



Avifaunal diversity status and abundance of Siddheshwar Reservoir, district Hingoli, Maharashtra, India

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Abstract

Siddheshwar reservoir constructed on Purna River at Siddheshwar village in Taluka Aundha Nagnath, District Hingoli of Maharashtra state, India. Siddheshwar dam is an important reservoir for provides several benefits and facilities to the region of Hingoli, Parbhani and Nanded districts. The present study revealed total 70 species of birds belonging to 54 genera spread over 26 families and 12 orders. Further, it was interesting to note that the order Passeriformes dominated among the avian diversity with 27 species. Thus the water of reservoir is favorable for faunal diversity, rich in dissolved oxygen and supports variety of aquatic weeds and fishes, it has been found to be suitable habitat for bird fauna.

Keywords: Siddheshwar Reservoir, Avian diversity, Purna River, Migratory Birds, Abundance etc.

Introduction

Bird community evaluation has become an important tool in biodiversity conservation and for identifying conservation actions in areas of high human and animals pressure especially aquatic resources. Indian subcontinent is well known for diverse and rich bird's variety whose taxonomy, distribution and their general habitat characteristics are well documented. Bird communities have been studied fairly well both in temperate and tropical forests. However, only a very small is notorious about bird community structure and their dynamics in India. Understanding the diversity, structure and niche relationships of bird communities is essential to demarcate the importance of regional or local landscapes for avian conservation. Moreover seasonal monitoring is equally important to trace the dynamic movement of birds in such habitats.

Many researchers have studied on avian fauna in Marathwada region of Maharashtra as this area is blessed with various natural habitats such as river, reservoirs, hills, forests, grassland. (Yardi, *et al.*, 2004) reported 64 species of birds in Salim Ali Lake, Aurangabad. (Kulkarni, *et al.*, 2005) reported 151 species of birds in and around Nanded city. Kulkarni *et al.*, (2006) recorded 18 Piscivorous bird species in Dongarkheda irrigation tank. Dist. Hingoli. Kulkarni, *et al.*, (2006) also recorded 93 species of birds in Shikhachiwadi Wadi, reservoir Dist. Nanded; Kulkarni *et al.*, (2010) listed 62 bird species in forest Jaldhara, Kinwat. Dist.Nanded. Balkhande *et al.*, (2012) recorded 53 species of birds on river Godavari near Dhangar Takli; Balkhande *et al.*, (2013) recorded 50 species of birds near river Purna Dist. Parbhani.

Pentewar MS (2018) identified total 56 birds are near Sikara Dam. Wagh Gajanan (2019) studied Wetlands and Water birds of Amravati District. R.T. Pawar et.al, (2019) recorded 84 species of birds belonging to 15 orders and 30 families of Majalgaon reservoir and their tributaries. Satish N. Harde et.al, (2020) recorded 97 species of birds belonged to 48 families. Highest number 68 of bird species observed from agricultural areas, 57 species from forest areas, 41 species from Kundalika River and 32 species from wetlands. Also, Wagh G. A. et.al, (2020) recorded total 221 species were reported in the study area in MIDC area of Amravati.

Study of avifaunal diversity is essential ecological tools which act as an important indicator to evaluate the different habitats both quantitatively and qualitatively. Now-a-days, avifaunal diversity has been decreasing due to anthropogenic activities and destruction of natural habits by human beings, environmental pollution and also natural disasters. Many species of birds may be forced to inhabit in the urban areas and constrain to breed there. Birds are

important animal group of an ecosystem and maintain a trophic level. Therefore, there is a need of detail study on avifauna and their ecology is important to protect them. Birds play essential and diverse role in religion, and popular culture. They have their functional role in the ecosystem as potential pollinators and scavengers and are rightly called as bioindicators of the nature.

Materials and Methods

Study area

The Siddheshwar reservoir is a medium sized reservoir of about 2574 ha area, constructed on Purna River which is a tributary of River Godavari at Rupur camp Tq. Aundha Nagnath, Dist, Hingoli and near village Siddheshwar Tq, Aundha Nagnath, Dist, Hingoli in 1968. The site is at about 15 Km North-west to the city of Hingoli. The reservoir lies in between north latitude $19^{\circ}-0'-20''$ and East longitude $76.57'30''$. The reservoir is naturally situated in hilly region on both sides.

