



## Research Article

# Preferences of Indonesian Birdwatchers Toward Locations, Target Birds, and Buddies

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## ABSTRACT

Birdwatching focuses on observing wild birds. Nevertheless, previous studies were still focused on the supply aspect. Meanwhile, the demand aspect is still limited, including in Indonesia. Furthermore, understanding birdwatchers' preferences can lead to market segmentation. Therefore, this study aimed to analyze the preferences of Indonesian birdwatchers towards location, bird targets, and buddies. Data on the demographics and preferences of Indonesian birdwatchers were collected from 1,203 respondents using an online questionnaire. Data were analyzed using Chi-Square and the Generalized Linear Model. The results revealed that most respondents prefer destinations outside the biogeographic region, with Papua being the most preferred location. Overall, birds of the Paradisaeidae family were chosen by the largest number of respondents, followed by the Accipitridae family. Variables that significantly influence the preference of birdwatching destination based on the distance taken, age, domicile, income, organization, and expertise of the birdwatchers. Locations that are further away attract young respondents who live in urban areas, have higher incomes, are members of organizations, and have high birdwatching skills. The bird species and locations preferred by the birdwatcher can be used as a basis for developing birdwatching destinations according to the birdwatcher's preferences.

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## 1. Introduction

Birdwatching is one of the ecotourism sections that focuses on visually observing and enjoying the wild birds or listening to their voices (Belaire et al. 2015; Steven 2016). These activities are conducted without disrupting the birds' wildlife because it is carried out without direct contact, with birdwatchers just seeing, hearing, or photographing the birds (Basnet et al. 2021; Kurnia et al. 2021). Observing activity may use naked eyes and direct listening to the birds' voice or by visual and hearing enhancements, such as binoculars, telescopes, and voice-recorder. The main object is wild birds living freely in natural habitats, not cages or in captivity. These activities are also called avitourism (Forero and Rodríguez 2021) or birding (Pintassilgo et al. 2021), while actors who perform these activities are called birdwatchers or birders.

Birds are parts of the ecosystem that can be found in various landscapes and habitats around the inhabitants (Suarez-Rubio et al. 2023), forests (Komlós et al. 2024), mountains (Wakass et al.

2023), or the middle of the sea (Trevail et al. 2023). The high bird population, rising to 10,000 species in the world (Mittermeier et al. 2021), with 1,826 species living in Indonesia (Juaid et al. 2023), has caused birdwatching to become one of the developing tourism objects in various countries, including developing countries (Janeczko et al. 2021; Ren et al. 2022). Birdwatching is known to improve mental and psychological health (Lenda et al. 2023), enhance health recovery (Zhao et al. 2020), and reduce all negative moods (Cobar et al. 2017). Birdwatching can also be defined as ornithological tourism based on its characteristics, which combine scientific and sports elements (Afanasiev 2022).

Bird diversity has become an asset for tourism development. For example, Eyster et al. (2023) reported that bird species diversity is the highest preference for visiting four national parks in South Africa. Birds have been used as flag or icon species (Garnett et al. 2018; Prideaux et al. 2018). Thus, a popular bird can be the main symbol to attract the wide community (Veríssimo et al. 2014). The community tends to enjoy the wildlife with a certain status, either rare, protected, or endemic. The ecological status and attributes affect the birdwatchers' decision to come to the tourism destination (de Salvo et al. 2022), such as birdwatchers inside protected areas in Costa Rica (Echeverri et al. 2022).

Birdwatching offers positive impacts on bird conservation, environment, and economy. Birdwatching can also become a stimulus for conservation acts, either protected or out of protected areas, such as in China (Basnet et al. 2021) and Brazil (Enedino et al. 2018). Birdwatchers are known to have a deep concern for the environment and conservation (Cheung et al. 2017). Birdwatching is considered an effective way of environmental education (Can et al. 2017). Birdwatching has become a stimulus for fast economic development, such as in Alaska (Schwoerer and Dawson 2022), Costa Rica (Maldonado et al. 2018), and Poland (Szczepańska et al. 2014).

Nevertheless, previous studies were still focused on the supply aspect related to the bird potential in several locations, such as natural landscape (Ardiansyah et al. 2019; Mulawi and Kurnia 2023), semi-natural landscape (Mubarik et al. 2020), rural landscape (Afif et al. 2018; Iswandar et al. 2023), and urban landscape (Kurnia et al. 2021). Meanwhile, the demand aspect studies related to the birdwatchers' preferences for birds are still limited (Steven 2015), including in Indonesia. Studies regarding the birdwatchers' preferences for bird species were only conducted by Frątczak et al. (2020) in Poland and Steven (2015) in Australia. Studies on bird watchers in Indonesia were only limited to economic value, as carried out by Kurnia et al. (2024) and Paranata et al. (2017).

Tourist preferences are commonly the most related aspect of tourism activities. The tourists' preferences are beneficial for raising tourist funds and the community in birdwatching and other animal tourism activities (Stemmer et al. 2022). Birdwatchers' preferences are affected by various aspects, such as the ecological attributes of the birds and whether they are rare or unusual (Callaghan et al. 2018; De Salvo et al. 2022). Socio-demographic factors are also known to influence the birdwatchers' preferences (Rutter et al. 2021). Furthermore, understanding birdwatchers' preferences can lead to market segmentation for the promotion and development of birdwatching destinations, which will ultimately shape the travel satisfaction of birdwatchers. Satisfaction is one of the factors that encourage birdwatchers to return to the tourist destination (Ren et al. 2022). Therefore, this study aimed to analyze the preferences of Indonesian birdwatchers towards location, bird targets, and buddies for birdwatching.

