

Building evidence for conservation globally

Journal of Threatened Taxa



Open Access

10.11609/jott.2025.17.11.27787-28010

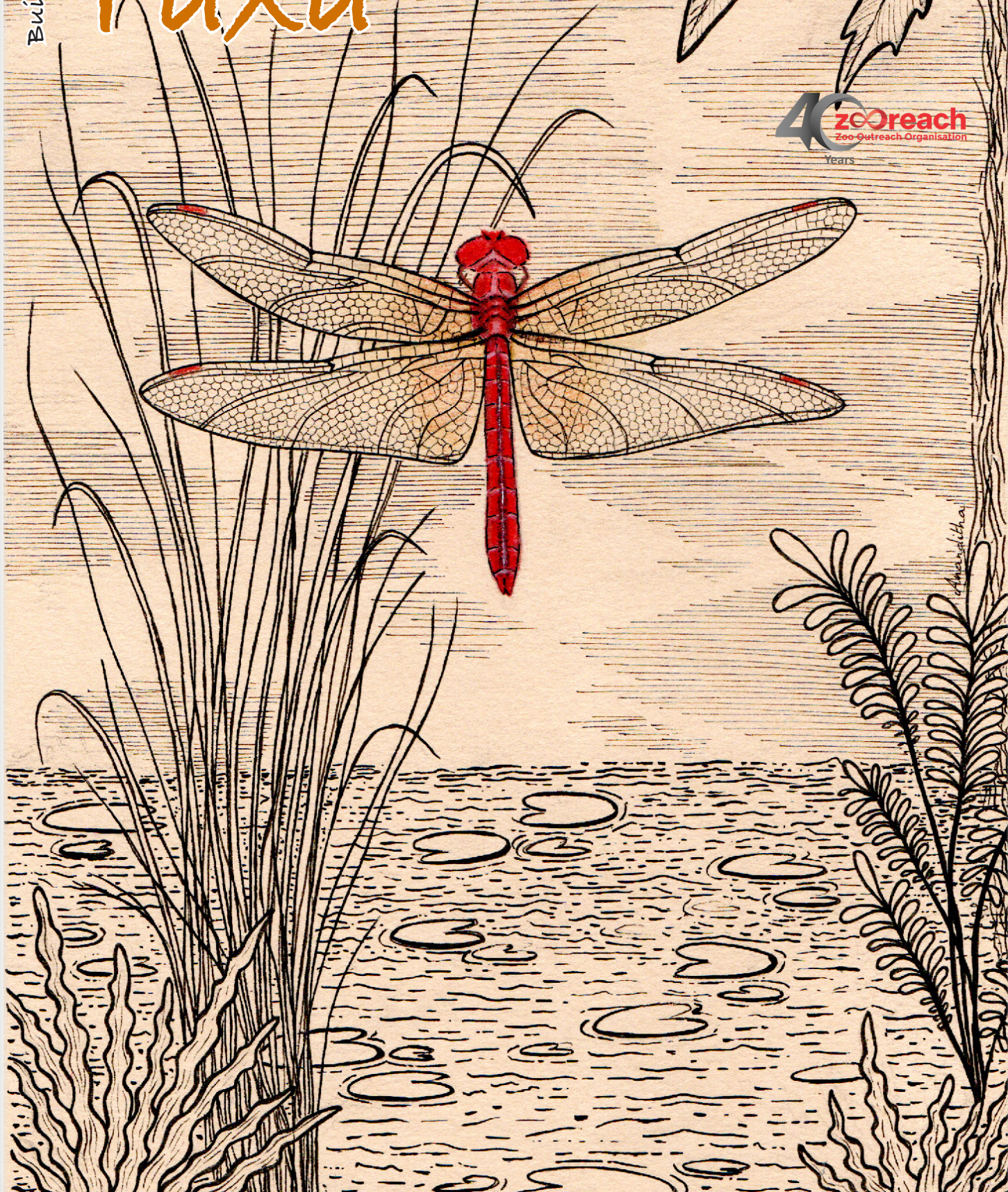
www.threatenedtaxa.org

26 November 2025 (Online & Print)

17(11): 27787-28010

ISSN 0974-7907 (Online)

ISSN 0974-7893 (Print)





ISSN 0974-7907 (Online); ISSN 0974-7893 (Print)

Publisher
Wildlife Information Liaison Development Society
www.wild.zooreach.org

Host
Zoo Outreach Organization
www.zooreach.org

Srivari Illam, No. 61, Karthik Nagar, 10th Street, Saravanampatti, Coimbatore, Tamil Nadu 641035, India
Registered Office: 3A2 Varadarajulu Nagar, FCI Road, Ganapathy, Coimbatore, Tamil Nadu 641006, India
Ph: +91 9385339863 | www.threatenedtaxa.org
Email: sanjay@threatenedtaxa.org

EDITORS

Founder & Chief Editor

Dr. Sanjay Molur

Wildlife Information Liaison Development (WILD) Society & Zoo Outreach Organization (ZOO),
Coimbatore, Tamil Nadu 641006, India

Assistant Editor

Dr. Chaithra Shree J., WILD/ZOO, Coimbatore, Tamil Nadu 641006, India

Managing Editor

Mr. B. Ravichandran, WILD/ZOO, Coimbatore, Tamil Nadu 641006, India

Associate Editors

Dr. Mandar Paingankar, Government Science College Gadchiroli, Maharashtra 442605, India

Dr. Ulrike Streicher, Wildlife Veterinarian, Eugene, Oregon, USA

Ms. Priyanka Iyer, ZOO/WILD, Coimbatore, Tamil Nadu 641006, India

Board of Editors

Dr. Russel Mittermeier

Executive Vice Chair, Conservation International, Arlington, Virginia 22202, USA

Prof. Mewa Singh Ph.D., FASc, FNA, FNAsc, FNAPsy

Ramanna Fellow and Life-Long Distinguished Professor, Biopsychology Laboratory, and
Institute of Excellence, University of Mysore, Mysuru, Karnataka 570006, India; Honorary
Professor, Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore; and Adjunct
Professor, National Institute of Advanced Studies, Bangalore

Stephen D. Nash

Scientific Illustrator, Conservation International, Dept. of Anatomical Sciences, Health Sciences
Center, T-8, Room 045, Stony Brook University, Stony Brook, NY 11794-8081, USA

Dr. Fred Pluthero

Toronto, Canada

Dr. Priya Davidar

Sigur Nature Trust, Chadapatti, Mavinahalla PO, Nilgiris, Tamil Nadu 643223, India

Dr. John Fellowes

Honorary Assistant Professor, The Kadoorie Institute, 8/F, T.T. Tsui Building, The University of
Hong Kong, Pokfulam Road, Hong Kong

Prof. Dr. Mirco Solé

Universidade Estadual de Santa Cruz, Departamento de Ciências Biológicas, Vice-coordenador
do Programa de Pós-Graduação em Zoologia, Rodovia Ilhéus/Itabuna, Km 16 (45662-000)
Salobrinho, Ilhéus - Bahia - Brasil

Dr. Rajeev Raghavan

Professor of Taxonomy, Kerala University of Fisheries & Ocean Studies, Kochi, Kerala, India

English Editors

Mrs. Mira Bhojwani, Pune, India

Dr. Fred Pluthero, Toronto, Canada

Copy Editors

Ms. Usha Madgunaki, Zooreach, Coimbatore, India

Ms. Trisa Bhattacharjee, Zooreach, Coimbatore, India

Ms. Paloma Noronha, Daman & Diu, India

Web Development

Mrs. Latha G. Ravikumar, ZOO/WILD, Coimbatore, India

Typesetting

Mrs. Radhika, Zooreach, Coimbatore, India

Mrs. Geetha, Zooreach, Coimbatore, India

Fundraising/Communications

Mrs. Payal B. Molur, Coimbatore, India

Subject Editors 2021–2023

Fungi

Dr. B. Shivaraju, Bengaluru, Karnataka, India

Dr. R.K. Verma, Tropical Forest Research Institute, Jabalpur, India

Dr. Vatsavaya S. Raju, Kakatiya University, Warangal, Andhra Pradesh, India

Dr. M. Krishnappa, Jnana Sahyadri, Kuvempu University, Shimoga, Karnataka, India

Dr. K.R. Sridhar, Mangalore University, Mangalagangothri, Mangalore, Karnataka, India

Dr. Gunjan Biswas, Vidyasagar University, Midnapore, West Bengal, India

Dr. Kiran Ramchandra Ranadive, Annasaheb Magar Mahavidyalaya, Maharashtra, India

Plants

Dr. G.P. Sinha, Botanical Survey of India, Allahabad, India

Dr. N.P. Balakrishnan, Ret. Joint Director, BSI, Coimbatore, India

Dr. Shonil Bhagwat, Open University and University of Oxford, UK

Prof. D.J. Bhat, Retd. Professor, Goa University, Goa, India

Dr. Ferdinando Boero, Università del Salento, Lecce, Italy

Dr. Dale R. Calder, Royal Ontario Museum, Toronto, Ontario, Canada

Dr. Cleofas Cervancia, Univ. of Philippines Los Baños College Laguna, Philippines

Dr. F.B. Vincent Florens, University of Mauritius, Mauritius

Dr. Merlin Franco, Curtin University, Malaysia

Dr. V. Irudayaraj, St. Xavier's College, Palayamkottai, Tamil Nadu, India

Dr. B.S. Kholia, Botanical Survey of India, Gangtok, Sikkim, India

Dr. Pankaj Kumar, Department of Plant and Soil Science, Texas Tech University, Lubbock, Texas, USA.