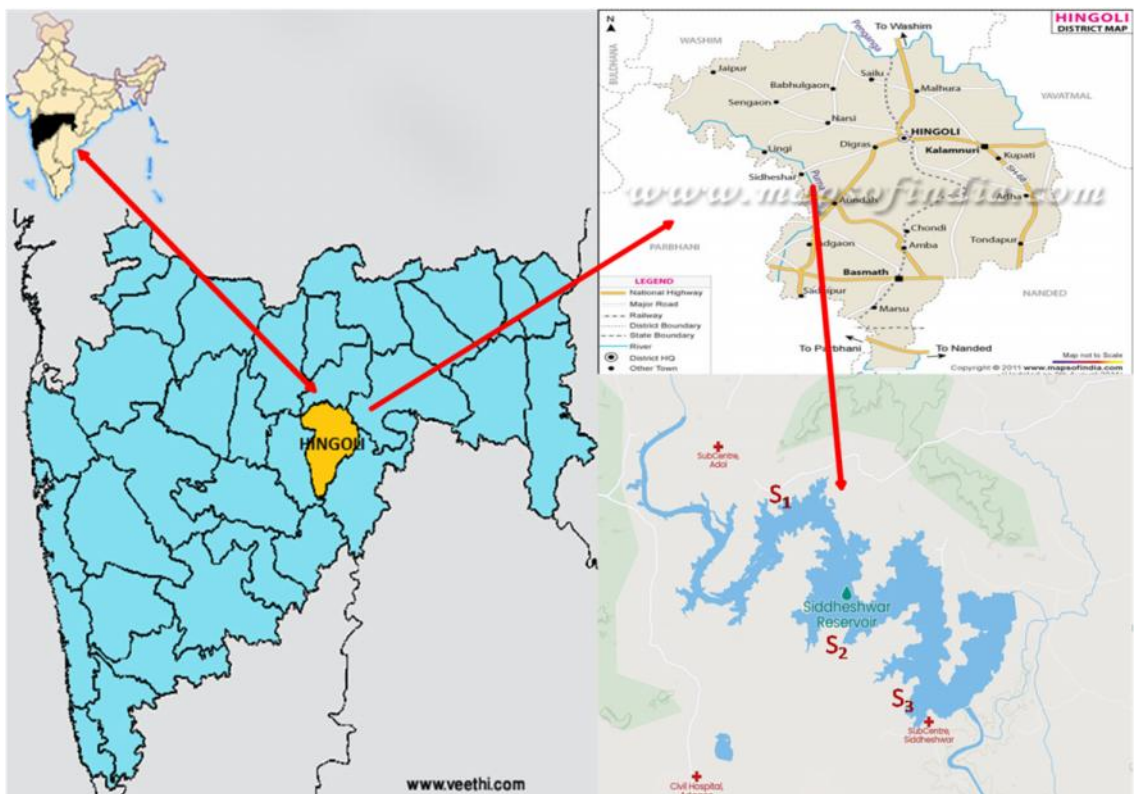


Figure – Map Showing study area of Siddheshwar reservoir

Avian faunal diversity of Siddheshwar reservoir surveys were conducted for a period of two years starting from January 2015 to December 2016 covering all the seasons. The areas were surveyed by using binoculars and digital cameras (NIKON D40 - 6.1MP DSLR camera 3.1x optical zoom AF-S DX Zoom-NIKKOR 18-55mmf/3.5-5.5.6G EDII lens) and NIKON D90 -12.3MP DSLR camera AF-S DX – CMOS sensor Zoom 18-105mm VR lens) for proper bird records. Also Direct observations and species noting was made by walking on channel of river, reservoir tracks, and reservoir areas. The observations were carried out at different points around the large wetland. Birds were identified following with the avifaunal field guidebooks (Kazmierczak et. al., 2003; Grimmett et. al., 2011) and Internet Birds database were used. The checklist of bird species is prepared by following the guidelines for checklist of birds (Abdulali, 1981; Ali and Replay, 1983, Ali et.al, 2003). The population status observed of bird species was recorded as per ACOR rating (Buckland et. al., 1983). Current status of threatened categories was adopted from Bird Life International (2000).

Results

The present studies on bird community structure of Siddheshwar Reservoir of Hingoli district, Marathwada region, Maharashtra state, India revealed the presence of 70 species of birds belonging to 54 genera spread over 26 families and 12 orders. Further, it was interesting to note that the order Passeriformes dominated among the avian diversity with 27 species (Table 1).

