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Research Article

Unlocking the Avian Diversity of Sorong District, Southwest Papua, Indonesia: A High Conservation Value Perspective

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ABSTRACT

Sorong District, situated in the Southwest Papua Province of Indonesia, boasts exceptional avian diversity, attributed to its unique ecosystems and diverse range of habitats including dense forests, wetlands, and lowland ecosystems. This study documents the avian diversity from 5 subdistricts across 14 villages in Sorong District, viz. Kasimle, Klafdalim, Klaforo, Klasarin, Klasof, Matawolot, Ninjemur, Sakamerin, Wonosobo, Asbaken, Rawa Sugi, Klasowoh, Malaguptuk, and Wayankede. This study is the first to document bird diversity in Sorong District within the broader context of identifying High Conservation Value (HCV) areas. Utilizing an HCV framework, the research pinpoints critical habitats and endemic species should be focused for biodiversity conservation. During the study, seventy-four bird species were recorded belonging to 31) families and 13 orders. The findings underscore the necessity of integrating conservation priorities with active involvement from local communities to protect Sorong's avian biodiversity. Moreover, this study alsohighlights the global importance of Sorong District as a significant biodiversity hotspot, emphasizing the need for sustainable land-use management. Recommendations are provided for key areas and actions to preserve bird diversity and the habitats and landscapes that support the sustainability of High Conservation Value areas.

Key words: New Guinea, Species Checklist, Diversity, Ornithology, Birds Survey

INTRODUCTION

Biodiversity is essential for maintaining ecosystem stability and resilience, particularly in areas of high conservation value (HCV) (Myers *et al.,* 2000). Indonesia is renowned for its remarkable biodiversity and ranking fourth globally regarding bird species richness (Nursanti *et al.,* 2023). The Southwest Papua Province, located in the eastern part of Indonesia, is recognized as one of the richest biodiversity regions on the planet (Mangubhai *et al*. 2012; Cámara-Leret *et al*. 2020; Schrader *et al*. 2020). Within this province, Sorong District, situated in the southwestern area of Papua, is of extraordinary ecological importance, supporting critical ecosystems and an impressive diversity of avian species. This region is distinguished by a notable degree of endemism, hence it is essential to enlist the species to prioritize the conservation of bird diversity (Beehler *et al.,* 1986; Beehler *et al.,* 2001; Mack & Wright, 1998). Birds serve as key indicators of ecosystem health and fulfil vital roles as pollinators, seed dispersers, and predators (Kissling *et al.,* 2012; Sodhi *et al.,* 2004). Characterized by various ecosystems, including lowland rainforests, mangroves, and montane forests, Sorong District is a crucial habitat for many bird species. However, the region has faced significant biodiversity loss, due to urban expansion and land conversion (Puspitasari *et al.,* 2021).

New Guinean birds are always drawing the attention of visitors, researchers, poachers, and even bird collectors. Several avifauna studies conducted on the Indonesian Papua region are mainly related to their diversity, and with the facts that such studies are still limited to regional coverage, however the information on avifaunal diversity needs to be updated regularly. Reports on avifaunal studies are also limited to national journals; most are published in Bahasa. The last species composition of Numfor Island was recorded by Warsito & Yuliana in 2007 and reported to be 46 species. The same study also highlighted the possibility of key species existence for cultural and ecological protection.

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Inventory study on water birds in wetlands of Wasur National Park, Merauke was carried out by Winara (2015), while comparison of birds' diversity in three types of habitats (i.e plantation forest, natural forest, and horticultural land) within the educational forest of Papua University in Manokwari was reported by Mainase *et al.* (2016). Avifaunal study by Warsito *et al.* (2018) focuses on the compositions and distribution of birds in protected forests of South Sorong in West Papua. Studies on birds of paradise diversity in Malagufuk, Sorong (Pattiwael & Turot, 2020) and Yapen Island (Womsiwor *et al.,* 2024) also contribute to updating the information on New Guinea avifauna diversity.

Meanwhile, Sorong is known as a home for at least 336 bird species, encompassing 42% of recognized species in the Indonesian New Guinea region (Avibase, 2024). Several bird species endemics to the Bird's Head Peninsula can be found in Sorong, including the Wilson's Bird-of-Paradise (*Diphyllodes respublica*) and the Western Crowned Pigeon (*Goura cristata*). Both species hold global significance due to their restricted geographic ranges and associated conservation issues (BirdLife International, 2024). Research suggests that the unique combination of isolated geography and diverse microhabitats in Sorong has played a crucial role in the evolution of its endemic avifauna, establishing the region as a biodiversity hotspot of international importance (Kisokau, 1976; Mayr, 1941).

Despite its ecological importance, the region is increasingly threatened by deforestation, habitat degradation, and climate change (Margono *et al.,* 2014). These activities not only diminish habitats but also put the survival of numerous bird species at risk (Sodhi *et al.,* 2010). These pressures highlight the urgent need for effective conservation strategies based on a comprehensive understanding of Sorong's avifauna. Therefore, understanding the distribution and diversity of birds within the High Conservation Value (HCV) areas of Sorong District is essential for sustainable conservation planning and policy development. By identifying critical species and habitats, this study aims to provide valuable insights into biodiversity conservation strategies that align with sustainable development goals . This paper seeks to emphasize the importance of Sorong District as a vital habitat for bird biodiversity, particularly focusing on its endemic species, to advocate for its prioritization in both regional and global conservation initiatives.

The High Conservation Value (HCV) framework serves as a practical approach for identifying and managing ecologically significant habitats (Jennings *et al.,* 2003). This study also examineed avian diversity across 14 villages in the Sorong District, which includes lowland forests, riparian zones, and agricultural landscapes. However we concentrate mainly on two groups of birds: waterbirds, which rely on wetlands for crucial activities such as foraging and nesting, and forest-terrestrial birds, which may occasionally utilize wetland areas for food and shelter. Species diversity, defined as the number of distinct bird species present in a given area (Rajpar & Zakaria, 2010), offers valuable insights into the complexity and distribution of bird populations.

