

ENVIS Centre on  
AVIAN ECOLOGY

# BUCEROS

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## BUCEROS

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### ENVIS

ENVIS (Environmental Information System) is a network of subject specific centres located in various institutions throughout India. The focal point of the present 66 ENVIS centres in India is at the Ministry of Environment and Forests, New Delhi, which further serves as the Regional Service Centre (RSC) for INFOTERRA, the global information network of the United Nations Environment Programme (UNEP) to cater to environment information needs in the South Asian sub-region. The primary objective of all ENVIS centres is to collect, collate, store and disseminate environment related information to various user groups, including researchers, policy planners and decision makers.

The ENVIS Centre at the Bombay Natural History Society was set up in June 1996 to serve as a source of information on Avian Ecology and Inland Wetlands.

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Cover: Spot-billed Pelican *Pelecanus philippensis*, Sarus Crane *Grus antigone* and Lesser Florican *Sypheotides indicus* by Dr. Asad R. Rahmani  
Red-headed Vulture *Aegypius calvus*, Brown-winged Kingfisher *Pelargopsis amauroptera* and Lesser Flamingo *Phoeniconaias minor* by Asif N. Khan

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## Aichi Target No. 19

Knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred and applied

## Special Issue for COP-11

### Data discovery and information dissemination service of the Environmental Information System (ENVIS) Centre on Avian Ecology at BNHS, India

By Sujit Narwade, Divya Varier and Tejashree Nakashe

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# Data discovery and information dissemination service of the Environmental Information System (ENVIS) Centre on Avian Ecology at BNHS, India

Sujit Narwade, Divya Varier and Tejashree Nakashe

## Abstract

Realizing the importance of a data collection and dissemination network, the Environmental Information Division of the Ministry of Environment and Forests (MoEF), Government of India, in December, 1982, established the Environmental Information System (ENVIS), as a plan programme. Since its inception, the focus of ENVIS has been on providing environmental information to decision makers, policy planners, researchers, etc. across the country. As the environment is a broad-ranging, multi-disciplinary subject, a comprehensive information system would necessarily involve effective participation of concerned institutions/organizations in the country that are actively engaged in work relating to different subject areas of the environment. ENVIS has therefore developed by forming a network of such participating institutions/organizations to make the programme meaningful. The Focal Point of the present 66 ENVIS centres in India is at the Ministry of Environment and Forests, New Delhi. The ENVIS Centre at the BNHS has been assigned the responsibility for information on Avian Ecology. Through this document we would like to share our experience of data discovery and information dissemination services provided by ENVIS Centres. Having experience of more than 15 years, we feel that a lot can be done to improve such systems.

**Key words:** Environmental Information System, avian ecology, databases, BUCEROS, website hits

## Introduction

The Bombay Natural History Society (BNHS) is a non-profit organization working towards conservation of biological diversity through research, awareness and education since 1883. As the Society had been established to collect and share data and exhibits, it has many publications including a journal, magazine, newsletters, and popular as well as scientific books, to its credit. All the scientific publications of the Society have been first points of reference to naturalists and amateurs alike. The Society also has a membership base of more than 5000 members spanning 25 countries, that include individuals as well as other organizations. Details regarding the Society and its research projects can be accessed on the Society's website <[www.bnhs.org](http://www.bnhs.org)>.

Realizing the importance of a network for environmental data collection and dissemination, the Government of India, in December 1982, established the Environmental Information System (ENVIS) as a plan programme. The focus of ENVIS programme since its inception has been on providing environmental information to decision makers, policy planners, researchers, and the general public across the country and worldwide. The primary objective of all ENVIS centres is to collect, collate, store and disseminate environmental information to various user groups, including policy planners, decision makers, researchers and the layman. The Focal Point of the present 66 ENVIS centres in India is at the Ministry of Environment and Forests, New Delhi <<http://envis.nic.in/>>.



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Inauguration of the ENVIS Centre at BNHS by Mr. N.R. Krishnan, Secretary, Ministry of Environment and Forests, Government of India, on 18th June, 1996

The BNHS was selected as an Environmental Information System (ENVIS) Centre for Avian Ecology and Inland Wetlands by the Ministry of Environment and Forests (MoEF), Government of India, in 1996, the year of Sálim Ali Centenary celebration i.e. 1996. The ENVIS Centre was inaugurated at BNHS by Mr. N.R. Krishnan, Secretary, Ministry of Environment and Forests on June 18, 1996. The choice of BNHS for such a centre is understandable, as it has been related in one way or another with studies on ornithology, natural history, conservation, and with Dr. Sálim Ali, who is considered the father of Indian ornithology. From 2006, the Centre at the BNHS has been assigned the responsibility of being the focal point for Avian Ecology in India, excluding the Inland Wetland component.

The establishment of such a Centre in BNHS has certainly given a boost to the mission of the Society as one of the primary objectives of the Centre is to collect and disseminate information on Indian birds and wetlands to various user groups, including policy planners, decision makers, researchers and the layman. The Centre's objectives conform to the Aichi Biodiversity Target No. 19, i.e. "Knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred and applied".

