

## New Bird Species Records from the Ruzizi Delta: Rusizi Burundian Delta and Ruzizi Congolese Delta, in the African Great Lakes Region, 2019-2021

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### ABSTRACT

The new bird species records from the Ruzizi Delta were identified from April 2019 until November 2021 during our doctoral fieldwork in five sites of the Rusizi 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 investigation was conducted by direct observation on transect counts, point counts and on road bird counting, using binoculars and two telescopes. Travel was facilitated by the motorized fiberglass boat and the double cabin field vehicle of the Centre for Research in Hydrobiology (CRH) in Uvira, DRC. The Ruzizi Delta includes terrestrial dry areas in wooded and tree-steppe, marshes, rivers, ponds and the northern shoreline of Lake Tanganyika in Bujumbura (Burundi) and Uvira (Democratic Republic of Congo). On the coast and on the ponds, the investigation sometimes resorted to traveling in non-motorized canoes to inform us, among other things, of illegal exploitation in supposedly protected areas. At the end of our investigations, we have drawn up the list of 18 orders, 84 families and 490 species of birds of which 60 bird species that we present in this publication are newly recorded in the Ruzizi Delta.

**Keywords:** New bird species record; Rusizi Burundian Delta; Ruzizi Congolese Delta; African Great Lakes Region; Northern Shoreline of Lake Tanganyika.

### INTRODUCTION

The new bird species records from the Ruzizi Delta (RD) in Burundi and the Democratic Republic of Congo (DRC) was investigated from April 2019 until November 2021 in five sites of the Rusizi 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. Following documents are published about birds 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 (Demey & Louette, 2001). The Rusizi Burundian Delta is an Important Bird Areas

(Nkezabahizi & Manirambona, 2011), (Dowset & Dowset-Lemaire, 1993) and (Gaugris, 1979).

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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) investigated the 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.

My doctoral research is unique to investigate bird checklist 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. It will contribute to the Ruzizi Congolese Wetland 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., 2009); (Butchart, Stattersfield, & Collar, 2006); (Chapman A. D., 2005); (Deanna, Brunner, Nige, Karr, & Nielsen, 1998).

To constitute the bird checklist of Ruzizi Delta we referred essentially to the following authors (1) (Stevenson & Fanshawe, 2002); (2) (Fishpool & Evans, 2002); (3) (Williams & Arlott, 1988). The paper presents 60 new bird species records of which four from the unprotected Ruzizi Congolese Delta (RCD), 37 from the protected Rusizi Burundian Delta (RBD) and 19 new bird species records from both the RCD and the RBD.