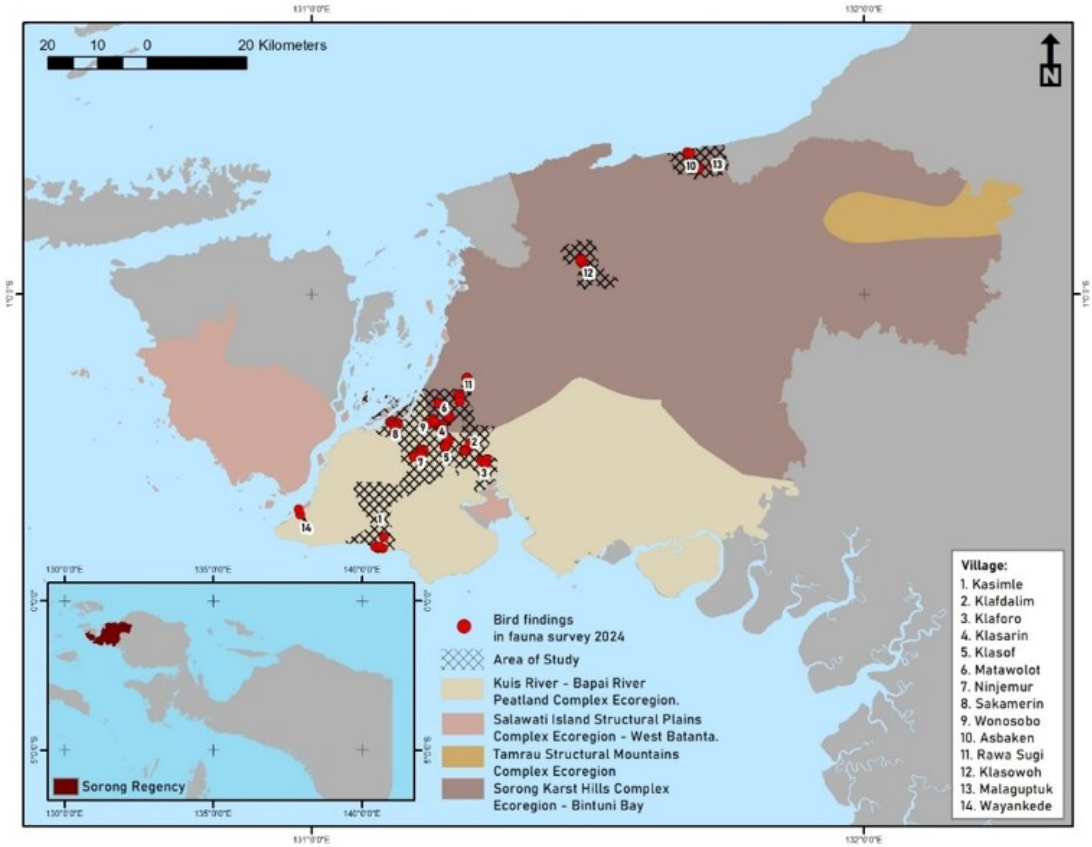

Figure 1. A map of Sorong District that highlights the study area, shows where various bird species were encountered during our research, and details the classification of the ecoregion.

MATERIAL AND METHODS

Location of Study

Sorong District spans a diverse landscape of tropical rainforests, lowland wetlands, savannas, and agricultural zones. Its proximity to the Vogelkop Peninsula and its unique ecological characteristics makes it a biodiversity hotspot (Beehler *et al.,* 1986). The study was conducted between October 1st to 31, 2024, across 14 villages from 5 subdistricts of Sorong District, Southwest Papua, Indonesia, encompassing a range of habitats, including lowland rainforests, mangroves, and montane forests (Table 1). We employed the Visual Encounter Survey (VES) method to assess bird biodiversity, which is widely used for avian studies in tropical ecosystems (Bibby *et al.,* 2000). Surveys were conducted during peak bird activity periods in the morning (05:30–10:00) and late afternoon (15:30–18:00) to maximize observation opportunities. Every village was observed for three days by five active observers. The study area covering 14 villages was mapped within their corresponding ecoregion classification, and locations where birds were encountered during the survey, including surveyed area (sq. km) and manhour effort at each subdistrict, are presented in Figure 1.

Five different subdistricts and their villages were selected as a sample of the region to record the diversity of bird species. Moisegen Subdistrict consists of several villages comprising coastal mangroves and inland secondary rainforests, makes it a significant area for conservation and ecological studies. Makbon Subdistrict is predominantly covered by tropical primary and secondary rainforests, which are rich in biodiversity and play a crucial role in the region's ecological balance (Turot *et al*. 2025). Salawati Subdistrict has patches of tropical secondary rainforests and mangrove ecosystems along its coastal areas. These mangroves are essential for coastal protection and breeding grounds for various

Table 1. Observation sites of the Sorong District for Birds biodiversity

No	Subdistricts (Kecamatan/Distrik)	Villages/ Kampung	Type of habitats	Area (sq. km)	Manhour efforts
1.	Moisegen	1. Kasimle 2. Klafdalim 3. Klaforo 4. Klasarin 5. Klasof 6. Matawolot 7. Ninjemur 8. Sakamerin 9. Wonosobo	Coastal mangroves, inland tropical rainforests, and areas that have undergone land-use changes due to agricultural activities. Oil palm plantation in Ninjemur-Klasof-Klafdalim-Klaforo; Seaside forest in Kasimle; Klasarin and Matawolot with lowland horticultural fields and open grass area for cattle grazing sites; the lowland tropical secondary forest and mangrove area in Sakamerin; and Wonosobo representing lowland agricultural areas with long history as cultivation practices.	404.57	945
2.	Makbon	10. Asbaken	Hilly tropical rainforests bordering the sea with steep cliffs along seashores and some patches of white-sand beaches.	40.68	105
3.	Salawati	11. Rawa Sugi	Wetlands, lowland agricultural area, with coastal mangroves and inland secondary forest.	3.51	105
4.	Klayili	12. Klasowoh 13. Malaguptuk	Tropical rainforests, consisted of primary and secondary forests.	79.93	210
5.	Segun	14. Wayankede	A riparian ecosystem and gentle plain in a coastal area, characterized by abundant coconut trees and an extensive coastal mangrove forest with some secondary and sago forest alongside the river.	4.76	105

Table 2. Avian diversity of Sorong District recorded on October 2024

	Species	Common Name	Indonesian Name	Notes on conservation
	FOREST AND TERRESTRIAL BIRDS			
1.	**Accipitridae**			
	1. *Aquila gurneyi*	Gurney's Eagle	Rajawali kuskus	[A]; [B]NT; [C]App II
	2. *Aviceda subcristata*	Pacific Baza	Baza pasifik	[A]; [B]LC; [C]App II
	3. *Haliastur indus*	Brahminy Kite	Elang bondol	[A]; [B]LC; [C]App II
	4. *Henicopernis longicauda*	Long-tailed Honey-buzzard	Elang ekor panjang	[A]; [B]LC; [C]App II
	5. *Accipiter hiogaster*	Variable Goshawk	Elang alap kelabu	[A]; [B]LC; [C]App II
2.	**Acrocephalidae**			
	6. *Acrocephalus bistrigiceps*	Black-browed Reed-Warbler	Kerak-basi alis-hitam	[B]LC
3.	**Alcedinidae**			
	7. *Dacelo gaudichaud*	Rufous-bellied Kookaburra	Kokabura perut merah	[B]LC
	8. *Todirhamphus sanctus*	Sacred Kingfisher	Cekakak suci	[B]LC
4.	**Artamidae**			
	9. *Artamus leucorynchus*	White-breasted Woodswallow	Kekep babi	[B]LC
	10. *Cracticus cassicus*	Hooded Butcherbird	Jagal Papua	[B]LC
	11. *Melloria quoyi*	Black Butcherbird	Jagal hitam	[B]LC
5.	**Bucerotidae**			
	12. *Rhyticeros plicatus*	Blyth's Hornbill	Julang Irian	[A]; [B]LC; [C]App II
6.	**Cacatuidae**			
	13. *Cacatua galerita*	Sulphur-crested Cockatoo	Kakatua koki	[A]; [B]LC; [C]App II
	14. *Probosciger aterrimus*	Palm Cockatoo	Kakatua raja	[A]; [B]NT; [C]App I
7.	**Campephagidae**			
	15. *Coracina papuensis*	White-bellied Cuckooshrike	Kepodang sungu kartula	[B]LC
	16. *Lalage atrovirens*	Black-browed Triller	Kapasan alis-hitam	[B]LC
8.	**Casuariidae**			
	17. *Casuarius casuarius*	Southern Cassowary	Kasuari gelambir-ganda	[A]; [B]LC
9.	**Columbidae**			
	18. *Ducula bicolor*	Pied Imperial-Pigeon	Pergam laut	[B]LC
	19. *Ducula pinon*	Pinon Imperial-Pigeon	Pergam pinon	[B]LC
	20. *Goura cristata*	Western Crowned-Pigeon	Mambruk ubiaat	[A]; [B]VU; [C]App II; Endemic
	21. *Macropygia doreya*	Sultan's Cuckoo-Dove	Uncal Sultan	[B]NE
	22. *Ptilinopus aurantiifrons*	Orange-fronted Fruit-Dove	Walik dahi-jingga	[B]LC
	23. *Ptilinopus iozonus*	Orange-bellied Fruit-Dove	Walik perut jingga	[B]LC
	24. *Ptilinopus magnificus*	Wompoo Fruit-Dove	Walik wompu	[B]LC
10.	**Corvidae**			
	25. *Corvus tristis*	Grey Crow	Gagak kelabu	[A]; [B]LC