Family wise analysis of bird communities showed that family Ardeidae, Anatidae and Muscicapidae (06 species) which is dominated the avifauna, followed by Rallidae , Pycnonotidae and Cuculidae (4 species each) besides Cionidae, Charadriidae, Columbidae, Alcedinidae, Hirundinidae and Paridae (3 species each) while Threskiornithidae, Pisttaciidae, Meropidae, Motacillidae, Laniidae, Passeridae, Sturnidae and Corvidae (2 species each) whereas, Podicipidae, Phalacrocoracidae, Gruidae, Recurviorstridae, Apodidae and Dicruridae (1 species each) were poorly represented in the area (Table 1). Analysis of data on residential status revealed that out of 70 species, 27 were resident common and rest 43 showed migrant common, residential migrant common, uncommon rare, migrant rare, resident rare, uncommon, seasonally migrant common, uncommon, rare and breeding migrant rare uncommon (Table 1).

Further analysis of data showed that as per ACOR and IUCN status, the ACOR rating only 08 species were abundant, 31 species are common, 21 species are occasional and 10 species were rare. According to IUCN categorization 66 species were least concern, 02 nearly threatened and 01 species from vulnerable and critically endangered respectively. No any bird species from threatened and endangered (EN) category was sighted at any selected bird habitat. Similarly, there is no report of any species of bird which has been extinct from this region in recent time (Table 1).

Table 1: Systematic list of birds of Siddheshwar Reservoir

Sr. No.	Taxon	Common Name	Population, IUCN Status	Ecological status
	Order I: Podicipediformes			
	Family I: Podicipidae			
1	<i>Tachybaptus ruficollis</i> (Pallas, 1764)	Little grabe	C (LC)	MC
	Order II: Pelecaniformes			
	Family II : Phalacrocoracidae			
2	<i>Phalacrocorax niger</i> (Vieillot, 1817)	Little Cormorant	A (LC)	RMC
	Order III: Ciconiiformes			
	Family III: Ardeidae			
3	<i>Ardeola grayii</i> (Skyes, 1832)	Indian pond Heron	A (LC)	RC
4	<i>Egretta garzetta</i> (Linnaeus, 1766)	Little Egret	C (LC)	RM
5	<i>Bubulcus ibis</i> (Linnaeus, 1758)	Cattle Egret	A (LC)	RM
6	<i>Casmerodius albus</i> (Linnaeus, 1758)	Large Egert	O (LC)	Mr

7	<i>Ardea insignis</i> (Hume, 1878)	White bellied Heron	R (Cr)	Mr
8	<i>Nycticorax nycticorax</i> (Linnaeus, 1758)	Night Heron	C (LC)	Rr
	Family IV: Ciconiidae			
9	<i>Mycteria leucocephala</i> (Pennant, 1769)	Painted Stork	C (NT)	MC
10	<i>Anastomus oscitans</i> (Boddaert, 1783)	Asian Open bill Stork	R (LC)	Mr
11	<i>Ciconia episcopus</i> (Boddaert, 1783)	White Necked/Wooly Stork	O (LC)	WMr
	Family V: Threskiornithidae			
12	<i>Pseudibis papillosa</i> (Temminck, 1824)	Oriental White/Black Head Ibis	R (LC)	MU
13	<i>Platalea leucorodia</i> (Linnaeus, 1758)	Euresion Spoonbill	C (LC)	WMU
	Order IV: Ansariformes			
	Family VI: Anatidae			
14	<i>Tadorna ferruginea</i> (Pallas, 1764)	Ruddy Shelduck	M (LC)	WMC
15	<i>Dendrocygna javanica</i> (Horsfield, 1821)	Lesser Whistling Duck	C (LC)	WMC
16	<i>Anas poicillorhyncha</i> (Forster JR,1781)	Spot Billed Duck	C (LC)	RMC
17	<i>Netapus coromandalianus</i> (Gmelin J F, 1789)	Cotton/Pigmy Goose	O (LC)	WMr
18	<i>Aythya ferina</i> (Linnaeus, 1758)	Common pochard	O (LC)	WMr
19	<i>Netta rufina</i> (Pallas, 1773)	Red crested pochard	O (LC)	WMr
	Order V: Gruiformes			
	Family VII: Gruidae			
20	<i>Grus antigone</i> (Linnaeus, 1758)	Sarus Crane	O (VU)	RU
	Family VIII: Rallidae			
21	<i>Amaurornis phoenicurus</i> (Pennant, 1769)	White-breasted Waterhen	A (LC)	RC
22	<i>Porphyrio porphyrio</i> (Linnaeus, 1758)	Purple Moorhen	A (LC)	RC
23	<i>Fulica atra</i> (Linnaeus, 1758)	Eurasian Coot	O (LC)	RC
24	<i>Gallinula chloropus</i> (Linnaeus, 1758)	Common Moorhen	C (LC)	RC
	Order VI: Charadriiformes			
	Family IX: Charadriidae			
25	<i>Vanellus duvaucelii</i> (Lesson, 1826)	River Lapwing	R (NT)	Rr
26	<i>Vanellus indicus</i> (Boddaert, 1783)	Red-wattled Lapwing	C (LC)	RC
27	<i>Vanellus malabricus</i> (Boddaert, 1783)	Yellow wattled Lawping	O (LC)	RU
	Family X: Recurvirostridae			
28	<i>Himantopus himantopus</i> (Linnaeus, 1758)	Black winged stilt	A (LC)	WMC
	Order VII: Columbiformes			
	Family XI: Columbidae			
29	<i>Columba livia</i> (Gmelin, 1789)	Blue Rock Pigeon	C (LC)	RC
30	<i>Streptopelia senegalensis</i> (Linnaeus, 1766)	Little Brown Dove	C (LC)	RU
31	<i>Streptopelia decaocto</i> (Frisvaldszky, 1838)	Eurasian Collared-Dove	C (LC)	RC
	Order VIII: Psittaciformes			
	Family XII: Psittacidae			
32	<i>Psittacula eupatria</i> (Linnaeus, 1766)	Alexandrine Parakeet	O (LC)	RC
33	<i>Psittacula krameri</i> (Scopoli, 1769)	Rose-ringed Parakeet	O (LC)	RC