## MATERIALS 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°

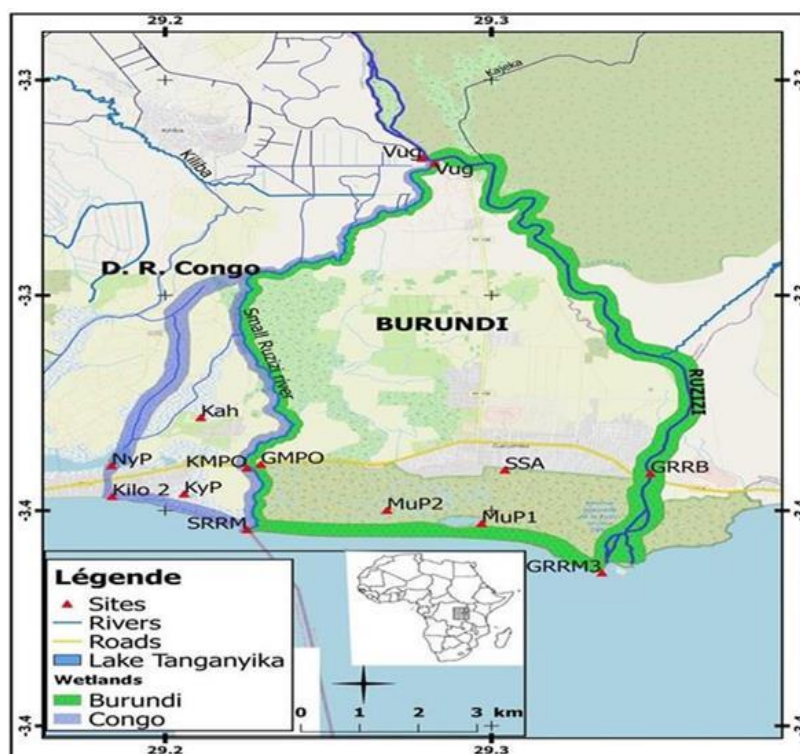


Figure 1 Map showing the study areas and studied sites in Ruzizi Delta

Source: Our fieldwork of 2019-2021



**Figure 3 Some research materials for bird study in the Ruzizi Delta**

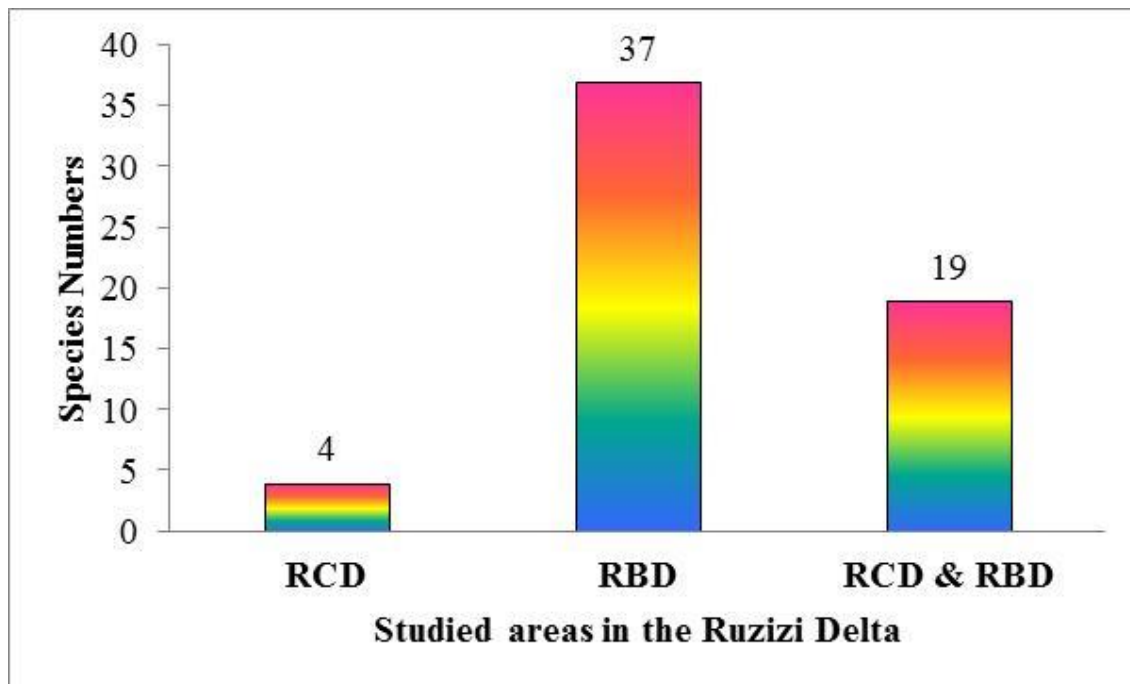
16' 04" E 029° 14' 37" 779 m altitude in the Rusizi Burundian Delta (RBD) along the Grande Rusizi River to the Great Rusizi River Bridge (GRRB), S 03° 20' 33" E 029° 16' 25" 777 m altitude up to the Great Rusizi River Mouth (GRRM), S 03° 20' 27.8" E 029° 16' 23.5" 779 m above sea level, then along the shore of Lake Tanganyika towards the west passing through the Small Rusizi River Mouth (SRRM), S 03° 21' 259" E 029° 12' 746" in the Ruzizi Congolese Delta (RCD), 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 Rusizi River towards the northeast as far as Vugizo, junction with the Great Rusizi River (Figure 1).

Figure 2 presents some research materials for birds in the Ruzizi Delta 2019-2021. 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 sites; A digital camera was used to capture birds and site features; Three binoculars and two telescopes were used for direct observation to distinguish birds; 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.

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 and 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 a telescope. They were identified using available field guides books: (Stevenson & Fanshawe, 2002); (Zimmerman, Turner, & Pearson, 1999); (Guggisberg, 1986); (Guggisberg, 1988) and (Williams & Arlott, 1988). Then birds were counted by transect counts using binoculars and a telescope in terrestrial areas for bird abundance and density calculations. With respect to the research questions and hypotheses, total number of birds seen was recorded as bird abundance and the total number of different bird species observed was recorded as species richness (Yee, 2022). That was because we are seeking to identify structural attributes that affect species richness and abundance in the Ruzizi Delta. Bird species identification was done using available above cited field guides. To draw the bird checklist we referred to (1) (Stevenson & Fanshawe, 2002); (2) (Fishpool & Evans, 2001); (3) (Williams & Arlott, 1988). Also birds were sampled



