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COMMUNICATION

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A CHECKLIST OF BIRD COMMUNITIES IN TAMHINI WILDLIFE SANCTUARY, THE NORTHERN WESTERN GHATS, MAHARASHTRA, INDIA

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Abstract: Bird communities in Tamhini Wildlife Sanctuary in the northern Western Ghats were studied using line transect and point count methods from the year 2011 to 2013. The updated checklist of birds at the Sanctuary is now represented by 164 bird species. The present study reported 35 new records to the area, while 15 earlier reported bird species were not observed. Overall, 55 insectivorous, 19 omnivorous, 14 granivorous, nine piscivorous, eight frugivorous, eight carnivorous and six nectarivorous species were observed. Out of these, 98 were residents, 17 winter visitors, three vagrant visitors and one was summer migrant. Four restricted range species were recorded from the Sanctuary as Nilgiri Wood Pigeon *Columba elphinstonii*, Malabar Grey Hornbill *Ocyrceros griseus*, White-bellied Blue Flycatcher *Cyornis pallipes* and Crimson-backed Sunbird *Leptocoma minima*. Human activities such as pruning, cutting, grazing, fires, quarrying, trailing and camping were also reported in and around the Sanctuary.

Keywords: Avifauna, checklist, human activities, Tamhini, Western Ghats.

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Author Contribution: DCV and SVM designed the study plan. DCV carried out the field work. DCV wrote the manuscript and SVM provided critical inputs.

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INTRODUCTION

Birds are known as ecological indicators of habitat quality (Bibby 1999; Morelli et al. 2014) as bird species composition varies across vegetation types and depends on stratification, canopy density, altitude, season and disturbance (Das 2008; Jayson & Mathew 2003). Comparing temporal information on bird communities helps to keep track of any change in species composition and alterations in habitats at local level. The present study provides information on bird communities composition and their habitat utilization in the Tamhini Wildlife Sanctuary (TWS).

TWS is spread across Pune and Raigad districts of Maharashtra, India. The Sanctuary spans over 49.05km² of geographical extent between 18°20'–18°30'N & 73°21'–73° 30'E and altitude ranging from 560–1,050 m. Vegetation in this northern part of the Western Ghats is broadly classified as tropical semi-evergreen forest (Champion & Seth 1968). The secondary vegetation formations include patches of open forest, scrubs and grasses.

Vegetation is represented by tree species such as *Memecylon umbellatum*, *Syzygium cumini*, *Terminalia bellerica*, *Diospyros montana*, *Termanilia paniculata*, *Meyna laxiflora*, *Actinodaphne angustifolia*, *Albizia chinensis*, *Neolamarkia kadamba*, *Termanalia elliptica*, *Lagerstroemia microcarpa*, *Ficus racemosa* and *Macaranga peltata*, while the scrubs are represented by *Bridelia retusa*, *Catunaregam spinosa* and *Erythrina stricta*. Among grassy patches species like *Dimeria stafiana*, *Fimbristylis lawianus*, *Themeda triandra*, *Apluda mulica*, *Iscaemum polytrias*, *Hetropogon ritchei*, *H. contortus*, *Sehina nervosa*, *Oplismenus burmannii*, *Arthraxon lanceolatus*, *A. hispida* etc. are common (Datar 2016; Potdar et al. 2012).

METHODS

The base map of the Sanctuary was prepared by using Gram ++ software and sampling sites locations were collected and imported to the software by using Global Positioning System (Garmin, GPS 60).

Surveys were conducted using line transects at 12 accessible sites and point counts at three dense and inaccessible sites (Bibby et al. 2000), covering six major habitats, viz. dense forest (Fd), open forest (Fo), sparse open forest with scrub (Fs), cliffs and plateaus with rocks and grasses (C), agriculture (A), and water bodies (W) (Fig. 1; Images 1–4). These habitats were walked between

sunrise to 10:00hr from October 2011 to September 2013. Birds were directly observed by binoculars (Olympus: 8x40, 10x50) and calls of species were used to confirm the presence of species; however, species were recorded only after their sighting. Identification of most of the bird species was possible on the field, while for the ambiguities in identification, Grimmett et al. (2011) was referred. Sightings of bird species were ranked according to following abundance categories—Stray (S) (1 or 2 sightings), Occasional (O) (3–5 sightings), Uncommon (U) (6–15 sightings), Common (C) (16–25 sightings) and Abundant (A) (>25 sightings). Cumulative number of species recorded was plotted against number of samples. Migratory status and feeding guild of species were observed and referred to literature (Pande 2003; Grimmett et al. 2011).

