



# UDAIPUR

## BIRD FESTIVAL

20<sup>th</sup> to 22<sup>nd</sup> January, 2023



**DEPARTMENT OF FORESTS, GOVT. OF RAJASTHAN**  
DEPUTY CONSERVATOR OF FORESTS (WILDLIFE), UDAIPUR



Baghdarrah Nature Park  
Image by Pankaj Singh



Baghdarrah Nature Park  
Image by Pankaj Singh



**R.K. Khairwa IFS**  
Chief Conservator of Forests  
Wildlife, Udaipur

# ACKNOWLEDGEMENTS

This is matter of immense pleasure that after covid-19 pandemic, we are organizing 9th edition of bird fair now well renewed as Udaipur bird festival. Existence of mankind depends on existence of biodiversity, hills, streams and other components of mother nature. Among biodiversity, the common man is well acquainted with the avian diversity that also plays a vital role in survival of humanity. Southern Rajasthan is known for its forest, IBAs, sanctuaries, water bodies, bird diversity and conservation ethos. In Udaipur, we are organizing bird festival from 2014 with full enthusiasm.

Besides many lakes situated amidst Udaipur city, a large number of water bodies are confined to the southern part of the stage to name some are Kishan Kareri, Badwai and Mangalwar of Chittorgarh district which are 85 to 100 kilometer away from Udaipur city. The water bodies of Menar (recently declared IBA), Nagavali and Bhatewar that fall in Udaipur district are 35 to 80 kilometer away from Udaipur city. Sai dam of Udaipur district which is also an IBA is 75 km away from Udaipur. Jawai dam in Pali district is very important water body where birds of desert and Aravallis can be seen together. Rajsamand, Udaisagar, Baghdarrah, Piladar, Ranakpur etc. are other important water bodies where diverse varieties of birds can be seen. Various taxonomic groups of aquatic birds like Ducks, Geese, Rails and Waders etc. Can be commonly seen over here .

I take this privilege to acknowledge here the sincere efforts put in by city people, students, researchers, partners, professionals, armed forces, electronic and print media, organizations, members of Eco-development Committees and Village Forest Protection and Management Committees, NGOs and all who have contributed to organize "Udaipur Bird Festival" and to bring the souvenir in existence.

I Congratulate the Udaipur Wildlife Division for their efforts and wish event a grand success.

**R.K. Khairwa IFS**



मुख्य मंत्री

राजस्थान

मुम. / सन्देश / ओएसडीएफ / 2023  
जयपुर, 15 जनवरी, 2023

## संदेश

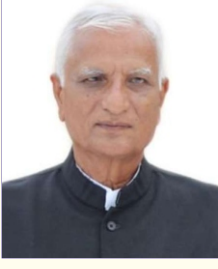
मुझे यह जानकर प्रसन्नता है कि उपवन संरक्षक, वन्यजीव, उदयपुर के सौजन्य से राष्ट्रीय स्तर के "उदयपुर पक्षी पर्व" का 20 से 22 जनवरी, 2023 तक आयोजन और इस अवसर पर एक स्मारिका का प्रकाशन किया जा रहा है।

हमारे पर्यावरण एवं पारिस्थितिकी संतुलन में पवन, जल, पेड़, वन्य जीव और पक्षियों का महत्वपूर्ण योगदान है। इस प्रकार के समारोहों से वन्यजीव प्रेमियों एवं विशेषज्ञों को पर्यावरण के क्षेत्र में नवीनतम शोध, तकनीक और ज्ञान की जानकारी मिलती है। साथ ही नई पीढ़ी को वन्य जीवन से प्रेम करने के साथ पक्षियों की विभिन्न प्रजातियों के कार्यकलापों की जानकारी मिलती है।

आशा है पक्षी पर्व के कार्यक्रम एवं स्मारिका की सामग्री प्रदेश और विशेष कर उदयपुर क्षेत्र में इस ऋतु में आने वाले पक्षियों के आवागमन एवं उनकी विशेषताओं को प्रकाशमान करने वाली होगी।

मैं "उदयपुर पक्षी पर्व" के आयोजन एवं स्मारिका के प्रकाशन की सफलता के लिए शुभकामनाएं प्रेषित करता हूं।

(अशोक गहलोत)



**हेमाराम चौधरी**

मंत्री

वन, पर्यावरण एवं  
जलवायु परिवर्तन विभाग  
राजस्थान सरकार

## संदेश

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मुझे यह जानकर खुशी हुई कि गत वर्षों की भांति वन विभाग उदयपुर द्वारा इस वर्ष भी उदयपुर पर्व के “9वें” संस्करण का आयोजन वृहत् स्तर पर किया जा रहा है। इस आयोजन से उदयपुर शहर एवं आसपास के जल स्रोतों पर आने वाली देशी-विदेशी पक्षियों के बारे में जानने का अवसर राज्य एवं राज्य के बाहर से आने वाले प्रकृति प्रेमी नागरिकों, विशेष तौर पर विद्यार्थियों, पक्षी विशेषज्ञों एवं पक्षी प्रेमियों को मिलेगा।

विभिन्न प्रकार के देशी-विदेशी पक्षियों के अवलोकन से हमें न केवल मनोरंजन प्राप्त होता है बल्कि हमें उस महती जिम्मेदारी का भी अहसास होता है कि पक्षियों के संरक्षण में आ रही बाधाओं को दूर करने में हमारी भागीदारी आवश्यक है। परागण, प्रकीर्णन, नाशक जीव नियन्त्रण, प्रकृति स्वच्छता आदि पक्षियों की ऐसी जैविक क्रियाएं हैं जो हमे प्रत्यक्ष लाभ पहुंचाती हैं तथा मानव जाति के अस्तित्व को बनाये रखने में मदद करती हैं। पक्षी मेलों एवं पर्वों के आयोजन से हमें पक्षियों के बारे में और भी अधिक जानने का अवसर मिलता है।

पक्षी अवलोकन भले ही एक हॉबी का रूप है लेकिन इस क्षेत्र में रोजगार के अवसर भी काफी हैं। पारिस्थितिकी पर्यटन को बढ़ावा देकर एवं उनसे पक्षी अवलोकन कार्यक्रम को जोड़कर, रोजगार के अवसर भी बढ़ाये जा सकते हैं तथा अनेक युवाओं को रोजगार दिया जा सकता है।

पक्षियों के बारे में आमजन में जागृति लाकर उदयपुर शहर एवं संभाग के जलाशयों के पक्षियों के संरक्षण की मुहिम को प्रभावी बनाया जा सकता है। इससे शहर की झीलें जीवन्त हो सकेंगी एवं अधिक संख्या में पक्षी प्रेमियों एवं पर्यटकों का आगमन भी संभव हो सकेगा, ऐसी आशा है।

मैं इस आयोजन की परम सफलता की कामना करता हूँ एवं आशा करता हूँ कि यह आयोजन अपने उद्देश्यों में अवश्य ही सफल होगा।

(हेमाराम चौधरी)

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**उषा शर्मा**  
आई.ए.एस.  
मुख्य सचिव  
राजस्थान सरकार

## संदेश

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उदयपुर संभाग अपने वन, वन्य जीवों एवं संरक्षित स्थलों के लिए विख्यात है। पक्षियों के विविध आवास इस क्षेत्र में सब जगह विद्यमान हैं। इस विरासत को सहेजने, खासकर पक्षियों के संरक्षण एवं उनके आवासों को संरक्षित करने के विशेष प्रयास इस क्षेत्र में देखने को मिलते हैं। गत वर्षों में अनेक महत्वपूर्ण पक्षी स्थलों का अस्तित्व में आना एवं उदयपुर पक्षी पर्व इसके कुछ उदाहरण हैं।

वर्ष 2014 में उदयपुर संभाग ने अपना पहला पक्षी पर्व अपार सफलता के साथ मनाया। यह क्रम आने वाले वर्षों में भी जारी रहा लेकिन पिछले 2 वर्षों में कोविड महामारी के कारण इस आयोजन को ऑनलाइन मनाया गया। निरन्तरता बरकरार रखते हुए इस वर्ष पक्षी पर्व का 9वां संस्करण साक्षात संपन्न होने जा रहा है। कोविड के बाद इस आयोजन के प्रति विशेष उत्साह का माहौल है जो निःसंदेह इस पक्षी पर्व को नई ऊंचाईयाँ देगा।

इस आयोजन में संभाग के अलावा राज्य के दूसरे भागों तथा अन्य राज्यों से भी पक्षी प्रेमी भाग लेने पहुँचते हैं। ऐसे आयोजन से निःसंदेह जनजागरण की मुहिम तीव्र होती है तथा वन, वन्य जीव एवं संरक्षित स्थलों के संरक्षण प्रयासों में सकारात्मक उन्नयन का मार्ग भी प्रशस्त होता है।

मैं इस आयोजन की अपार सफलता की कामना करती हूँ एवं आशा करती हूँ कि यह आयोजन अपने उद्देश्यों में सफल होगा।

(उषा शर्मा)

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**शिखर अग्रवाल**

आई.ए.एस.