**Figure 4 New bird species records from the Ruzizi Delta**

**Legend:** RCD, Ruzizi Congolese Delta; RBD, Rusizi Burundian Delta; N=60

**Source:** Our fieldwork 2019-2021 and (Gaugris Y. , 1979); (Dowset & Dowset-Lemaire, 1993); (Gaugris & Weghe, 1993); (Zimmerman, Turner, & Pearson, 1999); (Ntakimazi, Nzigidahera, Nicayenzi, & West, 2000); (Fishpool & Evans, 2001); (Stevenson & Fanshawe, 2002); (Chapman A. D., 2005); (Nkezabahizi & Bizimana, 2008); (Sinclair & Ryan, 2010); (Nkezabahizi & Manirambona, 2011); (Lepage, 2020); (HBW, BirdLife, & International, 2021)

on point counts in marshes, ponds, bowls, in rivers and flood areas, for abundance and density calculations (Yee, 2022). After-wards birds were counted along roads from Kavimvira Customs Station (KCS) to Kavimvira Migration Post Offices (KMPO) in the Ruzizi Congolese Delta (RCD) and from Gatumba to Gatumba Migration Post Offices (GMPO) in the Rusizi Burundian Delta (RBD) (Yee, 2022). Finally GPS coordinates were recorded for study areas and studied sites habitats mapping.

## RESULTS

Figure 4 presents the new bird species numbers recorded from the Ruzizi Delta. 60 new bird species records of which four from the unprotected Ruzizi Congolese Delta (RCD), 37 from the protected Rusizi Burundian Delta (RBD) and 19 new bird species records from both the RCD and the RBD. The difference of the distribution of the new bird species recorded is highly significant between the unprotected RCD and the protected RBD ( $\chi=27.3$ ;  $DF=2$ ;  $p<0.001$ ).

The research extends thus the list of bird species now known in the Ruzizi Delta from 410 (Ntakiyica, 2008) to 490 species in the Rusizi Delta. Table 1 presents the list of 60 newly recorded bird species in the Ruzizi Delta. The list of bird species in the Ruzizi Congolese Delta is extended by 4 species recorded only in the Ruzizi Congolese Delta and by 19 species recorded both in the Ruzizi Congolese and Rusizi Burundian Delta, making an extension of 23 species increasing the list of currently known bird species from 252 (Bashonga B. , The Importance of Ruzizi Congolese Plain, South Kivu, DRC for the Conservation of Birds. A dissertation submitted to the DRGT in partial fulfilment of the requirements for the award of a degree of Master of Science in ENR of MUK, Uganda., 2013) to 275. Similarly, the list of bird species in the Rusizi Burundian Delta is extended by 56 species of which 37 are only recorded in the Rusizi Burundian Delta and 19 species recorded in both the RCD and RBD, extending the list of now known bird species in the Rusizi Burundian Delta from 410 (Ntakiyica, 2008) to 466.