RESULTS AND DISCUSSION

The updated checklist of birds at TWS including present and past records, now contains 164 species (Table 1; Images 5–16). The present study alone reported 149 species belonging to 59 families and 17 orders, of which 119 within TWS while 30 were just outside TWS limit. Past survey in 1997–98 (Padhye et al. 2007) reported 102 species. Highlights of the present survey includes 35 new records of species to the area, 87 common species to that of the earlier survey; 84 of which were recorded within sanctuary and three were recorded outside the sanctuary limits, while 15 species from the past survey were not reported. Feeding guild wise classification of 119 birds species reported within sanctuary limits includes 55 insectivorous, 19 omnivorous, 14 granivorous, nine piscivorous, eight frugivorous, eight carnivorous and six nectarivorous birds. Of the total, 98 were residents, 17 winter visitors, three were vagrant visitors and one was summer visitor from Konkan region. The highest number of sightings of species was recorded in agriculture (A), followed by sparse open forest with scrub (Fs), open forest (Fo), dense forest (Fd), water bodies (W) and cliffs and plateaus with rocks and grasses (C).

Four bird species from the IUCN Red List of Threatened Species (IUCN 2016) are recorded in the Sanctuary: Indian Vulture *Gyps indicus* - Critically Endangered, Nilgiri Wood Pigeon *Columba elphinstonii* - Vulnerable, Malabar Pied Hornbill *Anthracoceros coronatus* and River Tern *Sterna aurantia* - Near Threatened. Seven Western Ghats endemic bird species recorded from the sanctuary were the Nilgiri Wood Pigeon *Columba elphinstonii*, Malabar