## 2. Materials and Methods

### 2.1. Period

This study was conducted from February to April 2021. This study had no regional limitations as the respondents had no limited domicile. Still, they were restricted by certain criteria, namely Indonesian citizens conducting birdwatching in any location around Indonesia at least once.

### 2.2. Data Collection

Data were composed of demographic conditions and birdwatchers' preferences that were collected using an online questionnaire instrument (Google Forms). The responses were obtained (1) directly from birdwatchers and (2) from scientific publications, the birdwatcher community, the environment-enthusiast community, or student organizations. Questionnaires were distributed to 2000 respondents through email, WhatsApp, and other social media. The total respondents who completed the questionnaire were 1,203 people from 33 provinces in Indonesia.

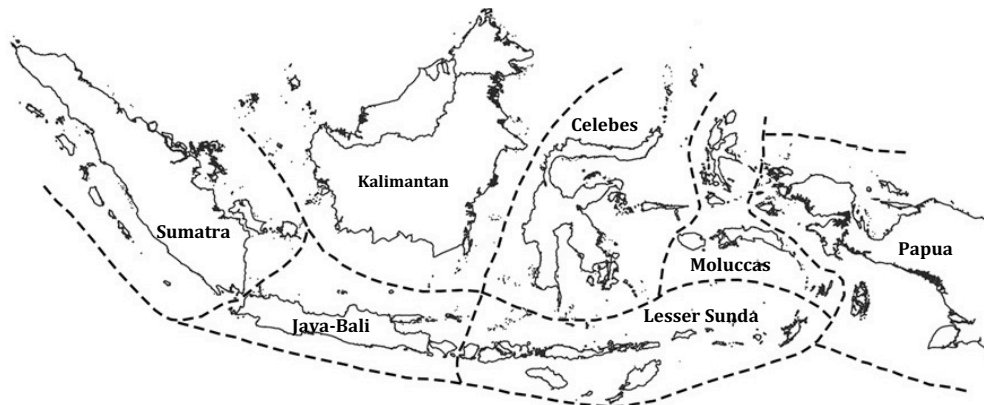
The socio-demographic data were closed-ended data with various possible answer choices. Respondents were asked to provide information regarding their gender (male, female), age (less than 17 years, 18–25 years, 26–35 years, 36–45 years, 46–55 years, > 55 years), place of living (city, regency), level of education (primary, secondary, higher, undergraduate, postgraduate), individual monthly income (no income; less than IDR 500,000.00; IDR 500,001.00–1,000,000.00; IDR 1,000,001.00–2,500,000.00; IDR 2,500,001.00–5,000,000.00; IDR 5,000,001.00–7,500,000.00; IDR 7,500,001.00–10,000,000.00; more than IDR 10,000,001.00), membership in a conservation organization (not a member, participant only, membership), and birdwatching skills (beginner, intermediate, expert). The level of birdwatcher expertise was determined based on claims from birdwatchers (Maple et al. 2010). Meanwhile, the preferences are open questions regarding the most preferred location target and the most preferred bird target in birdwatching activities.

### 2.3. Data Analysis

The respondents' answer data on preferred locations and birds were analyzed quantitatively. The conservation area data was adjusted to the Ministry of Environment and Forestry (KLHK 2018; KLHK 2022) and other relevant literature. The biogeographical region classification refers to fauna distribution based on geographical area (Brown and Lomolino 2000; Maryanto and Higashi 2011). The region division is based on Andrew (1992), who divided Indonesia into seven biogeographic regions (**Fig. 1**). Birdwatching destination locations were divided into (1) inhabitant environment, including yards and housing complexes; (2) inside the city; (3) outside city, closed distance (less than 3 hours from residence); (4) outside city, long distance (more than 3 hours from residence); (5) outside the provincial, administrative boundaries; (6) outside the biogeographic region, ecological limits, and (7) overseas, national borders. The nomenclature of bird species was adapted to Sukmanto et al. (2007) and Taufiqurrahman et al. (2022).

Data were analyzed using the Chi-Square and the Generalized Linear Model (GLZ). Chi-Square was used to analyze the number of respondents. The dependent variables in GLZ were binary answers, such as yes or no answers to the questions. This aspect was analyzed against the

independent variable, namely socio-demographic data, to determine the factors significantly affected. The significance level used was 5% ( $p < 0.05$ ). Data processing uses IBM SPSS 24.0.

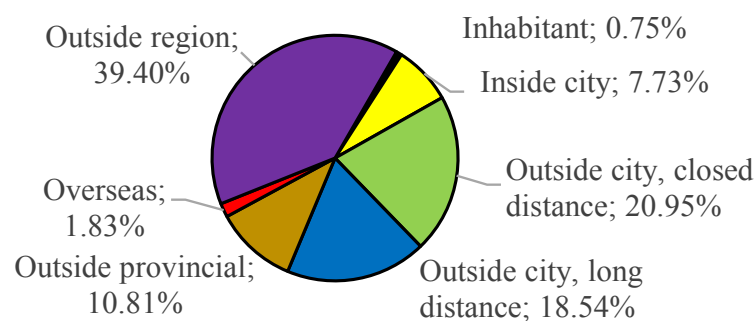


**Fig. 1.** Distribution of biogeographic region in Indonesia (BAPPENAS 1993; Mackinnon and MacKinnon 1986).

### 3. Results and Discussion

#### 3.1. Birdwatching Destination Location from Distance Factor

The destination locations for birdwatching activities have significantly different preferences in terms of the respondents ( $\chi^2_{\text{count}} = 915.17$ ;  $df = 6$ ;  $p < 0.05$ ). Most respondents prefer destinations outside the biogeographic region (39.40%;  $n = 474$ ), followed by the preference for birdwatching outside the city area at a relatively close distance (20.95%;  $n = 252$ ). Meanwhile, the lowest preference is presented from the destinations around the inhabitants (0.75%;  $n = 9$ ). Overseas is also a preferred destination, but only for a small number of respondents (1.83%;  $n = 22$ ) (**Fig. 2**).