Through this paper we would like to discuss the overall scenario of ornithological studies in India based on bibliometric analysis, website hit statistics, and feedback and queries received from the readers of *BUCEROS*, the newsletter published by our Centre.

An evaluation of the history of Indian ornithology was done by the ENVIS Centre in 1999 (Eds. 1999). Attempts were made to assess the ornithological studies in India in comparison to other countries, such as the United Kingdom (UK). Detailed discussions were carried out on how the tools of the information age can be used to increase the spread, numbers and quality of potential contributors and build databases that will enable long-term and large-scale studies (Shyamal 2007). Some attempts were also made to compile the bibliographic database of Indian ornithology in form of a CD-ROM (Pittie 2001) and on a website <<http://avis.indianbiodiversity.org>>. BirdLife International has provided open access to the data zone available on all bird species of the world including India on its website. A new initiative towards public



Sudhir Devrukhkar

The Great Indian Bustard *Ardeotis nigriceps*, recently declared as a Critically Endangered species, is being studied in its critical habitats by the BNHS for the past three decades



Asad R. Rahmani

Thanks to the incessant advocacy by BNHS and Royal Society for Protection of Birds, UK, the Government of India banned veterinary use of the drug Diclofenac, the prime culprit responsible for decline of *Gyps* vultures of the Indian subcontinent, in 2006



Tarique Sani

After its rediscovery in 1997, two studies were taken up by BNHS on the Forest Owlet *Heteroglaux blewitti* that revealed information about its status, distribution and ecology



© BNHS

Research initiated by BNHS scientists in collaboration with the Royal Society for Protection of Birds, UK, resulted in identification and recording of the call of the elusive Jerdon's Courser *Rhinoptilus bitorquatus* for the first time

participation was started through a Migrant Watch project <<http://www.migrantwatch.in/>> of the Citizen Science Programme of National Centre for Biological Sciences (NCBS) in association with Indian Birds in 2007. This system covers compilation of sight records of migratory birds of India. Through e-Bird reference dataset <<http://www.avianknowledge.net/content/>>, scientists from USA are trying to understand the patterns and dynamics of bird populations across the Western Hemisphere and now from the Asian region.

## Methodology

1. Bibliometric analysis - A bibliographic database of published literature related to avian ecology of India was collected and stored. Information from scientific papers, notes, project reports, theses, books, bulletins and popular publications from the BNHS library was collected and compiled. More than of 14,500 references were selected for the data analysis.
2. Membership feedback - *BUCEROS* newsletter of ENVIS Centre on Avian Ecology is being published and distributed to NGOs, universities, research institutions, Forest Departments and interested individuals since 1996 (Eds. 2010). Track of increase in membership of the newsletter and feedback received from the readers was maintained.
3. Query-answer service - Subject-relevant queries were received from all over the world, though most of them came from Indian region, through various media such as email, phone, post and in person. These queries were answered accordingly and a log of such queries was maintained for analysis.
4. Website hit statistics - Webstat tool provided by National Informatics Centre (NIC), Government of India, was used to get the details of website hits and response to BNHS-ENVIS website by internet users before and after uploading particular web pages.

## Results

### A) Data discovery and data analysis

The number of databases available with the ENVIS Centre of BNHS has increased from two to 12 over the years from 1996 to 2010, as provided in Table 1. Databases were modified based on the queries and feedback

Sr. No.	Subject	Nature of the Database	Entries
1.	Avian ecology bibliography	References	14,500+
2.	List of birds of Indian subcontinent along with changed nomenclature	List	1200+
3.	Threatened birds of India	Level of threat (IUCN Red Data category), criteria, General information on the bird	156
4.	Endemic birds of India	Name of bird, area, general information	79
5.	Important Bird Areas (IBAs)	IBA code, site name, province, districts, area, status, criteria, Habitat criteria, location, IBA Code, IBA criteria, habitat	466
6.	State/UT-wise bird list	List	30+
7.	Vernacular names of birds of Indian Subcontinent	Name list	1200+
8.	Indian waterbirds checklist	List, Status, abundance, Schedule as per Wildlife (Protection) Act (1972), South Asia Population Estimates	302
9.	News section including bustard news	Title, Date, Content, Source	100+
10.	Species occurrence database	Sighting record, individual bird details, observer, publications	2400+
11.	Migratory birds of India	Type of migration, distribution	370+
12.	PowerPoint Presentations	Presentations on birds	5

Table 1: Databases available at ENVIS Centre on Avian Ecology of BNHS

Year	2008	2009	2010	2011
<b>Summary</b>				
<b>Visitor summary</b>				
Visitors	3,858	17,260	35,303	44,499
Visitors who visited once	3,481	15,509	31,050	39,423
Visitors who visited more than once	377	1,751	4,253	5,076
<b>Visit summary</b>				
Visits	6,413	30,589	61,785	72,079
Average per day	29	83	169	197
Average visit duration (min:sec)	16:49	37:55	24:57	26:31
<b>Page view summary</b>				
Page views	7,274	83,579	1,11,738	1,49,499
Average per day	33	228	374	409
Average page views per visit	1.13	2.73	2.5	2.07