Dr. V. Sampath Kumar, Botanical Survey of India, Howrah, West Bengal, India

Dr. A.J. Solomon Raju, Andhra University, Visakhapatnam, India

Dr. Vijayasankar Raman, University of Mississippi, USA

Dr. B. Ravi Prasad Rao, Sri Krishnadevaraya University, Anantpur, India

Dr. K. Ravikumar, FRLHT, Bengaluru, Karnataka, India

Dr. Aparna Watve, Pune, Maharashtra, India

Dr. Qiang Liu, Xishuangbanna Tropical Botanical Garden, Yunnan, China

Dr. Noor Azhar Mohamed Shazili, Universiti Malaysia Terengganu, Kuala Terengganu, Malaysia

Dr. M.K. Vasudeva Rao, Shiv Ranjani Housing Society, Pune, Maharashtra, India

Prof. A.J. Solomon Raju, Andhra University, Visakhapatnam, India

Dr. Mandar Datar, Agharkar Research Institute, Pune, Maharashtra, India

Dr. M.K. Janarthanam, Goa University, Goa, India

Dr. K. Karthikeyan, Botanical Survey of India, India

Dr. Errol Vela, University of Montpellier, Montpellier, France

Dr. P. Lakshminarasimhan, Botanical Survey of India, Howrah, India

Dr. Larry R. Noblick, Montgomery Botanical Center, Miami, USA

Dr. K. Haridasan, Pallavur, Palakkad District, Kerala, India

Dr. Analinda Manila-Fajard, University of the Philippines Los Baños, Laguna, Philippines

Dr. P.A. Sinu, Central University of Kerala, Kasaragod, Kerala, India

Dr. Afroz Alam, Banasthali Vidyapith (accredited A grade by NAAC), Rajasthan, India

Dr. K.P. Rajesh, Zamorin's Guruvayurappan College, GA College PO, Kozhikode, Kerala, India

Dr. David E. Boufford, Harvard University Herbaria, Cambridge, MA 02138-2020, USA

Dr. Ritesh Kumar Choudhary, Agharkar Research Institute, Pune, Maharashtra, India

Dr. A.G. Pandurangan, Thiruvananthapuram, Kerala, India

Dr. Navendu Page, Wildlife Institute of India, Chandrabani, Dehradun, Uttarakhand, India

Dr. Kannan C.S. Warriar, Institute of Forest Genetics and Tree Breeding, Tamil Nadu, India

Invertebrates

Dr. R.K. Avasthi, Rohtak University, Haryana, India

Dr. D.B. Bastawade, Maharashtra, India

Dr. Partha Pratim Bhattacharjee, Tripura University, Suryamaninagar, India

Dr. Kailash Chandra, Zoological Survey of India, Jabalpur, Madhya Pradesh, India

Dr. Ansie Dippenaar-Schoeman, University of Pretoria, Queenswood, South Africa

Dr. Rory Dow, National Museum of Natural History Naturalis, The Netherlands

Dr. Brian Fisher, California Academy of Sciences, USA

Dr. Richard Gallon, Llandudno, North Wales, LL30 1UP

Dr. Hemant V. Ghate, Modern College, Pune, India

Dr. M. Monwar Hossain, Jahangirnagar University, Dhaka, Bangladesh

For Focus, Scope, Aims, and Policies, visit https://threatenedtaxa.org/index.php/JoTT/aims_scope

For Article Submission Guidelines, visit <https://threatenedtaxa.org/index.php/JoTT/about/submissions>

For Policies against Scientific Misconduct, visit https://threatenedtaxa.org/index.php/JoTT/policies_various

continued on the back inside cover

Cover: A male Scarlet Skimmer perching on vegetation by the banks of a waterbody. Ink and watercolour illustration by Ananditha Pascal.



Avian composition and distribution in the bird sanctuary planning zone of Can Gio Mangrove Biosphere Reserve, Ho Chi Minh City, Vietnam

Huynh Duc Hieu¹ , Huynh Duc Hoan^{2*} , Bui Nguyen The Kiet³ , Dang Ngoc Hiep⁴ ,
Nguyen Thi Phuong Linh⁵ & Nguyen Dang Hoang Vu^{6*}

¹⁻⁵ Management Board of Protection and Special-use Forests of Ho Chi Minh City, 176 Hai Ba Trung Street, Tan Dinh Ward, Ho Chi Minh City, Vietnam.

⁶ Institute of Life Science, Vietnam Academy of Science and Technology, 9/621, Vo Nguyen Giap Street, Linh Xuan, Chi Minh City, Vietnam.

¹ huynhduchieu.7879@gmail.com, ² huynhduchoanpy@gmail.com, ³ joankietthe@gmail.com, ⁴ hqt.ngochiep93@gmail.com,

⁵ ntplin1709@gmail.com, ⁶ nguyendanghoangvu888@gmail.com

(^{2,6} *corresponding authors)

Abstract: Six field surveys were conducted from July 2024 to May 2025 in six sessions (three during dry and three during wet seasons) along 10 fixed transects (five in the core zone and five in the buffer zone) to assess the bird species composition and spatial distribution in the bird sanctuary planning zone of the Can Gio Mangrove Biosphere Reserve, after 47 years of restoration (1978–2025). A total of 57 bird species, representing 11 orders, 32 families, and 45 genera were recorded, including 18 waterbird species. Four species are listed as threatened and prioritized for conservation by the IUCN Red List: *Porzana paykullii* as Near Threatened, Vietnam Red List Book: *Anhinga melanogaster* and *Mycteria leucocephala* as Vulnerable, and Vietnamese law: *Milvus migrans* and *Anhinga melanogaster* as prioritized for conservation. The order Passeriformes was the most species-rich (21 species), while Pelecaniformes had the highest number of individual encounters (2,427). Overall, bird diversity in the area was relatively high (Shannon-Wiener index $H' = 2.60 \pm 0.34$), with a moderate level of dominance (Simpson $D = 0.12 \pm 0.06$). Species abundance was uneven across seasons and transects, with higher diversity and abundance during the wet season, although the differences were not statistically significant. Only the transect L8 in the buffer zone showed statistically significant differences in diversity and abundance, representing a newly recorded breeding area dominated by waterbird species such as *Nycticorax nycticorax*, *Egretta garzetta*, *Ardea intermedia*, and *Microcarbo niger*. Compared to a 2019 study, the number of breeding species in the core zone declined to seven species with approximately 1,000 individuals, while a new breeding area in the buffer zone was identified with eight breeding species and approximately 1,500 individuals. Continuous monitoring and conservation efforts are necessary to sustain and manage avian biodiversity in this critical wetland ecosystem.

KEYWORDS: Species diversity, biological index, breeding ecology, habitat use, core and buffer zones, conservation priority species, seasonal variation, waterbirds, avifauna.

Editor: H. Byju, Coimbatore, Tamil Nadu, India.

Date of publication: 26 November 2025 (online & print)

Citation: Hieu, H.D., H.D. Hoan, B.N.T. Kiet, D.N. Hiep, N.T.P. Linh & N.D.H. Vu (2025). Avian composition and distribution in the bird sanctuary planning zone of Can Gio Mangrove Biosphere Reserve, Ho Chi Minh City, Vietnam. *Journal of Threatened Taxa* 17(11): 27889–27896. <https://doi.org/10.11609/jott.9940.17.11.27889-27896>

Copyright: © Hieu et al. 2025. Creative Commons Attribution 4.0 International License. JoTT allows unrestricted use, reproduction, and distribution of this article in any medium by providing adequate credit to the author(s) and the source of publication.

Funding: The project was funded by the Youth Science and Technology Incubator Program, managed by the Center for Youth Science and Technology Development - Ho Chi Minh City Youth Union and the Department of Science and Technology of Ho Chi Minh City, under contract No. 30/2024/HD-KHCNT-VU, “Composition and distribution of bird species in the Can Gio Mangrove Biosphere Reserve”.

Competing interests: The authors declare no competing interests.

Vietnamese abstract, Author details & Author contributions: See end of this article.

Acknowledgements: The project was funded by the Youth Science and Technology Incubator Program, managed by the Center for Youth Science and Technology Development - Ho Chi Minh City Youth Union and the Department of Science and Technology of Ho Chi Minh City, under contract No. 30/2024/HD-KHCNT-VU, “Composition and distribution of bird species in the Can Gio Mangrove Biosphere Reserve”. We would like to thank the Management Board of Protection and Special-use Forests of Ho Chi Minh City for allowing this research, and the Department of Natural Resources Management and Development for their support during the field survey, data collection and processing. We would like to thank the anonymous reviewers and the editorial team for their useful comments to improve the article.



INTRODUCTION

Waterbirds are key indicators of wetland health and play critical ecological roles as predators, seed dispersers, and contributors to nutrient cycling (Byju et al. 2025a). Across Asia, particularly along coastal zones, wetlands support rich avifaunal diversity but are increasingly threatened by habitat loss, pollution, and human disturbance. Long-term monitoring in India has revealed marked declines in the abundance and breeding success of both migratory and resident waterbirds due to anthropogenic pressures (Byju et al. 2025b,c). These findings underscore the urgent need to assess and monitor waterbird communities in other Asian coastal ecosystems, where comparable data remain scarce.

Vietnam is one of the 22 countries along the East Asian-Australasian Flyway Partnership (EAAFP), which supports the diversity of migratory birds and hosts about 40% of the world's migratory bird species (Yamaura et al. 2017). Vietnam's avifauna is highly diverse, with over 900 species documented (Le 2020), including 53 species listed as threatened in the country (Ministry of Science and Technology 2007) and 10 endemic species (Tran 2020). However, despite Vietnam's strategic importance along the flyway, comprehensive site-based assessments of waterbird communities remain limited.