**अतिरिक्त मुख्य सचिव**

वन, पर्यावरण एवं

जलवायु परिवर्तन विभाग

राजस्थान सरकार

## संदेश

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उदयपुर संभाग पक्षी विविधता व उपलब्धता के संदर्भ में धनी क्षेत्र है। राज्य के सबसे अधिक महत्वपूर्ण पक्षी स्थल इसी क्षेत्र में विद्यमान हैं। विभिन्न आकार व प्रकृति के जलाशय, घास के मैदानों, वनों एवं पहाड़ी आवासों की उपलब्धता पक्षी विविधता को बढ़ाने में सहायक होते हैं। इस क्षेत्र में अनेक दुर्लभ प्रजातियों सहित ऐसी प्रजातियाँ भी विद्यमान हैं जो दक्षिणी भारत से फैलाव करती हुई इस क्षेत्र तक विचरण करती पाई जाती हैं तथा आगे उत्तर दिशा में नहीं पहुँच पाई। इस लिहाज से पक्षी अवलोकन करने हेतु यह क्षेत्र राजस्थान में अपना विशिष्ट स्थान रखता है।

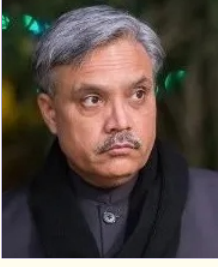
संभाग की इस विशिष्ट पक्षी सम्पदा का सभी को दिग्दर्शन कराने हेतु वर्ष 2014 से निरन्तर पक्षी पर्व का आयोजन किया जा रहा है जिसका इस वर्ष 9वां संस्करण संपन्न होने जा रहा है। यह पर्व हर साल शीत ऋतु में आयोजित किया जाता है ताकि इस समय स्थानीय पक्षियों के साथ-साथ देशान्तर गमन कर आने वाले पक्षियों को भी आसानी से देखा जा सके।

जन शिक्षण एवं जागृति हेतु ऐसे आयोजन बहुत अहम साबित होते हैं। इस आयोजन में स्थानीय जन समुदायों के साथ-साथ राज्य के दूसरे भागों व दूसरे राज्यों से भी पक्षी प्रेमी भाग लेने हेतु पहुँचते हैं जिससे पक्षी व उनके आवासों के संरक्षण के प्रयासों को व्यापकता मिलती है। संरक्षण प्रयासों को और व्यापकता देने हेतु हर वर्ष की तरह इस वर्ष भी एक स्मारिका का प्रकाशन किया जा रहा है जो एक सराहनीय प्रयास है।

मैं उदयपुर बर्ड फेस्टिवल के सफल आयोजन के लिए बधाई एवं शुभकामनाएँ प्रेषित करता हूँ।

(शिखर अग्रवाल)

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**डॉ. दीप नारायण पाण्डेय**  
प्रधान मुख्य वन संरक्षक  
(वन बल प्रमुख)  
राजस्थान

## संदेश

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राजस्थान ऐतिहासिक, निर्मित एवं प्राकृतिक विरासतों एवं विविधताओं के लिए जाना जाता है। खास कर दक्षिणी राजस्थान इस क्षेत्र में अपनी विशिष्ट पहचान रखता है। राजस्थान के इस संभाग में वन व अन्य प्राणी हमारी अद्भुत प्राकृतिक विरासत हैं। इस प्राकृतिक विरासत को संरक्षित कर अगली पीढ़ियों को सौंपना हमारा दायित्व है। इस दायित्व भाव को जन-जन में फैलाने हेतु वन विभाग ने उदयपुर संभाग में वर्ष 2014 से उदयपुर पक्षी पर्व के एक रूप में अनूठा आयोजन प्रारंभ किया जो वर्ष 2023 में अपना 9वां संस्करण आयोजित कर रहा है।

उदयपुर अपनी झीलों, वनों व पहाड़ों के लिए जाना जाता है जिसमें विशेषता पक्षियों के प्राकृतिक आवास की है। इन आवासों एवं पक्षियों को संरक्षित करने हेतु पक्षी पर्व जैसे आयोजन अपना स्थाई प्रभाव छोड़ते हैं। ऐसे आयोजनों से आमजन भी पक्षी व प्रकृति संरक्षण की मुहिम से जुड़ते हैं। जिससे संरक्षण कार्य और प्रभावी हो जाता है।

उदयपुर पक्षी पर्व में राज्य एवं राज्य से बाहर के पक्षी व प्रकृति प्रेमी बड़ी संख्या में भाग लेने पहुँचते हैं। बड़ी संख्या में शिक्षण संस्थाओं के छात्र-छात्राएँ भी सम्मिलित होते हैं जिससे पक्षी प्रेम व संरक्षण के संदेश दूर दराज के लोगों तक पहुँचते हैं। इन संदेशों को और स्थाई व प्रभावी बनाने हेतु स्मारिका का भी प्रकाशन किया जा रहा है, जो एक सराहनीय प्रयास है।

ऐसे आयोजन पर्यटन को भी बढ़ावा देते हैं जिससे रोजगार के नए अवसर सृजित होते हैं। खास कर संरक्षित क्षेत्रों एवं महत्त्वपूर्ण पक्षी स्थलों के आस-पास के शिक्षित युवाओं को लाभ मिलता है।

मैं इस आयोजन की सफलता हेतु शुभकामनाएँ देता हूँ।

(डॉ. दीप नारायण पाण्डेय)

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**अरिन्दम तोमर**  
प्रधान मुख्य वन संरक्षण एवं  
मुख्य वन्यजीव प्रतिपालक  
राजस्थान सरकार

## संदेश

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मुझे यह जानकर अति प्रसन्नता का अनुभव हो रहा है कि वर्ष 2014 से प्रारम्भ हुआ उदयपुर पक्षी पर्व इस वर्ष 20 जनवरी 2023 से 22 जनवरी 2023 तक अपना 9वां संस्करण मनाने जा रहा है। इसके साथ ही एक स्मारिका का प्रकाशन भी किया जा रहा है।

पक्षी पर्व उदयपुर धीरे-धीरे अपने स्वरूप को काफी व्यापक कर चुका है। इस तरह के आयोजन से न केवल पक्षियों के पर्यावास को सुरक्षित करने की मुहिम में तेजी आती है बल्कि पक्षियों सहित सभी दूसरे वर्ग के वन्यजीवों की सुरक्षा व संरक्षण के प्रति जन जागृति होती है। निश्चित ही ऐसे आयोजन राज्य की वन व वन्यजीव सम्पदा के संरक्षण में सराहनीय योगदान देते हैं।

आशा है, स्मारिका से पक्षियों, उनके पर्यावास, विविधता, पक्षी संरक्षण में आ रही कठिनाईयों व उनके निराकरण के उपायों सहित सभी पहलुओं पर अच्छी समझ पैदा होगी। इस प्रकार यह स्मारिका पक्षी संरक्षण कार्य में और भी उपयोगी साबित होगी।

मैं पक्षी पर्व के आयोजन एवं स्मारिका प्रकाशन की सफलता के लिये अपनी हार्दिक शुभकामनाएं प्रेषित करता हूँ।

(अरिन्दम तोमर)

”



**Arun Misra**  
CEO  
Hindustan Zinc Limited

## MESSAGE

“

I extend my best wishes to the Department of Forests and the Department of Tourism for the successful accomplishment of the on-ground Udaipur Bird Festival 2022-2023. Udaipur is an abundance of beauty with its resplendent lakes, grand architecture, amazing people and beautiful display of flora and fauna. It is commendable that this festival, in addition to bringing attention to Udaipur, the City of Lakes' abundant birdlife, also focuses on preserving the habitat and promoting avian tourism. Such occasions give bird watchers and people in general, the chance to explore and record the city's rich avian diversity.

The delicate ecosystem of our beautiful lakes is closely related to the birds. They maintain the balance of nature by promoting pollination and harmful vermin. History notes the birds as great indicators of environmental change. At Hindustan Zinc, we are committed to sustainable development, and we understand the value of protecting biodiversity. Both within our operations and outside them, we have taken many steps to preserve and improve the biodiversity of our projects.

We are proud to collaborate with the Government of Rajasthan and offer our support of this wonderful event held on international standards under our community service interventions. The on-ground experiences will open up a new world of bird watching and appreciation for nature.

I wish the team at Udaipur Bird Festival, the very best of luck and applaud their efforts in organising the event.

(Arun Misra)

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## UNVEILING MY JOURNEY FOR THE CONSERVATION BREEDING OF GREEN AVADAVAT *Amandava formosa* AT GULAB BAGH BIRD PARK, UDAIPUR



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Conservation Breeding and reintroduction are often the only choice for species that have undergone rapid declines over the years. This article unfolds the efforts and a need for establishing a Green Avadavat Conservation Breeding Programme at Gulab Bagh, Udaipur by the Rajasthan Forest Department with Bombay Natural History Society as the Knowledge Partner.

The Green Avadavat, earlier known as Green Munia, is a globally threatened bird listed as Vulnerable in the IUCN Red List. A species endemic to central India, the widespread trapping for the cage-bird trade, compounded by habitat loss and degradation through agricultural intensification are the main reason for its decline. It is listed in Schedule I of the Indian Wildlife (Protection) Act, 1972, whereby its hunting and trapping is totally prohibited.