	Order IX : Cuculiformes			
	Family XIII: Cuculidae			
34	<i>Clamator jacobinus</i> (Boddaert, 1783)	Pied Crested Cuckoo	O (LC)	BMr
35	<i>Cuculus micropterus</i> (Gould, 1838)	Indian Cuckoo	A (LC)	RC
36	<i>Cuculus canorus</i> (Linnaeus, 1758)	Common Cuckoo	R (LC)	RC
37	<i>Eudynamis scolopacea</i> (Linnaeus, 1758)	Asian Koel	C (LC)	RC
	Order X: Apodiformes			
	Family XIV: Apodidae			
38	<i>Apus apus</i> (Linnaeus 1758)	Common swift	C (LC)	Rr
	Order XI: Coraciiformes			
	Family XV: Alcedinidae			
39	<i>Alcedo atthis</i> (Linnaeus, 1758)	Small Blue Kingfisher	C (LC)	RU
40	<i>Halcyon smyrnensis</i> (Linnaeus, 1758)	White-breasted Kingfisher	C (LC)	RU
41	<i>Ceryle rudis</i> (Linnaeus, 1758)	Pied Kingfisher	C (LC)	RU
	Family XVI: Meropidae			
42	<i>Merops orientalis</i> (Latham, 1801)	Small Bee-eater	C (LC)	RMC
43	<i>Merops philippines</i> (Linnaeus, 1766)	Blue tailed bee eater	C (LC)	RMU
	Order XII: Passeriformes			
	Family XVII: Hirundinidae			
44	<i>Hirundo rustica</i> (Linnaeus, 1758)	Common Swallow	O (LC)	RMC
45	<i>Hirundo daurica</i> (Linnaeus, 1771)	Red-rumped Swallow	O (LC)	RMC
46	<i>Hirundo smithii</i> (Leach, 1818)	Coire tailed swallow	O (LC)	WMr
	Family XVIII: Motacillidae			
47	<i>Motacilla alba</i> (Linnaeus, 1758)	White Wagtail	R (LC)	MU
48	<i>Motacilla maderaspatensis</i> (Gmelin, 1789)	Large Pied Wagtail	R (LC)	RM
	Family XIX: Pycnonotidae			
49	<i>Pycnonotus leucogenys</i> (Gray, 1835)	Himalayan Bulbul	C (LC)	RC
50	<i>Pycnonotus cafer</i> (Linnaeus, 1766)	Red-vented Bulbul	C (LC)	RC
51	<i>Hypsipetes leucocephalus</i> (P.L.S. Muller, 1776)	Black Bulbul	O (LC)	WMr
52	<i>Pyconotus jocosus</i> (Linnaeus, 1758)	Red-whiskered bulbul	A (LC)	RC
	Family XX: Laniidae			
53	<i>Lanius vittatus</i> Valenciennes, 1826	Bay-backed Shrike	O (LC)	WMU
54	<i>Lanius schach</i> (Linnaeus, 1758)	Rufous-backed Shrike	O (LC)	WMU
	Family XXI: Muscicapidae			
	Subfamily: Turdinae			
55	<i>Copsychus saularis</i> (Linnaeus, 1758)	Oriental Magpie-Robin	C (LC)	RC
56	<i>Saxicoloides fulicata</i> (Linnaeus, 1776)	Indian Robin	C (LC)	RU
	Subfamily: Timaliinae			
57	<i>Turdoides striatus</i> (Dumont, 1823)	Jungle Babbler	C (LC)	RC
58	<i>Turdoides malcolmi</i> (Skyes, 1832)	Large Gray Babbler	C (LC)	RC
	Subfamily: Sylviinae			
59	<i>Prinia socialis</i> (Sykes, 1832)	Ashy Prinia	O (LC)	RC
60	<i>Orthotomus sutorius</i> (Pennant, 1769)	Common Tailorbird	O (LC)	Rr