The Can Gio Mangrove Biosphere Reserve (CGMBR) in southern Vietnam represents the largest rehabilitated mangrove forest in southeastern Asia and serves as a critical breeding and stopover site for numerous waterbird species. Previous surveys documented 164 bird species across 51 families and 15 orders (Le 2021), including five nationally protected and 16 globally threatened species (IUCN 2025). Yet, these studies were spatially and temporally restricted, focusing mainly on the core zone (Huynh et al. 2019). Consequently, current knowledge about the distribution and composition of waterbirds across the broader bird sanctuary planning zone—including both core and buffer zones—remains incomplete.

Given the ongoing coastal development and mounting anthropogenic pressures on mangrove ecosystems, updated information is urgently needed to evaluate the outcomes of nearly five decades of forest restoration and to guide effective conservation management. This study aims to (1) document the current species composition and distribution of waterbirds in the bird sanctuary planning zone of CGMBR, and (2) provide baseline data for long-term monitoring and habitat management.

MATERIALS AND METHODS

Can Gio Mangrove Biosphere Reserve (CGMBR) is Vietnam's first UNESCO Biosphere Reserve, recognized on 21 January 2000 and is part of the "discontinuous biodiversity corridor" planning initiative for the 2020–2030 period under decision no. 1250/QĐ-TTg of the Vietnam Prime Minister on 31 July 2013 (Can Gio District Forest Protection Management Board 2025). As part of CGMBR, the bird sanctuary planning zone, located at Vam Sat in subzone 15a, encompasses 602.5 ha buffer zone and 126.2 ha in the core zone. The entire bird sanctuary planning zone was designated for protection by Decision No. 27/QĐ-UB on 06 January 2004 (Chairman of Ho Chi Minh City People's Committee 2004).

Ten fixed transects were established across the bird sanctuary planning zone, covering different habitat types: natural forest (4 transects), plantation forest (3 transects), and other land types, including pond banks, and salt fields adjacent to forested areas (3 transects) (Figure 1). Five transects were in the core zone in the same area as Huynh et al. (2019) (L1–5), and five in the buffer zone (L6–10). Each transect was 500 m in length with a 20 m observation radius.

Field surveys were conducted in six sessions: three in the dry season (November 2024–April 2025) and three in the wet season (May–October 2025), with monthly intervals. Observations were carried out from 0700 h to 1130 h. Birds were identified based on morphology, size, plumage, and vocalizations. Unidentified species were documented with photographs and sound recordings for later verification using field guides (Vo 1981; King et al. 1997; Nguyen et al. 2000; Koshiyama & Asano 2019) and the Birds of South East Asia website (Vietnam Wildlife Photography Club 2025). Taxonomy followed the Avibase.

Collected data were analysed using BioDiversity Professional 2.0 (McAleece et al. 1997) and Statgraphics XIX (Nguyen 2009). Three biodiversity indices were used to assess community structure, including Shannon-Wiener index (H' , to evaluate species diversity) (Shannon & Wiener 1963), Simpson's dominance index (D , to measure species dominance) (Simpson 1949), and Sorensen similarity index (SI , to compare species similarity among transects) (Shannon & Wiener 1963). Diversity categories followed standard classifications: $H' < 0.6$ = low diversity; $0.6 \leq H' \leq 1.5$ = moderate; $1.5 < H' \leq 2.5$ = high; $2.5 < H' \leq 3.5$ = very high; $H' > 3.5$ = extremely high diversity. The lower the Simpson's D , the higher the diversity. Sorensen Index was used to classify pairwise similarity from very low (<20%) to very high (≥80%).

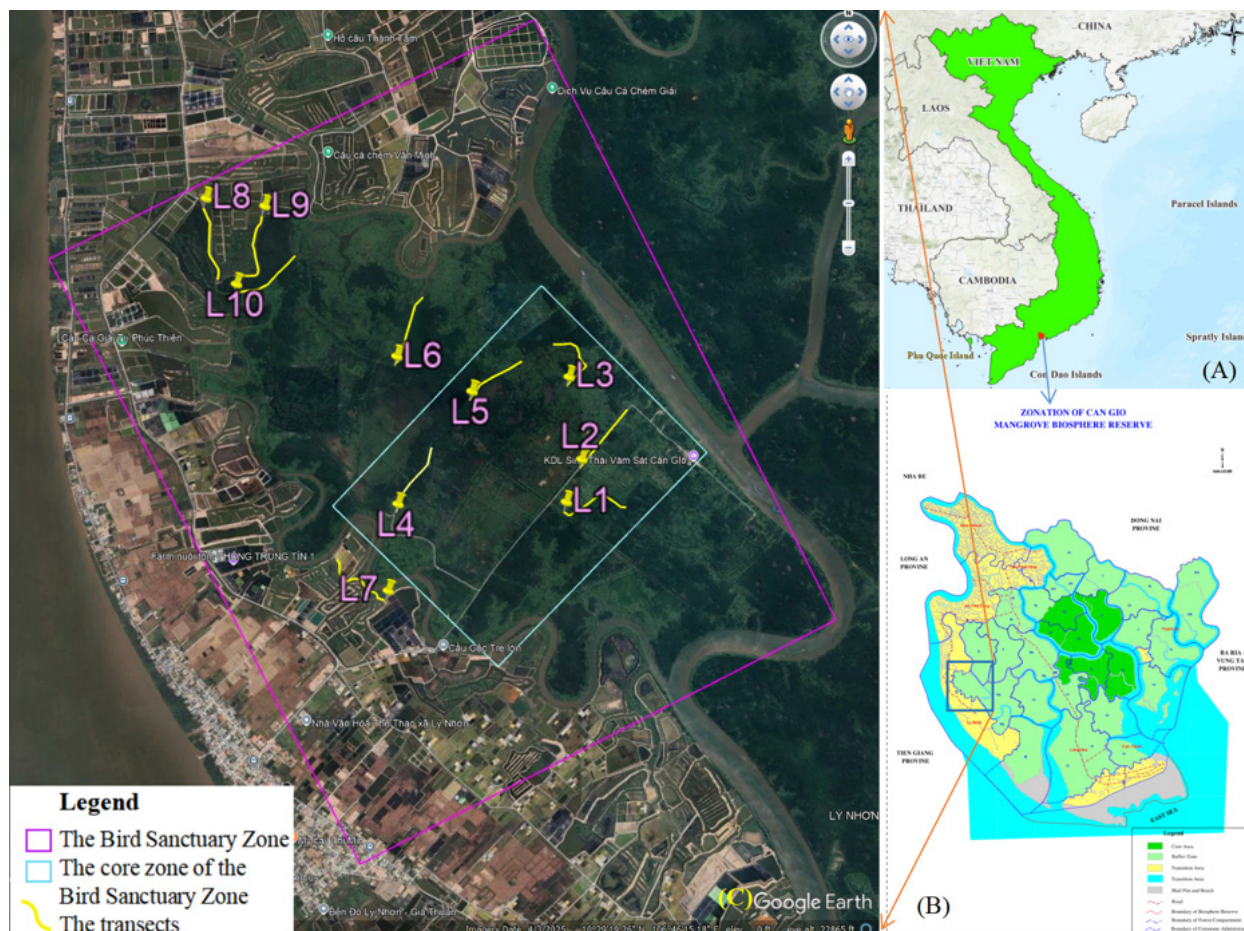


Image 1. Map of the study area: A—Location of Can Gio Mangrove Biosphere Reserve on a map of Vietnam | B—the study area on the Can Gio Mangrove Biosphere Reserve, the map was provided by Can Gio Mangrove Biosphere Reserve | C—ecosystems and survey areas within Can Gio Mangrove Biosphere Reserve. The map was created with QGIS software version 3.34.11. The ecosystem layer data for Google Earth Pro version 7.3.6.10201. The base map of Vietnam was sourced from GADM (Global Administrative Areas). https://gadm.org/download_country.html

In addition, biodiversity indices were compared between the wet and dry seasons to examine temporal variation in bird communities. Differences among habitat types (core zone vs. buffer zone; mixed vegetation, waterbody, and edge habitats) were also analysed to evaluate spatial patterns in avian diversity and composition. This allowed us to assess not only overall community structure but also seasonal and habitat-specific differences that may influence waterbird assemblages. Breeding bird populations were assessed by comparing current observations with data from a 2019 study.

RESULTS AND DISCUSSION

Avian composition

A total of 57 bird species belonging to 45 genera,

32 families, and 11 orders were recorded across the bird sanctuary planning zone in the Can Gio Mangrove Biosphere Reserve (CGMBR) during six surveys from July 2024 to May 2025 (July, September 2024 and May 2025 represent wet season and November 2024 and January, March 2025 represent dry season) (Table 1). The wet season (July, September 2024, and May 2025) had more species and showed higher individual encounters than the dry season (November 2024, January and March 2025), with 54 vs. 42, and 2,779 vs. 1,899, respectively (Appendix 1). Among all recorded species, 18 species were waterbirds, including four of conservation concern—*Anhinga melanogaster*, *Milvus migrans*, *Mycteria leucocephala*, and *Porzana paykullii*—listed as Near Threatened or Vulnerable by the IUCN Red List, the Vietnam Red Data Book, and Vietnamese law (Prime Minister of Vietnam 2019, 2021). Their presence underscores the ecological and conservation importance

Table 1. Bird species composition in the bird sanctuary planning area.