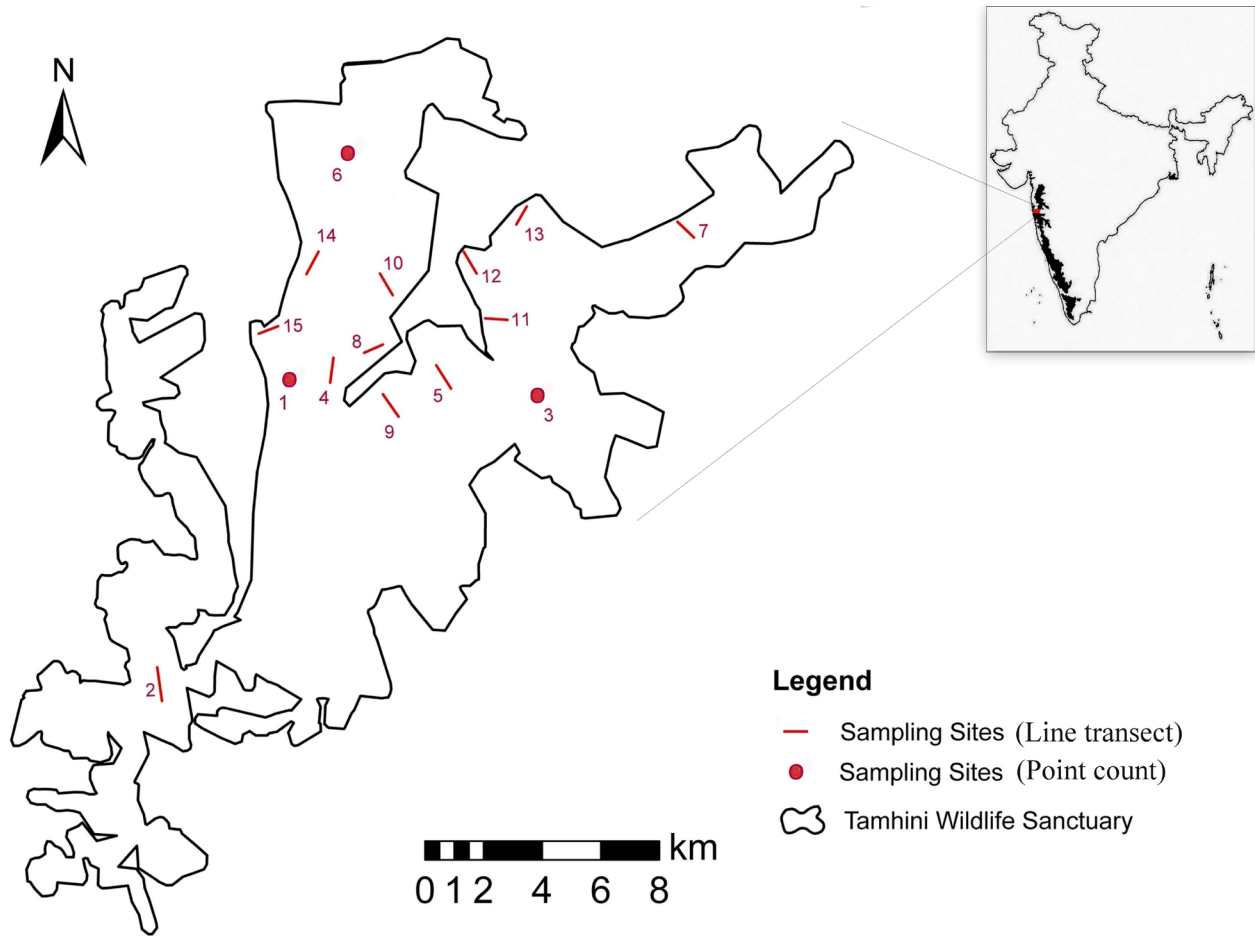


Figure 1. Sampling sites for birds in Tamhini Wildlife Sanctuary.



Image 1. Agriculture, with open and sparse open forest



Image 2. Dence forest



Image 3. Water body



Image 4. Cliffs and plateaus with rocks and grasses

Grey Hornbill *Ocyeros griseus*, White-bellied Blue Flycatcher *Cyornis pallipes*, Crimson-backed Sunbird *Leptocoma minima*, White-cheeked Barbet *Megalaima viridis*, Malabar Lark *Galerida malabarica* and Vigor’s Sunbird *Aethopyga (siparaja) vigorsii*, of these, the first four species are listed as restricted range species (Birdlife International 2018).

The study revealed that four species were restricted to a single habitat. Among this the Indian Vulture was observed nesting and roosting only at higher cliffs of

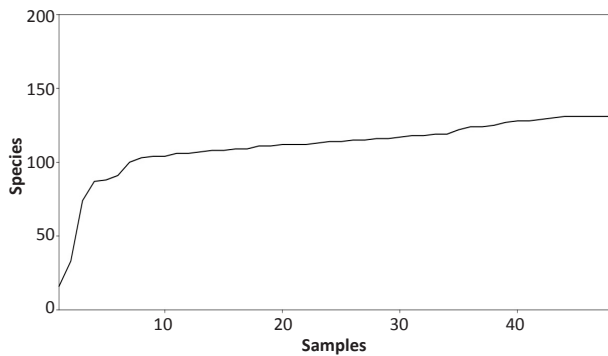


Figure 2. Species accumulation curve.

the sanctuary with around 20 individuals and six active nests, while Nilgiri Wood Pigeon, Orange-headed Thrush and Crimson-backed Sunbird were reported only from the undisturbed dense semi-evergreen forest.

Five species were widely distributed and found in three or more habitats and nine or more sites. Among these the Green Bee-eater *Merops orientalis* found across five habitats and 12 sites, Purple-rumped Sunbird *Leptocoma zeylonica* found across four habitats and 10 sites, Purple Sunbird *Cinnyris asiaticus* found across four habitats and 10 sites, Red-whiskered Bulbul *Pycnonotus jocosus* found across six habitats and 14 sites and White-cheeked Barbet *Megalaima viridis* was found across three habitats and 11 sites. Four bird species found restricted towards western side of Western Ghats, i.e., Konkan part of Sanctuary which includes Malabar Grey Hornbill, Oriental Dwarf Kingfisher, Vernal Hanging Parrot and Vigor's Sunbird.

The present study brings out an updated checklist of bird species, with considerable addition to the earlier recorded avifauna. It also provides critical information on their habitats along with the abundance in terms of number of sightings. Though TWS is comparatively small with an area of 49.05km², it has a high diversity of habitats and rich avifauna including threatened and endemic species. It houses the locally rare Nilgiri Wood Pigeon and globally rare Indian Vulture. These species are facing population decline, and hence the recent declaration of the Tamhini region as a Wildlife Sanctuary, would go a long way in ensuring protection of such species. Reduction in existing human disturbances such as pruning, cutting, grazing, fires, quarrying, trailing and camping, would likely bring further change in the species composition and/or distribution (Vijayan & Gokula 2006). Long-term studies on habitat-wise distribution of the species and impact of ongoing disturbances on bird communities are needed for providing inputs to better conservation of the avifauna and its habitats within the

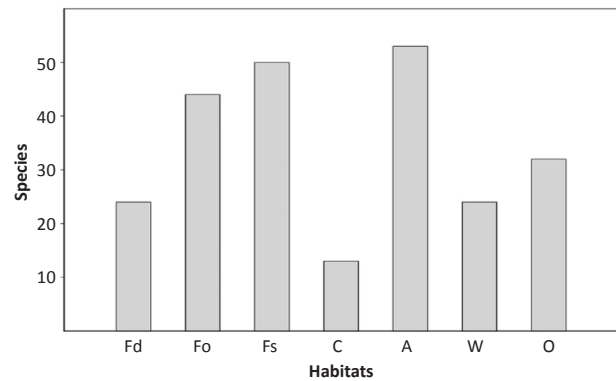


Figure 3. Species richness recorded in different habitats of Tamhini Wildlife Sanctuary, northern Western Ghats, Maharashtra, India. Habitats: Fd - Dense forest, Fo - Open forest, Fs - Sparse open forest with scrub, C - Cliffs and plateaus with rocks and grasses, A - Agriculture, W - Water bodies, O - Outside the Sanctuary limits.

