

Migrant Bird Species of the Ruzizi Delta, Northern End of Lake Tanganyika, in Burundi and the Democratic Republic of Congo

Bashonga Bishobibiri Alexis^{1*}, Eric Sande², Charles Kahindo³, Gaspard Ntakimazi⁴

¹Doctoral School of University of Burundi and Centre for Research in Hydrobiology (CRH) at Uvira, DRC E-mail: bshobisho@gmail.com;

² Makerere University Kampala Uganda, Corresponding Author +256 772 688 55, E-mail: ericssande@cns.mak.ac.ug;

³State University of Bukavu (UOB), DRC ckahindo@yahoo.com

⁴University of Burundi, Gaspard.ntakimazi@ub.edu.bi

ABSTRACT

Migrant bird species from the Ruzizi Delta in Burundi and the Democratic Republic of Congo (DRC) were investigated from April 2019 until August 2021 in five sites of the Ruzizi Burundian Delta (RBD) and five sites of the Ruzizi Congolese Delta (RCD). Each site was visited three times a year during the years 2019, 2020 and 2021. The investigations were conducted by direct observation on transect counts, point counts and on road bird counts using binoculars and telescopes. Travels were facilitated by the motorized fiberglass boat and the double cabin field vehicle of the Centre for Research in Hydrobiology (CRH) in Uvira, DRC. At the end of our investigations, we compiled a list of 131 migrant bird species, of which 87 (34%) were recorded in the unprotected Ruzizi Congolese Delta (RCD), 107 (42%) in the Ruzizi Burundian Delta (RBD) protected at 85%, and 62 species (24%) recorded in both the RCD and the RBD. The migration positions encountered were migratory birds (M), 52 species (24%); Afrotropical migrants (A), 10 species (6%); Palearctic migrants (P), 83 species (51%); migrants with some marine populations (p), four species (3%); nesting migrants (N), 3 species (2%); and wintering migrants (Wi), 10 species (6%). For migrant bird species to survive in a sustainable way in the Ruzizi Delta there must be abundant, permanent and diversified vegetation through the creation of a protected area in the Ruzizi Congolese Delta.

Keywords: Migrant bird species; Afrotropical migrants; Palearctic Migrants; Wintering migrants; Migrants with at least some marine populations

INTRODUCTION

The migrant bird species of the Ruzizi Delta (RD) in Burundi and the Democratic Republic of Congo (DRC) were investigated from April 2019 until August 2021 in five sites of the Ruzizi Burundian (RBD) Delta and five sites of the Ruzizi Congolese Delta (RCD). Each site was visited three times a year during the years 2019, 2020 and 2021. Following documents are published about birds and migrant bird species for the Ruzizi Delta in the Democratic Republic of Congo (DRC) and in the Republic of Burundi. Ornithological importance of DRC and conservation issues in protected and unprotected areas including wetland areas, are published by

(Srinivas, Boominathan, & Estari, 2018) (Srinivas, Boominathan, & Estari, 2018).

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The Rusizi Burundian Delta is an Important Bird Areas (Nkezabahizi & Manirambona, 2011); (Dowset & Dowset-Lemaire, 1993) and (Gaugris, 1979). Authors (Ntakimazi, Nzigidahera, Nicayenzi, & West, 2000) inventoried 120 bird species and their terrestrial or aquatic biotopes in the Rusizi Burundian Delta. Finally the following authors (Nkezabahizi & Bizimana, 2008) investigated Burundi's Important Bird Areas Status and Trends 2008 listing only two birds, the White-winged Tern (*Chlidonia leucopterus*) and the African Skimmer (*Rynchops flavirostris*) fulfilling the Ramsar Criteria A4i and A1 in the Rusizi Natural Reserve. The very rich ornithological fauna of Rusizi Burundian National Park and Ramsar site includes 350 sedentary and migratory bird species (MEEATU, Ramsar, & WWF, 2014).