	Scientific name	Dry season	Rainy season	Conservation status		
				1	2	3
	I. ACCIPITRIFORMES					
	1. Accipitridae					
1	<i>Milvus migrans</i> (Boddaert, 1783)	-	1	-	LC	IIB
	II. ANSERIFORMES					
	2. Anatidae					
2	<i>Anas platyrhynchos</i> Linnaeus, 1758*	-	2	-	LC	-
	III. APODIFORMES					
	3. Apodidae					
3	<i>Aerodramus germani</i> Oustalet, 1876	278	232	-	-	-
	IV. CHARADRIIFORMES					
	4. Laridae					
4	<i>Chlidonias hybrida</i> (Pallas, 1811)*	-	2	-	LC	-
5	<i>Chroicocephalus ridibundus</i> (Linnaeus, 1766)*	1	-	-	LC	-
	5. Recurvirostridae					
6	<i>Himantopus himantopus</i> (Linnaeus, 1758)*	43	16	-	LC	-
	6. Scolopacidae					
7	<i>Tringa glareola</i> Linnaeus, 1758*	16	2	-	LC	-
8	<i>Tringa nebularia</i> (Gunnerus, 1767)*	-	2	-	LC	-
	V. COLUMBIFORMES					
	7. Columbidae					
9	<i>Streptopelia chinensis</i> (Scopoli, 1786)	33	41	-	-	-
10	<i>Streptopelia tranquebarica</i> (Hermann, 1804)	2	4	-	LC	-
11	<i>Treron bicinctus</i> (Jerdon, 1840)	2	1	-	LC	-
12	<i>Treron vernans</i> (Linnaeus, 1771)	2	11	-	-	-
	VI. CORACIIFORMES					
	8. Alcedinidae					
13	<i>Alcedo atthis</i> (Linnaeus, 1758)	9	13	-	LC	-
14	<i>Halcyon smyrnensis</i> (Linnaeus, 1758)	-	3	-	LC	-
15	<i>Todiramphus chloris</i> (Boddaert, 1783)	61	98	-	LC	-
	9. Meropidae					
16	<i>Merops superciliosus</i> Linnaeus, 1766		4	-	LC	-
	VII. CUCULIFORMES					
	10. Cuculidae					
17	<i>Centropus sinensis</i> (Stephens, 1815)	9	30	-	LC	-
18	<i>Cuculus micropterus</i> Gould, 1837	1	-	-	LC	-

	Scientific name	Dry season	Rainy season	Conservation status		
				1	2	3
	VIII. GRUIFORMES					
	11. Rallidae					
19	<i>Amaurornis phoenicurus</i> Pennant, 1769	3	3	-	LC	-
20	<i>Porzana fusca</i> Linnaeus, 1766	2	1	-	LC	-
21	<i>Porzana paykullii</i> (Ljungh, 1813)	2	-	-	NT	-
22	<i>Rallus striatus</i> (Linnaeus, 1766)	4	5	-	-	-
	IX. PASSERIFORMES					
	12. Acanthizidae					
23	<i>Gerygone sulphurea</i> Wallace, 1864	78	121	-	LC	-
	13. Cisticolidae					
24	<i>Orthotomus ruficeps</i> (Lesson, 1830)	-	2	-	LC	-
25	<i>Orthotomus sepium</i> Horsfield, 1821	73	97	-	LC	-
26	<i>Prinia inornata</i> Sykes, 1832	-	2	-	LC	-
	14. Corvidae					
27	<i>Crypsirina temia</i> (Daudin, 1800)	13	36	-	LC	-
	15. Dicaeidae					
28	<i>Dicaeum cruentatum</i> (Linnaeus, 1758)	-	16	-	LC	-
29	<i>Dicaeum ignipectus</i> (Blyth, 1843)	-	3	-	LC	-
	16. Estrildidae					
30	<i>Lonchura punctulata</i> (Linnaeus, 1758)	13	32	-	LC	-
	17. Motacillidae					
31	<i>Motacilla alba</i> Linnaeus, 1758	34	30	-	LC	-
	18. Muscicapidae					
32	<i>Copsychus malabaricus</i> (Scopoli, 1786)	-	1	-	LC	-
33	<i>Copsychus saularis</i> (Linnaeus, 1758)	50	65	-	LC	-
	19. Paridae					
34	<i>Parus minor</i> Temminck & Schlegel, 1848	7	5	-	-	-
	20. Passeridae					
35	<i>Passer flaveolus</i> Blyth, 1845	13	15	-	LC	-
36	<i>Passer montanus</i> (Linnaeus, 1758)	5	4	-	LC	-
	21. Pellorneidae					
37	<i>Graminicola bengalensis</i> Jerdon, 1863	-	5	-	LC	-
	22. Phylloscopidae					
38	<i>Phylloscopus fuscatus</i> (Blyth, 1842)	-	6	-	LC	-
	23. Ploceidae					

	Scientific name	Dry season	Rainy season	Conservation status		
				1	2	3
39	<i>Ploceus philippinus</i> (Linnaeus, 1766)	3	2	-	LC	-
	24. Pycnonotidae					
40	<i>Pycnonotus goiavier</i> (Scopoli, 1786)	62	80	-	LC	-
	25. Rhipiduridae					
41	<i>Rhipidura javanica</i> (Sparrman, 1788)	66	49	-	LC	-
	26. Sturnidae					
42	<i>Acridotheres grandis</i> Moore, 1858	-	17	-	LC	-
	27. Zosteropidae					
43	<i>Zosterops palpebrosus</i> (Temminck, 1824)	30	27	-	LC	-
	X. PELECANIFORMES					
	28. Anhingidae					
44	<i>Anhinga melanogaster</i> Pennant, 1769*	4	3	-	NT	IB
	29. Ardeidae					
45	<i>Ardea alba</i> Linnaeus, 1758*	105	12	-	LC	-
46	<i>Ardea cinerea</i> Linnaeus, 1758*	1	10	-	LC	-
47	<i>Ardea intermedia</i> Wagler, 1829*	180	194	-	LC	-
48	<i>Ardea purpurea</i> Linnaeus, 1766*	1	6	-	LC	-
49	<i>Ardeola bacchus</i> (Bonaparte, 1855)*	-	5	-	LC	-
50	<i>Ardeola speciosa</i> (Horsfield, 1821)*	1	9	-	LC	-
51	<i>Butorides striata</i> (Linnaeus, 1758)*	3	14	-	LC	-
52	<i>Egretta garzetta</i> (Linnaeus, 1766)*	370	585	-	LC	-
53	<i>Nycticorax nycticorax</i> (Linnaeus, 1758)*	247	645	-	LC	-
	30. Ciconiidae					
54	<i>Mycteria leucocephala</i> (Pennant, 1769)*	-	39	VU	LC	-
	31. Phalacrocoracidae					
55	<i>Microcarbo niger</i> (Vieillot, 1817)*	60	142	-	LC	-
	XI. PICIFORMES					
	32. Picidae					
56	<i>Chrysocolaptes lucidus</i> (Scopoli, 1786)	1	11	-	LC	-
57	<i>Picus vittatus</i> Vieillot, 1818	11	18	-	LC	-

Note: —unrecorded/not listed in IUCN or Vietnamese law | Conservation status: 1—in Vietnam Red List Book (2007) | 2—in IUCN Red List (2025): VU—Vulnerable | NT—Near Threatened | LC—Least Concern | 3—according to Decree 06/2019/ND-CP dated 22 January 2019 and updated by Decree 84/2021/ND-CP dated 22 September 2021 of the Government | *—waterbird.

of this wetland.

Species richness and diversity indices varied significantly across transects and between seasons (Table 2; Figures 2–3). Shannon–Wiener diversity index (H') ranged from 1.77–2.93, indicating moderate to high diversity. The highest diversity occurred in the core zone (L10, $H' = 2.93$), while the lowest was in buffer zone (L8, $H' = 1.77$). In contrast, Simpson's dominance index (D) ranged 0.06–0.16, with highest dominance also observed at L8, where bird communities were strongly dominated by *Nycticorax nycticorax* (827 individuals), *Egretta garzetta* (664), *Ardea intermedia* (283), and *Microcarbo niger* (143). This indicates that while the buffer zone (L8) had fewer species, it supported larger populations of a few dominant waterbird species.

Breeding data further support this pattern. The transect L8 recorded eight breeding bird species with approximately 1,500 individuals, while the core zone supported only seven breeding species with around 1,000 individuals—a decline from 2,000 breeding individuals recorded in 2019 (Huynh Duc Hoan et al. 2019). The Sorensen similarity index also indicated the lowest overlap between transect L8 with others sites (Figure 4), suggesting that L8 represents a distinct habitat type now more suitable for breeding. The shift in breeding activity from the core to the buffer zone may reflect localized habitat changes, possibly linked vegetation structure, prey availability, or anthropogenic disturbance.

Similar spatial and seasonal shifts in waterbird assemblages have been reported in other Asian wetlands, where breeding colonies relocate or decline under human pressure (Byju et al. 2025a,c). For instance, studies from India have shown that lagoon and estuarine with high bird abundance are often sensitive to disturbance, resulting in temporal declines in breeding success (Byju et al. 2024, 2025a,b). In CGMBR, the emergence of transect L8 as a new breeding hotspot reflects the dynamic adaptation of waterbird populations to changing habitat conditions within restored mangrove systems.