Table 2: Response to ENVIS website  
(Source: www.webstats.nic.in)

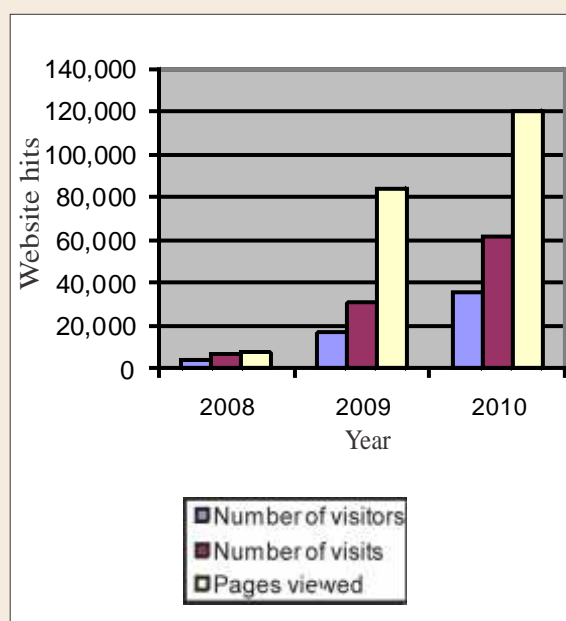


Figure 1: Website hit statistics

received from the users. In the year 2008, all the databases were uploaded on the Centre's website <[www.bnhsenvis.nic.in](http://www.bnhsenvis.nic.in)>, the domain name and space of which were assigned to the Centre by the National Informatics Centre (NIC), India. An increasing trend in the website hits from 2008 can be easily observed in Table 2 and Figure 1. It was observed that the newly uploaded pages such as Bustard Forum, and translated

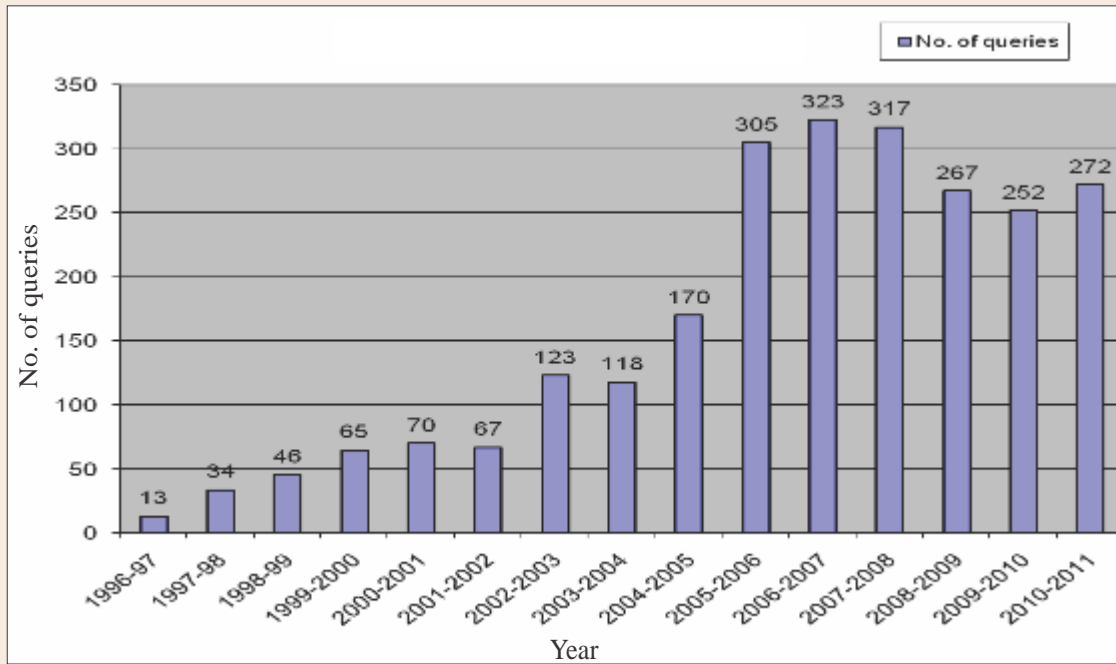


Figure 2: Yearwise query statistics

web pages in two languages, Hindi and Marathi, got the maximum number of visits in a couple of months after they were uploaded.