**Fig. 2.** Respondent percentage on the location preference for birdwatching ( $n = 1,203$ ).

Birds are one of the ecosystem components found in various landscapes, making it possible to see them in the environment around the inhabitants. Human interaction with birds in the yard is the closest human interaction with wild animals (Erastova et al. 2021; Francis et al. 2018). Various forms of interaction occur, particularly bird-feeding in the yard, as a popular form of human-wildlife interaction in several regions, such as North America, Europe, Australia, and New Zealand (Clark et al. 2019; Cox and Gaston 2018; Dayer et al. 2019; Reynolds et al. 2017). Observing birds in the yard can also be done from inside the house through the window (Lenda et al. 2023). Enjoying the ecosystem as an outside activity around the house, including birds, is part of human needs (Vallecillo et al. 2019).

Outdoor activities facilitate connections between humans, nature, and wildlife (Wilkins et al. 2019). In general, outdoor activities around the inhabitants become the most selected option of many people in the world during COVID-19 (Phillips et al. 2023; Ugolini et al. 2020), including birdwatching activities (Randler et al. 2020; Rice et al. 2020). Birdwatching activities have increased during the pandemic as a form of simple and easy-to-do outdoor recreation near the inhabitants. A mutually beneficial symbiotic relationship exists between humans and birds in interactions around their homes. Birds obtain food, while humans harness some benefits by increasing their welfare through birdwatching activities (Brock et al. 2021).

The birdwatching destinations based on the distance from the respondents' homes are dominated by locations far from where they live, up to 91.52% (n = 1,101), which was relatively different from birdwatchers in the USA. In 2011, 47 million people in the USA were birdwatchers, with 41 million watching birds around their homes while 18 million watching birds far from their residence (Carver 2013). Humans need nearby ecosystems to fulfill their natural recreation needs, such as urban parks for leisure activities and other natural recreation activities. However, Vallecillo et al. (2019) stated that a further location away from their domicile has a higher preference than a closer location.

The difference in birdwatchers' preference for visiting locations further from their domicile is driven by the increased size of recreational areas in Belgium and the demand level in Ireland (Vallecillo et al. 2019). This condition aligns with the addition of birdwatching recreational destinations in Indonesia. This condition emphasizes the information aspect. The information development that includes the potential of birds as a demand for birdwatching in a location encourages birdwatchers to come, especially information regarding the discovery of new species, as shown in Belitung Island (Iqbal 2015; Lestari and Kurnia 2023), the Northern Coast of Java (Iswandaru et al. 2022), and Riau Archipelagos (Chan and Chan 2019). The addition of birdwatching recreational destinations is also related to adding various information about the destinations, making them attractive for birdwatchers. For example, lately, 556 conservational sites comprise 54 national parks in Indonesia with a total area of 22.1 million ha and protected forests at 29.7 million ha (KLHK 2018; KLHK, 2022).

### 3.2. Birdwatching Destination Location from the Regional Border of the Fauna

The Papua Region is the most preferred location outside the respondents' region (n = 229). Other regions are also considered birdwatching destinations from outside the respondents' region with 29–51 respondents, which differed significantly ( $\chi^2_{\text{count}} = 455.11$ ; df = 7;  $P < 0.05$ ). Therefore, the Papua Region is the main destination for the major respondents (Table 1). Meanwhile, the overseas destination locations in 13 countries were chosen by 22 respondents, with Australia as the region with the highest preference, which was chosen by six respondents (Table 2).

The target locations and birds overseas show that the respondents are birdwatchers familiar with birdwatching. For example, the target of looking at the parrots from Ordo Psittaciformes in Australia is in line with the fact that Australia is an area with high endemic parrots (Olah et al. 2018). Likewise, Christmas Island is known as a habitat for seabirds, including frigatebirds (*Fregata* spp.), which are known to breed on this island (James and McAllan 2014).

The locations for birdwatching activity sites were not all specifically mentioned by respondents. Some respondents only mentioned the region's name, location status, or habitat type. However, most respondents mentioned specific target locations (49,96%; n = 601), namely 171

locations (**Fig. 3**). The most frequent locations mentioned by respondents were Gede Pangrango National Park and Baluran National Park (34 respondents for each location), followed by Bali Barat National Park (n = 32). Eleven sites are the most preferred locations for birdwatching, and they are dominated by national parks (10 locations). In contrast, one location is a public area with a protected site, namely the Raja Ampat, Papua (**Fig. 4**).