Overall, our findings highlight both the resilience and vulnerability of avian communities in the bird sanctuary planning zone. The persistence of threatened species and the establishment of new breeding colonies emphasize the conservation value and ecological recovery potential of restored mangroves. However, the decline of core zone breeders indicates emerging habitats stress. Continuous, long-term monitoring, similar to those conducted in other Asian wetlands (Byju et al. 2025b), is therefore essential to evaluate restoration outcomes,

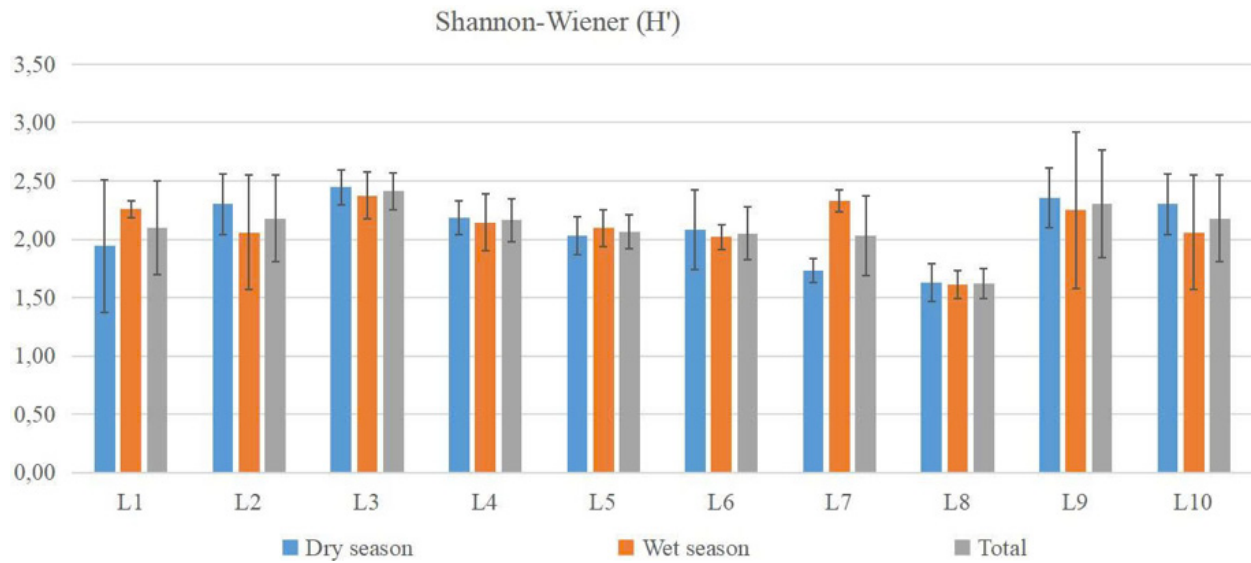


Figure 1. Shannon-Wiener (H') calculated from transect L1–12.

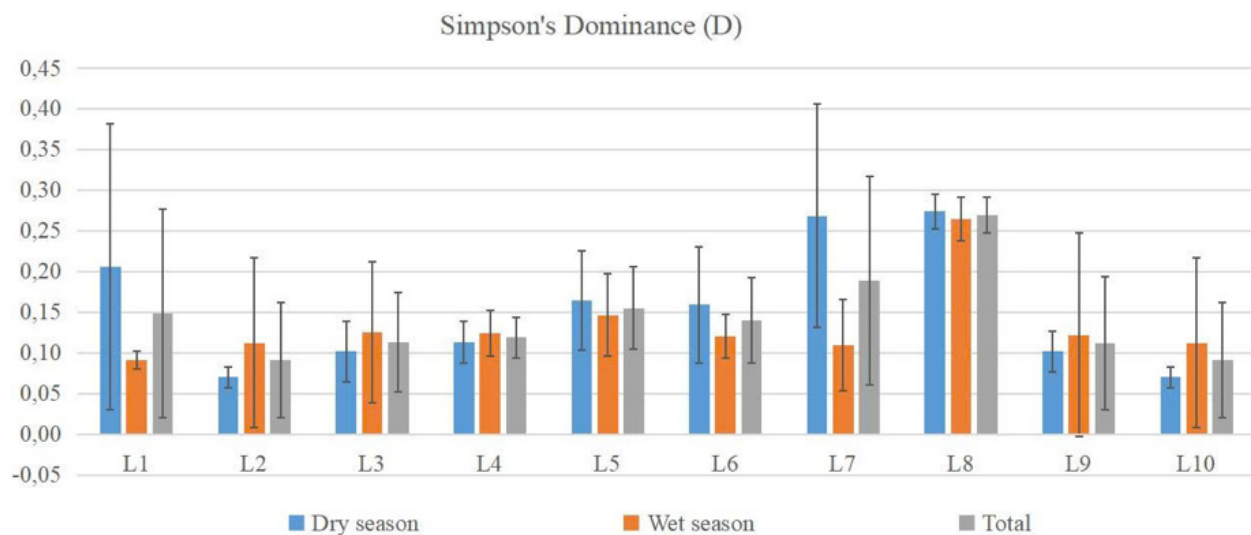


Figure 2. Simpson's dominance (D) calculated from transect L1–12.

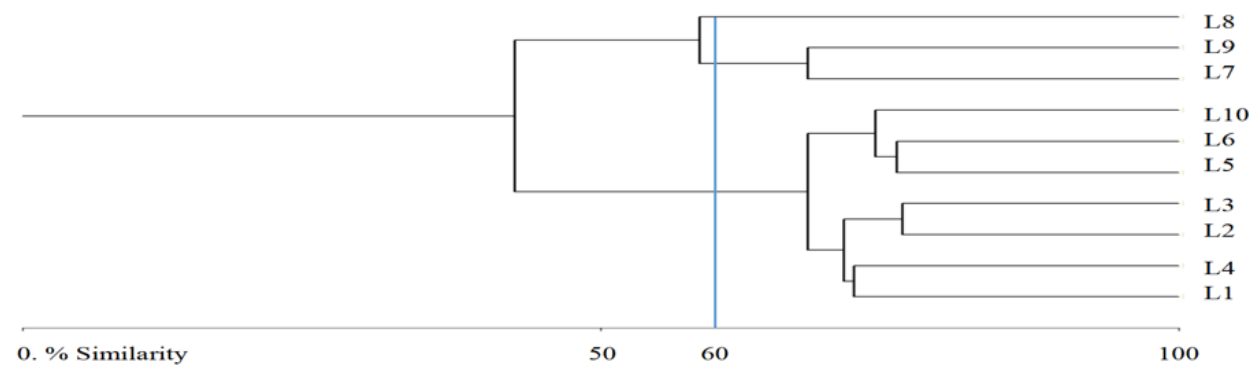


Figure 3. Similarity diagram of bird species composition among 10 transects.

detect ecological shifts, and guide adaptive conservation management in this UNESCO-designated biosphere reserve.

CONCLUSION

The bird sanctuary planning zone within the Can Gio Mangrove Biosphere Reserve supports a relatively high diversity of bird species including four globally and nationally threatened taxa. The discovery of a new breeding area in the buffer zone (transect L8) and the decline in species abundance in the core zone emphasize the need for adaptive management and continuous monitoring.

Preserving the ecological integrity of this wetland is vital for sustaining its role as a key habitat for waterbirds, especially during the breeding season. Future conservation efforts should prioritize habitat protection, environmental education, and the mitigation of anthropogenic pressures to maintain avian biodiversity in this region.