Green Avadavat is also known as 'Tiger Finch' among foreign aviculturists due to the zebra markings present on its side flanks

India is home to eight species of munias belonging to the family Estrildidae. These include the Red Avadavat *Amandava amandava*, Green Avadavat *A. formosa*, Scaly-breasted Munia *Lonchura punctulata*, Indian Silverbill *L. malabarica*, Tricoloured Munia *L. malacca*, Chestnut Munia *L. atricapilla*, White-rumped Munia *L. striata* and Black-throated Munia *L. kelaarti*. All Indian munias including Green Avadavat are popular aviculture subjects being beautifully colored, small sized (10 cm) with melodious call, easy maintenance in captivity, and low cost diet make them highly sought-after cage birds.

### Historical Background

After two decades, I every now and then wonder - resigning from the post of National Coordinator of Indian Bird Conservation Network (IBCN) in November 2002 at India's premium bird organization - Bombay Natural History Society (BNHS) was not an easy resolution. Nevertheless, my decision amused me with ample opportunities to pursue my passion for native bird species that I had dreamt as a teenager to be associated with.

On my return to my hometown – Meerut, Uttar Pradesh, I volunteered for a two week survey for the 'extinct' Himalayan Quail *Ophrysia superciliosa* in north Himalayas. Enjoying every bit of my travel in and around Nainital and Mussoorie, Uttarakhand far from the maddening crowd of Mumbai, I had to return for delivering a talk on "Bird-keeping in Indian Zoos" at a Zoo Directors Workshop organized by the Central Zoo Authority (CZA) in Tamil Nadu. Soon after my class got over, I was given an offer by three zoo directors to assist their department with best possible practices for the avifauna housed in their respective zoos. It was there, where I first met Mr Rahul Bhatnagar, the then Deputy Conservator of Forests and also in-charge of Udaipur Zoo, Rajasthan. I instantly agreed to his proposal. The hidden reason was also to search for my favourite Green Avadavat, told to be locally abundant in nearby Sirohi district.

I grew up learning about the practical side of bird-handling from the 'Baheliya' clan in North India, a few of their families that happened to be my backyard neighbors. This tribe made a living by bird-trapping, cage-making and exports of wild birds worldwide, before the ban on wild bird business in 1990-91. More so before, I joined for a

Masters Degree in Wildlife Science at Aligarh Muslim University (AMU) in 1991, I lived as an aviculturist, rearing birds on my terrace with munias being my first group of pet birds since I was in class II. Fortunately enough, mentorship from my first wildlife teacher Dr Asad R. Rahmani at Department of Wildlife Science, AMU transformed me from a bird-keeper into the realm of conservation world. My exposure to keeping birds since childhood became a boon for my career when it comes to work with captive zoo birds.

Early 2003, for more than two months, I continued my stay at Udaipur Zoo situated at Gulab Bagh working towards giving a facelift to the bird aviaries and other animals sections, focusing on the enrichment and creation of more natural captive settings. In between my stay at Udaipur, my obsession for Green Avadavat led me to survey various areas around Udaipur for Green Avadavat. Our first surveys for Green Avadavat in Rajasthan along with local naturalist Dr Tej Razdan and Shalendra Tiwari of Seva Mandir took us to Kumbhalgarh, Gogunda and places around Udaipur as and when possible. Advice on the species former whereabouts from Dr Satish Sharma, an encyclopedia of Rajasthan's flora and fauna, was quite helpful.

I also initiated a dialogue with the Udaipur Zoo Monitoring Committee to have a few attempts for captive-breeding of the Green Avadavat and Grey Junglefowl *Gallus sonneratii* - avian species of prominence in Mewar. It was in Gulab Bagh premises that I also requested Dr S. P. Mehra to work on Green Avadavat who had come to meet me after reading a news item published in a local daily mentioning our Green Avadavat surveys. I really feel privileged that Mr Bhatnagar during a month long training course on 'Endangered Species Recovery Program' in 2009, at the Jersey Wildlife Preservation Trust, Trinity, UK (now known as Durrell Wildlife Conservation Trust) chose and presented his project dissertation on the *ex-situ* Conservation of Green Avadavat in India. My idea of having a breeding centre for Green Avadavat at Udaipur was always at back of his mindset ever since I interacted way back with him in 2003.

My journeys to Udaipur Zoo became more frequent when it was decided to have a Gulab Bagh Bird Park and shift the other zoo 'inmates' to a new location with ample space. The process of this zoo transfer began in 2008-2009 on the Central Zoo Authority recommendations to give Udaipur Zoo due recognition only after the animal enclosures are reconstructed based on the CZA norms. Finally the foundation of Sajjangarh Biological Park, the new zoo came into existence, that got its final shape in 2015.

A new chapter for Gulab Bagh was written in August 2017 during a two day workshop that was held in the presence of state ministers Mr Gulab Chand Kataria and the Minister for Forest, Environment, Youth Affairs & Sports Mr Gajendra Singh regarding the creation of Bird Park in Gulab Bagh, Udaipur. This workshop of national avian experts, NGOs and various stakeholders including tourism department officials was hosted by Udaipur forest officials to seek inputs for fine-tuning the bird park concept in accordance with master layout plan of the park as approved by CZA.

The meeting attended by 29 participants included Dr G.V. Reddy, Mr Rajpal Singh, Mr Vikram Singh, Dr Asad R. Rahmani, Mr Rahul Bhatnagar, Mr R.S. Shekhawat, Mr R.K. Jain and Ms Harni V. After detailed discussions and presentations, my proposal to initiate a Conservation Breeding programme for Green Avadavat was accepted. It was also unanimously decided by the members to recognize Bombay Natural History Society as the Knowledge Partner for developing this bird park with my involvement as the scientist-in-charge. BNHS and Udaipur Forest Department had mutually agreed on the working proposal in form of an MOU, which was signed by both parties in January 2019, however due to Covid-19 the entire project was much delayed.

### **BNHS also initiates a country-wide *in-situ* study on Green Avadavat**

As a conservationist, I believe we need to prioritize our ornithological studies on threatened species that are endemic to India with little research done on them. I have been on and off working on Green Avadavat for several years but since last two years, I have been trying to study this species as part of my BNHS project apart from the attempt for Conservation Breeding. Dr Deepak Apte, ex Director BNHS fully supported me for my *in-situ* and *ex-situ* conservation idea.

The main aim of this ongoing project is to gather information on Green Avadavat populations throughout its range with special focus on Rajasthan, and to identify key sites of its remaining populations. Secondly, my plan is to conduct ecological and behavioural studies on this little known species. An investigation into its tolerance to habitat degradation is another objective of the study. And lastly, I hope to prevent or reduce the capture and trade in Green Avadavat by developing more effective measures at the grassroots level and develop rehabilitation strategies for traditional bird trappers and traders willing to adopt alternative livelihoods and help in the species conservation.

### **A glance through Green Avadavat morphology, habitat and habits:**

The Green Avadavat is a small colourful finch. It is olive-green above, and has a pale yellow throat and breast. The centre of belly and undertail-coverts are bright yellow; the flanks are barred olive-brown and white. The female is similar to the male, but browner above and duller and paler below; the flanks have fewer and less obvious bars. The bird is known to inhabit grass and low bush habitat, tall grassland, sugarcane fields, and boulder-strewn scrub jungle.



A pair of Green Avadavat

According to Sálím Ali's and S. Dillon Ripley's HANDBOOK OF THE BIRDS OF INDIA AND PAKISTAN, the Green Avadavat is "very locally and unevenly distributed. It is found mainly in central India from Mt Abu, Gwalior, Jhansi, and Surguja south to Mahabaleshwar, Utnur, and the Vishakapatnam Ghats. It is also recorded from Lucknow and Lahore." A small breeding colony, which was formerly present in Lahore, Pakistan, is believed to have originated from escaped cage-birds.



A typical habitat preferred by Green Avadavat. Picture taken at Mount Abu Wildlife Sanctuary

It is a bird of warm dry scrub areas, being truly a sun worshipper! Mt Abu is the only area in the world where this species survives in such extreme cold weather where temperature in winter may falls lower than zero degree. Flock members keep in touch with each other through their *swee swee* calls. In summer, they had a bimodal feeding activity pattern, foraging in the morning and evening. When the weather is hot, they would spend long hours resting in the shade. With the onset of breeding season in end-June, they are mostly seen in pairs. Pairs would sit on a thin branch, or a rock and when excited, would flatten the tail, pointing towards each other, synchronously uttering a high pitched note. They feed mainly on grass seeds.

## A look at the need for Conservation Breeding of Green Avadavat – An Overview

The first credit of breeding a Green Avadavat in captivity goes to a British aviculturist - W. E. Teschemaker - who bred this species in 1905. Before the export of live birds was banned from India, our endemic Green Avadavat was exported to many countries. More interestingly, there is a Green Avadavat Breeders Group in Australia under the umbrella of Queensland Finch Society, which has been breeding this species for last many years. This group, dedicated to captive breeding of Green Avadavat has a stock of less than 100 birds.



A pair of Green Avadavat nesting in a small cage at Gulab Bagh

I have been aware of few success stories in breeding Green Avadavat by private bird-keepers in India before the ban in 1990-91. So far, captive breeding of Green Avadavat has actually been relatively illustrative, more as a bird-keeping hobby and trade oriented. However present day aviculturists in India cannot have captive stocks of the Green Avadavat since it is a protected species, and captive breeding on a private basis cannot be encouraged as it may lead to hidden trade in wild specimens on the pretext of being captive bred.

