MigrantWatch: changes and results from the second year

Uttara Mendiratta & Suhel Quader

Mendiratta, U. & Quader, S. 2009. MigrantWatch: changes and results from the second year. Indian Birds 4 (4): 122–126 (2008).
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MigrantWatch was launched in August 2007 as a collaborative effort to monitor the timing of bird migration in India using a citizen science approach (Quader & Raza 2007). The overarching objective of the project is to investigate possible impacts of climate change on the timing of long-distance bird migration. Data are collected through the participation of volunteers from all over the country, who note migration dates and send this information to a central database.

Volunteer-based ornithology networks have generated information that provides some of the best examples of the impacts of recent climate change on natural systems (Hüppop & Hüppop 2003; Sparks & Mason 2004; Greenwood 2007). The availability of such data is, however, largely restricted to the temperate latitudes, where many migratory birds breed; in contrast, little information is available from important tropical wintering habitats—due in part to poorly developed volunteer networks (Gordo 2007; Jonzén *et al.* 2007; Rosenzweig *et al*. 2007). India, in particular, is an important wintering ground for a large number of migrants, with over 300 species from the Palaearctic region wintering here. The recent growth of interest in birding and bird photography in India (Shyamal 2007) suggests that this is a good time to explore the possibilities of involving volunteers in collecting information relevant to birds and their conservation. MigrantWatch is the first volunteer-based project in India devoted to collecting information on the timing of bird migration. Baseline information collected in the first few years of the project will be used to assess changes in the timing of migration over the medium-to-long term.

MigrantWatch in its second year

MigrantWatch volunteers from across the country have been recording the arrival and presence of Palaearctic migrants since August 2007. Following an assessment of the first year of the project and feedback from participants, MigrantWatch in 2008–2009 carried several new features.

In the first year the project monitored the migration of nine common and widespread species (marked with an asterisk in Table 1). In 2008 this list was extended to include a total of approximately 300 Palaearctic migrants. To be included species must be predominantly winter migrants to the plains and peninsula of the Indian Subcontinent. The full list of species is on the MigrantWatch website (Box 1).

Box 1. About MigrantWatch

MigrantWatch is organised jointly by *Indian Birds* journal and the National Centre for Biological Sciences, Bangalore. MigrantWatch now has new Internet and email addresses:
Web: http://www.migrantwatch.in
Email: *mw@migrantwatch.in*

Postal address:
MigrantWatch
Citizen Science Programme
National Centre for Biological Sciences
GKVK Campus, Bellary Road
Bangalore 560065, India.

Kalyan Varma

Fig. 1a. Bar-headed Goose *Anser indicus*

To help beginning birders choose and identify common migrants, 30 of these species are highlighted on the website, and are accompanied by an online identification guide. These 30 migrants are listed in Table 1 (see also Figs. 1a–1d).

Data collection has been altered slightly. In the first year, participants were asked to submit dates of first sighting (termed Level 1) and to keep a regular record of sightings of migrants through the season (Level 2). In 2008–2009 and henceforth, the key data being collected are First Sighting and Last Sighting dates of each species in the migration season. For the purposes of MigrantWatch, we define a migration season as running from 1st July of one year to 30th June of the following year, although most arrivals are likely to occur between July and November, and most departures between February and April. Participants also have the option to submit sighting dates other than first and last sightings; this can be done for both Palaearctic migrants and other kinds of migrants like Pied Crested Cuckoo *Clamator jacobinus* and Paradise Flycatcher *Terpsiphone paradisi*.

Data entry is through an online login system in which each participant has a separate account, through which First, Last, and General Sightings are submitted for user-specified locations. The entire database can be queried, tabulated, and mapped using tools made available on the website. All data are open access and any person who registers with MigrantWatch can download and use the data.

MigrantWatch participation has now increased to over 700 volunteers, with notable expansion of geographic coverage in some parts of the country, while the coverage of other parts remains poor (Fig. 2).