Tamhini Wildlife Sanctuary.

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Table 1. Checklist of birds of Tamhini Wildlife Sanctuary, northern Western Ghats, Maharashtra, India.

	Family/Species	Feeding guild	Migratory status	Habitat	Locality	Total sightings	Abundance	Remarks
	Accipitridae							
1	Black Kite <i>Milvus migrans</i>	C	R	Fs	7	10	U	PP
2	Black-winged Kite <i>Elanus caeruleus</i>	C	R	A, W	10, 11, 12, 13	10	U	PP
3	Black Eagle <i>Ictinaetus malayensis</i>	C	R	Fd	3	2	S	NR
4	Bonelli's Eagle <i>Aquila fasciata</i>							OR
5	Brahminy Kite <i>Haliastur indus</i>							OR
6	Crested Hawk Eagle <i>Nisaetus cirrhatus</i>	C	R	Fo, Fs	5, 6, 7	2	S	NR
7	Crested Serpent Eagle <i>Spilornis cheela</i>	C	R	Fo, Fs	4, 6, 7	7	U	PP
8	Oriental Honey Buzzard <i>Pernis ptilorhynchus</i>							OR
9	Montagu's Harrier <i>Circus pygargus</i>							PR
10	Pallid Harrier <i>Circus macrourus</i>							OR
11	Shikra <i>Accipiter badius</i>	C	R	Fs	7	5	O	PP
12	Indian Vulture <i>Gyps indicus</i>	C	R	C	14, 15	11	U	PP
13	White-rumped Vulture <i>Gyps bengalensis</i>							PR
	Pandionidae							
14	Osprey <i>Pandion haliaetus</i>							OR
	Bucerotidae							
15	Malabar Pied Hornbill <i>Anthracoceros coronatus</i>							POR
16	Malabar Grey Hornbill <i>Ocyroceros griseus</i>	O	R	Fo, Fs	6	4	O	NR
	Apodidae							
17	Alpine Swift <i>Tachymarptis melba</i>	I	R	C	14, 15	10	U	PP
18	Little Swift <i>Apus affinis</i>	I	R	C, A	14, 15, 10, 11	11	U	PP
	Caprimulgidae							
19	Indian Nightjar <i>Caprimulgus asiaticus</i>	I	R	C	14	3	O	NR
	Charadriidae							
20	Red-wattled Lapwing <i>Vanellus indicus</i>	I	R	A	10, 11	7	U	PP
21	Little Ringed Plover <i>Charadrius dubius</i>							OR
	Laridae							
22	River Tern <i>Sterna aurantia</i>	P	R	W	12, 13	2	S	PP
	Scolopacidae							
23	Common Sandpiper <i>Actitis hypoleucos</i>	O	W	W	12, 13	2	S	PP
	Columbidae							
24	Common Pigeon <i>Columba livia</i>	G	R	Fs, A	7, 8, 9, 10, 11	29	C	PP
25	Nilgiri Wood Pigeon <i>Columba elphinstonii</i>	F	R	Fd	1	3	O	NR
26	Oriental Turtle Dove <i>Streptopelia orientalis</i>	G	W	Fs, A	9, 11	3	O	NR
27	Eurasian Collared Dove <i>Streptopelia decaocto</i>	G	R	Fs, A	9, 11	2	S	PP
28	Red Collared Dove <i>Streptopelia tranquebarica</i>	G	R	Fs, A	7, 9, 11	14	U	PP
29	Spotted Dove <i>Streptopelia chinensis</i>	G	R	Fs, A	9, 11	9	U	PP
30	Laughing Dove <i>Streptopelia senegalensis</i>	G	R	Fs, A	7, 8, 9, 10, 11	22	C	PP
31	Yellow-legged Green Pigeon <i>Treron phoenicopterus</i>	G	R	Fd, Fo	2, 6	4	O	NR
32	Emerald Dove <i>Chalcophaps indica</i>	G	R	R	4	3	O	NR
	Alcedinidae							