11.	**Cuculidae**				
	26.	*Cacomantis variolosus*	Australian Brush Cuckoo	Wiwik rimba	[B]LC
	27.	*Centropus bernsteini*	Lesser Black Coucal	Bubut hitam	[B]LC
12.	**Dicaeidae**				
	28.	*Dicaeum pectorale*	Olive-crowned Flowerpecker	Cabai Papua	[B]LC
13.	**Dicruridae**				
	29.	*Dicrurus macrocercus*	Black Drongo	Srigunting hitam	[B]LC
	30.	*Dicrurus bracteatus*	Spangled Drongo	Srigunting lencana	[B]LC
14.	**Hirundinidae**				
	31.	*Hirundo javanica*	Pacific Swallow	Layang-layang pasi-fik	[B]LC
	32.	*Hirundo rustica*	Barn Swallow	Layang-layang asia	[B]LC
15.	**Laniidae**				
	33.	*Lanius cristatus*	Brown Shrike	Bentet coklat	[B]LC
16.	**Megapodiidae**				
	34.	*Talegalla cuvieri*	Red-billed Brushturkey	Maleo kamur	[A]; [B]LC; Endemic
17.	**Meliphagidae**				
	35.	*Meliphaga albonotata*	Scrub Honeyeater	Meliphaga semak	[B]LC
	36.	*Philemon buceroides*	Helmeted Friarbird	Cikukua tanduk	[B]LC
	37.	*Xanthotis polygrammus*	Spotted Honeyeater	Isap-madu tutul	[B]LC
18.	**Monarchidae**				
	38.	*Myiagra alecto*	Shining Flycatcher	Sikatan kilap	[B]LC
19.	**Motacillidae**				
	39.	*Motacilla flava*	Western Yellow Wagtail	Kicuit kerbau	[B]LC
	40.	*Motacilla tschutschensis*	Eastern Yellow Wagtail	Kicuit kerbau	[B]LC
20.	**Nectariniidae**				
	41.	*Cinnyris frenatus*	Sahul Sunbird	Burung-madu timur	[B]NE
	42.	*Cinnyris clementiae*	South Moluccan Sunbird	Burung-madu Maluku	[B]NE
	43.	*Leptocoma aspasia*	Black Sunbird	Burung-madu hitam	[B]LC
21.	**Oriolidae**				
	44.	*Oriolus szalayi*	Brown Oriole	Kepodang coklat	[B]LC
22.	**Paradisaeidae**				
	45.	*Manucodia ater*	Glossy-mantled Manucode	Manukodia kilap	[A]; [B]LC; [B]App II; Endemic
	46.	*Paradisaea minor*	Lesser Bird-of-Paradise	Cendrawasih kecil	[A]; [B]LC; [B]App II; Endemic
	47.	*Seleucidis melanoleucus*	Twelve-wired Bird-of-Paradise	Cendrawasih mati-kawat	[A]; [B]LC; [B]App II; Endemic
23.	**Podargidae**				
	48.	*Podargus papuensis*	Papuan Frogmouth	Paruh-kodok Papua	[B]LC

24.	**Psittacidae**				
	49.	*Trichoglossus haematodus*	Coconut Lorikeet	Perkici pelangi	[A]; [B]LC; [B]App II
25.	**Psittaculidae**				
	50.	*Charmosyna placentis*	Red-flanked Lorikeet	Perkici dagu-merah	[A]; [B]LC; [B]App II
	51.	*Cyclopsitta diophthalma*	Double-eyed Fig-parrot	Nuri-ara mata-ganda	[A]; [B]LC; [B]App II
	52.	*Eclectus polychloros*	Papuan Eclectus	Nuri-bayan Papua	[B]LC
	53.	*Geoffroyus geoffroyi*	Red-cheeked Parrot	Nuri pipi-merah	[A]; [B]LC; [B]App II
	54.	*Psittaculirostris desmarestii*	Large Fig-parrot	Nuri-ara besar	[A]; [B]LC; [B]App II; Endemic
26.	**Rhipiduridae**				
	55.	*Chaetorhynchus papuensis*	Drongo Fantail	Srigunting kerdil	[B]LC
	56.	*Rhipidura leucophrys*	Willie Wagtail	Kipasan kebun	[B]LC
	57	*Rhipidura rufiventris*	Northern Wagtail	Kipasan dada-lurik	[B]LC
27.	**Sturnidae**				
	58.	*Aplonis cantoroides*	Singing Starling	Perling kicau	[B]LC
	59.	*Aplonis metallica*	Metallic Starling	Perling ungu	[B]LC
	60.	*Mino dumontii*	Yellow-faced Myna	Mino muka kuning	[B]LC
	WATER BIRDS				
28.	**Ardeidae**				
	61.	*Bubulcus coromandus*	Eastern Cattle Egret	Kuntul kerbau	[B]NE
	62.	*Egretta sacra*	Pacific Reef-Egret	Kuntul karang	[B]LC
	63.	*Ixobrychus cinnamomeus*	Cinnamon Bittern	Bambangan merah	[B]LC
	64.	*Zonerodius heliosylus*	Forest Bittern	Bambangan rimba	[A]; [B]NT
29.	**Laridae**				
	65.	*Chlidonias leucopterus*	White-winged Tren	Dara-laut sayap putih	[A]; [B]LC
	66.	*Sternula albifrons*	Little Tren	Dara-laut kecil	[A]; [B]LC
30.	**Rallidae**				
	67.	*Amaurornis moluccana*	Pale-vented Bush-hen	Kareo zaitun	[B]LC
	68.	*Amaurornis phoenicurus*	White-breasted Waterhen	Kareo padi	[B]LC
	69.	*Gallirallus philippensis*	Buff-banded Rail	Mandar-padi kalung-kuning	[B]LC
	70.	*Porphyrio melanotus*	Australasian Swamphen	Mandar Australia	[B]NE
31.	**Scolopacidae**				
	71.	*Calidris acuminata*	Sharp-tailed Sandpiper	Kedidi ekor tajam	[B]VU
	72.	*Calidris melanotos*	Pectoral Sandpiper	Kedidi dada-coret	[B]LC
	73.	*Tringa brevipes*	Grey-tailed Tattler	Trinil ekor-kelabu	[B]LC
	74.	*Tringa glareola*	Wood Sandpiper	Trinil semak	[B]LC