Conservation Breeding is never the first option for saving any species – it is, in fact, the last resort. Considering the declining status of Green Avadavat around Udaipur district, BNHS wanted to initiate a 'motivational' conservation breeding programme for Green Avadavat which simply implies building support for conservation. The role of zoos and bird parks across India in the conservation of threatened birds has not been so far pivotal. One remarkable dimension to this endeavour is having the first official attempt by any zoo or bird park in the world for providing a back-up population of Green Avadavat. The main purpose is 'precautionary measure' to prevent total extinction of wild birds, and soft release programme to augment the wild population.

It is just a start, at least on an experimental manner, that too in its former distribution zone. The idea is that wild population would be supplemented by Conservation Breeding. If it has to be done, it should be done with technical expertise and at a stage when wild birds are still there. Udaipur had the advantage of locally abundant population of Green Avadavat at Mount Abu just 150 km away, that too in the same state. The facilities developed by Rajasthan Forest Department at the recently developed Gulab Bagh Bird Park is the most viable option since this place can be slowly developed in a state-of-art Conservation Breeding Centre for Green Avadavat, in fact for the Genus *Amandava*.

The greatest advantage of choosing Udaipur is the availability of many suitable sites where the tagged captive-bred birds can be released and monitored to know the survival and adaptation in the wild. It has been shown in many such programmes that captive-bred individuals mix easily with the wild birds and also quickly learn the trick of survival in the wild. We can also collaborate with Australians to exchange experience and upgrade our conservation breeding programme.

### The initial progress

In August 2017, the Conservation Breeding Programme for Green Avadavat got a final acceptance from everyone concerned. Soon the work for 25 ft (L) x 25 ft (B) x 16 ft (H) sized aviary began at Gulab Bagh, with rodent proof flooring, with layer of mud and special small mesh size of one square cm.



Green Avadavat Conservation Breeding Centre at Gulab Bagh Bird Park, Udaipur, Rajasthan

In December the same year, Mr Rahul Bhatnagar, Chief Conservation of Forests (CCF) applied for permission for capture and transport of two pairs of Green Avadavat from Mount Abu to Gulab Bagh. In February 2018, Dr G.V. Reddy, Principal Chief Conservator of Forests (PCCF) and Chief Wildlife Warden of Rajasthan kindly granted permission for procuring the founder stock.



Picture by Mahendra Dhan

After consultation with Mr Balaji Kari, Mount Abu Dy. Conservator of Forests (DCF), we attempted to capture two males and two females from different flocks to avoid in-breeding among the initial founder population. With help of mist net we got a total of 11 Green Avadavats from two flocks between 24<sup>th</sup> and 26<sup>th</sup> May 2019. We retained two pairs and the rest seven birds were simultaneously released at the trapping sites. BNHS also ringed the seven birds with ring of Z size: ring no. 17270 and 17271 were put in two adult females, ring no. 17272 to 17275 in four adult males and ring no. 17276 in un-sexed sub-adult single bird in order to collect data on the bird local movements, home range and age.

Green Avadavat ringing at Mount Abu along with Mr Balaji Kari



Cultivation of micro-insects inside Green Avadavat aviary at Gulab Bagh

The best season for Green Avadavat research is between May to September when they are in full activity. Due to Covid-19 we lost valuable time in finalizing the cage. I also freed one pair back in wild, since the dominant pair had laid eggs in a small holding cage in October 2022 in an artificial basket and would chase the other pair. We initially wanted to separate the second pair, but than we thought of having the second pair of all together different age composition.

The inaugural of the park was decided on 12 May 2022, before which we got one pair on 8<sup>th</sup> May 2022. We released both the pair simultaneously in the large aviary pre-planted with *Lantana*, bamboo,

small palm trees, *Saccharum* spp., along with local grass species that we brought from Mount Abu. We also brought cow dung from Mount Abu especially collected from Green Avadavat foraging areas since it contained many local grass seeds. Dr Ajit Uchoi, ex DCF Udaipur supported my endeavour in every possible manner.

The gracious presence of Hon'ble Chief Minister Mr Ashok Gehlot for inaugurating the Gulab Bagh Bird Park gave a very good launch for the entire endeavour. Hon'ble Mr Hema Ram Chaudhary Cabinet Minister and Dr Girija Vyas were also present for the function.



Pictures by Farman Alam

The Green Avadavat project got accolades from the top Rajasthan forest officials especially Mr Shikhar Agarwal (Adl. C.S., Forest, Env. & Climate Change), Dr D. N. Pandey (PCCF & HoFF), Mr Arindam Tomar (PCCF & CWLW), Mr R. K. Singh (CCF), Mr R. K. Kairwa (CCF), Mr Rahul Bhatnagar (Ex CCF) and local wildliflers.



## The first step in captive-breeding

I am happy to share the first breeding success of Green Avadavat at Gulab Bagh. In mid November 2022, one pair successfully raised four chicks, making Gulab Bagh Bird Park the first zoo in India or abroad for conservation breeding of this species. A clutch of four parent-reared fledglings gave their first appearance on 18<sup>th</sup> November 2022, delighting everyone.

During the early second week of October 2022, Mr Deepak Purbia, in-charge Bird Park during his routine check in the morning got a little worried when he could only see two Green Avadavats from the visitor view side. He requested the animal attendant to have a search from inside the aviary. Once the attendant went inside the aviary, he happily located all the four birds and then while cleaning the ground floor, noticed a little grass platform about three feet among the *Lantana* plantation. On 12<sup>th</sup> October 2022, my BNHS ex-colleague Dr Girish Jathar who was in Udaipur, along with Mr Purbia on closer examination concluded that one Green Avadavat pair had prepared a ball like globular nest in the aviary. I immediately after a video call with them instructed that no one will enter the aviary and the food and water will be kept near the entrance with minimal interaction with the 'nesting parents'.

On 14<sup>th</sup> November 2022, Mr Purbia got a glimpse of a dark beak small bird in the munia aviary which quickly disappeared from his sight. It was on 18<sup>th</sup> November when we all got confirmed about the presence of four chicks when Mr Ajay Chittora, the new DCF of Udaipur managed to get a document shot of four fledglings in the aviary. On hearing this good news Dr Bivash Pandav, my present Director BNHS, immediately congratulated everyone and gave his approval for my visit to Udaipur to provide 'every possible assistance' for the new aviary occupants.

I started my observation from third week of November when the chicks were still fed by the parents. The end week of December and January 2023 has been really cold in Udaipur especially in night and we at the bird park are taking every possible precaution to prevent the winter chill hampering the growth of Green Avadavat family. We covered the whole aviary with a double plastic sheet that allows natural light and sunshine but prevent the winter wind and dew drops chilling the aviary birds. For almost six hours on bright sunny days, we let open the front plastic cover between 09 to 15 hrs.



A clutch of four parent-reared fledglings born at Gulab Bagh Bird Park, November 2022



Saving the new born Green Avadavat juveniles from winter chill is the top priority for the Gulab Bagh Bird Park staff

On 29<sup>th</sup> October 2022, I noticed the earlier breeding pair building a new nest on a dried branch of *Lantana*, but concealed from the visitor view side. The new nest was fully completed in less than four days made by both parents. I have examined discarded Red Avadavat nests in wild and what struck me was use of almost forty Sarus Crane *Grus antigone* body feathers by the munia. This prompted me to spread some feathers in our aviary. We avoided poultry feathers as they were too dirty. We collected shed Silver Pheasant *Lophura nycthemera* body feathers and hard boiled them in a pressure pan to kill every possible bacteria or insects and sun-dried them. To everyone's delight the nesting munias fully utilized them in their nest building activity.

The parents finished re-laying another full clutch by second week of December and were incubating them almost till last week of December 2022 since we could see only one parent bird. We presume the chicks have hatched by the time of writing this article in first week of January 2023, but I have resisted myself and zoo staff from either checking the nest or entering the aviary.

Once a week in sunny forenoons, I enter the aviary to replenish fresh bird seeds: Foxtail Millet *Setaria italica* and Sawa Millet *Echinochloa frumentacea*, water indoor aviary plants and reshuffle areas created with cow-dung for allowing micro-insects to flourish. The fledglings were readily fed by the parents with the thriving small insects cultivated by the bird park staff along with the grass seeds. On a daily basis drinking water (also used by all birds to regularly bath) is changed and seeds are kept at the aviary entrance. The first four juveniles can be often seen foraging along with the adult birds, amidst the ground strata, searching for tiny insects in between the rock crevices and mud-flooring. Regular watering despite cold weather helps to flush small insects thriving among the rocks, which are voraciously extricated by the caged birds.



Nest making in progress. The full nest is made in less than four days.



A fully constructed Green Avadavat nest in a *Lantana* bush at Gulab Bagh Bird Park avaries

Keeping in mind the severe winter chill in Udaipur, particularly from end December to mid January, we have little apprehension about the survival of the newly hatched chicks. However, the parents reaction of raising 'continuous' alarm calls on noticing anyone near the rear side of the aviary is a well enough indication that the chicks are healthy and growing well.