	Family XXII: Paridae			
61	<i>Parus major</i> (Linnaeus, 1758)	Great Tit	R (LC)	Rr
62	<i>Parus monticolus</i> (Vigors, 1831)	Green-backed Tit	R (LC)	Rr
63	<i>Parus cinereus</i> (Vieillot, 1818)	Cinereous tit	R (LC)	RC
	Family XXIII: Passeridae			
	Subfamily: Passerinae			
64	<i>Passer domesticus</i> (Linnaeus, 1758)	House Sparrow	C (LC)	RC
65	<i>Petronia xanthocollis</i> (Burton, 1838)	Yellow-throated Sparrow	C (LC)	RC
	Family XXIV: Sturnidae			
66	<i>Sturnus pagodarum</i> (Gmelin, 1789)	Brahminy Starling	C (LC)	RC
67	<i>Acridotheres tristis</i> (Linnaeus, 1766)	Common Myna	C (LC)	RC
	Family XXV: Dicruridae			
68	<i>Dicrurus macrocercus</i> (Vieillot, 1817)	Black Drongo	C (LC)	RC
	Family XXVI: Corvidae			
69	<i>Corvus splendens</i> (Vieillot, 1817)	House Crow	O (LC)	RC
70	<i>Corvus macrorhynchos</i> (Wagler, 1827)	Jungle Crow	O (LC)	RU

Abbreviation in ACOR are A = Abundant, C = Common, O=Occasional, R = Rare

Abbreviation used for Ecological rating and status are WM = Winter Migrant, WMr= Winter Migrant Rare, WMU= Winter Migrant Uncommon, WMC= Winter Migrant Common, RU = Resident Uncommon, Rr = Resident Rare, RMR= Residence Migrant Rare, RMC = Residential Migrant Common, RMC= Residential Migrant Uncommon, RC =Resident Common, BM= Breeding Migrant, BMR= Breeding Migrant Rare, BMU= Breeding Migrant Uncommon, PM = Passage Migrant.

Abbreviation for IUCN Status are LC= Least Concern, NT = Nearly Threatened, T = Threatened, VU = Vulnerable, EN = Endangered, CR = Critically Endangered.

Discussion

Siddheshwar reservoir and its tributaries habitat are favorable for the attraction for migratory birds also suitable for growth and development of birds. After conducting the present study avian fauna is richest, i.e. total 70 species of birds belonging to 54 genera spread over 26 families and 12 orders.

The present work is in conformity with the earlier work of S. P. Chavan et.al. (2015) was reported 168 birds from Godaverri river basin Nanded, Thakur et al. (2003) carried out in Balh Valley of Mandi district in lower Himalayan region of Himachal Pradesh. Similarly, this investigation is in agreement with the earlier works of Mahabal and Mukherjee (1991), Thakur et al. (2002), Mahabal (2000), Mattu and Thakur (2006), Thakur (2008) and Thakur et al. (2010) who also reported resident, altitudinal migrant, summer and winter visitor birds in different areas of Himachal Pradesh.