[A]Regulation of the Minister of Environment and Forestry Number P.106/MENLHK/SETJEN/KUM.1/12/2018 concerning Second Amendment to Regulation of the Minister of Environment and Forestry Number P.20/ MENLHK/SETJEN/KUM.1/6/2018 concerning Protected Plants and Animals Species.
[B]IUCN (*International Union for Conservation of Nature*): NE – *Not Evaluated*, LC– *Least Concern,* NT – *Near Threatened*, VU – *Vulnerable*
[C]CITES (*the Convention on International Trade in Endangered Species of Wild Fauna and Flora*): App. I – Appendix I, App. II – Appendix II

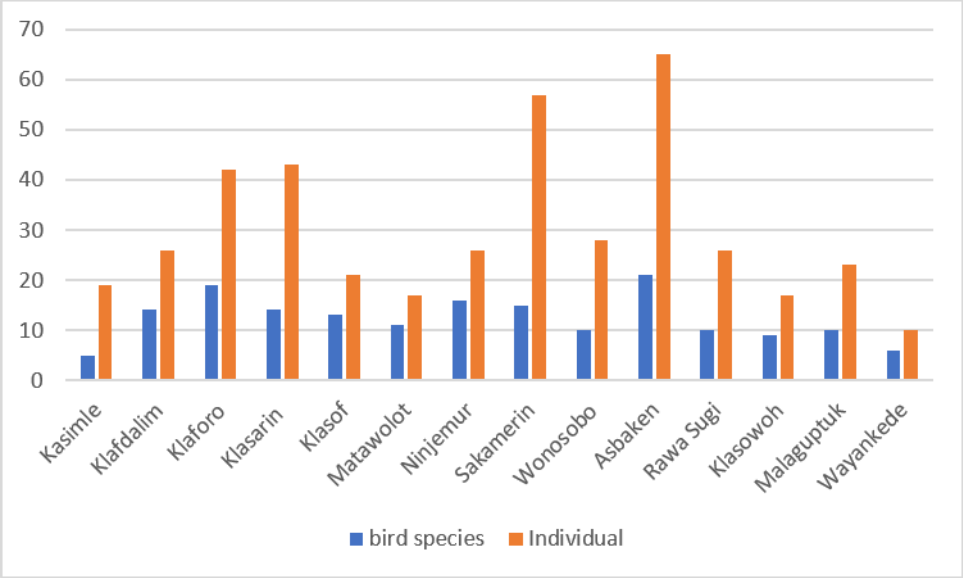

Figure 2. Comparison of bird's species and number of individuals recorded between villages across Sorong District

marine species. Klayili Subdistrict is a vibrant area dominated by tropical rainforests, home to a remarkable array of plant and animal life. The lush forest cover significantly contributes to the region's ecological richness. On the other hand, Segun Subdistrict includes tropical rainforests and areas that have changed due to agricultural activities. Historically, parts of Segun were set aside for transmigration programs and agricultural development, which led to the transformation of forested land into farmland (Forest Watch Indonesia, 2019).

Unfortunately, these natural habitats are facing increasing pressures from human activities such as logging, agricultural expansion, and mining (Nurbia & Affandi, 2024; Kadir 2024). This highlights the urgent need for conservation efforts to protect the ecological integrity and biodiversity of these subdistricts. The area under study showcases dense lowland tropical forests, riparian corridors, and a patchwork of agricultural lands that provide critical habitats for numerous bird species.

Observation Methods

The surveys were conducted by traversing designated paths while monitoring for birds in each subdistrict. Whenever we identified a bird, we made a point to document it and, when possible, capture a photograph with our Canon PowerShot SX70 HS to assist with identification later. We concentrated on essential details such as their songs, feather colors, behaviors, and the specific habitats in which they were observed. This approach allowed us to enhance our accuracy in identification.

In identifying the bird species we encountered, we relied on several trusted regional field guides. Notably, "*Burung-Burung di Kawasan Papua*" by Beehler et al. (2001) and "*Birds of New Guinea: Second Edition*" by Pratt & Beehler (2015) offered insightful and comprehensive descriptions of the local avifauna found in Papua and its surrounding islands. To explore some of the more unique species in greater detail, we also referred to "*The Birds of Paradise and Bowerbirds*" by Frith and Beehler (1998), which effectively showcased the iconic and endemic birds we observed during our survey. Whenever we encountered uncertainties or discrepancies in our findings, we took the time to cross-check the species against these authoritative sources.

Survey data, photographic evidence, and field notes were collected and analysed to evaluate species richness, endemism, and habitat associations within the surveyed subdistricts. This comprehensive approach allowed for a thorough understanding of the ecological dynamics present in each area. The Visual Encounter Survey approach was chosen for its practicality and effectiveness in diverse tropical terrains, allowing for rapid biodiversity assessments while minimizing environmental disturbance. We also calculate the diversity, evenness, and dominance indices for the birds of Sorong District.

Additional information was gathered through (1) Habitat Assessment: Identification of habitat types and their conservation status. (2) HCV Framework Analysis: Criteria for High Conservation Value were applied, focusing on HCV1 (species diversity).

RESULTS AND DISCUSSION

Avian Diversity in Sorong District

Results indicate high avian diversity across the surveyed villages, with 74 species recorded belonging to 31 families and 13 orders. These include 24 endemic, 13 migratory, and 20 threatened or protected species. The endemic species represent the character of New Guinean birds such as the Western crowned pigeon (*Goura cristata*), Red-billed brushturkey (*Talegalla cuvieri*), large fig–parrot (*Psittaculirostris desmarestii*), and all birds of paradise (Paradisaeidae). The migratory birds also use the Sorong habitats for feeding and transit, such as groups of shorebirds, terns, swallows, wagtails, and cuckoos. Roughly one-third of the birds recorded are protected by Indonesian law, such as all raptors, Psittaciformes, Birds of Paradise, Cassowary, waterbirds, and some of the forest birds.

Endemic species richness highlights Sorong's role as part of the New Guinea avian biogeographical region (Beehler *et al.,* 2016). Table 2 shows the recorded species during the survey and their

conservation status. The endemicity and protected species combination is very important for identifying the HCV area. Based on their habitat, we classify the species into forest-terrestrial and water birds.

Figure 2 presents the number of species and individuals recorded from each village. Villages near intact forests, such as Asbaken, recorded the highest species diversity, whereas more fragmented areas, like Kasimle, showed lower species counts.

A survey conducted across 14 villages in Sorong District revealed varying numbers of bird species, reflecting the biodiversity distribution in the region. Asbaken recorded the highest number of bird species, with 21 species identified, followed by Klaforo, 19 species, and Ninjemur and Sakamerin, 16 and 15 species, respectively. Klasarin and Klafdalim each reported 14 species, while Klasof documented 13. Matawolot recorded 11 species, matching the counts in Wonosobo, Malaguptuk, and Rawa Sugi, each noting 10 species. Klasowoh followed with nine species, and Wayankede and Kasimle recorded the lowest numbers, with 6 and 5 species, respectively. This data provides valuable insights into the avian diversity across the villages. The number of bird individuals varies depending on the behavior, solitary, or social. Most solitary birds are raptors, cassowaries, some egrets, and some passerine birds, while the social group is mostly shorebirds, cockatoos, parrots, and parakeets. Some other birds also forage or are sighted in pairs.

The findings derived from the diversity indices in this study indicate a highly diverse and well-balanced avian community in the Sorong region. The Shannon-Wiener diversity index ($H' = 3.75$) signifies a considerable level of species diversity within the community. In ecological research, elevated values of H' typically denote a community characterized by a greater number of species alongside a more equitable distribution of individual populations. This phenomenon is generally indicative of a healthier and more resilient ecosystem (Magurran, 2004).