The Centre usually replies to hundreds of queries on Avian Ecology received from various Government as well as non-Governmental organizations, media, students and researchers from any part of the globe. The number of queries received by the Centre showed a slight decrease after all the databases and publications of the Centre were uploaded on the website, as observed in Figure 2. Queries regarding general information on birds and literature available on a particular bird species were received in greater numbers. Other queries include identification of birds and their threatened categories, and requests regarding list of birds found in a particular region. Figure 3 indicates the time series data of the published literature (decade-wise) and how the number of publications has increased over time with a slight decrease in the last decade. Reasons may be non

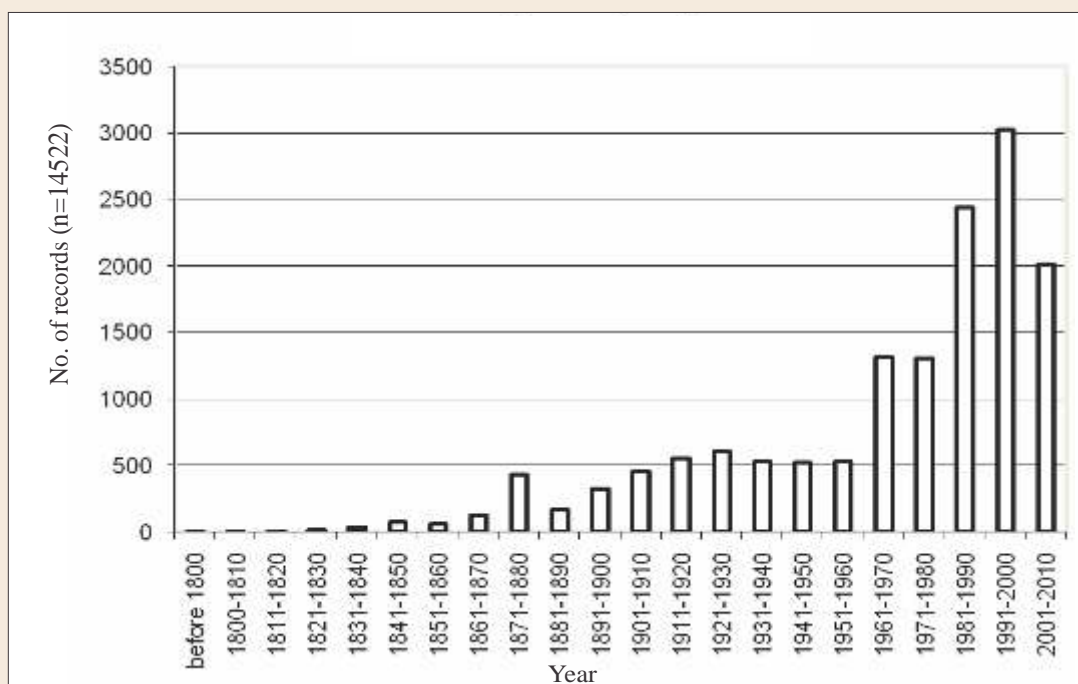


Figure 3: Time series data of the published literature (decadewise)

availability of literature in the BNHS library or due to wide use of blogs, internet groups or websites by people to share their observations instead of waiting to get their data published in journals or other print media.

Figure 4 shows that more than 55% of the publications are small scientific notes, followed by near about 27% of detailed research papers. Ph.D./M.Sc. theses on birds are less than 2%.