BNHS would recommend and has requested the Rajasthan State Forest Department to grant necessary permission for trapping four more unrelated Green Avadavat juveniles of opposite sex either from Mount Abu or Jaswantgarh (Gogunda) in order to prevent future inbreeding that may arise from pairing siblings born from the same parents. It is advisable to do this exercise within a period of three months (before March 2023 end) so that we know the exact age of the freshly trapped birds which is otherwise difficult once the wild juveniles attain their adult plumage. This effort will boost the founder population to a total of six pairs which can be easily accommodated in the present lesser passerine aviary existing at Gulab Bagh. I would also like to highlight that globally a total of eight unrelated pairs are scientifically considered as a robust founder population for any Conservation Breeding Programme. We are also anticipating that the second pair will also breed in Gulab Bagh aviaries in next breeding season.

In the end, I can only say let's wait and hope to hear the good news of more fledglings in our aviary at the Udaipur Bird Festival starting from 19<sup>th</sup> January 2023!

**Acknowledgements:** I would like to put on records my sincere regards, appreciation for the people acknowledgement below for their blessings, cooperation, approval, assistance and faith in the captive breeding programme of Green Avadavat at Gulab Bagh Bird Park, Udaipur: Mr Shikhar Agarwal (ACS), Dr D. N. Pandey, Mr Arindam Tomar, Dr G.V. Reddy, Mr Rahul Bhatnagar, Mr R K Kairwa, Dr T. MohanRaj, Dr Balaji Kari, Ms Harni V., Dr Ajit Uchoi, Mr Ajay Chittora, Mr Vijay Shankar Pandey, Mr Mukesh Saini, Mr Iqbal Singh Maan, Mr Shaitan Singh Deora, Mr Chandra Pal Chauhan, Mr Suhel Majboor, Mr Fateh Singh Rathore, Mr V. S. Rana, Dr Satish Sharma, Mr Ashish Vyas, Dr Kamlesh Sharma, Mr Ganeshi Lal Gothwal, Mr Subash Chandra, Mr Mohan Chaudhry, Mr Savarupa Ram, Mr Himmat Singh, Mr Deepak Purabia, Mr Giriraj Rathore, Mr Kalu Lal Bhoi, Mr Manji Meena, Mr Ram Singh, Mr Shankar Meena, Mr Mahendar, Mr Prem, Ms. Lali and family.

At BNHS especially - Dr Asad R. Rahmani, Dr Bivash Pandav, Dr Deepak Apte, Dr Kishore Rithe, Dr Anuj Jain, Ms. Gisha Shanker, Dr Girish Jathar and Md. Farman Alam. I would also like to thank Dr Esther Wullschleger, Dr Tej Razdan, Mr Vikram Singh, Mr Rajpal Singh, Dr Gopi Sundar, Mr Amit Puri, Mr Amit Tiwari, Dr Abha Gupta, Mr Shailendra Tiwari, Mr Manoj Kulshreshtha, Mr Kanish Kothari, Mr Devendra Srimali, Mr Arun Soni, Mr Sharad Agarwal, Mr Vinay Dave, Mr Prema Ram Alika, Mr Mahendra Dhan, Mr Anil Mathur, Mr Sudhindra Shrimali, Mr Bharat Alika, Mr Rohit Alika, Ms Pushpa Ravi Khamesra, Mr Vidhan Dwivedi, Mr Vedang Saikhedkar and Ms. Kanchan Sahu.



Green Peepal Society and Department of Forest, Udaipur organised a talk on Conservation Breeding of Green Avadavat on 14<sup>th</sup> May 2022.

## BIOMIMICRY TELLS US THE IMPORTANCE OF NATURE

**Dr Asad R. Rahmani**

Ex-Director, Bombay Natural History Society.

Google search will tell you that “biomimicry is a technological-oriented approach focussed on putting nature's lessons into practice.” Biomimicry sees nature as a model and imitates it or uses it as an inspiration for designs or processes with the goal of solving human problems. Biomimicry is of three types: first, copying from Nature; second is copying a process, such as photosynthesis, and the third is mimicking at an ecosystem level - like building a nature-inspired building (for example, how ants keep their ant castle cool, or China's National Stadium built like a bird nest).

Biomimicry is a combination of two words: bio from the Greek word bios or life, and *mimicry* is copying or imitating someone. Perhaps the first recorded biomimicry was by famous Italian polymath, Leonardo de Vinci who was an expert painter, draughtsman, engineer, scientist, theorist, sculptor, and architect. He studied bird anatomy/wings to develop a flying machine (it did not work though). The term biomimicry was made popular in 1997 by Janine Benyus in her book *Biomimicry: Innovation Inspired by Nature*. Now there are departments on biomimicry in many universities, such as Arizona State University and California State University in the USA, and University of Manchester, UK. Even Indian Institute of Technology (IIT), Madras has started a course in Biomimicry.

In this brief article I will give some examples of how human beings have benefited from copying Nature, and why species and habitat conservation is important. If we do not protect Nature, how will we learn and benefit from the species, ecosystems, environment, and processes that make our natural world.

Without being politically correct, I will describe the “Lotus Effect”. Lotus is our national flower and a part of our religious rituals, besides being a delight of any well-kept garden. Fortunately, it is found all over India, and introduced locally in many ponds and lakes, and private gardens. There is a huge market of lotus flowers during *Durga Puja*. What is not so well-known is that its leaves are dirt and water resistant. They actually have self-cleaning properties which scientists have named “the lotus effect”. In 1999, Sto, a building supply company that claims to “build architecture that are aspirational, inspirational and attainable” developed an outdoor paint that self-clean, mimicking the lotus leaves. They named it Lotusan, the paint imitates the surface of lotus leaves, repelling all moisture and dirt from exteriors.

Slugs tell us that no species, how “lowly” it may be, is useless. Every species has its ecological and environmental role in the web of life. Who knew that slug slime is the basis of a new biomedical adhesive that can be used for mending tissues that are otherwise very tough to repair, such as a beating heart, lungs, and connective tissue. Imitating slug slime, scientists have developed surgical superglue that is malleable, non-toxic, incredibly sticky, and biocompatible too (meaning that the human body will not reject it). Next time you see a “slimy” slug, give a second look. It is not so useless as we think.

Night driving in India is a nightmare with pot-filled roads and glaring headlights from the opposite direction. Most roads do not have even cats-eyes to show us when turning is required. Some drivers will ask “What is a cat's eye?” A cat's eye, popularly known as 'road stud' is a retroreflective safety device used in road marking that reflect the headlights of a vehicles. They are placed on the side of the roads to show the direction of a road, particularly on curves. This is based on the eye reflection of many animals that hunts in the night. Most animals, but particularly carnivores such as felids and canids have a specialized pigment named tapetum lucidum in their eyes. This helps them to have a good night vision to hunt prey in the night. Scientists have developed a very similar pigment in the lab, and now it is used to paint them in cat's eye or anything to be illuminated at night.

Termites are a bane of books and documents in tropical regions. Some archivists and book lovers say that we were not able to preserve our old literature in India mainly due to the ravages of the termites. Any bibliophile will know how difficult it is to protect books and documents from termites. In good libraries, protection from termites is an ongoing struggle. In the BNHS library, for example, pest control is done every month to protect valuable books and specimen collection. But, listen. We can learn many things from termites. From ecological point of view termites are not so bad as any librarian would like us to believe. Termitarium or termite castles, as seen in the Indian *terai* forest (e.g. Dudhwa National Park) will teach us a revolutionary way to design self-cooling buildings. Termitaria are tall and contain strategically placed holes that allow hot air to move and escape through the top, leaving the nest's interior relatively cool. The design is now used in many modern buildings to keep them cool.

Life in some desert can be harsh due to near absence of surface water and low rainfall but still numerous species survive. The tiny Namib Desert beetle *Stenocara gracilipes*, for example, knows how to harvest water from fog. In the foggy mornings, it stands on the crest of sand dunes, lift its body up, and collect water droplets that drip down through its wing case into its mouth. Scientists are trying to imitate its skin texture so they can make surfaces that would collect water for human use from moisture-laden fog.

Daniel Goldman, a biological physicist at the Georgia Institute of Technology, USA studied centipedes: small creeping crawling creatures that give shiver to most housewives when they make uninvited appearance in kitchens and bathrooms. But their elongated bodies, with dozens of legs give them power to move in any cranny or hole with remarkable dexterity. Goldman and his team have developed a robot-centipede that can help in removing weeds in a farm, or crawling inside debris to reach trapped humans after an earthquake or a storm.

I have hundreds of examples on biomimicry but will end with one more example. We all admire large antlers of Sambar and Barasingha deer. Even some adult Cheetal sports impressive antlers. We all know that deer antlers are secondary sexual characters to attract the opposite sex, and repel rival males. Antlers, unlike horns, are shed every year after the breeding season. Antlers are also the fastest growing organ of an adult deer, sometimes growing one inch per day. Scientists have found that antler growth is more like that of bone cancer than that of typical bones. However, in contrast to bone cancer, where tumours grow unchecked, antler growth is tightly regulated by the activity of tumour-suppressing and tumour-growth-inhibiting genes. In a paper published in 2019 in the prestigious Science, scientists say "Genes that both promote and suppress cancer are partially responsible, suggesting the bony tissue may reveal new ways to fight cancer."