For his dissertation, the graduate student Apollinaire Ntakiyica (Ntakiyica, 2008) checked the bibliographic State of knowledge on the distribution sites of ornithological fauna in Burundi. He presented 638 bird species for Burundi of which 410 were listed in the Rusizi Burundian Delta. For author (Coulter, 1991), most attention in resident and migratory bird fauna on the Ruzizi Plain (Burundi), begun with (Curry-Lindahl, 1960), followed by (Schouteden, 1966); (Gaugris G. Y., 1976); (Gaugris, 1979); and (Veschuren, 1988). In the book Lake Tanganyika and its Life, Coulter reports 168 aquatic birds distributed into 37 families of which 52 bird species are Palearctic migrants (Coulter, 1991).

My doctoral research is unique to investigate migrant bird species in the Ruzizi Delta simultaneously in the Ruzizi Congolese Delta (RCD) in DRC and the Rusizi Burundian Delta (RBD) in Burundi. It has updated the list of bird species in the RCD and the RBD (Bashonga, Sande, Kahindo, & Ntakimazi, 2023).

It will contribute to the Ruzizi Congolese Delta wetlands protection for bird and biodiversity conservation, strengthening the management of protected areas in Burundi with a view to combating climate change, epidemics and disasters and preventing the extinction of certain species of birds (Chapman A. D., Numbers of Living Species in Australia and the World, 2009); (Butchart, Stattersfield, & Collar, 2006); (Chapman A. D., 2005); (Deanna, Brunner, Nige, Karr, & Nielsen, 1998). To constitute the migrant bird species checklist in the Ruzizi Delta we referred essentially to the following

authors (Stevenson & Fanshawe, 2002); (Fishpool & Evans, Important Bird Areas in Africa and Associated Islands, Priority Sites for Conservation., 2001); (Srinivas, Boominathan, & Estari, 2018); (Zimmerman, Turner, & Pearson, Zimmerman D. A., Turner D.A. & Pearson D.J. Birds of Kenya and Northern Tanzania, 1999); (Coulter, 1991); (Williams & Arlott, 1988); (Guggisberg, 1988); (Guggisberg, 1986).

MATERIAL AND METHODS

Study Area and Studied Sites

The Ruzizi delta extends from Vugizo, the point of separation of the small Ruzizi River from the Great Ruzizi River with the Vugizo 1 site (Vug 1), S 03° 16' 08.5" E 029° 14' 27.1" 781 m altitude in the Ruzizi Congolese Delta (RCD) and Vugizo 2 (Vug 2), S 03° 16' 04" E 029° 14' 37" 779 m altitude in the Rusizi Burundian Delta (RBD) along the Grande Ruzizi River to the Great Ruzizi River Bridge (GRRB), S 03° 20' 33" E 029° 16' 25" 777 m altitude up to the Great Ruzizi River Mouth (GRRM), S 03° 20' 27.8" E 029° 16' 23.5" 779 m above sea level, then along the shore of Lake Tanganyika towards the west passing through the Small Ruzizi River Mouth (SRRM), S 03° 21' 259" E 029° 12' 746" in the DRC, up to Kilomoni 2 (Kilo 2) Fishing Beach, S 03° 20' 49.2" E 029° 11' 30.7" then, turning north to the Nyangara pond (NyaP), S 03° 20' 22.4" E 029° 11' 42.9" 772 m above sea level, along the Small Ruzizi River towards the northeast as far as Vugizo, junction with the Grande Ruzizi River (Figure 1).