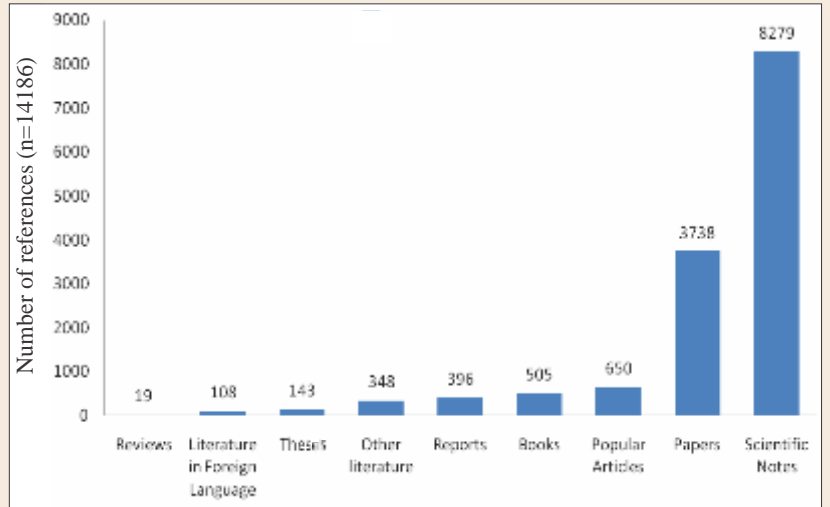


Figure 4: Graph of Categories of ornithological literature in India

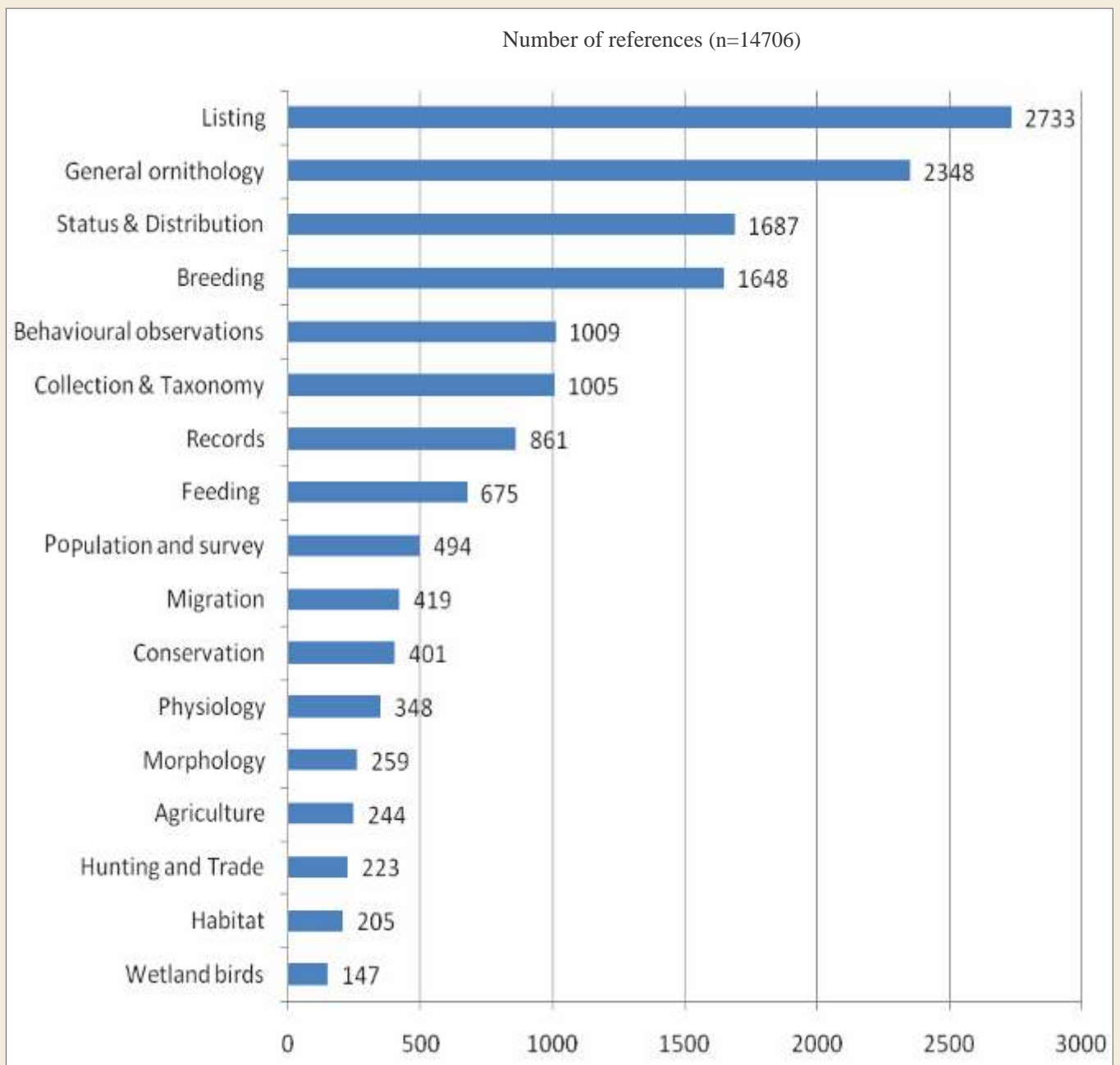


Figure 5: Subjectwise literature availability



The majority of the bibliographic records comprise listing, sighting, status and distribution of birds as shown in Figure 5.

Very little literature is available on agriculture and birds, hunting, and migration. If we compare the literature published based on studies carried out in particular states of India, Gujarat stands first, followed by Maharashtra and others as denoted in Figure 6.

