euplecte de Zanzibar	A3
<b>Total, 16 new bird records from the Ruzizi Congolese Plain fieldwork of 2010-2011</b>			

**Legend: Legend: RC, Ramsar Criteria;**

**A2,** Ramsar Criterion of restricted-range species whose breeding distributions define an Endemic Bird Area (EBA) or Secondary Important Bird Area (SBA);

**A3,** Ramsar Criteria of Biome restricted-range species,

**A4i,** Ramsar Criterion of water bird conservation concern.

Source: (Fishpool & Evans, 2001); (Demey & Louette, 2001); (Seyler, Thomas, Mwanza, & Mpoy, 2010); and our fieldwork of 2010-2011 (Bashonga B. , 2013).

classified forests under Articles 3 and 13 below (Kabila, 2003).

**Article 3** paragraph 3 Title 1 of the Forest Code stipulates: The Forest Code also contributes to the enhancement of biodiversity, the protection of the natural habitat of wildlife and tourism.

**Article 13,** title 2, chapter 1 stipulates: Are further classified, the drills necessary for:

- protection of slopes against erosion;
- the protection of springs and watercourses;
- conservation of biological diversity;
- soil conservation;
- public health and improvement of the living environment;
- protection of the human environment;
- in general, any other purpose deemed useful by the administration in charge of forests.

**Article 39** Title 3 Chapter 2, stipulates: In classified forests, the rights of use are limited: (a) the collection of dead wood and straw; (b) picking fruits, food or medicinal plants; (c) the harvesting of gums, resins or honey; (d) the collection of caterpillars, snails or frogs; (e) the removal of

wood intended for the construction of dwellings and for artisanal use.

**Article 45** paragraph 2 Title 4 chapter one, stipulates: Any act of deforestation of areas exposed to the risk of erosion and flooding is particularly prohibited.

**Article 48** Title 4 Chapter one stipulates: Any deforestation over a distance of 50 meters on either side of water courses and within a radius of 100 meters around their sources is prohibited.

**Article 51** Title 4 Chapter 1, stipulates: In order to protect forest biological diversity, the administration in charge of forests may, even in concession forest areas, reserve certain species or enact any restrictions it deems useful. ;

**Article 59** Title 4 in Chapter 4, stipulates: Any fire caused is to be controlled by its author who is liable for damages resulting from his act in accordance with article 258 of the civil code of obligations. No one has never been punished while bush fires are always observed.

**Article 146** Title 9 Chapter 2, stipulates: Shall be punished with a penal servitude of six months to five years and a fine of 20,000 to 500,000 constant francs or one of the



penalties only whoever: (a) degrades a forest ecosystem or deforests an area exposed to the risk of erosion or flooding; (b) in a classified forest, prunes or limbs trees or practices clearing cultivation; (c) clears the forest over a distance of 50 meters on either side of watercourses or within a radius of 100 meters around their source; (d) without being authorized to do so, cuts, pulls out, removes, mutilates or damages trees or plants of protected forest species. Nobody has never been punished using this article in Uvira City and Uvira Territory; (e) removes, moves or damages boundary markers, marks or fences used to delimit forests or forest concessions (Kabila, 2003); (FAO & UKAID, 2015).

These regulations are not applied, among other reasons, because land is distributed among individuals and that is origin of community conflicts and law non respect (Cabinet & DRC, 2011); (Cabinet & DRC, 2014). We are debating so that these regulations in force are applied on the one hand, and on the other hand so that the wetlands on the Ruzizi Congolese River bank and the Ruzizi Congolese Delta are protected and erected in bamboo forests for the securing the birds, crocodiles, hippos and biodiversity of the northern end of Lake Tanganyika. Lake Tanganyika is an ecosystem of world interest already inscribed on the UNESCO heritage list (Bank, 2018).

## Conclusion

This paper introducing the doctoral thesis demonstrates that the Ruzizi Congolese Plain including the Ruzizi Congolese Delta is an Important Area for the conservation of Birds (IBA). The area fulfils six of seven Ramsar Criteria for an IBA (Important Bird Area) in Africa ((Fishpool & Evans, 2001). The Ruzizi Delta is the low land area of the whole Ruzizi Plain in the Democratic Republic of Congo and in Burundi.

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## Conflicts of Interest

Authors declare that there is no conflict of interests regarding the publication of this paper.

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