	Family/Species	Feeding guild	Migratory status	Habitat	Locality	Total sightings	Abundance	Remarks
33	Oriental Dwarf Kingfisher <i>Ceyx erithaca</i>	P	V	W	8	1	S	NR
34	Common Kingfisher <i>Alcedo atthis</i>	P	R	A, W	10, 11, 12, 13	10	U	PP
35	Pied Kingfisher <i>Ceryle rudis</i>							POR
36	White-throated Kingfisher <i>Halcyon smyrnensis</i>	P	R	A, W	10, 11, 12, 13	10	U	PP
37	Stork-billed Kingfisher <i>Pelargopsis capensis</i>							PR
	Coraciidae							
38	Indian Roller <i>Coracias benghalensis</i>	I	R	Fs	8	4	O	NR
	Meropidae							
39	Green Bee-eater <i>Merops orientalis</i>	I	R	Fo, Fs, C, A, W	4, 5, 6, 7, 8, 9, 14, 15, 10, 11, 12, 13	24	C	PP
	Cuculidae							
40	Greater Coucal <i>Centropus sinensis</i>	O	R	A	10, 11	8	U	PP
41	Common Hawk Cuckoo <i>Hierococcyx varius</i>	I	R	Fs	7, 9	3	O	NR
42	Jacobin Cuckoo <i>Clamator jacobins</i>							PR
43	Asian Koel <i>Eudynamis scolopaceus</i>	F	R	Fs, A	7, 9, 10, 11	15	U	PP
44	Blue-Faced Malkoha <i>Phaenicophaeus viridirostris</i>							PR
	Falconidae							
45	Common Kestrel <i>Falco tinnunculus</i>	C	R	C	14, 15	10	U	NR
	Phasianidae							
46	Indian Peafowl <i>Pavo cristatus</i>							OR
47	Jungle Bush Quail <i>Pedicularia asiatica</i>	G	R	Fo	4, 5	2	S	NR
48	Common Quail <i>Coturnix Coturnix</i>							PR
49	Painted Francolin <i>Francolinus pictus</i>	G	R	Fo	5	2	S	PP
50	Grey Junglefowl <i>Gallus sonneratii</i>	G	R	Fo	4, 5	17	C	PP
51	Red Spurfowl <i>Galloperdix spadicea</i>	G	R	Fo	4	2	S	NR
	Anatidae							
52	Indian Spot-billed Duck <i>Anas poecilorhyncha</i>							OR
53	Common Pochard <i>Aythya ferina</i>							OR
54	Eurasian Wigeon <i>Mareca penelope</i>							OR
55	Tufted Duck <i>Aythya fuligula</i>							OR
	Rallidae							
56	Common Coot <i>Fulica atra</i>							OR
57	Common Moorhen <i>Gallinula chloropus</i>	I	R	W	12	2	S	PP
58	White-breasted Waterhen <i>Amaurornis phoenicurus</i>	I	R	W	12	2	S	PP
	Acrocephalidae							
59	Blyth's Reed Warbler <i>Acrocephalus dumetorum</i>	I	W	Fs	10	2	S	PP
60	Paddyfield Warbler <i>Acrocephalus Agricola</i>							OR
	Aegithinidae							
61	Common Iora <i>Aegithina tiphia</i>	I	R	Fo, Fs, A	4, 5, 6, 7, 9, 11	16	C	PP
	Alaudidae							
62	Malabar Lark <i>Galerida malabarica</i>	O	R	C	14, 15	3	O	PP
	Campephagidae							
63	Orange Minivet <i>Pericrocotus flammeus</i>	I	R	Fo	5	5	O	PP