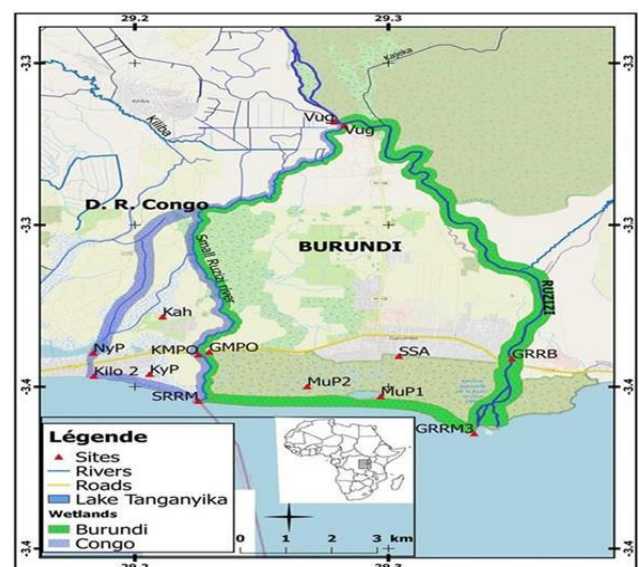


Figure 1 Map showing the study areas and studied sites in Ruzizi Delta

Source: Our fieldwork of 2019-2021

Research Materials

A meter, a three meters length surveyor and a tape decametre were used to measure length, width, and depth of ponds, rivers, river banks and marshes; A GPS was used to record geographical coordinates, length of sampling areas and sampling sites; A digital camera was used to capture birds and site features; Three binoculars and two telescopes were used in direct observation technique to distinguish birds (Figure 2); A vehicle and a medium ship were used for displacements; We used bibliography from three institutional libraries including the CRH (Centre for Research in Hydrobiology) at Uvira, DRC; the CRSNE (Centre for Natural Research and Environment) of Burundi University, and the library of the Department of Zoology, Entomology and Fisheries Sciences of Makerere University, Kampala Uganda. Finally we checked Internet literature.



Figure-2. Some Bird sampling materials in the Ruzizi Delta

Source: CRH-Uvira, fieldwork 2019-2021

Research Methods

Regular weekly bird direct observations (Richer, 2018) were made in ten sites of two study areas, the Ruzizi Congolese Delta (RCD) and the Rusizi Burundian Delta (RBD) from April 2019 to August 2021 for the period of 32 months to record all bird

species seen or heard in the Ruzizi Delta. Birds were observed by direct observation (Richer, 2018) on transect counts, point counts and on road bird counting using binoculars and telescopes. They were identified using available field guide books: (Stevenson & Fanshawe, 2002); (Zimmerman, Turner, & Pearson, 1999); (Guggisberg, 1986); (Guggisberg, 1988) and (Williams & Arlott, 1988).

A) On transect counts

Birds were counted by transect counts using binoculars and telescopes in terrestrial areas. The total number of birds seen or heard was recorded (Yee, 2022). Bird species identification was done using available above cited field guides.

To draw the migrant bird species checklist we referred to (Stevenson & Fanshawe, 2002); (Fishpool & Evans, 2001); (Zimmerman, Turner, & Pearson, 1999) and (Williams & Arlott, 1988); (Srinivas, Boominathan, & Estari, 2018); and (Coulter, 1991).

B) From point counts

Birds were sampled on point counts in marshes (Yee, 2022), ponds, bowls, in rivers and flood areas.

C) Bird Road Counting (BRC)

Birds were counted along roads (Yee, 2022) from Kavimvira Customs Station (KCS) to Kavimvira Migration Post Offices (KMPO) in the Ruzizi Congolese Delta (RCD) and from Gatumba City to Gatumba Migration Post Offices (GMPO) in the Rusizi Burundian Delta (RBD).

D) GPS

GPS coordinates were recorded for study areas and studied sites habitats mapping.