**Table 1.** Number of respondents based on region origin and destinations for birdwatching

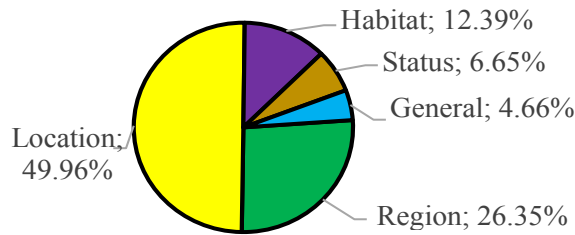
No.	The origin of respondent region	The destination of region preference								Total
		Sumatra	Java – Bali	Kalimantan	Celebes	Lesser Sunda	Moluccas	Papua	Overseas	
1	Sumatra	120*	18	4	2	3	2	23	7	179
2	Java –Bali	42	406*	25	24	36	42	165	11	751
3	Kalimantan	2	8	65*	2	4	1	11	2	95
4	Celebes	1	6	1	56*	1	5	20	1	91
5	Lesser Sunda	2	7	0	1	28*	1	7	0	46
6	Moluccas	0	0	0	0	0	22*	3	0	25
7	Papua	0	0	0	0	5	0	10*	1	16
	<b>Total</b>	167	445	95	85	77	73	239	22	1203

Note: \*The region's origin and destination are the same

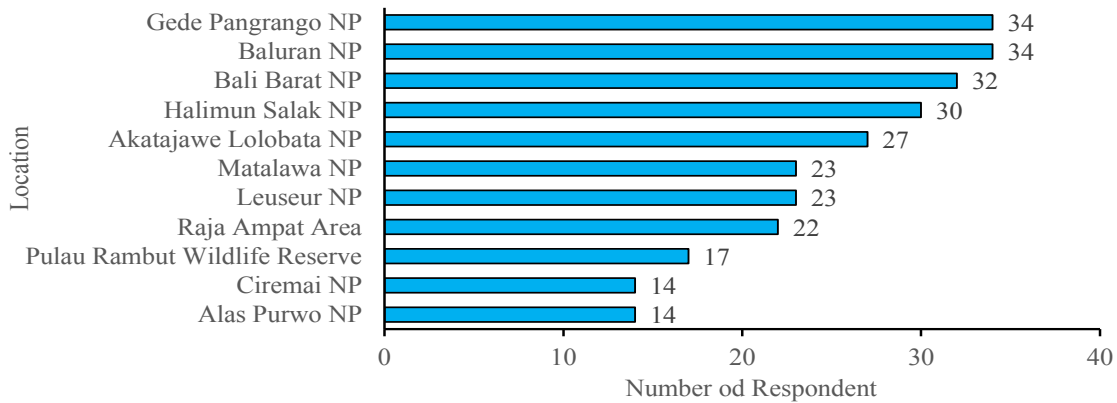
**Table 2.** Number of respondents who prefer birdwatching overseas

No.	Country	Location	Number of respondent	Bird targets
1	Japan	Motosu Lake, Fuji Mountain	1	All species
		Kushiro Shitsugen National Park	1	<i>Grus japonensis</i> , Gruide, Gruiformes
2	Malaysia	Kinabalu National Park	1	<i>Spilornis kinabaluensis</i> , Falconidae, Falconiformes
3	South Korea	Yellow Sea Coastal	1	Shorebirds, migration birds
4	Europe	Not specific	1	<i>Luscinia megarhynchos</i> , Muscicapidae, Passeriformes
5	Papua New Guinea	Mountain habitat	1	<i>Astrapia mayeri</i> , Paradisaeidae, Passeriformes
6	Africa	Not specific	1	All species
7	Madagascar	Not specific	1	All species
8	Australia	Coastal, general	2	Shorebirds, migration birds
		East Coastal	1	Parrots, Order Psittaciformes
		Christmas Island	2	Sea birds
		Antarctica	1	Ordo Spenisciformes
9	Brazil	Amazon forest	2	All species
			1	Ordo Psittaciformes
			1	<i>Ara macao</i> , Psittacidae, Psittaciformes
10	Costa Rica	Not specific	1	All species
11	Ecuador	Galapagos Island	1	All species
12	Peru	Manu Biosphere Reserve	1	<i>Asthenes ottonis</i> , Furnariidae, Passeriformes
13	USA	Yellowstone National Park	1	All species



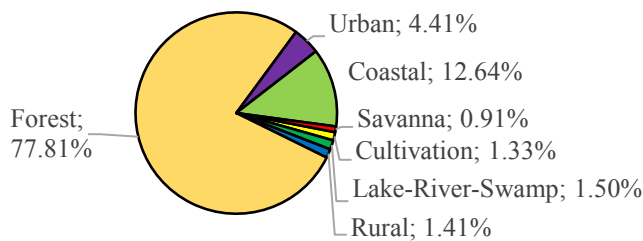


**Fig. 3.** Respondent percentage according to the location specification for birdwatching.



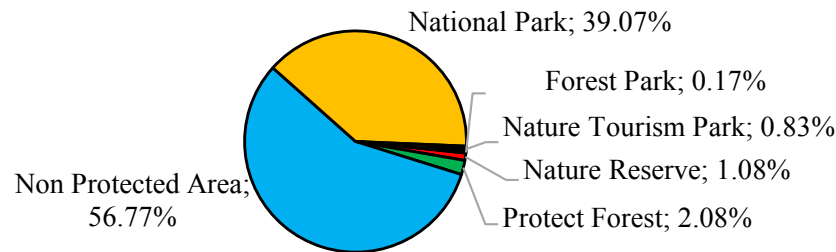
**Fig. 4.** Number of respondents who chose 11 locations as the most preferred sites for birdwatching.

There are seven habitat types targeted by respondents. The destination habitat for birdwatching activities has a significantly different preference on the number of respondents ( $\chi^2_{\text{count}} = 4051.36$ ;  $df = 6$ ;  $P < 0.05$ ). Forest obtains the most preferable site (77.81%;  $n = 936$ ), followed by coastal habitat (12.64%;  $n = 152$ ). Meanwhile, the least preferred site is presented in the savanna habitat (0.91%;  $n = 11$ ) (**Fig. 5**).