	Family/Species	Feeding guild	Migratory status	Habitat	Locality	Total sightings	Abundance	Remarks
64	Small Minivet <i>Pericrocotus cinnamomeus</i>							POR
	Cisticolidae							
65	Ashy Prinia <i>Prinia socialis</i>	I	R	Fs, A	7, 9, 10, 11	17	C	PP
66	Common Tailorbird <i>Orthotomus sutorius</i>	I	R	Fs, A	7, 9, 11	10	U	PP
67	Grey breasted Prinia <i>Prinia hodgsonii</i>	I	R	Fs, A	7, 9, 11	6	U	PP
68	Jungle Prinia <i>Prinia sylvatica</i>	I	R	Fo, Fs	5, 7, 9	6	U	NR
69	Plain Prinia <i>Prinia inornata</i>							OR
	Corvidae							
70	House Crow <i>Corvus splendens</i>	O	R	Fs, A	7, 9, 10, 11	12	U	PP
71	Indian Jungle Crow <i>Corvus (macrorhynchos) culminatus</i>	O	R	Fs, A	7, 8, 9, 10, 11	34	A	PP
72	Rufous Treepie <i>Dendrocitta vagabunda</i>							PR
	Dicaeidae							
73	Pale-billed Flowerpecker <i>Dicaeum erythrorhynchos</i>	N	R	Fo, Fs	4, 5, 7	9	U	PP
74	Thick-billed Flowerpecker <i>Dicaeum agile</i>	N	R	Fo, Fs	5, 7	9	U	NR
	Dicruridae							
75	Black Drongo <i>Dicurus macrocercus</i>	I	R	Fs, A	7, 8, 9, 10, 11	8	U	PP
76	Ashy Drongo <i>Dicurus leucophaeus</i>	I	W	Fs, A, W	7, 8, 9, 10, 11	6	U	NR
77	White-bellied Drongo <i>Dicurus caerulescens</i>							OR
	Emberizidae							
78	Crested Bunting <i>Melophus lathami</i>							PR
	Estrildidae							
79	Scaly-breasted Munia <i>Lonchura punctulata</i>	I	R	Fs, A	7, 8, 9, 11	7	U	PP
	Fringillidae							
80	Common Rosefinch <i>Carpodacus erythrinus</i>	G	W	Fs, A	7, 8, 9, 10, 11	30	C	PP
	Hirundinidae							
81	Red-rumped Swallow <i>Cecropis daurica</i>	I	R	C, A	14, 15, 10, 11	6	U	PP
82	Wire-tailed Swallow <i>Hirundo smithii</i>	I	R	C, A	14, 15, 10, 11	9	U	PP
83	Barn Swallow <i>Hirundo rustica</i>	I	W	C, A	14, 10, 11	4	O	NR
84	Eurasian Crag Martin <i>Ptyonoprogne rupestris</i>	I	W	C, A	14, 15, 10, 11	16	C	NR
85	Dusky Crag Martin <i>Ptyonoprogne concolor</i>	I	R	C, A	14, 15, 10, 11	17	C	PP
	Irenidae							
86	Golden-fronted Leafbird <i>Chloropsis aurifrons</i>	I	R	Fo	5, 11	5	O	NR
87	Jerdon's Leafbird <i>Chloropsis jerdoni</i>	I	R	Fo	11	1	S	NR
88	Asian Fairy-bluebird <i>Irena puella</i>							PR
	Laniidae							
89	Bay-backed Shrike <i>Lanius vittatus</i>	I	R	Fs, A	7, 8, 9, 10, 11	12	U	NR
90	Long-tailed Shrike <i>Lanius schach</i>	I	R	Fs, A	7, 8, 9, 10, 11	25	C	PP
91	Southern Grey Shrike <i>Lanius meridionalis</i>							PR
	Leiothrichidae							
92	Brown cheeked fulvetta <i>Alcippe poioicephala</i>							PR
93	Jungle Babbler <i>Turdoides striata</i>	I	R	Fo	4, 5, 6	28	C	PP