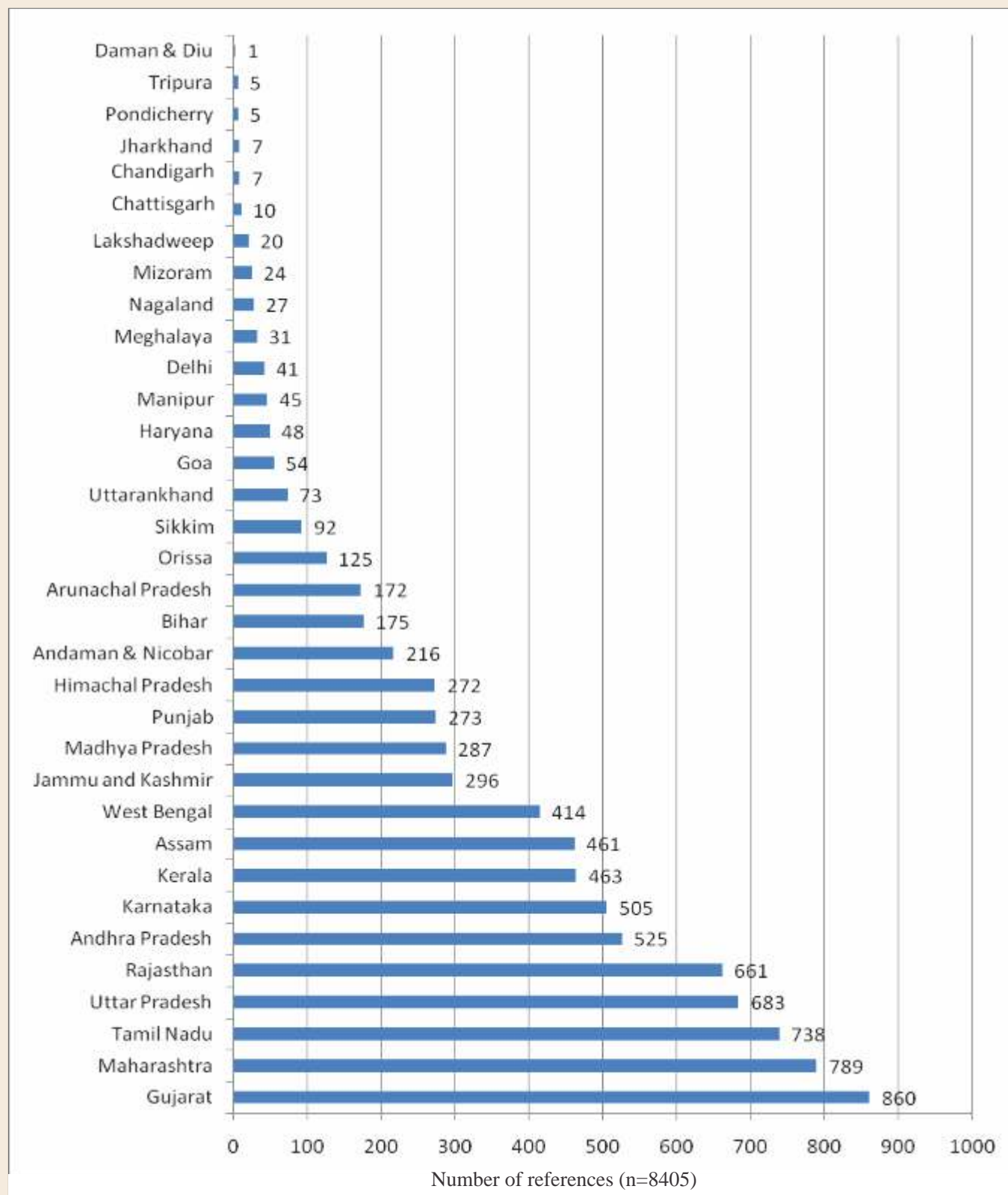
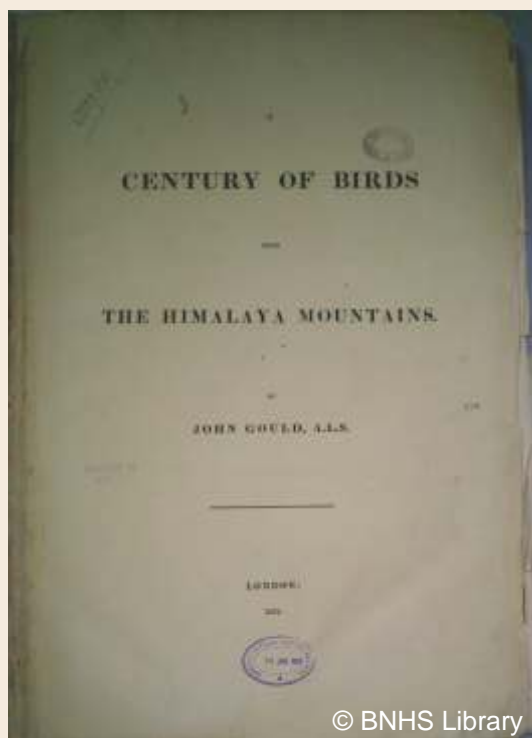


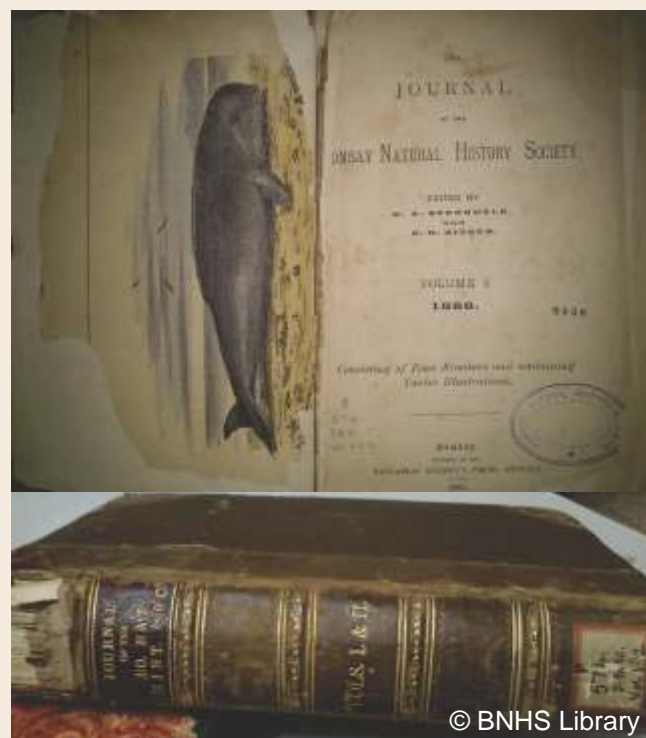
Figure 6: State/Union territorywise literature availability

## B) Oldest literature on Indian ornithology available in BNHS

One of the oldest foreign journals exclusively on ornithology is *Ibis* which is being published since 1859. The oldest book on birds in our library is *A Century of Birds from the Himalayan Mountains* (Gould and Gould 1838). Inclusion of abstracts was started from 1965 in *The Auk* while in India the *Journal of Bombay Natural History Society (JBNHS)* started including abstracts from 1967. One of the oldest papers with multiple authors was published in 1960 which focused on feeding behaviour of birds (Faruqi et al. 1960). Many of the older publications on birds were focused on lists and observational notes taken during travelling but the trend of writing detailed papers on birds started in the 1950s.