REFERENCES

- Avibase (2025).** Bird checklists - taxonomy - distribution - maps - links. <https://avibase.bsc-eoc.org/avibase.jsp?lang=EN>. Accessed on 14.iv.2025.
- Byju, H., H. Maitreyi, N. Raveendran & R. Vijayan (2024).** Avifaunal diversity assessment and conservation significance of Therthangal Bird Sanctuary, Ramanathapuram, Tamil Nadu: insights about breeding waterbirds. *Journal of Threatened Taxa* 16(9): 25802–25815. <https://doi.org/10.11609/jott.8999.16.9.25802-25815>
- Byju, H., H. Maitreyi, R. Natarajan, R. Vijayan & B.A.V. Maran (2025a).** The avifauna of Ramanathapuram, Tamil Nadu along the southeast coast of India: waterbird assessments and conservation implications across key sanctuaries and Ramsar sites. *PeerJ* 13: e18899. <http://doi.org/10.7717/peerj.18899>
- Byju, H., H. Maitreyi, K.M. Aarif & N. Raveendran (2025b).** Disappearing colonies: temporal decline in abundance and nesting of waterbirds in a key Indian wetland. *Wetlands Ecology and Management* 33: 47. <https://doi.org/10.1007/s11273-025-10067-y>
- Byju, H., H. Maitreyi, N. Raveendran, S. Ravichandran & R. Vijayan (2025c).** Avifaunal diversity and conservation status of waterbirds in Pillaimadam Lagoon, Palk Bay, India. *Journal of Threatened Taxa* 17(4): 26789–26802. <https://doi.org/10.11609/jott.9432.17.4.26789-26802>
- Can Gio District Forest Protection Management Board (2025).** Overview of Can Gio Mangrove Biosphere Reserve. <https://rungngapmancangio.org/>. Electronic version accessed on 14.iv.2025.
- Chairman of Ho Chi Minh City People's Committee (2004).** Decision No. 27/QĐ-UB dated January 6, 2004 on approving the zoning of wild birds and animals in Can Gio protective forest. 3pp. (in Vietnamese).
- Huynh, D.H., N.T.K. Bui, V.T. Phan, N.H. Dang & N.N. Vien (2019).** Current status of bird biodiversity in Vam Sat bird sanctuary in Can Gio Mangrove Biosphere Reserve. *Journal of Agriculture and Rural Development* 1: 69–74.
- IUCN (2025).** The IUCN Red List of Threatened Species. Version 2025-1. <https://www.iucnredlist.org/en>. Electronic version accessed on 14.iv.2025.
- King, B., M. Woodcock & E.C. Dickinson (1997).** *Birds of South-East Asia*. Collins Field Guide series, 480pp.
- Koshiyama, Y. & T. Asano (2019).** *Birds living in Can Gio*. Nam Du Association, 28 pp.
- Le, B.T. (2021).** Summary report of scientific and technological results of the project Research on building a mechanism and model of cooperation between tourism development and sustainable conservation of biodiversity in Can Gio Biosphere Reserve, 462 pp.
- Le, M.H. (2020).** *Birds of Vietnam*. Nha Nam Publishing House, 822 pp.
- McAleece, N., J.D.G. Gage, P.J.D. Lamshead & G.L.J. Paterson (1997).** *BioDiversity Professional Statistics Analysis Software*. Jointly developed by the Scottish Association for Marine Science and the Natural History Museum London.
- Ministry of Science and Technology (2007).** *Vietnam Red List Book, Part I. Animals*. Natural Science and Technology Publishing House, Hanoi, 516 pp. (in Vietnamese)
- Nguyen, C., T.K. Le & K. Phillipps (2000).** *Birds of Vietnam. Labor*. Social Publishing House, Hanoi, 408 pp.
- Nguyen, M.C. (2009).** *Textbook of Statistics in Forestry*. Ho Chi Minh City University of Agriculture and Forestry, 223 pp.
- Prime Minister of Vietnam (2019).** Decree No. 06/2019/ND-CP dated January 22, 2019 on the management of endangered, precious and rare forest plants and animals and the implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora, 87 pp.
- Prime Minister of Vietnam (2021).** Decree No. 84/2021/ND-CP dated September 22, 2021 amending and supplementing a number of articles of Decree No. 06/2019/ND-CP dated January 22, 2019 of the Government on the management of endangered, precious and rare forest plants and animals and the implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora, 34 pp.
- Shannon, C.E. & W. Wiener (1963).** *The Mathematical Theory of Communities*. Illinois: Urbana University, Illinois Press, 131 pp.
- Simpson, E.H. (1949).** Measurement of diversity. *Nature* 163: 688.
- Tran, V.B. (2020).** Biodiversity in Vietnam: Current status and conservation challenges. *Journal of Science and Life* 05: 57–61.
- Vietnam Wildlife Photography Club (2025).** Birds of South East Asia. <https://www.birdwatchingvietnam.net/>. Accessed on 14.iv.2025.
- Vo, Q. (1981).** *Morphology and Classification of Vietnamese birds, Volume II*. Science and Technology Publishing House, 394 pp.
- Yamaura, Y., H. Schmaljohann, S. Lisovski, M. Senzaki, K. Kawamura, Y. Fujimaki & F. Nakamura (2017).** Tracking the Stejneger's stonechat *Saxicola stejnegeri* along the East Asian - Australian Flyway from Japan via China to southeast Asia. *Journal of Avian Biology* 48: 197–202.

Appendix 1. Species counts (SC) and individual encounters (IE) in survey transects.

Transect		L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	Total
All transects	IE	204	256	387	219	242	188	327	2,197	515	143	4,678
	(%)	4.4	5.5	8.3	4.7	5.2	4.0	7.0	47.0	11.0	3.1	100.0
	SC	21	28	32	29	25	24	35	33	36	25	57
	(%)	36.8	49.1	56.1	50.9	43.9	42.1	61.4	57.9	63.2	43.9	100.0
Dry season	IE	91	135	162	70	83	81	122	726	383	46	1,899
	(%)	4.8	7.1	8.5	3.7	4.4	4.3	6.4	38.2	20.2	2.4	100.0
	SC	17	20	22	19	16	14	24	22	23	15	42
	(%)	41.5	48.8	53.7	46.3	39.0	34.1	58.5	53.7	56.1	36.6	100.0
Rainy season	IE	113	121	225	149	159	107	205	1,471	132	97	2,779
	(%)	4.1	4.4	8.1	5.4	5.7	3.9	7.4	52.9	4.7	3.5	100.0
	SC	20	23	28	23	22	21	27	29	32	23	54
	(%)	37.7	43.4	52.8	43.4	41.5	39.6	50.9	54.7	60.4	43.4	100.0

Vietnamese abstract: Trong giai đoạn từ tháng 7 năm 2024 đến tháng 5 năm 2025, sáu đợt khảo sát được tiến hành theo định kỳ hai tháng trên 10 tuyến cố định (năm tuyến trong vùng lõi và năm tuyến trong vùng đệm) nhằm đánh giá thành phần loài và sự phân bố của chim tại Khu Quy Hoạch Sân Chim thuộc Khu Dự trữ sinh quyển Rừng ngập mặn Cần Giờ, sau 47 năm phục hồi (1978–2025). Kết quả ghi nhận 57 loài chim thuộc 11 bộ, 32 họ và 45 chi, trong đó có 18 loài chim nước. Bốn loài được xếp vào nhóm nguy cấp, cần ưu tiên bảo tồn theo Danh lục Đỏ IUCN, Sách Đỏ Việt Nam và pháp luật hiện hành, bao gồm: *Porzana paykullii* (Sắp nguy cấp), *Anhinga melanogaster* và *Mycteria leucocephala* (Sẽ nguy cấp), cùng *Milvus migrans* và *Anhinga melanogaster* (được bảo vệ theo pháp luật hiện hành). Bộ Sẻ (Passeriformes) đa dạng loài nhất (21 loài), trong khi bộ Chim diên điểm (Pelecaniformes) ghi nhận số cá thể nhiều nhất (2.427 cá thể). Chỉ số đa dạng Shannon-Wiener đạt mức tương đối cao ($H' = 2,60 \pm 0,34$) và chỉ số ưu thế Simpson ở mức trung bình ($D = 0,12 \pm 0,06$). Sự phong phú và đa dạng loài có sự biến động theo mùa và giữa các tuyến khảo sát, trong đó mùa mưa có xu hướng cao hơn, nhưng không khác biệt có ý nghĩa thống kê. Riêng tuyến L8 thuộc vùng đệm thể hiện sự khác biệt rõ rệt, được ghi nhận như một khu sinh sản mới với tám loài chim và khoảng 1.500 cá thể, chủ yếu có sự hiện diện của các loài chim nước như *Nycticorax nycticorax*, *Egretta garzetta*, *Ardea intermedia* và *Microcarbo niger*. So với nghiên cứu năm 2019, số loài chim sinh sản trong vùng lõi giảm xuống còn bảy loài với khoảng 1.000 cá thể, trong khi vùng đệm lại xuất hiện một khu sinh sản mới với quy mô lớn hơn. Kết quả này cho thấy sự thay đổi về phân bố sinh sản của chim trong Khu Quy Hoạch Sân Chim, đồng thời nhấn mạnh sự cần thiết của việc giám sát lâu dài và áp dụng các biện pháp bảo tồn để duy trì và quản lý tính đa dạng chim tại hệ sinh thái đất ngập nước quan trọng này.

Author details: HUYNH DUC HIEU, specialist at the Forest Protection Management Department, Management Board of Protective and Special-use Forests of Ho Chi Minh City. He has over four years of experience in forest resource management and mangrove ecosystem conservation including monitoring forest resource dynamics, implementing biodiversity conservation programs, and supporting forest restoration and silvicultural projects. HUYNH DUC HOAN, director of the Management Board of Protective and Special-use Forests of Ho Chi Minh City. With 26 years of experience, he leads the management, protection, and sustainable development of the city's protective forests and the Can Gio Mangrove Biosphere Reserve. His expertise includes silviculture, biodiversity assessment, conservation management, ecotourism, and environmental education. BUI NGUYEN THE KIET, with 18 years of experience in forest resource management and biodiversity conservation. He leads Resource Development and Cooperation at the Management Board of Protective and Special-use Forests of Ho Chi Minh City. His work focuses on strategic planning and sustainable development within mangrove ecosystems and biosphere reserves to strengthening ecosystem resilience and community engagement. DANG NGOC HIEP, specialist in the Department of Resource Development and Cooperation. With nine years of experience, she contributes to the management and sustainable development of protective forests, including the Can Gio Mangrove Biosphere Reserve. Her interests cover silviculture, biodiversity assessment, conservation management, ecotourism, and environmental education. NGUYEN THI PHUONG LINH, forestry engineer at the Department of Resource Development and Cooperation, with over three years of experience in forest resource management and mangrove conservation. She works on monitoring forest changes, supporting forest development programs, and coordinating community-based activities. She also implements environmental communication and education initiatives in conservation. NGUYEN DANG HOANG VU, researcher at the Institute of Life Science, Vietnam Academy of Science and Technology, with 13 years of experience. His work focuses on biodiversity, including integrative taxonomy, species discovery, ecology, and distribution modeling. He develops conservation strategies for threatened species, engages citizen scientists, sustainable amphibian and reptile farming.

Author contributions: Huynh Duc Hieu developed the research idea. Huynh Duc Hieu, Bui Nguyen The Kiet, Dang Ngoc Hiep and Nguyen Thi Phuong Linh collected the data. Dang Ngoc Hiep and Huynh Duc Hieu analysed the data and wrote the first draft. Huynh Duc Hoan, Huynh Duc Hieu and Nguyen Dang Hoang Vu edited the final draft. Nguyen Dang Hoang Vu submitted the manuscript to the journal.