	Family/Species	Feeding guild	Migratory status	Habitat	Locality	Total sightings	Abundance	Remarks
94	Large Grey Babbler <i>Argya malcolmi</i>							OR
	Monarchidae							
95	Black-naped Monarch <i>Hypothymis azurea</i>	I	R	Fd, Fo	1, 4	3	O	NR
	Motacillidae							
96	Forest Wagtail <i>Dendronanthus indicus</i>	I	W	W	12	3	O	PP
97	Grey Wagtail <i>Motacilla cinerea</i>	I	W	A, W	11, 12, 13	7	U	PP
98	Tree Pipit <i>Anthus trivialis</i>							OR
99	White-browed Wagtail <i>Motacilla maderaspatensis</i>	I	R	A, W	11, 12, 13	5	O	PP
100	White Wagtail <i>Motacilla alba</i>	I	W	A, W	11, 12	2	S	PP
101	Yellow Wagtail <i>Motacilla flava</i>	I	W	W	12, 13	4	O	PP
	Muscicapidae							
102	Oriental Magpie Robin <i>Copsychus saularis</i>	I	R	Fd, Fo	2, 3, 4, 5, 6	20	C	PP
103	Verditer Flycatcher <i>Eumyias thalassinus</i>	I	W	Fd, Fo	1, 4	4	O	NR
104	Asian Brown Flycatcher <i>Muscicapa dauurica</i>	I	W	Fd, Fo	1, 4	4	O	NR
105	White-bellied Blue Flycatcher <i>Cyornis pallipes</i>	I	R	Fd, Fo	1, 4	5	O	PP
106	Tickell's Blue Flycatcher <i>Cyornis tickelliae</i>	I	R	Fd, Fo	1, 4	2	S	NR
107	Red-breasted Flycatcher <i>Ficedula parva</i>	I	W	Fs	9	5	O	NR
108	Indian Paradise-flycatcher <i>Terpsiphone paradisi</i>	I	R	Fd, Fo	1, 4, 6	8	U	PP
109	Malabar Whistling Thrush <i>Myophonus horsfieldii</i>	O	W	Fd, Fo	1, 6	2	S	PP
110	Pied Bushchat <i>Saxicola caprata</i>	I	R	Fs, A	7, 8, 9, 10, 11	30	A	PP
111	Ultramarine Flycatcher <i>Ficedula supercilialis</i>	I	W	Fd	1	1	S	NR
112	White-rumped Shama <i>Copsychus malabarica</i>	I	R	Fd, Fo	1, 4	2	S	NR
113	Indian Robin <i>Saxicoloides fulicatus</i>	I	R	Fo	4, 5, 6	16	C	PP
	Nectariniidae							
114	Purple-rumped Sunbird <i>Leptocoma zeylonica</i>	N	R	Fo, Fs, A, W	4, 5, 6, 7, 8, 9, 10, 11, 12, 13	25	C	PP
115	Crimson-backed Sunbird <i>Leptocoma minima</i>	N	R	Fd	1	7	U	PP
116	Purple Sunbird <i>Cinnyris asiaticus</i>	N	R	Fo, Fs, A, W	4, 5, 6, 7, 8, 9, 10, 11, 12, 13	19	C	PP
117	Vigor's Sunbird <i>Aethopyga (siparaja) vigorsii</i>	N	V	Fd	2	1	S	NR
	Oriolidae							
118	Indian Golden Oriole <i>Oriolus (oriolus) kundoo</i>	O	R	Fo	5, 6	5	O	PP
119	Black-naped Oriole <i>Oriolus chinensis</i>							PR
120	Black hooded Oriole <i>Oriolus xanthornus</i>	O	R	Fo	5, 6	2	S	NR
	Paridae							
121	Cinereous Tit <i>Parus cinereus</i>							OR
	Passeridae							
122	Chestnut shouldered Petronia <i>Gymnoris xanthocollis</i>	I	R	Fo	4	2	S	NR
123	House Sparrow <i>Passer domesticus</i>	I	R	Fo, Fs, A	4, 5, 7, 8, 9, 10, 11	17	C	PP
124	Great Tit <i>Parus major</i>	O	R	Fs, A	7, 9, 11	8	U	PP
	Pellorneidae							
125	Puff-throated Babbler <i>Pellorneum ruficeps</i>	I	R	Fo	6	2	S	PP
	Phylloscopidae							

	Family/Species	Feeding guild	Migratory status	Habitat	Locality	Total sightings	Abundance	Remarks
126	Greenish Warbler <i>Phylloscopus trochiloides</i>	I	W	Fs	10	2	S	PP
127	Tytler's Leaf Warbler <i>Phylloscopus tytleri</i>							OR
	Pittidae							
128	Indian Pitta <i>Pitta brachyura</i>							PR
	Ploceidae							
129	Baya Weaver <i>Ploceus philippinus</i>	G	R	Fs, A, W	7, 8, 9, 11	6	U	PP
	Pycnonotidae							
130	Square tailed black Bulbul <i>Hypsipetes (leucocephalus) ganeesa</i>	O	R	Fd, Fo	1, 4	9	U	PP
131	Red-vented Bulbul <i>Pycnonotus cafer</i>	O	R	Fs, A	7, 8, 9, 10, 11	28	C	PP
132	Red-whiskered Bulbul <i>Pycnonotus jocosus</i>	O	R	Fd, Fo, Fs, C, A, W	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14	50	A	PP
133	White-browed Bulbul <i>Pycnonotus luteolus</i>	O	R	Fd, Fo	1, 4	3	O	PP
134	Yellow-browed Bulbul <i>Acritillas indica</i>	O	R	Fd, Fo	1, 4	5	O	PP
	Rhipiduridae							
135	White-throated Fantail <i>Rhipidura albicollis</i>	I	R	Fs, A	7, 10, 11	4	O	PP
	Stenostiridae							
136	Grey-headed Canary-flycatcher <i>Culicicapa ceylonensis</i>							OR
	Sturnidae							
137	Brahminy Starling <i>Sturnia pagodarum</i>	O	R	Fs, A	7, 11	4	O	PP
138	Common Myna <i>Acridotheres tristis</i>	O	R	Fs, A	7, 10, 11	6	U	PP
139	Jungle Myna <i>Acridotheres fuscus</i>	O	R	Fs, A	7, 8, 9, 10, 11	16	C	PP
	Sylviidae							
140	Yellow-eyed Babbler <i>Chrysomma sinense</i>							OR
	Timaliidae							
141	Indian Scimitar Babbler <i>Pomatorhinus horsfieldii</i>	I	R	Fo	4, 10	8	U	PP
142	Tawny-bellied Babbler <i>Dumetia hyperythra</i>	I	R	Fo	6	2	S	PP
	Turdidae							
143	Eurasian Blackbird <i>Turdus merula</i>	I	S	Fd, Fo	1, 4, 5	4	O	PP
144	Orange-headed Thrush <i>Zoothera citrina</i>	O	R	Fd	1	2	S	NR
	Zosteropidae							
145	Oriental White-eye <i>Zosterops palpebrosus</i>	I	R	Fs, A	7, 11	2	S	PP
	Ardeidae							
146	Indian Pond Heron <i>Ardeola grayii</i>	P	R	A, W	11, 12, 13	2	S	PP
147	Intermediate Egret <i>Mesophoyx intermedia</i>							OR
148	Cattle Egret <i>Bubulcus ibis</i>	P	R	A, W	10, 11, 12, 13	10	U	PP
149	Great Egret <i>Casmerodius albus</i>							OR
150	Little Egret <i>Egretta garzetta</i>	P	R	A, W	11, 12, 13	4	O	PP
	Ciconiidae							
151	Asian Openbill <i>Anastomus oscitans</i>							OR
152	Woolly-necked Stork <i>Ciconia episcopus</i>							OR
	Phalacrocoracidae							
153	Little Cormorant <i>Phalacrocorax niger</i>	P	R	W	12	4	O	PP
154	Podicipedidae							