RESULTS

Table 1 presents the migrant bird species checklist 131 species distributed into 37 families. 87 species (34%) were recorded in the Ruzizi Congolese Delta (RCD), 107 (42%) in the Rusizi Burundian Delta (RBD) and 62 species (24%) were recorded in both the RCD and the RBD. The migration positions were Migrant (**M**), species that pass through the Ruzizi Delta within seasons 52 species (24%); Afrotropical migrants (**A**), species migrating within Africa (10

species (6%); Palearctic migrant (**P**), species which breed in Europe or Asia (83 species (51%); Species with at least some Palearctic population (**p**); Nesting

bird species (**N**) in the Ruzizi Delta but absent part of the year; Wintering birds species (**Wi**) who like to spend a good part of the winter in the Ruzizi Delta to escape colder conditions up north.

Table 1 Table 1 Migrant Bird Species of the Ruzizi Delta, Northern End of Lake Tanganyika, in Burundi and the Democratic Republic of Congo (RCD, Ruzizi Congolese Delta; RBD, Rusizi Burundian Delta; M, Migrant, species that passes through the Ruzizi Delta within seasons; A, Afrotropical migrant, species migrating within Africa; P, Palearctic migrant, species which breed in Europe or Asia; p, species with at least some Palearctic population; N, Nesting in the Ruzizi Delta but absent part of the year; Wi, Wintering birds, species who like to spend a good part of the winter in the Ruzizi Delta to escape colder conditions up north).

Order	Family	Species Name	RCD	RBD	RCD	Migratory position						
						RBD	M	A	P	p	N	Wi
Pelecaniformes	Pelecanidae	<i>Pelecanus onocrotalus</i>	1	1	1	1	1	1	1			
		<i>Pelecanus rufescens</i>	1	1	1	1	1					
Ciconiiformes	Ardeidae	<i>Ixobrychus sturmii</i>	1	1	1	1						
		<i>Ardeolla idea</i>		1		1	1					
		<i>Ardeola rufiventris</i>	1			1		1			1	
		<i>Egretta ardesiaca</i>	1	1	1	1	1					
	Ciconiidae	<i>Ciconia ciconia</i>	1						1		1	
		<i>Ciconia abdimii</i>		1		1	1					
		<i>Ciconia episcopus</i>	1	1	1	1		1				
Threskiornithidae	<i>Anastomus lamelligerinus</i>	1	1	1	1	1						
	<i>Threskiornis aethiopicus</i>	1	1	1	1	1						
Phoenicopteriformes	Phoenicopteridae	<i>Plegadis falcinellus</i>	1	1	1	1		1				
		<i>Phoenicopiterus ruber</i>		1		1		1			1	
		<i>Phoenicopiterus minor</i>		1		1		1			1	
Anseriformes	Anatidae	<i>Sarkidiornis melanotos</i>	1	1	1	1					1	
		<i>Dendrocygna viduata</i>	1	1	1	1					1	
		<i>Dendrocygna bicolor</i>	1	1	1	1					1	
		<i>Anas querquedula</i>	1	1	1			1			1	
		<i>Netta erythrophthalma</i>	1	1	1	1	1		1			
Falconiformes	Accipitridae	<i>Milvus migrans</i>	1	1	1		1		1			
		<i>Pandion haliaetus</i>	1	1	1	1		1			1	
		<i>Circus ranivorus</i>	1	1	1			1			1	
		<i>Circus aeruginosus</i>		1				1			1	
		<i>Accipiter ovampensis</i>		1		1		1				
		<i>Aquila nipalensis</i>		1					1		1	
		<i>Aquila wahlbergi</i>		1		1			1		1	
	<i>Hieraetus pennatus</i>		1				1					
	Falconidae	<i>Falco tinnunculus</i>	1	1	1			1				
		<i>Falco naumanni</i>		1				1				
<i>Falco amurensis</i>			1				1					
		<i>Falco vespertinus</i>		1			1					