**Fig. 5.** Percentage of respondent number in habitat type preference for birdwatching.

The respondents of the 520 birdwatching destinations prefer protected areas, while others prefer areas from outside protected areas or non-specific areas. There are five protected areas that respondents prefer. The destination location status for birdwatching activities significantly affects the number of respondents ( $\chi^2_{\text{count}} = 2229.85$ ;  $df = 6$ ;  $P < 0.05$ ). National parks have the highest preference for protected area status (39.07%;  $n = 470$ ), followed by protected forests (2.08%;  $n = 152$ ). Meanwhile, the least preference is forest park (0.17%;  $n = 2$ ) (**Fig. 6**).



**Fig. 6.** Percentage of respondents in preferred location status for birdwatching.

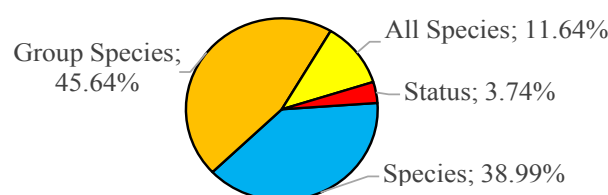
Birdwatchers' preferences for protected areas indicate that protected areas are attractive as birdwatching locations. Protected areas are generally forest habitats with more diverse bird species than others (LaManna and Martin 2017). Forest habitats have been proven to have more diverse bird species than non-forest areas. Moreover, generally protected areas are forest habitats (Chanda et al. 2023; Vargas-Cárdenas et al. 2022).

Protected areas become the best habitat for many endemic or rare bird species. Various bird species can be found in protected areas, such as maleo (*Macrocephalon maleo*) in Bogani Nani Wartabone National Park (Karim et al. 2023), bare-throated whistler (*Pachycephala nudigula*) in Kelimutu National Park (Fauzi et al. 2022), parrots in Aketajawe Lolobata National Park (Firdausy et al. 2021), knobbed hornbill (*Rhyticeros cassidix*) in Lore Lindu National Park (Ardi and Suardi 2020), Javan hawk-eagle (*Nisaetus bartelsi*) in Halimun Salak National Park (Septiana et al. 2020), and green peafowl (*Pavo muticus*) in Baluran National Park and Alas Purwo National Park (Hernowo et al. 2018).

A high preference for birdwatching in protected areas benefits the conservation act. Birdwatching has been advantageous for conservation in protected areas (Múnera-Roldán and Ocampo-Peñuela 2022; Steven et al. 2013). Therefore, birdwatching can be established as the conservation act continues in the protected areas. In addition, birdwatching activities, which aim to observe birds in the wild directly, will encourage the conservation site to provide these birds in protected areas, stimulating a further effort to protect these birds. A high preference for destinations outside protected areas shows that birdwatchers understand that birds can be found in various regions, although unprotected.

### 3.3. Target Bird Species in Birdwatching

The target birds that respondents prefer observing are dominated by the choice of bird species groups (45.64%; n = 549), followed by respondents who mentioned bird species directly as a target for birdwatching (39.07%; n = 470) (Fig. 7). Only a small number of respondents stated that the target was all bird species, without mentioning specific groups or species or certain statuses of the birds, such as the uniqueness or the protection status.