First arrival data for the 2008–2009 migration season

Between 1st July and 31st December 2008, 303 participants sent in arrival dates for 180 migrant species from across 28 Indian states and union territories. First arrival information for selected species is presented in Figs. 3 and 4. To produce the scatterplots of latitude or sighting in relation to first sighting date, we used only those sighting dates between 1st July and 30th November. Scatterplots are presented for the nine species originally covered in MigrantWatch so that comparable data can be shown for two years (Fig. 3). The relationship between latitude and first sighting date is likely to be best represented by the left edge of the scatter of datapoints in each year. A line representing this edge has been calculated and drawn using quantile regression (i.e., the 0.1th quantile), as described in Quader & Raza (2007).

Maps showing locations of first sighting, colour-coded by sighting date were also produced using sighting dates between 1st July and 30th November (Fig. 4). An additional filter was imposed based on the date that migration began to be monitored at a site. For any species, only those sightings are mapped that come from locations where participants began monitoring migration at most 45 days after the species was first recorded in India. For example, if the first record of a species in India was on 1st July, then only locations monitored from 14th August or earlier contribute points to Fig. 4. This filter has been imposed so that the maps do not contain too many "first" sightings from locations that were monitored from late in the season. The filters imposed here are somewhat arbitrary and, as always, we encourage readers to explore the complete database with their own set of criteria.

Kalyan Varma

Fig. 1b. Brown Shrike *Lanius cristatus*

Acknowledgements

The expanded list of migrant species and the details for highlighted species were compiled with the help of Mike Prince, Sumit Sen, Bikram Grewal, Nikhil Devasar, R. Jaypal, Rashid Raza, Umesh Srinivasan, Praveen J. and Karthik Sunagar. Samira Agnihotri and Pratap Singh have allowed the use of their bird recordings on the website. Tarique Sani and Jatin Chimote (SaniSoft) expanded and improved the login system for users, including data entry and search facilities, building on the base designed by V. Suresh. The current MigrantWatch web pages are hosted on server space generously provided by Kalyan Varma. S. U. Saravanakumar designed publicity material, and images for this and for the website were contributed by Sudhir Shivaram, Kalyan Varma, Vijay Cavale, Mohan Kemparaju, Clement Francis, Nikhil Devasar, V. Suresh, Anand Arya, Nagpur Birds and Girish Arjun Panjabi. Increases in participation are partly due to efforts of participants to distribute publicity material and to write articles in regional and national media; our thanks to Anish Andheria, Karthick B, Praveen Chopra, Pankaj Sekhsaria, Shibi Moses, R Sharada, Abheek Ghosh, C. K. Vishnudas, Aniket Bhatt, Fionna Prins, Navjit Singh, Aditya Chandra Panda, Prateek Panwar, Sunjoy Monga and many other participants. We have received generous and valuable advice and comments from organisations and individuals involved in Citizen Science in the UK, including the British Trust of Ornithology, the Royal Society for Preservation of Birds, the University of Leeds, Nature's Calendar; our thanks to J. C. Biesmeijer, Bill Kunin, Tim Sparks, Kate Lewthwaite, Mark Eaton, David Noble, Mark Grantham, Stephen Baillie, Kate Risely, Andy Musgrove, Dawn Balmer and others at these institutions. M. O. Anand helped with data analysis; Sumit Sinha has never refused a request for help, even with the most tedious jobs. Finally, as always, the most credit must go to MigrantWatch participants for devoting their time and effort to collecting and contributing data for the project.