*A Century of Birds from the Himalayan Mountains*



The first volume of *JBNHS* published in 1886

To get an idea about the oldest published literature on different aspects of Indian ornithology available in the BNHS library, we are providing some of the oldest references on various subjects (highlighted in bold fonts), in chronological order. **Listing** of birds during a voyage around the world (Dampier 1697) that includes Indian birds also, **distribution** of Red-headed Merlin *Falco chicquera* in Ganges area of West Bengal (Daudin 1800), **systematics** of Small Indian Pratincole *Glareola lactea* (Temminck 1820), **birds collected** in the jungles of Borabhum and Dholbhum, West Bengal (Tickell 1833), **collection** of Trogon specimen (Gould 1834), **morphology** of several birds from the Himalayan Mountains (Burton 1836), **nidification** of Indian Birds (Hutton 1848), **habits** of Indian birds (Burgess 1854-55), **migration** of species (Beavan 1865), **hunting** of game birds and wildfowl (Jerdon 1864), **breeding** of *Cisticola schoenicola* (Brooks 1869), notes on **conservation** of a species i.e. Pink-headed Duck *Rhodonessa caryophyllacea* (Simson 1884), **counting** of Rooks at Ludhiana (Chanter 1887), protection of insectivorous birds in the interest of **agriculture** (Rainey et. al 1889), **systematic survey** during a visit to the Null after the famine (Gilbert 1901), **traffic** in plumage (Dodsworth 1911), breeding birds for plume **trade** (Ticehurst and Baker 1920), reed-bed in the Dal Lake, Kashmir - a note on **wetland** bird (Bates 1929), **preservation** of vanishing wildlife of India (Burton 1948), are some examples from which we can get an idea about Indian ornithological studies.

### C) Case studies regarding services provided by the Centre

- 1) Avian Influenza survey: Based on published information and outbreak of avian flu, a preliminary survey of Avian Influenza was carried out by ENVIS staff in Nashik, Aurangabad and adjoining areas as well as Sewri and Uran areas near Mumbai, Maharashtra for the “Avian Influenza Surveillance Project”, the report of which was helpful in preparing the final report of the main project.
- 2) Bustard Forum: Taking advantage of the internet, the Centre launched a web-based “Bustard Forum” on <http://bnhsenvvis.nic.in/forms/list.aspx?lid=31312&Id=25> under the supervision of Dr. Asad R. Rahmani, Director, BNHS and Project Coordinator, ENVIS Centre. ENVIS team has collected all the available references on bustards from the BNHS library, internet and through personal communication. News and sight records of bustards provided by observers have been posted in chronological order. The forum is open to all.
- 3) Towards public participation
  - a. In 2010, the Centre prepared a project proposal regarding public participation in strengthening the bird checklist data of India and tried getting funds from corporate companies under Corporate Social Responsibility (CSR) funds.
  - b. Bird conservation needs involvement of non birdwatchers also. A workshop was organized by the Centre on “Conservation of Great Indian Bustard through involvement of local people” in March 2011 at Solapur, Maharashtra, India, to get multidisciplinary views from people such as villagers, lawyers, administrators, forest staff, media, educational institutions, developers and volunteers from the area of bird conservation. This workshop was an eye-opener to us and will be useful in defining our future conservation strategies.



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ENVIS staff at the bird banding and training workshop that was conducted at Sinhgad valley, Pune, in 2011 to spread awareness on bird ringing studies among the general public



© ENVIS Library

ENVIS staff organized a workshop on conservation of the Great Indian Bustard at Solapur in 2011 with the aim of involving local people in conservation of the species

#### 4) First database-derived data paper published in *ZooKeys* through ENVIS Centre, BNHS

The BNHS's ENVIS team published the first-ever peer-reviewed paper (Narwade *et. al* 2011) derived directly from a biodiversity metadata document in *ZooKeys*, an international open-access journal, in collaboration with Global Biodiversity Information Facility (GBIF), Denmark and Wildlife Institute of India (WII), Dehradun, India. The paper entitled, *Literature based species occurrence data of birds of North-East India* was produced with the help of a described dataset of bird observations in 11 Indian states between 1909 and 2008, centred on this Himalayan biodiversity hotspot, which were derived from references in literature, mainly the *Journal of the BNHS*. This dataset was compiled using GBIF Integrated Publishing Toolkit (IPT) <<http://www.gbif.org/informatics/infrastructure/publishing/>> generating a manuscript that underwent a rigorous review process lasting nearly three months before being accepted for publication in *ZooKeys*. Such papers will be helpful in compiling data records about the occurrence of species to make their existence known to the scientific community, helping to increase knowledge about biodiversity and to inform conservation measures.