Mr. Jatishwor Singh Irungbam, Biology Centre CAS, Branišovská, Czech Republic.
 Dr. Ian J. Kitching, Natural History Museum, Cromwell Road, UK
 Dr. George Mathew, Kerala Forest Research Institute, Peechi, India
 Dr. John Noyes, Natural History Museum, London, UK
 Dr. Albert G. Orr, Griffith University, Nathan, Australia
 Dr. Sameer Padhye, Katholieke Universiteit Leuven, Belgium
 Dr. Nancy van der Poorten, Toronto, Canada
 Dr. Kareen Schnabel, NIWA, Wellington, New Zealand
 Dr. R.M. Sharma, (Retd.) Scientist, Zoological Survey of India, Pune, India
 Dr. Manju Siliwal, WILD, Coimbatore, Tamil Nadu, India
 Dr. G.P. Sinha, Botanical Survey of India, Allahabad, India
 Dr. K.A. Subramanian, Zoological Survey of India, New Alipore, Kolkata, India
 Dr. P.M. Sureshan, Zoological Survey of India, Kozhikode, Kerala, India
 Dr. R. Varatharajan, Manipur University, Imphal, Manipur, India
 Dr. Eduard Vives, Museu de Ciències Naturals de Barcelona, Terrassa, Spain
 Dr. James Young, Hong Kong Lepidopterists' Society, Hong Kong
 Dr. R. Sundararaj, Institute of Wood Science & Technology, Bengaluru, India
 Dr. M. Nithyanandan, Environmental Department, La Ala Al Kuwait Real Estate. Co. K.S.C., Kuwait
 Dr. Himender Bharti, Punjabi University, Punjab, India
 Mr. Purnendu Roy, London, UK
 Mr. Saito Motoki, The Butterfly Society of Japan, Tokyo, Japan
 Dr. Sanjay Sondhi, TITLI TRUST, Kalpavriksh, Dehradun, India
 Dr. Nguyen Thi Phuong Lien, Vietnam Academy of Science and Technology, Hanoi, Vietnam
 Dr. Nitin Kulkarni, Tropical Research Institute, Jabalpur, India
 Dr. Robin Wen Jiang Ngiam, National Parks Board, Singapore
 Dr. Lionel Monod, Natural History Museum of Geneva, Genève, Switzerland.
 Dr. Asheesh Shivam, Nehru Gram Bharti University, Allahabad, India
 Dr. Rosana Moreira da Rocha, Universidade Federal do Paraná, Curitiba, Brasil
 Dr. Kurt R. Arnold, North Dakota State University, Saxony, Germany
 Dr. James M. Carpenter, American Museum of Natural History, New York, USA
 Dr. David M. Claborn, Missouri State University, Springfield, USA
 Dr. Kareen Schnabel, Marine Biologist, Wellington, New Zealand
 Dr. Amazonas Chagas Júnior, Universidade Federal de Mato Grosso, Cuiabá, Brasil
 Mr. Monsoon Jyoti Gogoi, Assam University, Silchar, Assam, India
 Dr. Heo Chong Chin, Universiti Teknologi MARA (UiTM), Selangor, Malaysia
 Dr. R.J. Shiel, University of Adelaide, SA 5005, Australia
 Dr. Siddharth Kulkarni, The George Washington University, Washington, USA
 Dr. Priyadarsanan Dharma Rajan, ATREE, Bengaluru, India
 Dr. Phil Alderslade, CSIRO Marine And Atmospheric Research, Hobart, Australia
 Dr. John E.N. Veron, Coral Reef Research, Townsville, Australia
 Dr. Daniel Whitmore, State Museum of Natural History Stuttgart, Rosenstein, Germany.
 Dr. Yu-Feng Hsu, National Taiwan Normal University, Taipei City, Taiwan
 Dr. Keith V. Wolfe, Antioch, California, USA
 Dr. Siddharth Kulkarni, The Hormiga Lab, The George Washington University, Washington, D.C., USA
 Dr. Tomas Ditrich, Faculty of Education, University of South Bohemia in Ceske Budejovice, Czech Republic
 Dr. Mihaly Foldvari, Natural History Museum, University of Oslo, Norway
 Dr. V.P. Uniyal, Wildlife Institute of India, Dehradun, Uttarakhand 248001, India
 Dr. John D. Caleb, Zoological Survey of India, Kolkata, West Bengal, India
 Dr. Priyadarsanan Dharma Rajan, Ashoka Trust for Research in Ecology and the Environment (ATREE), Royal Enclave, Bangalore, Karnataka, India

Fishes

Dr. Topiltzin Contreras MacBeath, Universidad Autónoma del estado de Morelos, México
 Dr. Heok Hee Ng, National University of Singapore, Science Drive, Singapore
 Dr. Rajeev Raghavan, St. Albert's College, Kochi, Kerala, India
 Dr. Robert D. Sluka, Chiltern Gateway Project, A Rocha UK, Southall, Middlesex, UK
 Dr. E. Vivekanandan, Central Marine Fisheries Research Institute, Chennai, India
 Dr. Davor Zanella, University of Zagreb, Zagreb, Croatia
 Dr. A. Biju Kumar, University of Kerala, Thiruvananthapuram, Kerala, India
 Dr. Akhilesh K.V., ICAR-Central Marine Fisheries Research Institute, Mumbai Research Centre, Mumbai, Maharashtra, India
 Dr. J.A. Johnson, Wildlife Institute of India, Dehradun, Uttarakhand, India
 Dr. R. Ravinesh, Gujarat Institute of Desert Ecology, Gujarat, India

Amphibians

Dr. Sushil K. Dutta, Indian Institute of Science, Bengaluru, Karnataka, India
 Dr. Annemarie Ohler, Muséum national d'Histoire naturelle, Paris, France

Reptiles

Dr. Gernot Vogel, Heidelberg, Germany
 Dr. Raju Vyas, Vadodara, Gujarat, India
 Dr. Pritpal S. Soorae, Environment Agency, Abu Dhabi, UAE.
 Prof. Dr. Wayne J. Fuller, Near East University, Mersin, Turkey
 Prof. Chandrashekhar U. Rivonker, Goa University, Taleigao Plateau, Goa. India
 Dr. S.R. Ganesh, Chennai Snake Park, Chennai, Tamil Nadu, India
 Dr. Himansu Sekhar Das, Terrestrial & Marine Biodiversity, Abu Dhabi, UAE

Journal of Threatened Taxa is indexed/abstracted in Bibliography of Systematic Mycology, Biological Abstracts, BIOSIS Previews, CAB Abstracts, EBSCO, Google Scholar, Index Copernicus, Index Fungorum, JournalSeek, National Academy of Agricultural Sciences, NewJour, OCLC WorldCat, SCOPUS, Stanford University Libraries, Virtual Library of Biology, Zoological Records.

NAAS rating (India) 5.64

Birds

Dr. Hem Sagar Baral, Charles Sturt University, NSW Australia
 Mr. H. Byju, Coimbatore, Tamil Nadu, India
 Dr. Chris Bowden, Royal Society for the Protection of Birds, Sandy, UK
 Dr. Priya Davidar, Pondicherry University, Kalapet, Puducherry, India
 Dr. J.W. Duckworth, IUCN SSC, Bath, UK
 Dr. Rajah Jayapal, SAGON, Coimbatore, Tamil Nadu, India
 Dr. Rajiv S. Kalsi, M.L.N. College, Yamuna Nagar, Haryana, India
 Dr. V. Santharam, Rishi Valley Education Centre, Chittoor Dt., Andhra Pradesh, India
 Dr. S. Balachandran, Bombay Natural History Society, Mumbai, India
 Mr. J. Praveen, Bengaluru, India
 Dr. C. Srinivasulu, Osmania University, Hyderabad, India
 Dr. K.S. Gopi Sundar, International Crane Foundation, Baraboo, USA
 Dr. Gombobaatar Sunde, Professor of Ornithology, Ulaanbaatar, Mongolia
 Prof. Reuven Yosef, International Birding & Research Centre, Eilat, Israel
 Dr. Taej Mundkur, Wetlands International, Wageningen, The Netherlands
 Dr. Carol Inskipp, Bishop Auckland Co., Durham, UK
 Dr. Tim Inskipp, Bishop Auckland Co., Durham, UK
 Dr. V. Gokula, National College, Tiruchirappalli, Tamil Nadu, India
 Dr. Arkady Lelej, Russian Academy of Sciences, Vladivostok, Russia
 Dr. Simon Dowell, Science Director, Chester Zoo, UK
 Dr. Mário Gabriel Santiago dos Santos, Universidade de Trás-os-Montes e Alto Douro, Quinta de Prados, Vila Real, Portugal
 Dr. Grant Connette, Smithsonian Institution, Royal, VA, USA
 Dr. P.A. Azeez, Coimbatore, Tamil Nadu, India

Mammals

Dr. Giovanni Amori, CNR - Institute of Ecosystem Studies, Rome, Italy
 Dr. Anwaruddin Chowdhury, Guwahati, India
 Dr. David Mallon, Zoological Society of London, UK
 Dr. Shomita Mukherjee, SAGON, Coimbatore, Tamil Nadu, India
 Dr. Angie Appel, Wild Cat Network, Germany
 Dr. P.O. Nameer, Kerala Agricultural University, Thrissur, Kerala, India
 Dr. Ian Redmond, UNEP Convention on Migratory Species, Lansdown, UK
 Dr. Heidi S. Riddle, Riddle's Elephant and Wildlife Sanctuary, Arkansas, USA
 Dr. Karin Schwartz, George Mason University, Fairfax, Virginia.
 Dr. Lala A.K. Singh, Bhubaneswar, Orissa, India
 Dr. Mewa Singh, Mysore University, Mysore, India
 Dr. Paul Racey, University of Exeter, Devon, UK
 Dr. Honnavalli N. Kumara, SAGON, Anaikatty P.O., Coimbatore, Tamil Nadu, India
 Dr. Nishith Dharaiya, HNG University, Patan, Gujarat, India
 Dr. Spartaco Gippoliti, Socio Onorario Società Italiana per la Storia della Fauna "Giuseppe Altobello", Rome, Italy
 Dr. Justus Joshua, Green Future Foundation, Tiruchirappalli, Tamil Nadu, India
 Dr. H. Raghuram, Sri S. Ramasamy Naidu Memorial College, Virudhunagar, Tamil Nadu, India
 Dr. Paul Bates, Harison Institute, Kent, UK
 Dr. Jim Sanderson, Small Wild Cat Conservation Foundation, Hartford, USA
 Dr. Dan Challender, University of Kent, Canterbury, UK
 Dr. David Mallon, Manchester Metropolitan University, Derbyshire, UK
 Dr. Brian L. Cypher, California State University-Stanislaus, Bakersfield, CA
 Dr. S.S. Talmale, Zoological Survey of India, Pune, Maharashtra, India
 Prof. Karan Bahadur Shah, Budhanilakantha Municipality, Kathmandu, Nepal
 Dr. Susan Cheyne, Borneo Nature Foundation International, Palangkaraja, Indonesia
 Dr. Hemanta Kafley, Wildlife Sciences, Tarleton State University, Texas, USA