If someone ask you why spend money in protecting species, tell him/her that Nature protection is for our benefit. Animals can live without us, we can't.

Nature is the world's oldest teacher. It is for us to take the course.

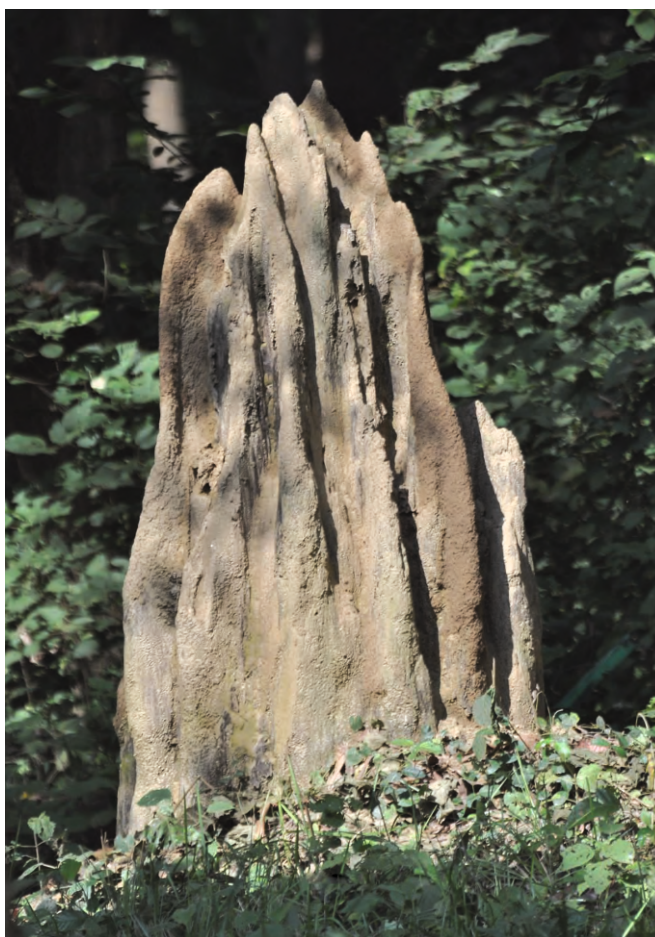


Image by Dr Rajat Bhargava

## THE IMPORTANCE OF ISOLATED CONICAL HILLS IN AND AROUND UDAIPUR FOR CONSERVATION OF WHITE-NAPED TIT *Machlolophus nuchalis*

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As many as 21 species of tits are known from India. Among them four are reported from southern Rajasthan namely Great tit (*Parus major*), White-naped tit (*Machlolophus nuchalis*), Black-lored tit (*Parus xanthogenys*) and Fire-capped tit (*Cephalopyrus flammiceps*) (Sharma, 2016). White-naped tit is endemic to India. A good population of this species is confined to Rajasthan and adjacent Gujarat state (Ali & Ripley, 1983; Kala, 2011; Mehra, 2004; Sharma, 2015; Sharma & Koli, 2014; Tiwari & Rahmani, 1996; Tiwari, 2001; Tiwari, 2007). According to Ali and Ripley (1980), White-naped tit prefers broken, stony, hummocky semi-desert country where well covered with Jungle of Babool, Prosopis, Pilu (*Salvadora*), *Balsamodendron*, *Grewia* and similar species. All the hills present in and around Udaipur city are liked by this endemic species as suitable habitat is present on them.

Two types of hills are present in and around Udaipur city, isolated conical and isolated linear. Isolated conical hills are present singly, without touching any extensive mountain chain. No typical *Nal*<sup>#</sup> is present in such hills. Since such isolated hills are either sharply conical or bluntly convex, hence they are prone to fast run off during monsoon season from all directions. Such hills remain exposed from all directions too and water retention is relatively poor and drying and desiccation is also very fast.

Isolated linear hills also behave like conical hills. Such hills have two prominent exposed slopes in two different directions. Such hills also lack typical *Nal* system. Like isolated conical hills, isolated linear hills have high run off and they are also prone to dryness.

Since isolated conical and linear hills present in and around Udaipur city are prone to fast run off, hence they remain relatively dry and develop thorny to deciduous forests on their slopes which is preferred by the White-naped tit. The details of hill pattern and habitat quality is given below in Table 1.

Table 1: Details of hills present in and around Udaipur city

S. no.	Name of hill/ Forest Block	Nature	Location	Major habitat type	Dominant plant species**	Activities of White – naped tit seen***
1	Machla Magra RF	Isolated, Linear	Outskirts of city	Deciduous and thorny	1,2,8	1,2,3,4
2.	Pandva PF*	Isolated, Conical	Outskirts of city	Deciduous and thorny	1,2 ,8	1,2,3,
3.	Tikalia PF	Isolated, Conical	Outskirts of city	Deciduous and thorny	1,2 ,8	1,2,3
4.	Thoria Magra	Isolated, Conical	Outskirts of city	Deciduous and thorny	1,2 ,8	1,2,3,4
5.	Nimach Mata RF*	Isolated, Conical	Inside city	Deciduous and thorny	1,2,7,8	1,2,3,4
6.	Devali Hills	Isolated, Conical	Outskirts of city	Deciduous and thorny	1,2 ,8	1,2,3
7.	Moti Magri	Isolated, Conical	Inside city	Deciduous and thorny	1,2,3,4,5,8	1,2,3,4
8.	Haridas Mgra (Haridas- Ji- Ki – Magri)	Isolated, Convex	Inside city	Deciduous and thorny	1,2,3,8	1,4

9.	Sajjangarh RF (Sanctuary)	Conical, Linear connected with other mountain chains	Outskirts of city	Deciduous and thorny	1,2,3,4,5,6,8	1,2,3,4
10.	Hora RF	Isolated, Conical	Inside city	Deciduous and thorny	1,2,3,8	1
11.	Gugla Magra	Isolated, Conical	Outskirts of city	Deciduous and thorny	1,2,8	1
12.	Teera Magri	Isolated, Conical	Inside city	Deciduous and thorny	6,8	1

\*PF= Protected Forest, RF= Reserve Forest

\*\*1= *Anogeissus pendula*, 2= *Acacia senegal*, 3= *Acacia leucophloea*, 4= *Boswellia serrata*, 5= *Lannea coromandelica*, 6= *Ziziphus mauritiana*, 7= *Azadirachta indica*, 8= *Prosopis juliflora*;

\*\*\*1= Feeding, 2= Roosting, 3= Breeding, 4= Drinking

It is evident from the above table that all the hills in and around of Udaipur City have good habitat for White-naped tit and the tit is visible everywhere. Away from Udaipur city but within 10km radius, there are many other conical hills like Segra, Hinglasiya, Bordi, Kamodiya, Umra, Baghdarrah and Kantia. All these hills have dry deciduous and dry thorny forest which are liked by White-naped tit. Low-heighted isolated conical hills and isolated linear hills possess 5/E<sub>1</sub> *Anogeissus pendula* forest on the most of their slopes. While high hills possess 5/E<sub>1</sub> forest on middle and lower slopes but 5/E<sub>2</sub>-*Boswellia* forest towards upper reaches. The 5/E<sub>1</sub> and 5/E<sub>2</sub> type of forests are liked by the White-naped tit. The *Anogeissus pendula* and *Boswellia serrata* are typical dominant species of 5/E<sub>1</sub> and 5/E<sub>2</sub> respectively. These both species have natural hollowness in their trunk and thick branches. These holes are used by the White-naped tit for night roosting and breeding activities. Initially most of conical hills were clad by primary forest of *Anogeissus pendula* but due to degradation, this species lost in many pockets. Later on, such degraded hills regenerated by the secondary forest of thorny species. As a result of this, many conical hills have good growth of thorny species like *Acacia senegal*, *A. catechu*, *A. leucophloea* and *Prosopis juliflora*. Forests with thorny species provide suitable habitat to White-naped tit (Ali & Ripely, 1983). Author is observing presence of White-naped tit in conical hills of Udaipur zone. since 1986 regularly. For conservation of this endemic tit, protection and conservation of conical hills and their thorny habitat is must.

Except Bedla- Ki- Nal and Jamuniya- Ki – Nal, typical Nals are absent in the vicinity of Udaipur city. Nals are valleys of different width between two parallelly running mountain chains. Many extensive *Nals* are present in Gogunda, Kumbhalgarh, Kotra and Jhadol Tehsils of Udaipur district. Most of Nals of these areas have good moisture regime and perennial or semi – perennial or seasonal streams in the valleys. The common forest types seen in the moist valleys are 5A/C<sub>1</sub>- Dry teak- bearing forest, 5B/C<sub>2</sub>- Northern Dry mixed deciduous forest, 5/E<sub>5</sub>- Butea forest, 5/E<sub>6</sub>- Aegle Forest, 5/E<sub>8</sub>- *Phoenix* Savannah and 5/E<sub>9</sub>- Dry bamboo brakes which are not congenial habitats for the White-naped tit.

# A valley between two parallel mountain chains is locally called 'Nal' in southern Rajasthan. 'Nals' have different type of micro-climate than the surrounding areas.