## Discussion

### A) Problems in data discovery and information dissemination

- 1) Lack of public participation in data collection.
- 2) Lack of sufficient funds needed for face to face interaction with birdwatchers.
- 3) Inadequate awareness about importance of publications.
- 4) Fear about data theft - In India people are reluctant to provide data as they fear their data might get stolen or misused. Incidents of data theft and exploitation of intellectual property are common in wildlife studies. Therefore there is a need to address this issue and think of different ways to encourage data sharing and publishing. A very good example is that of the Global Biodiversity Information Facility (GBIF) data publication kit where metadata has been provided about owner of the data. This means ownership of the data shared by any organization to GBIF will remain with the organization itself.
- 5) Quality of research - many research papers published in college and university level journals never come into the limelight, either because of poor quality or the lack of publicity.

### B) Finding solutions through possible collaborative work

ENVIS Centre wishes to initiate a programme of public participation in strengthening the bird checklist data in India. In India, a majority of people are either unaware or do not have easy access to the internet and those who do use the internet often do not know where to get the required information. Therefore uploading bird sightings on internet portals is usually done by a limited number of users. As an ENVIS Centre on Avian Ecology, we would like to utilize the data from portals such as WorldBirds <<http://www.worldbirds.org/v3/india.php?c=4>> of BirdLife International to strengthen the bird checklist data in India. We plan to extract, verify and compile location-wise bird checklists using the portal and publish them in the form of booklets with the support of local NGOs, academic institutions and volunteers. Such booklets shall be distributed among those who do not use internet regularly and in return, data about the local birds will be collected for uploading on portal. Through such information exchange, both the portal as well as interested communities will mutually benefit in terms of strengthening bird knowledge. This project

will serve the purpose of bird conservation awareness and preparation of bird checklists through public participation.

It is important that as many people as possible engage in such projects and enter any bird data they have. From Table 3 it can be seen that a good start has been made but India is still behind much smaller countries in Asia in terms of usage of this facility.

Country	Visits	Observations	Locations	Active Users
Malaysia	9,660	97,231	790	597
Sri Lanka	3,437	69,471	666	543
South Asia (India)	2,134	41,308	1,712	427
Indian Ocean	485	6,222	128	28
<b>On April 2011</b>				
South Asia (India)	2,199	42,738	1,712	469

Table 3: Summary information from WorldBirds on 1st November 2010

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## Additional Reading

- Morrone, J.J. and J.C. Guerrero (2008): General trends in world biogeographic literature: a preliminary bibliometric analysis. *Revista Brasileira de Entomologia* 52 (4): 493-499.
- Narwade, S.S. (2011): Of Black Stork, politician and terrorism. *Hornbill* (April-June): 12-15.
- Narwade, S.S. and A.R. Rahmani (2009): ENVIS (Environmental Information System): The gateway to extract the information on Environment. *Mistnet*: 10-11.

## E-resources

- Environmental Information System (ENVIS), India. <http://envis.nic.in/>
- AVIS (Avian Information System of India), an internet-based and peer-reviewed resource devoted to Indian Birds. <http://avis.indianbiodiversity.org>
- Migrantwatch, A project of the Citizen Science Programme of NCBS in association with Indian Birds Journal <http://www.migrantwatch.in/>
- eBird Reference dataset Version 2.0, to understand the patterns and dynamics of bird populations across the Western Hemisphere (2009) <http://www.avianknowledge.net/content/>
- Environmental Information System (ENVIS) Centre on Avian Ecology, BNHS. <http://bnhsenvis.nic.in>
- GBIF Integrated Publishing Toolkit (IPT) - A software platform to facilitate the efficient publishing of biodiversity data on the Internet, using the GBIF network.  
<http://www.gbif.org/informatics/infrastructure/publishing/>
- RSPB/BirdLife (South Asia Birds) - an Internet-based spatial database about birds, their science and their distribution, that allows users from anywhere in the world to input and query bird data. 2005, <http://www.worldbirds.org/v3/india.php?c=4>

## **BOMBAY NATURAL HISTORY SOCIETY**

Founded in 1883 for the study of natural history, the Bombay Natural History Society (BNHS) is now one of the premier research and conservation organisations in the country. The Society publishes a journal, the *Journal of the Bombay Natural History Society*, devoted to natural history and also has a popular publication, *Hornbill*, for the layman. It has also published a number of books on wildlife and nature. Its library has a large collection of books and scientific journals on wildlife and the environment. The Society's invaluable collection of bird, mammal, reptile, amphibian and insect specimens has been recognised as a National Heritage Collection.

Membership of the Society is open to individuals and institutions within India and abroad. For more details, please write to:

Membership Officer,  
Bombay Natural History Society,  
Hornbill House,  
Shaheed Bhagat Singh Road,  
Mumbai 400 001. INDIA.

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