Furthermore, the evenness index, calculated at $E = 0.871$, suggests a fairly even distribution of species, with no single species exerting dominance over others. A higher evenness value, approaching 1, reflects a more equitable allocation of individuals across various species, thereby signaling adequate availability and distribution of vital resources such as food, nesting sites, and habitats (Krebs, 1999). Such equitable resource distribution mitigates competition by preventing any single species from becoming excessively dominant, thus promoting the long-term sustainability of the avian community.

In parallel, the dominance index recorded at 0.033 corroborates the assertion that there is no singular, overwhelmingly dominant species within this community. Low dominance values indicate a more equitable utilization of ecological niches among species, which can decrease the likelihood of localized extinctions stemming from dependency on resources or conditions provided by a single species (Ludwig & Reynolds, 1988). This dynamic equilibrium typically signifies relatively intact habitat structures and intricate ecological interactions, both of which are critical for sustaining high levels of biodiversity.

Overall, the combination of high diversity, high evenness, and low dominance indices underscores the ecological importance of the Sorong bird community and potentially reflects supportive habitat quality and resource availability. Future management efforts should aim to maintain this region's environmental heterogeneity and habitat integrity. Protection of various habitat types (e.g., lowland forests, wetlands, and transitional zones) and the preservation of key resources—for example, flowering trees used by nectar-feeding birds such as Myrtaceae (e.g., *Syzygium* spp.) (Brown & Hopkins 1995; Mustaqim *et al*. 2020) and fruit-bearing trees important to frugivores such as *Ficus* spp. (keystone for tropical frugivores) (Shanahan *et al*. 2001), *Terminalia* spp. (dispersed by cassowaries in Papua) (Pangau-Adam *et al*. 2014), and hornbill-food genera including *Canarium*, *Horsfieldia* and other large-seeded trees (e.g., *Dysoxylum, Elaeocarpus*) (Liang *et al*. 2024)— will likely ensure the continued sustainability of bird populations and the broader ecological services they provide.

The Importance of Sorong Birds Community

Here, we discuss the noteworthy bird species with at least two or more statuses, a combination of endemic, protected, and migrant (Supplementary Material). Birds-of-Paradise represent an iconic group endemic to New Guinea and some surrounding regions. Notably, species such as the Lesser Bird-of-Paradise (*Paradisaea minor*) and the Twelve-wired Bird-of-Paradise (*Seleucidis melanoleucus*) are frequently observed in lowland forests across the Bird's Head Peninsula. Many of these species are legally protected under Indonesian regulations (Ministry of Environment and Forestry Decree No. P.106/MENLHK/SETJEN/KUM.1/12/2018) due to their cultural and ecological significance (Rheindt *et al*., 2020). Lesser Bird-of-Paradise (*Paradisaea minor*) are known for their striking plumage and elaborate courtship displays and inhabit Sorong's lowland and hill forests. Twelve-wired Bird-of-Paradise (*Seleucidis melanoleucus*), named for the twelve wire-like feathers extending from its tail, this species is typically found in swampy lowland forests. Habitat destruction, hunting for ceremonial plumes, and illegal trade remain major threats to their populations (Beehler & Pratt, 2016). Nonetheless, local community-based ecotourism initiatives—especially around Manokwari and Sorong—have begun to provide incentives for preserving these charismatic birds.

Parrots, cockatoos, and lorikeets are fascinating birds that belong to the order Psittaciformes, and they showcase a stunning variety of species, especially in eastern Indonesia, particularly Papua. The Bird's Head region is home to an impressive range of these colorful birds, including cockatoos like *Cacatua*, lorikeets such as *Trichoglossus*, and the beautiful eclectus parrots represented by *Eclectus*.

One standout species is the Palm Cockatoo (*Probosciger aterrimus*), known for its striking appearance, though it has a somewhat scattered distribution across northern Australia and New Guinea. Other popular birds, like the Sulphur-crested Cockatoo (*Cacatua galerita*) and the vibrant Rainbow Lorikeet (*Trichoglossus haematodus*), are cherished by bird enthusiasts. However, these species face significant challenges due to habitat loss, which is a growing concern (Olah *et al*. 2016; Vergara-Tabares *et al*. 2020).

Many parrots in Papua are listed under Appendix II of CITES, illustrating the dangers they face from the international pet trade. Their conservation is vital, not just for their survival but also because these birds play essential roles in their ecosystems. They are key players

Figure 3. Birds of Sorong District. Paradisaeidae: Forest-Terrestrial Birds (1-13). 1. *Paradisaea minor*, 2. *Seleucidis melanoleucus*; Alcedinidae: 3. *Dacelo gaudichaud*; Accipitridae: 4. *Henicopernis longicauda*, 5. *Aviceda subcristata*, 6. *Haliastur indus*; Casuariidae: 7. *Casuarius casuarius*; Megapodiidae: 8. *Talegalla cuvieri*'; Bucerotidae: 9. *Rhyticeros plicatus*; Cacatuiidae: 10. *Cacatua galerita*, 11. *Probosciger aterrimus*; Columbidae: 12. *Goura cristata*; Podargidae: 13. *Podargus papuensis*. Water birds (14-15). Laridae: 14. *Sternula albifrons*; Ardeidae: 15. *Zonerodius heliosylus*.

in seed dispersal, pollination, and contribute to forest regeneration and composition, underscoring their importance in our world (Blanco *et al*. 2015; Hernández-Brito *et al*. 2021).

In Sorong, the Southern Cassowary and Blyth's Hornbill are not just birds; they are vital contributors to the health of the ecosystem. The Southern Cassowary, a large and striking flightless bird, roams the dense tropical rainforests. In the Vogelkop area, it's known for its important role in dispersing seeds for many fruiting trees, helping to maintain the forest's diversity (West *et al.,* 2019). However, despite its significance, this bird faces threats from hunting and deforestation, particularly affecting localized populations that are already vulnerable (Pattiselanno *et al*. 2020).

On the other hand, Blyth's Hornbill *is* commonly found across New Guinea and is a master seed disperser for large-fruited trees (Whitney & Smith, 2021). Although these hornbills are legally protected in the Bird's Head region, they still struggle with habitat loss and hunting pressures. These challenges can hinder important conservation efforts aimed at preserving their populations (BirdLife International, 2024). Together, these birds highlight the rich biodiversity of Sorong and the need for ongoing conservation to protect their habitats and the ecological roles they play.

The Black-billed Brushturkey, scientifically known as *Talegalla cuvieri,* is a unique bird native to the forests of New Guinea, particularly found in areas like the Bird's Head Peninsula (Jones *et al.,* 1995). This interesting bird builds mounds to incubate its eggs, using the warmth produced by decomposing plant material. It's important to note that this species is protected by Indonesian law (Ministry of Environment and Forestry Decree No. P.106/MENLHK/SETJEN/KUM.1/12/2018) and plays a significant role in promoting forest health by dispersing seeds while it searches for food. The Western Crowned Pigeon, also known as the *Goura cristata*, is one of the largest pigeons in the world and is endemic to the lowland rainforests of northwestern New Guinea, including the Bird's Head Peninsula (Beehler & Pratt, 2016). It is distinguished by an ornate crest and striking blue-gray plumage. *G. cristata* is also legally protected under Indonesian law due to its restricted range and overhunting for meat and the pet trade. Additionally, the species is vital for forest regeneration through seed dispersal, as it predominantly feeds on fallen fruits and seeds on the forest floor.