**Fig. 7.** Respondent percentage on target bird preference for birdwatching.





**Table 3.** Bird species as birdwatching targets

Family	Species (number of respondents)
Accipitridae	<i>Accipiter novaehollandiae</i> (1), <i>Aquila gurneyi</i> (1), <i>Haliaeetus leucogaster</i> (10), <i>Haliastur indus</i> (1), <i>Harpia harpija</i> (1), <i>Harpyopsis novaeguineae</i> (2), <i>Ictinaetus malayensis</i> (1), <i>Nisaetus bartelsi</i> (70), <i>Nisaetus floris</i> (5), <i>N. lanceolatus</i> (1), <i>Pernis ptilorhynchus</i> (1), <i>Spilornis cheela</i> (2), <i>Spilornis kinabaluensis</i> (1)
Alcedinidae	<i>Actenoides monachus</i> (1), <i>Alcedo euryzona</i> (2), <i>Alcedo atthis</i> (2), <i>Ceyx erithaca</i> (1), <i>Todirhamphus chloris</i> (1)
Anatidae	<i>Asarcornis scutulata</i> (2)
Bucerotidae	<i>Aceros cassidix</i> (10), <i>Aceros corrugatus</i> (1), <i>Anthracoseros albirostris</i> (1), <i>Buceros bicornis</i> (2), <i>Buceros rhinoceros</i> (8), <i>Penelopides exarhatus</i> (1), <i>Rhinoplax vigil</i> (31), <i>Rhyticeros averitti</i> (6), <i>Rhyticeros undulatus</i> (3)
Caprimulgidae	<i>Eurostopodus diabolicus</i> (1)
Charadriidae	<i>Pluvialis fulva</i> (1), <i>Vanellus micropterus</i> (2)
Ciconiidae	<i>Ciconia episcopus</i> (1), <i>Ciconia stormi</i> (2), <i>Leptoptilos javanicus</i> (4), <i>Mycteria cinerea</i> (5)
Columbidae	<i>Caloenas nicobarica</i> (1), <i>Chalcophaps indica</i> (1)
Corvidae	<i>Cissa chinensis</i> (1), <i>Cissa thalassina</i> (4), <i>Corvus enca</i> (1)
Cuculidae	<i>Carpococcyx viridis</i> (4), <i>Centropus nigrorufus</i> (1), <i>Scythrops novaehollandiae</i> (1)
Estrildidae	<i>Lonchura montana</i> (1), <i>Padda oryzivora</i> (3)
Eurylaimidae	<i>Eurylaimus javanicus</i> (1)
Fregatidae	<i>Fregata andrewsi</i> (4)
Fringilidae	<i>Serinus estherae</i> (1)
Furnariidae	<i>Asthenes ottonis</i> (1)
Gruidae	<i>Grus japonensis</i> (1)
Jacaniidae	<i>Hydrophasianus chirurgus</i> (1)
Leiothrichidae	<i>Crocias albonotatus</i> (1), <i>Garrulax leucolophus</i> (2)
Megalaimidae	<i>Megalaima mystacophanos</i> (1)
Megapodidae	<i>Macrocephalon maleo</i> (10), <i>Megapodius cumingii</i> (1), <i>Megapodius reinwardt</i> (2)
Meliphagidae	<i>Macgregoria pulchra</i> (1), <i>Myzomela irianawidodoae</i> (1)
Monarchidae	<i>Eutrichomyias rowleyi</i> (4), <i>Hypothymis azurea</i> (1), <i>Terpsiphone paradisi</i> (6)
Muscicapidae	<i>Cyornis banyumas</i> (1), <i>C. sanfordi</i> (1), <i>Copsychus malabaricus</i> (9), <i>Enicurus leschenaulti</i> (2), <i>Eumyias indigo</i> (1), <i>Ficedula bonthaina</i> (2), <i>Luscinia megarhynchos</i> (1), <i>T. pyrropygus</i> (1)
Nectariniidae	<i>Leptocoma aspasia</i> (1), <i>Cinnyris jugularis</i> (1)
Oriolidae	<i>Oriolus chinensis</i> (2)
Pachycephalidae	<i>Colluricincla sanghirensis</i> (1), <i>Pachycephala nudigula</i> (1)
Paradisaeidae	<i>Astrapia mayeri</i> (1), <i>C. regius</i> (1), <i>C. republica</i> (4), <i>Epimachus fastosus</i> (1), <i>Paradisaea minor</i> (3), <i>P. rubra</i> (5), <i>P. rudolphi</i> (1), <i>Lophorina superba</i> (1), <i>Semioptera wallacii</i> (29)
Pellorneidae	<i>Trichastoma celebense</i> (1)
Phasianidae	<i>Arborophila javanica</i> (1), <i>Argusianus argus</i> (10), <i>Lophura bulweri</i> (1), <i>Lophura ignita</i> (1), <i>Pavo muticus</i> (15), <i>Rollulus rouloul</i> (1)
Picidae	<i>Dendrocopos temminckii</i> (1), <i>Dryocopus javensis</i> (1)
Pittidae	<i>Erythropitta dohertyi</i> (1), <i>Hydrornis schneideri</i> (1), <i>Pitta elegans</i> (1), <i>Pitta erythrogaster</i> (1), <i>Pitta guajana</i> (3), <i>Pitta maxima</i> (1)
Podargidae	<i>Batrachostomus cornutus</i> (1)
Psittacidae	<i>Ara macao</i> (1), <i>Cacatua alba</i> (1), <i>C. goffiniana</i> (1), <i>C. sulphurea</i> (18), <i>Eclectus roratus</i> (1), <i>Eos bornea</i> (1), <i>E. histrio</i> (2), <i>Lorius lory</i> (1), <i>L. stigmatus</i> (1), <i>Probosciger aterrimus</i> (3), <i>Psittacula longicauda</i> (2)
Pycnonotidae	<i>Alophoixus bres</i> (1), <i>Pycnonotus aurigaster</i> (2), <i>Pycnonotus zeylanicus</i> (1)
Rallidae	<i>Aramidopsis plateni</i> (1), <i>Gymnocrex talaudensis</i> (1), <i>Habroptila wallacii</i> (5)
Ramphastidae	<i>Ramphastos toco</i> (1)
Recurvirostridae	<i>Himantopus Himantopus</i> (1)
Scolopacidae	<i>Calidris pygmaea</i> (5), <i>Scolopax rochussenii</i> (1), <i>Scolopax saturata</i> (1), <i>Tringa guttifer</i> (2)
Strigidae	<i>Ninox rudolfi</i> (1), <i>Otus brookii</i> (1), <i>Otus jolanodea</i> (1), <i>Otus siaoensis</i> (1)
Sturnidae	<i>Acridotheres javanicus</i> (1), <i>Gracula religiosa</i> (6), <i>Leucopsar rothschildi</i> (32), <i>Sturnus melanopterus</i> (2)
Threskiornithidae	<i>Plegadis falcinellus</i> (1), <i>Pseudibis davisoni</i> (1)
Trogonidae	<i>Apalharpactes mackloti</i> (1), <i>A. reinwardtii</i> (3), <i>Harpactes oreskios</i> (2), <i>H. whiteheadi</i> (1)
Turdidae	<i>Chocoa azurea</i> (2), <i>Turdus poliocephalus</i> (1), <i>Zoothera citrina</i> (1)
Turnicidae	<i>Turnix everetti</i> (1)
Zosteropidae	<i>Zosterops nehrkorni</i> (1), <i>Zosterops palpebrosus</i> (2)

Overall, 52 families attract the respondents. The most popular family is the Paradisaeidae (n = 238), followed by the Accipritidae (n = 202) and the Bucerotidae (n = 147) (Fig. 9 and Table 4). Twelve families have the lowest preference, and only one respondent votes. Other families attracted two to 62 respondents. In particular, the passerine bird or songbirds group from the Order Passeriformes had the highest preference from respondents (n = 356; 35.00%). This order consists of 17 families Corvidae, Estrildidae, Eurylaimidae, Fringillidae, Furnariidae, Leiiothrichidae, Meliphagidae, Muscicapidae, Nectariniidae, Oriolidae, Pachycephalidae, Passeridae, Paradisaeidae, Pellorneidae, Pittidae, Pycnonotidae, Sturnidae, dan Zosteropidae.