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# दक्षिण राजस्थान में पक्षी अध्ययन का प्रारंभिक काल

आलेख : डॉ धर्मेन्द्र खांडल एवं डॉ धीरेन्द्र देवर्षि

C/o Tiger Watch, Ranthambore, Sawai Madhopur, Rajasthan

राजस्थान एक विशाल राज्य है, जिसका अपना एक वृहद् और जटिल इतिहास रहा है, परंतु राजस्थान के प्राकृतिक इतिहास (Natural History) की बात करें तो बहुत कम लोगों द्वारा प्रामाणिक शोध पूर्ण दस्तावेज लिखे गए हैं जो हमें बीते काल से परिचय करवाते हैं। जलवायु परिवर्तन के दौर में प्रजातियों और उनके पर्यावासों (हैबिटाट) में हुए अनेक परिवर्तनों का मूल्यांकन करने के लिए प्राकृतिक इतिहास का ज्ञान सबसे अधिक महत्वपूर्ण है, ताकि विभिन्न कालखण्डों में हुए बदलावों की वर्तमान से तुलना की जा सके। प्राकृतिक इतिहास के वर्णन में पक्षी जगत का अध्ययन करने वाले लोगों ने सबसे अधिक साहित्य सृजन किया है। राजस्थान के सन्दर्भ में सबसे अधिक शुरुआती शोधपरक अध्ययन दक्षिण राजस्थान में हुए है जिनका श्रेय अधिकतर ब्रिटिश खोजकर्ताओं को जाता है। इनमें से कुछ ऐसे भी लोग रहे जो दक्षिण राजस्थान आये भी नहीं परन्तु उन्होंने पक्षियों को उनके संगृहीत नमूनों के आधार पर व्याख्या की। जानते हैं उनके बारे में प्रस्तुत आलेख में!!

## लेफ्टिनेंट-कर्नल एडवर्ड आर्थर बटलर (Lieutenant-Colonel Edward Arthur Butler)

लेफ्टिनेंट-कर्नल एडवर्ड आर्थर बटलर (4 जुलाई 1843 - 16 अप्रैल 1916) एक ब्रिटिश सेना अधिकारी थे। वह 21 साल की उम्र में सेना में भर्ती हुए और जिब्राल्टर, भारत और दक्षिण अफ्रीका में सेवा की। बटलर एक उत्साही पक्षी विज्ञानी, पक्षी संग्राहक और टैक्सिडर्मिस्ट थे। उनके द्वारा एकत्रित किये गए कुछ नमूने नेचुरल हिस्ट्री म्यूजियम, लंदन को सीधे एवं कुछ नमूने एलन ऑक्टैवियन ह्यूम एवं लॉर्ड रोथ्सचाइल्ड और अन्य के संग्रह के माध्यम से भेजे गए थे।

बटलरने लगभग 11 वर्ष भारत में सेवाएं दीं। एलन ऑक्टैवियन ह्यूम, जिन्हें भारतीय कांग्रेस और भारत में आधुनिक पक्षीविज्ञान का जनक भी कहा जाता है, ने 1872 में पक्षी विज्ञान की एक शोधपत्रिका (Journal) का प्रकाशन प्रारम्भ किया था जिसका लघु नाम स्ट्रे फेदर्स (Stray Feathers) रखा था। ए.ओ. ह्यूम के आग्रह पर एडवर्ड बटलरने स्ट्रे फेदर्स के लिए अपने दो वर्ष के उत्तरी गुजरात और माउंट आबू के पक्षी-प्रेक्षण के अनुभव लिखे। उनका शोध कार्य वर्ष 1875, 1876 और 1877 में तीन भागों में ए.ओ. ह्यूम द्वारा सम्पादित जर्नल में प्रकाशित हुआ। बटलर के भारत के बाहर किये गए संकलन के आधार पर ह्यूम ने उल्लू पक्षी की एक जाति का नाम उनके सम्मान में Strix butleri रखा जो हाल ही में 2015 तक स्वीकार किया जाता रहा परन्तु बाद में इसे एक अन्य जाति Strix hadorami का पर्याय मान कर इसका उपयोग बंद कर दिया गया।

रिकॉर्ड के अनुसार एडवर्ड बटलर पहले ऐसे व्यक्ति थे जिन्होंने माउंट आबू के पक्षियों का विस्तृत विवरण किया। हालाँकि बटलर स्वयं मात्र एक छोटे समय के लिए ही माउंट आबू आये थे, परन्तु एक अन्य वनस्पति शास्त्री डॉ जॉर्ज किंग (12 April 1840 - 12 February 1909) द्वारा दिसंबर, 1867 से दिसंबर, 1868 के एक वर्ष में माउंट आबू से एकत्र किए गए पक्षियों के नमूनों के रूप में महत्वपूर्ण योगदान दिया। उन्होंने अपने संकलन का अधिकांश भाग ह्यूम को उपलब्ध करवाया जिसके आधार पर ह्यूम ने बटलर के शोधपत्र में अपनी सम्पादकीय टिप्पणियां स्थान-स्थान पर दी हैं। डॉ किंग से पक्षियों के जो स्पेसिमेन ह्यूम को प्राप्त हुए उनके आधार पर कालांतर में पक्षियों की तीन नयी उपजातियां (Subspecies) वर्णित की गयीं जिसमें से दो माउंट आबू से थीं। असल में वनस्पति शास्त्री डॉ जॉर्ज किंग, जो सम्पूर्ण भारत में कुनैन उपलब्ध करवाने वाले वनस्पति शास्त्री के रूप में जाने जाते हैं।

## एलन ऑक्टैवियन ह्यूम (Allan Octavian Hume)

एलन ऑक्टैवियन ह्यूम (4 June 1829 - 31 July 1912), जिनका उल्लेख ऊपर किया गया है, अत्यंत प्रतिभाशाली और विविध क्षेत्रों में गहरी जानकारी रखने वाले व्यक्ति थे। उनके योगदान के कारण भारत के प्राकृतिक इतिहास ही नहीं बल्कि राजनीति के इतिहास का लेखन भी उनके उल्लेख के बिना किया जाना संभव नहीं है। उनके द्वारा सम्पादित स्ट्रे फेदर्स नामक शोध पत्रिका भारत की पक्षियों पर केंद्रित पहली शोध पत्रिका थी। इसके १८७२ से १८९९ तक १९ अंक (Volume) प्रकाशित हुए जिसमें भारत के कोने-कोने से पक्षियों के वितरण, नीड़न, प्रवसन, आदि की जानकारी प्रकाशित हुई। हालाँकि स्वयं ह्यूम ने तो बटलर की तरह दक्षिणी राजस्थान के लिए कोई अलग से विस्तृत शोधपत्र तो नहीं लिखा परन्तु बटलर के शोधपत्र में उन्होंने स्थान-स्थान पर अपने प्रेक्षणों के आधार पर जो टिप्पणियां दी हैं उनसे स्पष्ट होता है कि उनके खुद इन स्थानों पर आये होने या यहाँ से प्राप्त स्पेसिमेन का अध्ययन करने के कारण उनके पास भी राजस्थान के पक्षिजात (avifauna) का गहन अनुभव था। राजस्थान से पक्षियों की जितनी भी उपजातियां सूचित की गयी हैं उनमें से लगभग आधी ह्यूम के संग्रह से ही हैं। ह्यूम ने 20 मई 1868 को माउंट आबू से ही एक स्पेसिमेन इकट्ठा किया जिसे उन्होने अपने ही एक आलेख में स्वतंत्र उपजाति का दर्जा दिया। इसे आज Indian scimitar babbler (Pomatorhinus horsfieldii obscurus) Hume, 1872 के नाम से जाना जाता है।

## विलियम थॉमस ब्लैनफोर्ड (William Thomas Blanford)

विलियम थॉमस ब्लैनफोर्ड (7 अक्टूबर 1832 - 23 जून 1905) एक अंग्रेजी भूविज्ञानी और प्रकृतिविद थे। उन्हें सीलोन और बर्मा सहित ब्रिटिश भारत के जीवों पर एक प्रमुख श्रृंखला के संपादक के रूप में याद किया जाता है। उन्होंने माउंट आबू में मिलने वाली रेड स्पूर फाउल (Red Spurfowl :Galloperdix spadicea) की एक



उप प्रजाति -कौरिना का वर्णन किया है अतः जीवों के नामकरण के नियमों के आधार पर इस उपजाति का अंतर उन्हें माना गया (*Galloperdix spadicea caurina* Blanford, 1898), हालाँकि जिस स्पेसिमेन के आधार पर उन्होंने इस उपजाति का वर्णन किया था उसका संकलन डॉ किंग ने 7 जुलाई 1868 को कर ह्यूम को सुपुर्द किया था। आबू और आस-पड़ोस मिलने वाली इस रेड स्पर फाउल उप प्रजाति अधिक मटमैली होती है, नर के ऊपरी हिस्सों पर वर्मीक्यूलेशन (कीड़ी द्वारा बनाये गए निशान के सदृश्य) कम होता है, और मादा की पीठ के पंखों, पंखों के आवरण आदि पर कोई अलग काली पट्टी नहीं होती है। ये सभी रूफस या यहां तक कि ग्रेडिश-बफ हैं, काले वर्मीक्यूलेशन के साथ और पंखों के लिए इंटरमार्जिनल स्ट्रीक्स खंडित हैं। जबकि मध्य भारत और दक्षिण भारत में मिलने वाली रेड स्परफाउल उपप्रजाति अधिक गहरे रंगों से परिपूर्ण है। खैर इसके अनुवांशिक स्तर पर विभिन्नता का अध्ययन कर इनके अंतर को और अधिक समझा जा सकता है। परन्तु *caurina* उपप्रजाति राजस्थान की एक एंडेमिक उपप्रजाति के रूप में जाना जाता है।