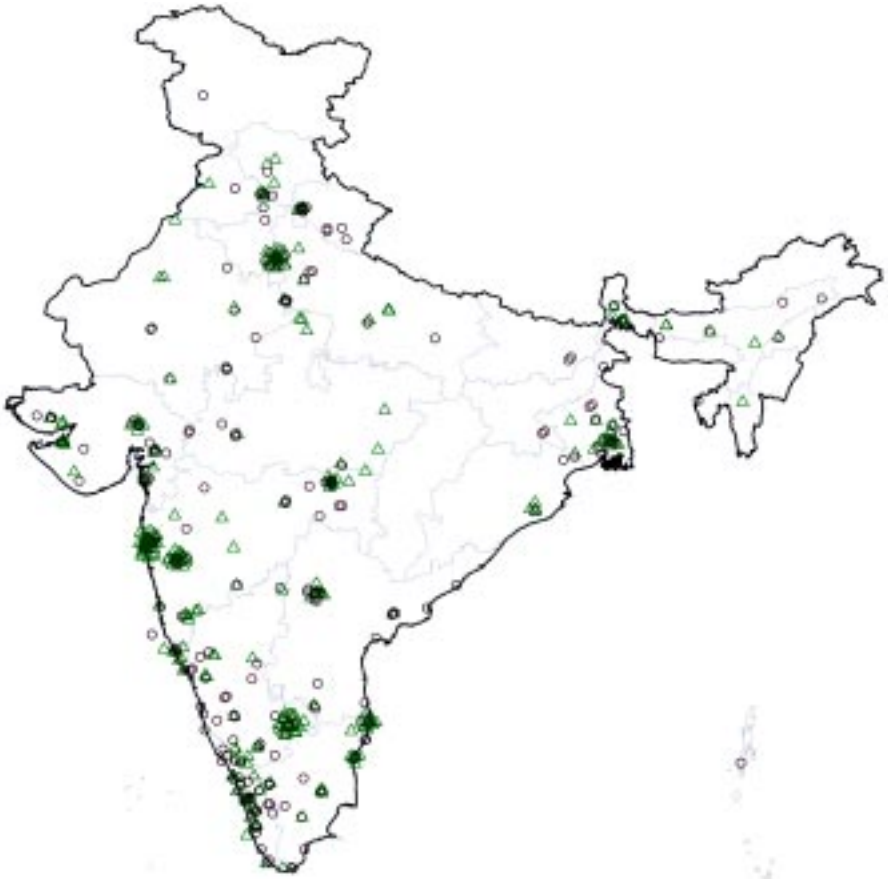

Fig. 2. Map of MigrantWatch participants. Brown circles represent participants who registered between August 2007 and February 2008, while green triangles represent those who registered between March 2008 and February 2009. The location of each part has been moved sightly to better depict clusters.

Sudhir Shivaram

Fig. 1c. Female Common Kestrel *Falco tinnunculus*

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Table 1. List of highlighted species for MigrantWatch 2008-2009 and beyond.

1. Black Stork *Ciconia nigra*
2. Bar-headed Goose *Anser indicus*
3. Brahminy Shelduck *Tadorna ferruginea*
4. Northern Shoveller *Anas clypeata**
5. Northern Pintail *A. acuta*
6. Western Marsh Harrier *Circus aeruginosus**
7. Osprey *Pandion haliaetus*
8. Common Kestrel *Falco tinnunculus*
9. Demoiselle Crane *Grus virgo*
10. Black-tailed Godwit *Limosa limosa*
11. Green Sandpiper *Tringa ochropus*
12. Wood Sandpiper *T. glareola**
13. Common Sandpiper *Actitis hypoleucos*
14. Ruff *Philomachus pugnax*
15. Pallas's Gull/Great Black-headed Gull *Larus ichthyaetus*
16. Eurasian Wryneck *Jynx torquilla*
17. Common Swallow *Hirundo rustica**
18. White Wagtail *Motacilla alba*
19. Grey Wagtail *M. cinerea**
20. Brown Shrike *Lanius cristatus**
21. Blue Rock-thrush *Monticola solitarius*
22. Bluethroat *Luscinia svecica*
23. Black Redstart *Phoenicurus ochruros**
24. Common Stonechat *Saxicola torquata*
25. Blyth's Reed-Warbler *Acrocephalus dumetorum*
26. Greenish Leaf-Warbler *Phylloscopus trochiloides**
27. Red-breasted / Red-throated Flycatcher *Ficedula parva* / *F. albicilla* complex
28. Verditer Flycatcher *Eumyias thalassina*
29. Common Rosefinch *Carpodacus erythrinus*
30. Rosy Starling *Sturnus roseus**

[* = monitored in 2007–2008]