Other Disciplines

Dr. Aniruddha Belsare, Columbia MO 65203, USA (Veterinary)
 Dr. Mandar S. Paingankar, University of Pune, Pune, Maharashtra, India (Molecular)
 Dr. Jack Tordoff, Critical Ecosystem Partnership Fund, Arlington, USA (Communities)
 Dr. Ulrike Streicher, University of Oregon, Eugene, USA (Veterinary)
 Dr. Hari Balasubramanian, EcoAdvisors, Nova Scotia, Canada (Communities)
 Dr. Rayanna Hellem Santos Bezerra, Universidade Federal de Sergipe, São Cristóvão, Brazil
 Dr. Jamie R. Wood, Landcare Research, Canterbury, New Zealand
 Dr. Wendy Collinson-Jonker, Endangered Wildlife Trust, Gauteng, South Africa
 Dr. Rajeshkumar G. Jani, Anand Agricultural University, Anand, Gujarat, India
 Dr. O.N. Tiwari, Senior Scientist, ICAR-Indian Agricultural Research Institute (IARI), New Delhi, India
 Dr. L.D. Singla, Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana, India
 Dr. Rupika S. Rajakaruna, University of Peradeniya, Peradeniya, Sri Lanka
 Dr. Bahar Baviskar, Wild-CER, Nagpur, Maharashtra 440013, India

Reviewers 2021–2023

Due to pausity of space, the list of reviewers for 2021–2023 is available online.

The opinions expressed by the authors do not reflect the views of the Journal of Threatened Taxa, Wildlife Information Liaison Development Society, Zoo Outreach Organization, or any of the partners. The journal, the publisher, the host, and the partners are not responsible for the accuracy of the political boundaries shown in the maps by the authors.

Print copies of the Journal are available at cost. Write to:
 The Managing Editor, JoTT,
 c/o Wildlife Information Liaison Development Society,
 3A2 Varadarajulu Nagar, FCI Road, Ganapathy, Coimbatore,
 Tamil Nadu 641006, India
 ravi@threatenedtaxa.org & ravi@zooreach.org



OPEN ACCESS



The Journal of Threatened Taxa (JoTT) is dedicated to building evidence for conservation globally by publishing peer-reviewed articles online every month at a reasonably rapid rate at www.threatenedtaxa.org. All articles published in JoTT are registered under [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/) unless otherwise mentioned. JoTT allows unrestricted use, reproduction, and distribution of articles in any medium by providing adequate credit to the author(s) and the source of publication.

ISSN 0974-7907 (Online) | ISSN 0974-7893 (Print)

November 2025 | Vol. 17 | No. 11 | Pages: 27787–28010

Date of Publication: 26 November 2025 (Online & Print)

DOI: 10.11609/jott.2025.17.11.27787-28010

www.threatenedtaxa.org

Articles

Morpho-taxonomic studies on the genus *Fissidens* Hedw. (Bryophyta: Fissidentaceae) in Senapati District, Manipur, India

– Kholi Kaini & Kazhuhrii Eshuo, Pp. 27787–27796

Ecology and conservation concerns of *Indianthus virgatus* (Marantaceae): an endemic species of the Western Ghats–Sri Lanka Biodiversity Hotspot

– Shreekara Bhat Vishnu, Vivek Pandi, Bhathiya Gopallawa, Rajendiran Gayathri, B. Mahim, Deepthi Yakandawala & Annamalai Muthusamy, Pp. 27797–27805

An updated floral diversity of Tal Chhapar Wildlife Sanctuary, Rajasthan, India

– Sneha Singh & Orus Ilyas, Pp. 27806–27821

An updated checklist of the family Rosaceae in Arunachal Pradesh, India

– Pinaki Adhikary & P.R. Gajurel, Pp. 27822–27841

Restoring biodiversity: case studies from two sacred groves of Kozhikode District, Kerala, India

– K. Kishore Kumar, Pp. 27842–27853

A preliminary investigation on wing morphology, flight patterns, and flight heights of selected odonates

– Ananditha Pascal & Chelmala Srinivasulu, Pp. 27854–27862

Phylogenetic confirmation of generic allocation and specific distinction of Mawphlang Golden-cheeked Frog *Odorrana mawphlangensis* (Pillai & Chanda, 1977) (Amphibia: Anura: Ranidae) and its updated distribution records

– Angshuman Das Tariang, Mathipi Vabeiryureilai, Fanai Malsawmdawngliana & Hmar Tlawmte Lalremsanga, Pp. 27863–27873

Phenotypic and genotypic variability in the Snowtrout *Schizothorax richardsonii* (Cypriniformes: Cyprinidae) wild populations from central Himalayan tributaries of the Ganga River basin

– Yasmeen Kousar, Mahender Singh & Deepak Singh, Pp. 27874–27888

Avian composition and distribution in the bird sanctuary planning zone of Can Gio Mangrove Biosphere Reserve, Ho Chi Minh City, Vietnam

– Huynh Duc Hieu, Huynh Duc Hoan, Bui Nguyen The Kiet, Dang Ngoc Hiep, Nguyen Thi Phuong Linh & Nguyen Dang Hoang Vu, Pp. 27889–27896

Bat echolocation in South Asia

– Aditya Srinivasulu, Chelmala Srinivasulu, Bhargavi Srinivasulu, Deepa Senapathi & Manuela González-Suárez, Pp. 27897–27931

A checklist of the mammals of Jammu & Kashmir, India

– Muzaffar A. Kichloo, Ajaz Ansari, Khursheed Ahmad & Neeraj Sharma, Pp. 27932–27945

Communications

Notes on distribution, identification and typification of the Elongated Sweet Grass *Anthoxanthum hookeri* (Aveneae: Poaceae) with comparative notes on *A. borii*

– Manoj Chandran, Kuntal Saha, Ranjana Negi & Saurabh Guleri, Pp. 27946–27953

Conservation significance of Yelakundli Sacred Grove: a relic population of the endemic dipterocarp *Vateria indica* L.

– G. Ramachandra Rao, Pp. 27954–27959

A preliminary study of fish diversity in Sirum River of East Siang District, Arunachal Pradesh, India

– Obinam Tayeng, Leki Wangchu & Debangshu Narayan Das, Pp. 27960–27969

Preliminary investigation on morphometrics and habitat of the Indian Flapshell Turtle *Lissemys punctata* (Bonnaterre, 1789) (Reptilia: Trionychidae) in rural wetlands of Alappuzha, Kerala, India

– Sajan Sunny, Appiyathu Saraswathy Vijayasree, Nisha Thomas Panikkaveetil & E. Sherly Williams, Pp. 27970–27975

A preliminary assessment of avifaunal diversity in Parwati Arga Bird Sanctuary, Uttar Pradesh, India

– Yashmita-Ulman & Manoj Singh, Pp. 27976–27984

Sightings of the Rusty-spotted Cat *Prionailurus rubiginosus* (I. Geoffroy Saint-Hilaire, 1831) (Mammalia: Carnivora: Felidae) in Saurashtra Peninsula, Gujarat, India

– Raju Vyas, Pranav Vaghshiya & Devendra Chauhan, Pp. 27985–27991

Short Communications

Abundance and distribution of the Critically Endangered Giant Staghorn Fern *Platyserium grande* (A.Cunn. ex Hook.) J.Sm. in Maguindanao del Sur, BARMM, Philippines

– Marylene M. Demapitan, Roxane B. Sombero, Datu Muhaymin C. Abo, Nof A. Balabagan & Cherie Cano-Mangaoang, Pp. 27992–27996

***Bonnaya gracilis* a novel find for the flora of Uttarakhand, India**

– Monal R. Jadhav, Revan Y. Chaudhari & Tanveer A. Khan, Pp. 27997–28000

Notes

Crab eating crab: first record of the Horn-eyed Ghost Crab *Ocypode brevicornis* preying on the Mottled Light-footed Crab *Grapsus albolineatus* in Visakhapatnam, India

– Harish Prakash, M.K. Abhisree & Rohan Kumar, Pp. 28001–28003

First record of Greater Scaup *Aythya marila* in Farakka IBA near West Bengal & Jharkhand border, India

– Subhro Paul, Sudip Ghosh & J. Jiju Jaesper, Pp. 28004–28006

Filling the gap: first regional record of the Little Owl *Athene noctua ludlowi* (Strigiformes: Strigidae) from Uttarakhand, India

– Anuj Joshi, Dhanesh Ponnu, Vineet K. Dubey & Sambandam Sathyakumar, Pp. 28007–28010

Publisher & Host



Threatened Taxa