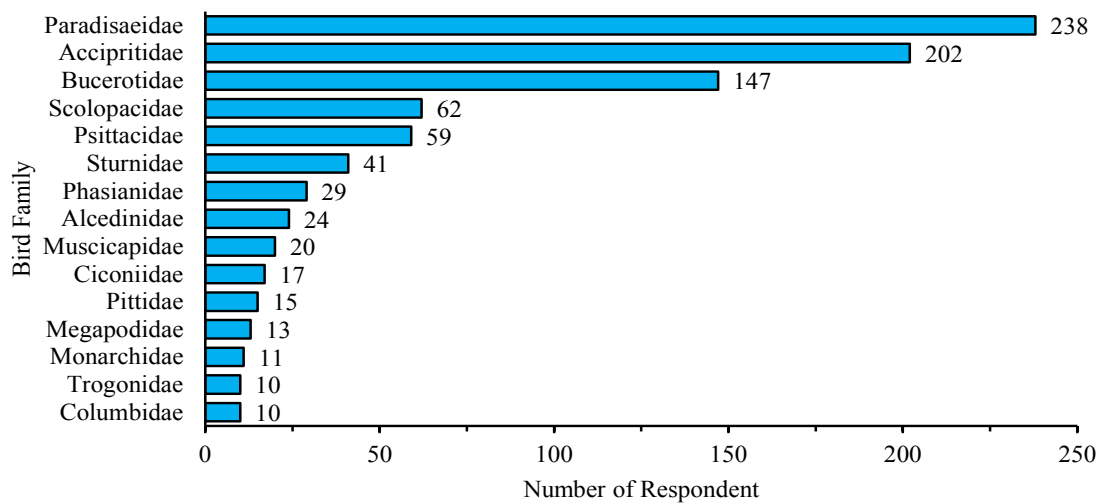


Fig. 9. Number of respondents (n > 10) according to the preference of bird families for birdwatching.

Table 4. Bird families as birdwatching target with number of respondents (n < 10) according to the preference for birdwatching

Number of respondent	Family
1	Eurylaimidae, Fringillidae, Furnariidae, Gruidae, Jacanidae, Laridae, Megalaimidae, Pellorneidae, Ramphastidae, Recurvirostridae, Spheniscidae, Turnicidae
2	Ardeidae, Meliphagidae, Oriolidae, Pachycephalidae, Threskiornithidae
3	Charadriidae, Leiiothrichidae, Picidae, Procellariidae, Zosteropidae
4	Estrildidae, Fregatidae, Podargidae, Pycnonotidae, Turdidae
5	Anatidae, Caprimulgidae
6	Corvidae, Dicruridae, Nectariniidae, Passeridae, Pelecanidae
7	Cuculidae, Rallidae
8	Strigidae

The high preference of birdwatchers for birds of paradise is supported by several factors related to their physical and distribution uniqueness. The Paradisaeidae family is mainly distributed in Papua and Papua New Guinea, a few of which can be found in Moluccas and Australia (Winkler et al. 2020). Therefore, the paradise birds have become the main icon in Papua (Wibawa 2019). The paradise birds are attractive to birdwatchers due to their feather color ornaments, behavior, and sounds (Scholes and Laman 2018). The limited distribution and uniqueness of the paradise birds have become an attraction for birdwatchers outside the Papua and Moluccas regions to come and enjoy them directly in nature.

In particular, the high preference for songbirds is thought to be closely related to the major preferred birds from the Passeriformes, up to 50% of the total number of birds (Juaid et al. 2023; Sibley and Ahlquist 1990; Taufiqurrahman et al. 2022). The passerines attract people due to color and sound (Clucas et al. 2015). Similar results were also stated by Green and Jones (2010), who state that passerines are the most memorable group of birds in Australia. Research by Santangeli et al. (2023) identified that the highest aesthetic value of birds is found in small birds with bright and specific colors such as blue, red, and grayish brown, and have extreme ornaments such as large-sized rose hips or long tails, and birds with a wider distribution area. Although Santangeli et al. (2023) did not specifically address passerines, these birds are generally small and have striking colors. These birds have high trading levels in the bird trade due to their aesthetic colors (Senior et al. 2022).

The number of birdwatchers who preferred observing new species was limited to a few respondents and was not included in the dominant category. However, birdwatchers are a group of tourists known to have high scientific knowledge and interest in scientific aspects. Therefore, even though it is not included in the dominant category, there are still groups of birdwatchers who are interested in seeing new scientifically discovered bird species, such as myzomela, limited to Rote Island, East Nusa Timur (Prawiradilaga et al. 2017). Birdwatchers with a target of looking for a particular species or even with a target of finding a new species are usually called twitchers who will have a target of finding that new species, rare or vagrant (Brock et al. 2021). Birdwatchers have personal satisfaction and pleasure by having a record list of the bird species they have encountered (Butler 2024).