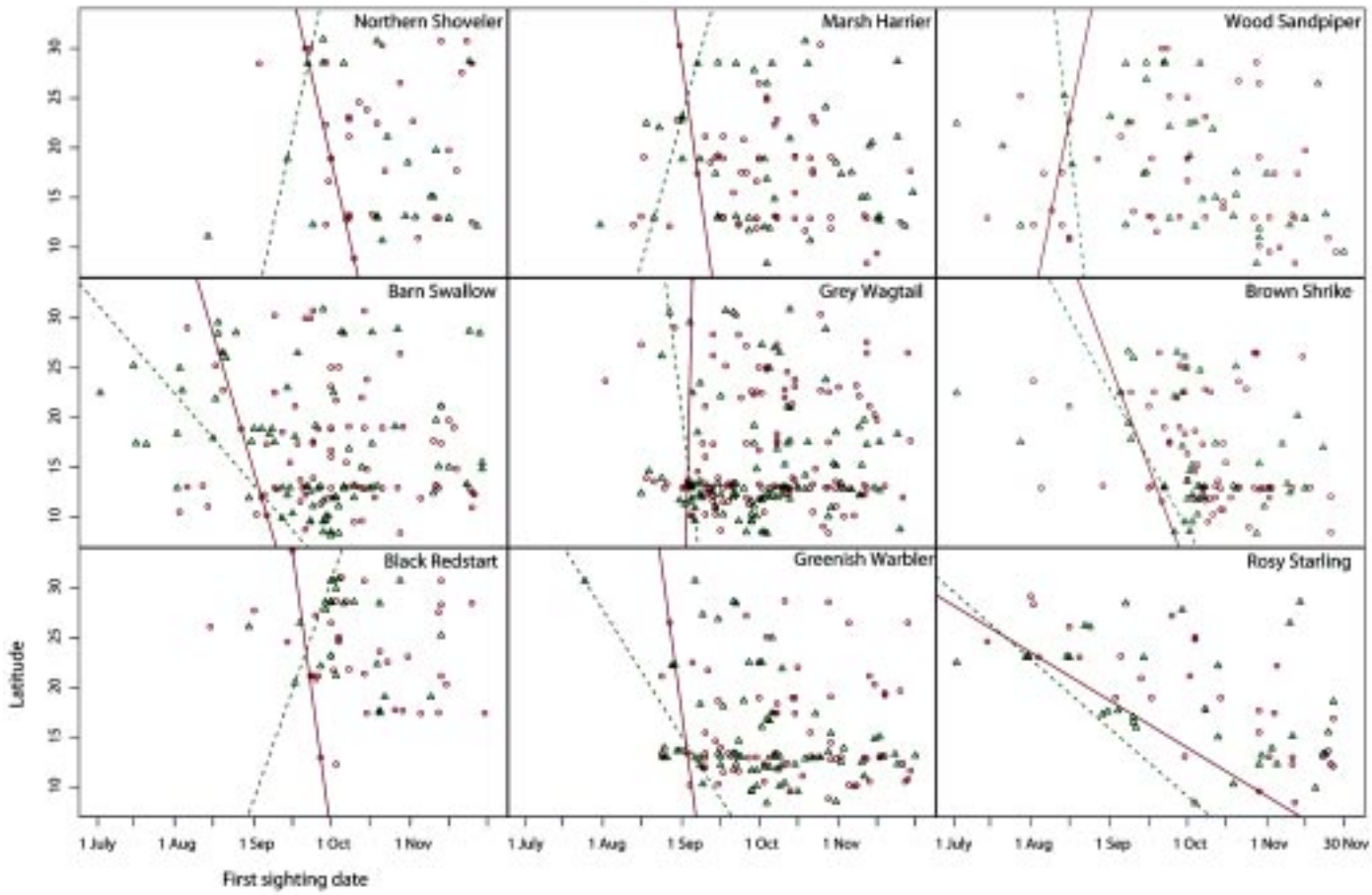

Fig. 3. Scatterplots showing the relationship between latitude and first sighting dates for nine migrant species in 2007 (brown circles) and 2008 (green triangles). Lines (solid brown and dashed green) depict 0.1th quantiles (as described in the text) for 2007 and 2008 respectively.