Order	Family	Species Name	RCD	RBD	RCD	Migratory position						
						RBD	M	A	P	p	N	Wi
Galliformes	Phasianidae	<i>Coturnix coturnix</i>		1					1			
Gruiformes	Rallidae	<i>Sarothrura boehmi</i>		1		1						
		<i>Crecoptis egregia</i>	1	1	1	1						
		<i>Crex crex</i>	1	1	1			1				
		<i>Porzana porzana</i>	1						1			
		<i>Porzana pusilla</i>		1					1			
		<i>Porphyrio alleni</i>	1				1					
		<i>Gallinula angulata</i>	1	1	1	1						
	Gruidae	<i>Neotis denhami</i>	1	1	1	1						
		<i>Balearica regulorum</i>		1				1				
	Gruiformes		<i>Bugeranus carunculatus</i>		1			1				
Recurvirostridae		<i>Recurvirostra avosetta</i>	1	1	1			1				
Gruiformes	Glareolidae	<i>Glareola pratincola</i>	1	1	1	1						
		<i>Glareola nordmanni</i>	1	1	1			1				
		<i>Glareola nuchalis</i>		1				1				
		<i>Glareola cinerea</i>		1		1						
	Charadriidae	<i>Charadrius forbesi</i>	1						1			
		<i>Charadrius hiaticula</i>	1	1					1			
		<i>Charadrius dubius</i>	1						1			
		<i>Charadrius alexandrinus</i>	1	1	1				1			
		<i>Charadrius mongolus</i>		1					1			
		<i>Charadrius leschenaultii</i>		1					1			
		<i>Charadrius asiaticus</i>	1	1	1				1			
		<i>Vanellus coronatus</i>	1	1	1	1						
		<i>Vanellus lugubris</i>	1	1	1	1						
		<i>Vanellus superciliosus</i>		1		1						
		<i>Pluvialis squatarola</i>	1	1	1				1			
		<i>Pluvialis fulva</i>	1						1			
Scolopacidae	<i>Philomachus pugnax</i>	1	1	1				1				
	<i>Tryngites subrificollis</i>	1						1				
	<i>Phalaropus lobatus</i>		1					1				
	<i>Phalaropus fulicarius</i>		1					1				
	<i>Actitis hypoleucos</i>	1	1	1				1				
	<i>Tringa glareola</i>	1						1				
	<i>Tringa ochropus</i>		1					1				
	<i>Xenus (Tringa) cinereus</i>	1	1	1				1				
	<i>Tringa nebularia</i>	1	1	1				1				
	<i>Tringa stagnatilis</i>	1	1	1				1				
	<i>Tringa erythropus</i>	1	1	1				1				
	<i>Tringa totanus</i>	1	1	1				1				
	<i>Calidris minuta</i>	1	1	1				1				
	<i>Calidris temminckii</i>	1						1				
<i>Calidris ferruginea</i>	1	1	1				1					
<i>Calidris alpina</i>	1						1					
<i>Limosa limosa</i>	1						1					
<i>Numenius phaeopus</i>	1	1	1				1					