Another bird group that plays a prominent role in the ecosystem is Birds of Prey. Raptors of Papua's Bird's Head region, such as the Gurney's Eagle (*Aquila gurneyi*) and the Long-tailed Honey Buzzard (*Henicopernis longicauda*), occupy the higher trophic levels of forest ecosystems (Sutton *et al.,* 2021). They regulate populations of smaller vertebrates and serve as indicators of environmental health. Some raptors, including the Brahminy Kite (*Haliastur indus*), also frequent coastal and open farmland areas, reflecting their ecological adaptability. The continued conversion of lowland forests to agriculture and hunting pressure has led to concern over population declines in certain species (BirdLife International, 2024).

The feeding guild composition of birds in Sorong, as depicted in Figure 4, reveals that carnivores constitute the highest number, with 14 species, followed by insectivores, and omnivores. The dominance of carnivorous birds suggests a well-established higher trophic level in the ecosystem, indicating the presence of abundant prey and a relatively intact forest structure that supports predatory species. This observation aligns with findings by Şekercioğlu *et al.* (2004), who noted that the presence of diverse feeding guilds, particularly carnivores, indicates healthy forest ecosystems.

The representation of frugivores and insectivores reflects the availability of diverse resources, such as fruits and insects, highlighting the richness of the forest's understorey and canopy layers. Frugivores play a critical role in seed dispersal, which supports forest regeneration and biodiversity, as discussed by Corlett (2017). The presence of nectarivores, though less pronounced, indicates the availability of flowering plants that are crucial for pollination and ecosystem resilience.

The relatively low numbers in other guilds, such as granivores or nectarivores, could suggest resource limitations or specific habitat preferences. Nevertheless, the diversity in guild representation suggests a balanced and functioning ecosystem. These findings emphasise the importance of conserving Sorong's forests, as they serve as critical habitats for birds and their ecological roles.

The dual and sometimes overlapping statuses of *endemic*, *protected*, and *migratory* among these bird taxa highlight the need for multifaceted conservation strategies (Beehler & Pratt, 2016). Dominance of carnivorous species, representing the top consumer level of forest ecosystem highlights a balanced and functioning ecosystem (Crooks & Soulé, 1999; Sergio et al. 2008; Ritchie & Johnson, 2009). Habitat protection via sustainable land-use planning and the establishment of protected areas in critical sites—such as lowland rainforests along the Vogelkop coast—remains essential (Rheindt *et al.,* 2020). Community-based conservation initiatives and ecotourism programs offer economic incentives for local residents to protect their avifauna. Meanwhile, stricter enforcement of wildlife trade regulations (CITES, 2023) and ongoing research into population trends (e.g., banding and satellite tracking) are necessary to ensure these species' survival.

In conclusion, the Bird's Head Peninsula exemplifies the intricate relationships between habitat integrity, ecological functions, and the long-term viability of avian populations. Many species carry multiple significant statuses—endemic, protected, and sometimes even migratory—underscoring their critical roles in forest regeneration, cultural heritage, and broader ecosystem health (BirdLife International, 2024). Strengthened collaborations among government agencies, researchers, and local communities will be pivotal in safeguarding these remarkable birds for future generations.

High Conservation Value Habitats

The data on bird biodiversity across 14 villages in Sorong District provides critical insights into local avian diversity, which aligns with the strategic objectives outlined in Indonesia's Biodiversity Strategy and Action Plan (IBSAP) 2025–2045. As highlighted in IBSAP, conserving biodiversity is essential for maintaining ecosystem services and supporting sustainable development. The varying bird species richness, with Asbaken reporting the highest diversity (21 species) and Kasimle the lowest (5 species), underscores the importance of targeted conservation efforts tailored to local ecological contexts. These findings can inform habitat protection priorities, restoration programs, and community-based

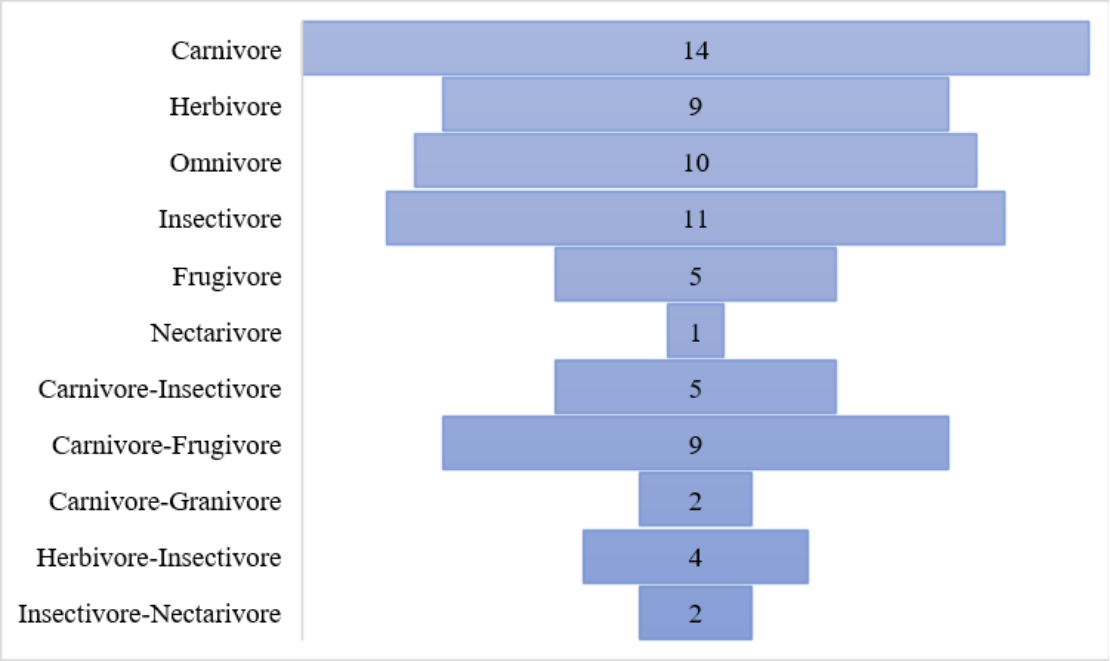

Figure 4. Composition of Bird Feeding Guilds in Sorong

Figure 5. Portions of bird species were recorded across 14 villages of 5 subdistricts in Sorong District.

conservation strategies, ensuring that Sorong District contributes to Indonesia's broader goals of biodiversity preservation and sustainable resource management.

Using the High Conservation Value (HCV) framework, this discussion examines the ecological and conservation significance of bird diversity in the region, aligning it with broader conservation goals.