	Family/Species	Feeding guild	Migratory status	Habitat	Locality	Total sightings	Abundance	Remarks
	Little Grebe <i>Tachybaptus ruficollis</i>	P	R	W	12	3	O	NR
155	Picidae							
	Yellow-fronted Pied Woodpecker <i>Dendrocopos mahrattensis</i>							PR
	Ramphastidae							
156	Brown-headed Barbet <i>Megalaima zeylanicus</i>	F	R	Fo, Fs	5, 6, 7, 9	25	C	PP
157	White-cheeked Barbet <i>Megalaima viridis</i>	F	R	Fd, Fo, Fs, A,	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11	30	C	PP
158	Coppersmith Barbet <i>Megalaima haemacephala</i>	F	R	Fs, A,	7, 11	13	U	PP
159	Psittaculidae							
	Vernal Hanging Parrot <i>Loriculus vernalis</i>	F	V	Fd	2	2	S	NR
160	Rose-ringed Parakeet <i>Psittacula krameri</i>	F	R	Fs, A,	9, 10	8	U	PP
161	Plum-headed Parakeet <i>Psittacula cyanocephala</i>	F	R	Fo	6	2	S	PP
	Strigidae							
162	Brown Fish Owl <i>Ketupa zeylonensis</i>							OR
163	Spotted Owlet <i>Athene brama</i>							OR
164	Indian Eagle Owl <i>Bubo bengalensis</i>							PR

Feeding Guild: F - Frugivores, N - Nectarivores, I - Insectivores, O - Omnivores, G - Granivores, C - Carnivores, P - Piscivores

Residence: R - Resident, W - Winter visitor, S - Summer visitor, V - Vagrant

Habitat: Fd - Dense forest, Fo: Open forest, Fs: Sparse open forest with scrub, C: Cliffs and plateaus with rocks and grasses, A: Agriculture, R: Riparian, W: Water bodies.

Locality: see surveyed locality in Figure 1.

Abundance: A - Abundant, C - Common, O - Occasional, S - Stray, U - Uncommon

Remarks (with respect to Padhye and et al. 2007): PP - Recorded in past and present surveys, NR - New Records; not recorded in the past survey, PR - Past Records; nor recorded during the present survey, POR - Recorded in the past survey and recorded outside the Sanctuary limits in the present survey, OR - recorded outside the Sanctuary limits during the present survey.



Image 5. White-cheeked Barbet *Megalaima viridis*



Image 6. Emerald Dove *Chalcophaps indica*



Image 7. Orange-headed Thrush *Zosterops citrina*



Image 8. Nilgiri Wood Pigeon *Columba elphinstonii*



Image 9. Indian Vulture *Gyps indicus*



Image 10. Common Kestrel *Falco tinnunculus*



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Image 11. Jerdon's Leafbird *Chloropsis jerdoni*



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Image 14. Ultramarine Flycatcher *Ficedula superciliaris*



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Image 15. Tickell's Blue Flycatcher *Cyornis tickelliae*



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Image 12. White-rumped Shama *Copsychus malabarica*



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Image 13. Malabar Grey Hornbill *Ocyceros griseus*



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Image 16. Verditer Flycatcher *Eumyias thalassinus*





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Miscellaneous

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