### 3.4. The Socio-Demographic Factors that Affect Birdwatching Destination Preference

Variables that significantly influence the preference of birdwatching destination based on the distance taken are age, domicile, income, organization, and expertise (Table 5). Locations that are further away attract young respondents who live in urban areas, have higher incomes, are members of organizations, and have high birdwatching skills.

**Table 5.** The GLZ analysis of the demographic effect on the preference for birdwatching destination

Dependent variable	Significant effect	p-value	Beta ( $\beta$ )	Odds
Location Targets	Age	0.000	-0.215	Young > Old
	Domicile	0.002	-0.271	City > Regency
	Income	0.014	0.960	High > Low
	Organization	0.006	0.156	Member > non-Member
	Skill	0.002	0.148	Expert > Beginner
Biogeography	Age	0.011	-0.009	Young > Old
Targets	Domicile	0.028	-0.019	City > Regency
	Income	0.013	0.003	High > Low

Notes: Significant at  $p < 0.05$ ; very significant at  $p < 0.01$ .

The high preference for visiting locations outside their domicile (91.52%) indicates that the respondents prefer finding different species of birds outside their inhabitants. The lowest diversity of bird species is found in urban landscapes, compared to the diversity of bird species in rural and natural landscapes (Bennett et al. 2022; Sarmiento-Garavito et al. 2022; Vignoli et al. 2013). Therefore, visiting other areas outside the domicile, either in the same region or different regions

and abroad, has a high chance of finding new bird species that are different from around the domicile. This preference is to the specialization of birdwatchers, namely generalist groups interested in studying as many bird species as possible and specialist groups interested in studying certain species (Brock et al. 2021). As a specific form of natural tourism, birdwatching has created specifications for birdwatchers according to their level of interest in birds (Kurt and Düzgün 2021). The preference for discovering new species is also one of the motivations of USA birdwatchers (Glowinski 2013).

The age group variable, namely young people, prefers visiting locations farther away than older respondents. A previous study by Jones only indicates that the late adult dominates the demographic condition of birdwatchers (> 35 years) (Costa et al. 2018). Likewise, what was found by Janeczko et al. (2021) and Conradie (2015). Birdwatching in developing countries is mostly conducted by birdwatchers aged < 35 years (Walther and White 2018). However, birdwatching in developed countries is mostly conducted by birdwatchers from the retirement age group, whereas the American birdwatchers in the age group > 55 years were found to be up to 30% (Carver 2013). However, the dominance of this age group does not indicate a preference for the destination distance from the domicile. A study by Rutter et al. (2021) using a bird application found that US birdwatchers were dominated by those over 45 years old, reaching 80.3% of all respondents. The differences in the characteristics of birdwatchers in developing and developed countries are thought to be related to their preference for birdwatching activities.

Respondents who live in urban areas have a higher preference for visiting birdwatching locations farther away than those who live in districts. Generally, areas outside urban areas have a better natural environment than urban areas dominated by human activity (Moosavi et al. 2018). This is thought to be related to the need of urban residents for a natural environment, which is not available in urban environments due to the lack of experience directly related to the natural environment (Cox and Gaston 2018). Apart from that, birdwatching is more often associated with natural habitats, so it is categorized as natural tourism (Kurt and Düzgün 2021; Stemmer et al. 2022) even though it can also be done in urban areas (Kurnia et al. 2021).

The income variable aligns with the concept that birdwatchers generally have a higher willingness to pay for birdwatching activities, thus contributing to one of the largest ecotourism income sources (Schwoerer and Dawson 2022). Logically, people with higher incomes will have a higher ability to pay to visit tourist destinations far from their domicile. In general, a relationship is discovered between capita income and tourism consumption (Zhang 2020). Likewise, travel distance increases as tourist income rises. Furthermore, the cost is also related to the destination distance, whereas the further the distance traveled, the higher the costs tourists will incur (Safarov et al. 2022). Furthermore, the length of the visit positively correlates with income level, whereas a higher income level will make tourists visit the destination longer (Oklevik et al. 2021).

The organizational membership variable only significantly affects the target location, whereas the organizational members prefer visiting more distant birdwatching destinations. This significant value shows that the organization's role is important in encouraging its members to conduct birdwatching activities with various activity choices. Organization members generally have a higher interest in birdwatching than non-organization members. Similar results were also found by Costa et al. (2018), who found that most birdwatchers are members of nature conservation organizations. Even though they are only participants in conservation organizations, birdwatchers generally have a higher willingness to be involved in bird conservation management (Eriksson et al. 2023).



#### 4. Conclusions

Birdwatchers have significantly different preferences based on their destination. The Papua region has the highest preference for visits by birdwatchers from outside the region. Respondents did not specifically mention all locations targeted for birdwatching activities. The bird species mentioned directly by respondents were 143 species from 45 families. The species with the highest preference is the Javan hawk-eagle, followed by Bali myna, while the groups with the highest preference are the birds of paradise and raptors. In total, 52 bird families are of interest to respondents. The most popular order is Paradisaeidae, followed by Accipritidae and Bucerotidae. Locations that are further away attract young respondents who live in city areas, have higher incomes, are members of organizations, and have high birdwatching skills. The high preference for visiting locations outside their domicile, which reached 91.52%, indicates the respondents' desire to find different species of birds compared to those around their domicile. Preferences for locations and birds show different birdwatchers' interests, so each location and bird can support each birdwatcher's preferences. This specification can help area managers and the community develop birdwatching according to the characteristics of birdwatchers.

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