Table 1 New bird species records from the Ruzizi Delta

Nb	Family	Species Name	RCD	RBD	RCD &	Refe
					RBD	
1	Anhingidae	<i>Podica senegalensis</i>	1	1	1	6, 7 & 11
2	Anatidae	<i>Anas capensis</i>	0	1	0	6, 7 & 12
3	Accipitridae	<i>Polyboroides radiatus</i>	0	1	0	1, 2, 6 & 7
4		<i>Buteo rufofuscus</i>	0	1	0	1, 2, 6 & 7
5		<i>Stephanoaetus coronatus</i>	1	1	1	6, 7, 8 & 9
6	Falconidae	<i>Polihierax semitorquatus</i>	0	1	0	6, 7 & 11
7	Phasianidae	<i>Francolinus nobilis</i>	0	1	0	6, 7 & 12
8	Rallidae	<i>Porzana pusilla</i>	0	1	0	6, 7 & 11
9	Gruidae	<i>Neotis denhami</i>	0	1	0	6, 7, 8 & 9
10	Otididae	<i>Bugeranus carunculatus</i>	0	1	0	1, 2, 6 & 7
11	Dromatidae	<i>Dromas ardeola</i>	0	1	0	6, 7 & 12
12	Stercoraridae	<i>Stercorarius parasiticus</i>	0	1	0	1, 2, 6 & 7
13		<i>Stercorarius pomarinus</i>	0	1	0	6, 7, 8 & 9
14	Psittacidae	<i>Poicephalus suahelicus</i>	0	1	0	1, 2, 6 & 7
15	Caprimulgidae	<i>Caprimulgus pectoralis</i>	1	0	0	6, 7 & 12
16	Coliidae	<i>Colius leucocephalus</i>	0	1	0	6, 7 & 11
17	Trogonidae	<i>Apaloderma vittatum</i>	0	1	0	6, 7, 8 & 9
18	Phoeniculidae	<i>Rhinopomastus cyannomelas</i>	1	1	1	1, 2, 6 & 7
19	Upupidae	<i>Upupa africana</i>	0	1	0	6, 7 & 12
20	Lybiidae	<i>Lybius rubrifacies</i>	0	1	0	6, 7 & 11
21	Indicatoridae	<i>Indicator pumilio</i>	0	1	0	6, 7, 8 & 9
22	Eurylaimidae	<i>Pseudocalyptomena graueri</i>	1	1	1	1, 2, 6 & 7
23	Hirundinidae	<i>Hirundo aethiopica</i>	1	1	1	6, 7 & 12
24	Pycnonotidae	<i>Nicator chloris</i>	0	1	0	6, 7 & 11
25	Turdidae	<i>Cossypha semirufa</i>	0	1	0	6, 7, 8 & 9
26		<i>Cercotrichas quadrivirgata</i>	0	1	0	6, 7 & 12
27		<i>Zoothera tanganjicae</i>	1	1	1	6, 7 & 11
28	Acrocephalidae	<i>Hippolais icterina</i>	0	1	0	6, 7, 8 & 9
29	Sylviidae	<i>Sylvia borin</i>	1	0	0	6, 7 & 12
30		<i>Sylvia communis</i>	1	0	0	6, 7, 8 & 9
31		<i>Eremomela scotops</i>	1	1	1	6, 7, 8 & 9
32	Cisticolidae	<i>Cisticola brachypterus</i>	0	1	0	1, 5, 6 & 7
33		<i>Calamonastes undosus</i>	0	1	0	5, 6 & 7

Nb	Family	Species Name	RCD	RBD	RCD &	Refe-
					RBD	
34		<i>Cisticola woosnami</i>	0	1	0	5, 6 & 7
35	Muscicapidae	<i>Melaenornis pammelaina</i>	0	1	0	3, 6 & 7
36		<i>Bradornis pallidus</i>	0	1	0	6, 7 & 11
37	Leiothrichidae	<i>Turdoides sharpei</i>	0	1	0	1, 2, 6 & 7
38		<i>Turdoides hartlaubii</i>	0	1	0	6, 7 & 12
39	Paridae	<i>Parus albiventris</i>	0	1	0	4, 5, 6 & 7
40	Monarchidae	<i>Trochocercus albonotatus</i>	1	1	1	1, 2, 6 & 7
41		<i>Trochocercus albiventris</i>	0	1	0	5, 6 & 7
42	Paridae	<i>Parus albiventris</i>	0	1	0	2,4, 6 & 7
43	Nectarinidae	<i>Cyanomitra (Nectarinia) amethystina</i>	1	1	1	5, 6 & 7
44	Laniidae	<i>Lanius isabellinus</i>	1	1	1	4, 6 & 7
45		<i>Urolestes melanoleucus</i>	0	1	0	3, 6 & 7
46		<i>Laniarius erythrogaster</i>	1	1	1	1, 3, 6 & 7
47		<i>Nilaus afer</i>	1	1	1	6, 7, 8 & 9
48	Sturnidae	<i>Onychognathus morio</i>	0	1	0	4, 5, 6 & 7
49	Ploceidae	<i>Ploceus insignis</i>	0	1	0	5, 6, 7 & 9
50		<i>Ploceus castanops</i>	0	1	0	2, 3, 6 & 7
51		<i>Ploceus taeniopterus</i>	1	0	0	3,4, 6 & 7
52		<i>Ploceus alienus</i>	1	1	1	1, 2, 6 & 7
53	Estrildidae	<i>Pytilia afra</i>	1	1	1	6, 7 & 8
54		<i>Mandingoa nitidula</i>	1	1	1	6, 7 & 12
55		<i>Spermophaga ruficapilla</i>	1	1	1	6, 7 & 11
56		<i>Estrilda paludicola</i>	0	1	0	6, 7 & 9
57	Fringillidae	<i>Crithagra (Serinus) frontalis</i>	0	1	0	6, 7 & 12
58		<i>Crithagra (Serinus) striolatus</i>	1	1	1	4, 5, 6 & 7
59		<i>Serinus atrogularis</i>	1	1	1	4, 6 & 7
60		<i>Serinus reichardi</i>	1	1	1	6, 7 & 8
	Total		23	56	19	