Order & Family	Species Name	RCD	RBD	RCD	Ramsar Criteria						RB Sp	MB Sp	IUCN Status	
					RBD	A1	A2	A3	A4i	A4ii				A4iv
Accipitridae	<i>Aquila verreauxii</i>		1								1			
	<i>Polemaetus bellicosus</i>		1								1		VU	
	<i>Stephanoaetus coronatus</i>	1	1	1							1		NT	
Falconidae	<i>Falco tinnunculus</i>	1	1	1							1	1		
	<i>Falco naumanni</i>		1						1	1		1		
	<i>Falco ardosiaceus</i>		1								1			
	<i>Polihierax semitorquatus</i>		1								1			
	<i>Falco subbuteo</i>		1							1	1			
	<i>Falco concolor</i>		1				1			1	1		NT	
	<i>Falco amurensis</i>		1						1	1		1		
	<i>Falco vespertinus</i>		1						1	1		1	NT	
	<i>Falco chicquera</i>		1								1		NT	
	<i>Falco biarmicus</i>		1								1			
	<i>Falco peregrinus</i>		1							1	1			
	Galliformes													
Numididae	<i>Numida meleagris</i>	1									1			
Phasianidae	<i>Francolinus squamatus</i>		1								1			
	<i>Francolinus nobilis</i>		1			1	1				1			
	<i>Francolinus levaillantii</i>	1									1			
	<i>Francolinus streptophorus</i>		1				1				1			
	<i>Francolinus coqui</i>	1									1			
	<i>Francolinus hildebrandti</i>		1								1			
	<i>Francolinus afer</i>	1	1	1							1			
	<i>Coturnix coturnix</i>		1									1		
Gruiformes														
Rallidae	<i>Sarothrura pulchra</i>		1				1	1			1			
	<i>Sarothrura rufa</i>		1					1			1			
	<i>Sarothrura boehmi</i>		1					1				1		
	<i>Crecopsis egregia</i>	1	1	1				1				1		
	<i>Crex crex</i>	1	1	1	1			1				1		
	<i>Porzana porzana</i>	1						1				1		
	<i>Porzana pusilla</i>		1					1				1		
	<i>Amauromis flavirostris</i>	1	1	1				1			1			
	<i>Porphyrio porphyrio</i>	1	1	1				1			1			
	<i>Porphyrio alleni</i>	1						1				1		
	<i>Rallus caerulescens</i>	1	1	1				1			1			
	<i>Fulica cristata</i>		1					1			1			
	<i>Gallinula chloropus</i>	1	1	1				1			1			
	<i>Gallinula angulata</i>	1	1	1				1				1		
	Gruidae	<i>Neotis denhami</i>	1	1	1								1	NT
		<i>Balearica regulorum</i>		1					1				1	EN
<i>Bugeranus carunculatus</i>			1									1	VU	
Otididae	<i>Eupodotis melanogaster</i>	1									1			
Charadriiformes														
Jacaniidae	<i>Actophilornis africanus</i>	1	1	1				1			1			

Order	Family	Species Name	RCD	RBD	RCD	Migratory position						
						RBD	M	A	P	p	N	Wi
Gruiformes	Scolopacidae	<i>Numenius arquata</i>	1	1	1				1			
		<i>Gallinago gallinago</i>		1					1			
		<i>Gallinago media</i>	1	1	1				1			
	Laridae	<i>Larus ridibundus</i>	1	1	1				1			
		<i>Larus fuscus</i>		1					1			
		<i>Larus ichthyaetus</i>		1					1			
	Sternidae	<i>Sterna bengalensis</i>		1					1			
		<i>Sterna caspia</i>		1					1			
		<i>Sterna nilotica</i>		1					1			
		<i>Sterna Hirundo</i>	1	1	1				1			
	Sternidae	<i>Sternula albifrons</i>	1						1			
		<i>Chlidonias leucopterus</i>	1	1	1				1			
		<i>Chlidonias hybridus</i>	1	1	1				1			
Rynchopidae	<i>Rynchops flavirostris</i>	1	1	1	1							
Columbiformes	Columbidae	<i>Oena capensis</i>		1				1				
Cuculiformes	Cuculidae	<i>Oxylophus levaillantii</i>	1				1					
		<i>Oxylophus jacobinus</i>	1				1					
		<i>Cuculus rochii</i>		1					1			
		<i>Centropus grillii</i>	1	1	1	1						
Apodiformes	Apodidae	<i>Apus apus</i>	1					1				
Coraciiformes	Alcedinidae	<i>Halcyon leucocephala</i>		1			1					
		<i>Halcyon senegalensis</i>	1	1	1	1						
		<i>Ispidina (Ceyx) picta</i>	1	1	1	1						
	Meropidae	<i>Merops albicollis</i>	1	1	1	1						
		<i>Merops apiaster</i>	1						1			
		<i>Merops persicus</i>	1	1	1				1			
		<i>Merops supeciliosus</i>	1	1	1	1						
		<i>Merops nubicoides</i>	1	1	1	1						
	Coraciidae	<i>Eurystomus glaucurus</i>	1	1	1	1						
		<i>Coracias garrulus</i>		1					1			
Piciformes	Pittidae	<i>Pitta angolensis</i>		1			1					
Passeriformes	Hirundinidae	<i>Riparia riparia</i>	1	1	1				1			
		<i>Riparia cincta</i>		1				1				
		<i>Delichon urbica</i>	1	1	1				1			
		<i>Hirundo daurica</i>	1	1	1	1						
		<i>Hirundo rustica</i>	1	1	1				1			
		<i>Psalidoprocne albiceps</i>	1					1				
		<i>Motacilla cinerea</i>	1						1			
	Motacillidae	<i>Motacilla flava</i>	1	1	1				1			
		Campephagidae	<i>Campephaga flava</i>		1			1				
	Turdidae	<i>Cossypha natalensis</i>	1					1				
		Acrocephalidae	<i>Acrocephalus scirpaceus</i>	1					1			
			<i>Acrocephalus arundinaceus</i>	1						1		
	<i>Acrocephalus shoenoaenus</i>		1						1			
	Phylloscopidae	<i>Phylloscopus trochilus</i>		1					1			
	Monarchidae	<i>Terpsiphone viridis</i>	1	1	1	1						