The application of the HCV framework revealed that Sorong's primary lowland forests and riparian zones are critical for avian diversity. Key findings include:

HCV 1: Species Diversity

HCV 1 emphasizes the presence of concentrations of biodiversity, including endemic, rare, or threatened species. In Sorong District, patterns of bird richness and turnover indicate unique ecological niches and populations of conservation concern. Lowland forest sites near Sorong, such as Asbaken and Malagufuk (Klasow Valley), support assemblies that include New Guinea endemics and near-endemics, with Malagufuk documented as a biodiversity hotspot hosting multiple birds-of-paradise (e.g., Lesser Bird-of-paradise *Paradisaea minor*, Twelve-wired *Seleucidis melanoleucus*) alongside other forest specialists.Forests in Klayili (e.g., Malagufuk) and Moisegen Subdistricts are particularly important for endemic/near-endemic taxa such as the Northern Cassowary *Casuarius unappendiculatus* and Forest Bittern *Zonerodius heliosylus* (NT), and for threatened lowland icons like the Western Crowned-pigeon *Goura cristata* (VU)—all native to the Vogelkop –northwest New Guinea lowlands used for this study. Coastal wetlands around Sorong also host migratory shorebirds of high conservation priority along the East Asian–Australasian Flyway, including Far Eastern Curlew *Numenius madagascariensis* (EN) and Great Knot *Calidris tenuirostris* (EN)—strengthening the case to include intertidal flats and estuaries in site-level HCV management. Taken together, these records align directly with HCV 1 criteria and indicate that high-diversity areas like Asbaken and the Klayili–Moisegen forests likely contain critical habitat for resident endemics and passage migrants, warranting prioritization in conservation planning and monitoring (Brown *et al*. 2013).

A study aiming at linking bird diversity and distribution with HCV areas was also conducted in Sweden with a focus on specialist forest birds and threatened species (Bakx *et al.,* 2023). The results of the study showed that birds under the two criteria, forest specialist and threatened species, were more commonly found in HCV areas, so that if these areas are managed properly, they will be sustainably providing suitable habitat to supports bird diversity. The study also pointed that the determination of HCV plays an important role in infrastructure planning to maintain the sustainability of forests and their biodiversity.

HCV 2: Landscape-level, Connectivity, and Avifauna

The diversity across Sorong District suggest a mosaic of ecosystems ranging from forests and wetlands to transitional landscapes. These varied habitats reflect the principles of HCV 2, which emphasizes the conservation of landscape-level ecosystems and species assemblages. Connectivity between these habitats is crucial for sustaining ecological processes, particularly for species with large home ranges or specific habitat requirements. Effective land-use planning that integrates biodiversity corridors can help maintain this ecological connectivity, ensuring the resilience of bird populations and associated ecosystems.

In relation to bird preferences and dependence on forest ecosystems, the results of a study by Simamora *et al.* (2021) in West Kalimantan showed that most birds, counted up to eighty percent, preferred undisturbed forest habitats. The study, which aimed to identify bird diversity as an indicator of ecosystem type in the context of forest fragmentation, revealed that there was a decreasing trend in bird diversity along with changes from primary forests to secondary forests, mixed agricultural gardens, to the lowest one is the industrial-level monoculture plantations. The study also identified bird species that act as indicators of ecosystem and landscape types, namely species with the feeding guild as fructivore and nectarivore whose food sources are flower nectar and fruits, such as *Argusianus argus* (great argus, terrestrial bird) and *Buceros rhinoceros* (rhinoceros hornbill, forest specialist) and *Harpactes orrhophaeus* (Cinnamon-rumped trogon, lowland forest inhabitant) which eat invertebrates are indicator species for mixed dipterocarp forests.

Connectivity matters directly for birds. Empirical work in New Guinea shows that when forests are fragmented and isolated, forest-specialist birds (especially understory insectivores, ground foragers, and several endemic guilds) decline, while generalists (e.g., sunbirds, pigeons) increase. Assemblages in fragments that remain connected to nearby intact forest retain more specialists than equally degraded but isolated patches, underscoring the importance of connectivity as a buffer against community erosion (Korejs *et al*. 2025a; 2025b). This pattern mirrors global syntheses, demonstrating substantial and lasting biodiversity losses and impaired ecosystem functions in fragmented systems, and it reinforces the irreplaceable role of primary forests in maintaining tropical biodiversity (Gibson *et al.* 2011; Haddad *et al*. 2015). For New Guinea frugivores that sustain forest regeneration (e.g., hornbills and cassowaries) disturbance reduces the abundance of key food plants and dispersers, with knock-on effects on seed arrival and recruitment. Cassowary densities in Papua drop measurably following rainforest disturbance (Naniwadekar et al., 2015).

HCV 3: Habitat and Ecosystems: Anthropogenic Pressures

The lower bird diversity observed in villages such as Kasimle (5 species) and Wayankede (6 species) may indicate ecosystems under anthropogenic pressure, aligning with HCV 3, which focuses on rare or threatened ecosystems. Habitat degradation, deforestation, and land conversion could be contributing to reduced species richness. Identifying and mitigating these pressures through habitat restoration and sustainable management is critical for reversing biodiversity loss in these areas.

HCV 3 highlights habitats and ecosystems that are rare or threatened, either naturally or due to human activities. In the Sorong–Bird's Head landscape, the principal anthropogenic pressures we observed, each with implications for HCV 1 (biodiversity concentrations) and HCV 2 (landscape integrity/connectivity), are:

1. **Road building and access expansion (including logging roads and segments of the Trans-Papua network).** New highways and informal access tracks accelerate fragmentation, exposing intact forests to timber extraction, hunting, and conversion. For avifauna, interior-forest specialists decline while generalists increase; the degree of connectivity to intact forest largely determines how well forest bird assemblages persist (e.g., Korejs *et al*., 2025b; Haddad *et al*., 2015).
2. **Industrial plantations and estates.** The historical and ongoing footprint of industrial agriculture (notably oil palm) has driven deforestation in parts of Indonesian New Guinea. Even where permits have been revoked, legacy edges and converted blocks persist. Ecological consequences include loss of large fruiting/nest trees (affecting hornbills and cockatoos), habitat homogenization, and strong edge effects (Gaveau *et al*., 2021; Gibson *et al*., 2011).
3. **Mining (nickel on small islands of Raja Ampat; gold in Manokwari/Arfak and Tambrauw) and river-sand extraction (Sorong).** Recent enforcement actions and permit cancellations reflect environmental concerns (deforestation, sedimentation) in highly sensitive seascapes and river basins. In Sorong, illegal sand mining has been linked to watershed degradation and urban flooding. For birds, impacts include the loss of lowland forests, increased turbidity in estuaries and intertidal flats used by waterbirds and migrants, and chronic disturbance (e.g., Kadir, 2024; Mangubhai *et al*., 2012).
4. **Smallholder agriculture, selective logging, and hunting.** Expanding smallholder mosaics and repeated selective logging alter guild composition, with understory insectivores and large frugivores declining, while edge-adapted generalists increase. In Papua, cassowary densities drop measurably with rainforest disturbance, likely resulting in knock-on effects on seed dispersal and forest regeneration (Pangau-Adam *et al*., 2015; Naniwadekar *et al*., 2015).
5. **Coastal modification and sedimentation.** Coastal development, along with upland land-use change and mining, increases sediment loads to deltas and reef-fringed shores, thereby degrading wetlands and intertidal habitats that are crucial to shorebirds and coastal waterbirds (Mangubhai *et al*., 2012).

Evaluation of the use of birds as indicator taxa to determine natural areas to be protected was presented by Kovařík *et al.* (2021) based on data on bird diversity and their habitats in the Czech Republic. The conclusion obtained in the study is that birds are reliable indicator to determine areas worthy of protection as habitats for territorial conservation in the country. Regarding to the results of this study, two villages whose areas are partly oil palm plantations, namely Klafdalim and Klaforo, the data showed that both villages still have a moderate diversity of bird species. This result shows that the existence of oil palm plantations still providing suitable habitat for birds.