**Legend:** Nb, Number; RCD, Ruzizi Congolese Delta; RBD, Rusizi Burundian Delta; 1, present; 0, absent.

**Source:** Our fieldwork and (Gaugris Y. , 1979)<sup>1</sup>; (Dowset & Dowset-Lemaire, 1993)<sup>2</sup>; (Gaugris & Weghe, 1993)<sup>3</sup>; (Zimmerman, Turner, & Pearson, 1999)<sup>4</sup>; (Ntakimazi, Nzigidahera, Nicayenzi, & West, 2000)<sup>5</sup>; (Fishpool & Evans, 2001)<sup>6</sup>; (Stevenson & Fanshawe, 2002)<sup>7</sup>; (Chapman A. D., 2005)<sup>8</sup>; (Nkezabahizi & Bizimana, 2008)<sup>9</sup>; (Ntakiyica, 2008)<sup>10</sup>; (Nkezabahizi & Manirambona, 2011)<sup>11</sup>; (Lepage, 2020)<sup>12</sup>.

Conservation issues targeting ecosystems particularly the Ruzizi Congolese Delta wetlands unprotected, are very important for the biogeocenosis of Ruzizi Delta to support the bird species communities of 490 species of which 60 new recorded bird species (ICCN, 2005); (ICCN, 2007). Biogeocenosis as defined by (Sukachev, 1964) is a territorial complex of uniform abiotic conditions and living organisms populating the corresponding territory, from bacteria to higher plants, higher vertebrates and invertebrates (Lewis, et al., 2019). According to (Lewis, et al., 2019), modern biology understands bird behaviour not as a result of miraculous wisdom of individuals but as a result of the action of evolution through mutation, selection and reproduction and it is important to note that not all changes in bird behaviour can be attributed to climate change as they are currently observed because other factors such as changes in land use, can influence resident or migration behaviour of birds.

In the Ruzizi Delta, traditional agriculture techniques, plant and vegetation overexploitation, crossfire, traditional fishing techniques, human settlement in wetlands, and inadequate human behaviour destroy nowadays suitable bird habitats (Lewis, et al., 2019). Effects can be accelerated or attenuated by climate change and in some cases it will not be possible to identify the primary source of change that affects a certain behavioural modification (Lewis, et al., 2019). Nevertheless, all of the environmental changes currently experienced, that top the list in terms of speed and extent, are very likely a result of human activity and thus share a common source in bird behaviour. Also it becomes clear for (Ockendon, et al., 2014) that birds as higher trophic level consumers and homeothermic animals with many behavioural options rarely are considerably affected directly by abiotic factors (like temperature) but rather by biotic mechanisms, namely altered species interactions such as predation or food availability (Lepage, 2020).

This paper is contributing to drawing Congolese decision makers to a protected Ruzizi Congolese Delta wetlands creation as a Ruzizi Congolese Delta Community Reserve, that will be submitted to the Ramsar Secretariat by the ICCN (Congolese Institute for Nature Conservation) for designation as the Ruzizi Congolese Delta Ramsar Site for wise bird and biodiversity conservation in the Ruzizi Congolese Delta, the Rusizi Burundian Delta and the northern end of Lake Tanganyika. It is not surprising that the

difference of the distribution of the new bird species recorded is highly significant between the unprotected RCD and the protected RBD. 37 (62%) new bird species records in the protected Rusizi Burundian Delta, 19 (31%) new bird species records in both RBD and RCD and only four (7%) in the unprotected RCD.

Wetland protection issues are needed for bird species to survive according to Congolese regulations for 50 m free from river banks, ponds and lake shore areas (Ramsar, 2013); (Seyler, Duncan, Mwanza, & Mpoy, 2010); (Bashonga A. B., 2019); (Bashonga, Sande, Ntakimazi, & Kahindo, 2023). We are convinced that once these regulations will be respected, the Ruzizi Congolese Delta will launch a protected area for bird and biodiversity wise conservation.

## CONCLUSION

The 60 bird species that we have newly recorded out of a total number of 490 species indicate that there are still unrecorded bird species in the Ruzizi Delta. Although protected, the Rusizi Burundian Delta still requires a systematic ornithological inventory using adequately, among other techniques, mist netting to highlight the small birds of this ecosystem. In the Congolese Ruzizi Delta, systematic ornithological inventory is also recommended, also making adequate use of mist nets for the identification of small birds. The entire Congolese coast of Lake Tanganyika, approximately 667 km long from the Small Ruzizi River Mouth to the limit with Zambia, also requires a systematic ornithological inventory with adequate use of mist netting to document species not yet recorded in this area of Lake Tanganyika currently on the UNESCO heritage list.

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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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