According to A. D. Tiple, et.al, (2010) out of 140 species of birds, 22 (16%) of birds were very commonly seen, 59 (42%) species were common, 45 (32%) bird species were not rare and 14 (10%) species rare. Several researchers reported the distribution of avian fauna of different habitats. Rasal et.al., (2011) reported 61 species of birds from different habitats present at the Aurangabad university campus, including watershed catchments, flowering tree shelters and marshy areas. The present work is in conformity with the earlier work according to Kulkarni et. al. (2005) had extensively studied the birds in and around Nanded city and enlisted with their categorization and ACOR rating for abundance. S. P. Chavan et.al. (2015) also reported ACOR categorization and IUCN status of birds from Godaverri river basin Nanded. Total 168 species of birds belonging to 53 Families and 15 Orders reported from the Godavari River Basin in Nanded District D. Yardi, et.al., (2004).

According to D. P. Katore (2017), Open billed storks were seen during the month of January and February when water shrinks excessively and exposed of snails. Red during January and February wattled Lapwing, common sandpiper; little ringed Plover was seen in abundance on the banks during the last week of January. The arrival of birds coincides with a reduction in water level, where they avail the food easily by probing into mud. Similarly, in the present study, we found that open billed stork recorded abundantly at Ghanewadi Lake; common sandpiper, black wing silt, painted stork, spoon bills, black ibis recorded at motilake and Revgaon Lake. Considering the abundance of avian fauna present study shows in and around Jalna city 43 (44.32%) bird species were commonly seen, 18 (18.55%) species were very common, 27 (27.83%) species were not rare but not common whereas 9 (9.27%) species were found to be very rare. The present study agree with R.T. Pawar et.al., (2019) recorded 84 species of birds belonging to 15 orders and 30 families of Majalgaon reservoir and their tributaries, As the water of the wetland is clear, rich in dissolved oxygen and supports variety of aquatic weeds and fishes, it has been found to be suitable for birds and attracts many migratory birds like large egret, purple heron, white bellied heron, Asian open bill stork, greater flamingo, white naked stork etc..

According to Satish N. Harde et.al, (2020) observed diversity, status and abundance of avian fauna around Jalana district and the 97 species of birds belonged to 48 families. Highest number 68 of bird species observed from agricultural areas, 57 species from forest areas, 41 species from Kundalika River and 32 species from wetlands. According to Status of birds 72 (74.22%) birds' species were residential, 9 (9.27%) were winter migrant, some 12 (12.37%) local migrant and 4 (4.12%) found passage migrants. Considering abundance, 43 (44.32%) birds' species were commonly seen, 18 (18.55%) species were very common, 27 (27.83%) species were not rare but not common whereas 9 (9.27%) species were rare. The present study agrees with findings of A. Dorlikar and P. Charde (2019) who found out of 154 bird species, 23 species were abundant, 60 species were common, 53 species were uncommon, 08 species were occasional and 10 species were rare in this habitat. In their study, they reported most abundant species were house crow, jungle babbler, Red-vented Bulbul, Black Drongo, Common tailor bird, Common myna, Brahminy starling, White-throated Munia, House sparrow etc.

The present study is confirmatory with finding of following researchers. According to Nagma Sayyad, Amir Dhamani (2017) noticed family Ardeidae was dominant and consists of 8.82% out of total 37 families of bird species followed by Cuculidae, Muscicapidae and Columbidae constitute 5.88% of families each. According to R.T. Pawar et.al, (2019) the family Ardeidae (07 species) dominated the avifauna, followed by Anatidae, Columbidae, Turdinae (6 species each), Cuculidae (5 Species), Rallidae, Pycnonotidae (4 species each) Cionidae, Charadriidae, Pisttaciidae, Alcedinidae, Hirundinidae, Paridae, Passerinae (3 species each) at Majalgaon Reservoir in Beed district. The dominane of three families like Ardeidae, Anatidae and Muscicapidae (06 species) dominated the avifauna in present study might be due to the availability of food and shelter for bird species.

Conclusion

Total 70 bird species observed during study period of January 2015 to December 2016. In the study of avian faunal diversity of Siddheshwar reservoir indicate abundance of most of the common species e.g. Little Egret, Spot Billed Duck, Common Coot, Red Wattled Lapwing, Blue Rock Pigeon, Blossom Headed parakeet, Common koel, Common Kingfisher, Common Myna, Red-Vented Bulbul and House Sparrow also found (NT) near threatened bird species Oriental White/Black Head Ibis and River Tern by IUCN status and other was LC – least concern.

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