Similar result was reported by Putri *et al.* (2021) from a study in the oil palm plantation area in Palembang which aims to analyze the effect of changes in land cover and land use on bird and butterfly diversity. The results of the study showed a loss and gain phenomenon, namely that there was a decrease in the number of certain species such as forest birds but also an increase in other bird species (water birds: *Ixobrychus flavicollis*, *Ardea speciosa*, and *Egretta garzetta*) as an impact of changes in land use to oil palm plantations, while the diversity of butterflies was not affected. This phenomenon might be caused by the existence of ground cover in oil palm plantations which serves as habitat for birds to perch and find their food. A different fact was found in the study of Simamora *et al.* (2021) in West Kalimantan which focused on the diversity and composition of bird species in various types of vegetation and identified bird species that have the potential as indicators of habitat quality. The results of the study showed that oil palm plantations were the least habitats that birds likely to inhabit, as indicated by very low species diversity.

HCV 4: Ecosystem Services

Birds play vital roles in ecosystem services, including seed dispersal, pollination, and pest regulation, functions integral to both ecological stability and human well-being. From an HCV 4 perspective, maintaining bird diversity across Sorong District is essential for preserving these services. The varying species richness underscores the need to manage habitats sustainably to ensure the continued delivery of these ecological benefits, which are particularly important in supporting agricultural productivity and forest regeneration.

The fact that in villages whose landscapes are mostly open areas, both as agricultural field and oil palm plantations, as found in several villages in the Miosegen Sub-district, where the existing human-made landscape still providing support for birds is an interesting finding. This situation is similar to those also reported by Mukhlisi *et al.* (2021) from a study conducted in the Wahea-Kelay landscape, East Kalimantan, a concession area owned by seven timber companies. The study showed that the timber concession areas still functioning as suitable habitat for birds, especially for the insectivores. Birds of this group can survive in the timber company area, among other things, because practice of selective logging creates open canopy that can trigger the growth of insect populations as a source of food for insectivorous birds.

HCV 5 and HCV 6: Community Basic Needs and Cultural Values

Birds also hold significant cultural and livelihood value for local communities in Sorong District. HCV 5 emphasizes the ecological resources necessary for community well-being, while HCV 6 highlights the cultural significance of biodiversity. Community-based conservation initiatives integrating traditional knowledge and local practices can strengthen conservation efforts. These approaches not only foster sustainable resource use but also promote stewardship among local stakeholders, ensuring long-term biodiversity protection.

In certain regions of Papua, there exists a customary practice that embodies local wisdom and positively influences the conservation of bird diversity. This includes established rules that restrict the hunting of birds of paradise, enforced through customary prohibitions viewed as taboos. The foundation of this local wisdom lies in the belief that the community's ancestors are descendants of these birds, making the act of hunting them a violation of customary law (Pattiselanno *et al.,* 2020; Pattiselanno *et al.,* 2024).

Birds and Ecosystem Dependency

The survey revealed a rich avian community, with 74 bird species recorded across the study area. This diversity includes endemic species such as the Western Crowned Pigeon and Red-billed Brushturkey, as well as migratory birds and threatened species. The findings highlighted the ecological importance of Sorong's varied habitats, including lowland rainforests, mangroves, and montane forests, in supporting this diverse avifauna.

Analysis of the data resulted in a Shannon-Wiener diversity index (H') of 3.75, indicating high species diversity. The evenness index (E) of 0.871 is showing a relatively balanced distribution of species, while the low dominance index of 0.033 confirms the absence of a single, strongly dominant species. These indices collectively paint a picture of a healthy and stable bird community in the landscape and ecosystem.

The study also revealed variations in species richness across different villages. Asbaken recorded the highest number of bird species at 21, while Kasimle had the lowest at 5 species. This variation likely reflects differences in habitat quality, conservation status, and human impact across the survey coverage area.

The findings of this study have important implications for planning efforts in Sorong District with the critical and urgency of integrated landscape management (ILM), which includes conservation, protection, and cultivation area, immediately defined. This comprehensive study underscores Sorong District's global significance as a biodiversity hotspot. It highlights the need for collaborative, integrated landscape management efforts involving local communities, policymakers, and private sectors to ensure the long-term preservation of the landscape's remarkable avian diversity among cultivation and commodity expansion.

The birds of Sorong District demonstrate complex and strong dependencies on their ecosystems and landscape, serving as both indicators of ecosystem health and key contributors to ecological processes. Their conservation is not only crucial for maintaining biodiversity but also for preserving ecosystem functions and cultural heritage. These interactions shape ecosystem structure, provide important services, and drive evolutionary adaptations. Recognizing the complexity of these relationships is essential for effective conservation and ecosystem management in Southwest Papua Province.

The research contributes to our understanding of Papua's unique birdlife and provides a foundation for integrated and sustainable landscape management that accommodates biodiversity conservation in this ecologically critical area.

Considering that birds need diverse types of habitats, it is of urgent need to maintain the integrity of the landscape and ecosystems where they exist. Despite their ecological importance, bird's habitats in Sorong District face numerous threats, including (1) Deforestation, expanding agriculture and logging activities in villages such as Kasimle and Rawa Sugi, (2) Infrastructure Development such as road construction fragments habitats and alters bird distributions, (3) Shifting Land Use, conversion of forests into monoculture plantations reduces habitat availability.

To safeguard avian diversity in Sorong District, the following measures are recommended:

1. Protect Primary and Secondary Forests: Implement community-based forest conservation initiatives, particularly in Moisegen and Klayili Subdistricts.
2. Strengthen HCV Identification: Collaborate with stakeholders to integrate HCV areas into land-use planning processes.
3. Community Engagement: Promote sustainable agricultural practices that balance livelihoods with biodiversity conservation.
4. Restore Riparian Zones: Encourage riparian reforestation to maintain critical ecosystem services.

Monitor and Research: Establish long-term avian monitoring programs to assess trends and conservation outcomes.

Some activities already elaborate on the conservation and economic building of Sorong District. Birdwatching as ecotourism is likely to be a facility to protect bird diversity, specifically Birds of Paradises and Psittaciformes birds such as Cockatoos, Parrots, and Lorikeets. With good management and protection of Sorong biodiversity, the HCV area will contribute to a better life for people and ecosystems.

CONCLUSION

Due to its distinctive lowland forests and riverine ecosystems, the Sorong District boasts an impressive array of bird species. This avian diversity is not merely a local asset; it is also of significant global importance. Our study emphasizes key habitats and specific bird species that require urgent conservation efforts, utilizing a High Conservation Value (HCV) framework to prioritize our actions.

It is essential for local communities, policymakers, and conservationists to collaborate in safeguarding Sorong's extraordinary birdlife for future generations' benefit. The remarkable variety of birds found in this region underscores the critical importance of preserving these natural areas, highlighting the need for targeted and informed conservation strategies. Protecting crucial hotspots, such as Asbaken, is particularly vital, especially in light of habitat loss in regions with lower species diversity. We can foster a robust ecosystem and enhance resilience against environmental changes by strategically directing our conservation efforts.

Integrating the HCV framework into our conservation planning can align our initiatives with Indonesia's broader objectives outlined in the IBSAP 2025–2045. This alignment enables us to protect biodiversity while supporting sustainable development. With a thoughtful and inclusive approach, the Sorong District can set a precedent in balancing the preservation of our natural heritage with the needs of human development in one of the world's most biodiverse regions.

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DATA AVAILABILITY

The data on which this paper was based was available by request.

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