Sudhir Shivaram

Fig. 1d. Black-tailed Godwit *Limosa limosa*

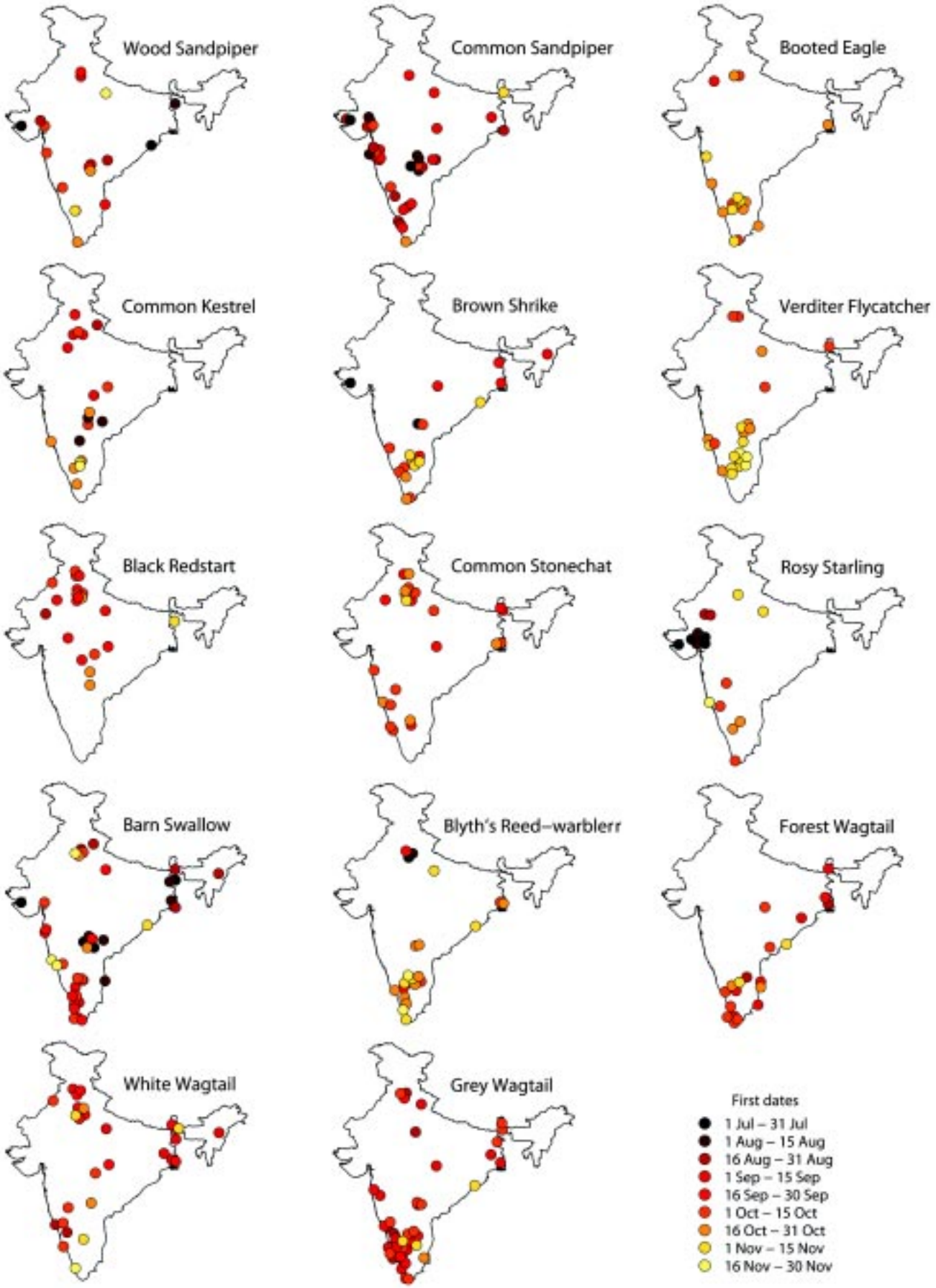

Fig. 4. Maps showing the location of first sightings for selected migrants in 2008, colour-coded by sighting dates. See text for a description of filters used in producing these maps.