Order	Family	Species Name	RCD	RBD	RCD	Migratory position					
					RBD	M	A	P	p	N	Wi
	Oriolidae	<i>Oriolus oriolus</i>		1				1			
		<i>Oriolus oratus</i>		1		1					
	Laniidae	<i>Lanius minor</i>	1					1			
		<i>Lanius collurio</i>		1				1			
	Malaconotidae	<i>Laniarius poensis</i>		1				1			
	Sturnidae	<i>Lamprotornis splendidus</i>		1		1					
		<i>Cinnyricinclus leucogaster</i>	1	1	1	1					
	Ploceidae	<i>Quelea quelea</i>	1	1	1	1					
13 Orders	37 Families	131 species	87	107	62	52	10	83	4	3	10
		Percentages	34	42	24	33	6	51	2	2	6

Legend: RCD, Ruzizi Congolese Delta; RBD, Rusizi Burundian Delta; RCD/RBD, Ruzizi Congolese Delta & Rusizi Burundian Delta. **M, Migrant**, species that passes through the Ruzizi Delta within seasons; **A**, Afrotropical migrant, species migrating within Africa; **P**, Palearctic migrant, species which breed in Europe or Asia; **p**, species with at least some Palearctic population; **N**, Nesting in the Ruzizi Delta but absent part of the year; **Wi**, Wintering birds, species who like to spend a good part of the winter in the Ruzizi Delta to escape colder conditions up north.

Further studies

The migrant bird species of Ruzizi Delta were investigated to draw DRC decision makers to a protected area creation in the Ruzizi Congolese Delta. The studies should be extended on the whole Lake Tanganyika Congolese shoreline from the Small Ruzizi River Mouth up to the limit of the DRC with the Republic of Zambia, almost 677 km, to identify most ornithological rich wetlands to protect for potential Ramsar sites. The study may point out the Ngovi River Mouth at Swima village; the Mutambala River Mouth or Burton Bay at Katanga village; the Songoma River Falls at Talama Village, the limit between the South Kivu Province and the Katanga Province; the Lukuga outlet River from Lake Tanganyika in Kalemie City; and the Moba rivers, up to the limit with the Republic of Zambia. Those areas are the main Fish Breeding Areas for the whole Lake Tanganyika. Protected areas creation will allow peace and environmental security for birds, crocodiles, hippos, fish and biodiversity in general. It will as well promote productivity for farming, fishing, and cow breeding; trading business, income for local, provincial and national governance.

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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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Author: Bashonga Bishobibiri Alexis