### ह्यूग व्हिस्लर (Hugh Whistler)

पहाड़ी बुलबुल (Red-whiskered bulbul) को पक्षी जगत की मधुर आवाज में बोलने वाली एक सुन्दर बुलबुल माना जाता है। इसकी आवाज में लगता है मानो यह बोल रही हो "प्लीस्ड टू मीट यू (pleased to meet you)"। इसी बुलबुल की आबूएन्सिस सब-स्पीशीज को ह्यूग व्हिस्लर द्वारा वर्ष 1931 में दुनिया के सामने लाया गया था। ह्यूग व्हिस्लर (28 सितम्बर 1889 – 7 जुलाई 1943) एक अंग्रेज पुलिस ऑफिसर थे और साथ ही वह एक उम्दा पक्षीविद भी थे। भारत में उन्होंने पंजाब में पुलिस अधिकारी के रूप में कार्य किया था। उन्होंने अपने जीवन में 17-18 हजार पक्षियों का संग्रह किया जो ब्रिटिश नेचुरल हिस्ट्री म्यूजियम में रखे गए हैं। उन्होंने जिस नर स्पेसिमेन के आधार पर इस नयी उपजाति का वर्णन किया असल में वह ह्यूम के संग्रह से ब्रिटिश म्यूजियम को प्राप्त हुई थी तथा इसे 29 अप्रैल 1868 में एकत्रित किया गया था। ह्यूग व्हिस्लर ने अन्य स्पेसिमेन से तुलना करते हुए आबू के इस स्पेसिमेन के अंतर पहचाने और लिखा कि, इस सब-स्पीशीज का ऊपरी और पृष्ठ भाग अन्य सब स्पीशीज की तुलना में अत्यंत हलके रंग का होता है। इसके सामने गले के नीचे बने हुए हारनुमा निशान में रंग हल्के होते हैं, यह संकरा होता है एवं मध्य से टूटा हुआ, यानि असतत, भी होता है। इसकी उपजाति के नाम (*Pycnonotus jocosus abuensis*, Whistler, 1931) से ऐसा प्रतीत होता है कि यह माउंट आबू की स्थानिक या एंडेमिक उपजाति है परन्तु यह राजस्थान के अन्य भागों के साथ गुजरात, मध्य प्रदेश एवं महाराष्ट्र में भी पायी जाती है।

### हर्बर्ट हास्टिंग्स हैरिंगटन (Herbert Hastings Harington)

माउंट आबू से हर्बर्ट हास्टिंग्स हैरिंगटन (16 जनवरी 1868 – 8 मार्च 1916) नामक एक ब्रिटिश आर्मी अफसर ने Tawny-bellied Babbler की एक नई उप-प्रजाति रिपोर्ट की जिसका नाम दिया गया - Abu's Tawny-bellied babbler (*Dumetia albigularis abuensis*)। हैरिंगटन लखनऊ में पैदा हुए थे एवं 48 वर्ष की आयु में मेसोपोटामिया यानि इराक में एक मिलिशिया द्वारा प्रथम विश्व युद्ध के दौरान वर्ष 1916 में मारे गए। इस पक्षी की खोज का विवरण जर्नल ऑफ बॉम्बे नेचुरल हिस्ट्री सोसाइटी (JBNHS) में 1914-15 में प्रकाशित हुआ था।

हैरिंगटन ने भारतीय पक्षियों के संकलन से टीमेलिडी (Timeliidae) कुल के पक्षियों की जाति-उपजातियों को व्यवस्थित करने हेतु एक शोधपत्र लिखा। इसी शोधपत्र में आबू से बटलर द्वारा 27 अप्रैल 1875 में संकलित किये गए स्पेसिमेन के आधार पर यह नयी उपजाति जोड़ी गयी। इस उपजाति के सिर के ऊपर का रंग कथई एवं गला सफ़ेद रंग का होता है जिस से यह एक टोपी पहने हुए लगती है, जबकि इनकी अन्य सबस्पीशीज के सिर का अग्र भाग ही मात्र कथई रंग का होता है। इनके व्यवहार को भारत में इस्तेमाल किये जाने वाले एक स्थानीय नाम से बखूबी समझा जा सकता है,

### मेजर जनरल थॉमस हार्डविक और डॉ जॉन एडवर्ड ग्रे

मेजर जनरल थॉमस हार्डविक (1756 – 3 मार्च 1835) अंग्रेज सैनिक के रूप में लगभग 1771 में भारत आये और 1818 तक यहाँ रहे। इन्होंने भारत में ईस्ट इंडिया कंपनी की सेना के लिए कई लड़ाईयां लड़ी जिनमें से एक टीपू सुल्तान के विरुद्ध भी थी। सैनिक होने के साथ ये प्रकृतिविद भी थे। इन्होंने बहुत से जीवों के नमूने संचित किये और अनेक के चित्र स्थानीय व अन्य चित्रकारों से बनवाये। इनके संकलन में लगभग 4500 प्लेट्स थीं जिनमें से अनेक पक्षियों के चित्र भी थे। इनका इरादा इन्हें प्रकाशित करने का था जिसमें इन्होंने डॉ जॉन एडवर्ड ग्रे (12 फरवरी 1800 – 7 मार्च 1875) का सहयोग लिया। डॉ ग्रे ने एक प्राणिशास्त्री के रूप में बहुत कुछ खोजे और लिखा तथा ख्याति प्राप्त की। हार्डविक द्वारा बनवाये गए चित्रों का संकलन डॉ ग्रे ने अनेक भागों में प्रकाशित किया परन्तु इनमें सिर्फ चित्र ही थे परन्तु जिन जीवों के चित्र थे उन्हें किसने एकत्र किया, किस तिथि को तथा किस खास स्थान से उन्हें लिया गया, किसने उनके चित्र बनाये आदि कोई वर्णन इनके साथ नहीं था। एक सन्दर्भ के अनुसार उनके अधिकांश चित्र स्थानीय चित्रकारों ने बनाये परन्तु एक गुरदयाल के अलावा किसी के नाम ज्ञात नहीं हैं। इन इतिहास की बातों से परे हम सीधे दक्षिणी राजस्थान से इन दोनों के सम्बन्ध पर आते हैं। असल में इनके संकलन के आधार पर ही उदयपुर से पेंटेड फ्रैंकोलिन (*Francolinus pictus*) की एक उपजाति स्वीकार की गयी जिसे *Francolinus pictus pallidus* कहा जाता है। जैसा कि ऊपर उल्लेख किया गया है, इसे हार्डविक ने उदयपुर में कहाँ से प्राप्त किया उसका कोई उल्लेख नहीं मिलता है।

### यूल मेरवीन चार्ल्स मैकैन (Yule Mervyn Charles McCann)

यूल मेरवीन चार्ल्स मैकैन (4 दिसंबर 1899 – 29 नवंबर 1980) वर्ष 1941 में माउंट आबू में छुट्टी मनाने आया एक बायोलॉजिस्ट जो वहाँ की जैव-विविधता पर शोध पत्र लिख कर राजस्थान के इतिहास का एक महत्वपूर्ण हिस्सा बन गया। मैकैन भारत में ही जन्मे एक अत्यंत मेधावी और मेहनती वनस्पति शास्त्री थे, जिन्होंने भारत के प्रमुख वनस्पति शास्त्री एथेलबर्ट ब्लैटर के साथ वर्षों तक पेड़-पौधों पर शोध कार्य किया। चार्ल्स मैकैन बॉम्बे नेचुरल हिस्ट्री सोसाइटी (BNHS) के संग्रहालय के

सहायक क्यूरेटर रहे और वर्षों तक भारत के प्रसिद्ध जर्नल (JBNHS)के संपादन का कार्य भी किया। इन्होंने 200 से अधिक शोध पत्र और भारत के पेड़ों पर पुस्तक भी लिखी है। इनके द्वारा घासों पर लिखा गया मोनोग्राफ अत्यंत महत्वपूर्ण माना गया है।

मई 1916, में एक छात्र के रूप में उन्होंने पहली माउंट आबू यात्रा की। उन दिनों में परिवहन के कोई यातायात के सुलभ साधन नहीं होते थे तो वह लिखते हैं किस प्रकार उन्होंने 15 मील की यात्रा को 12 घंटे में पूरा किया था। उनकी इस पहली यात्रा में प्रसिद्ध वनस्पति शास्त्री एथेलबर्ट ब्लैटर एवं प्रोफ. पी.एफ. हॉलबर्ग भी उनके साथ थे जो उन्हें एक बोटैनिकल यात्रा पर लेकर आये थे। चार्ल्स मैकैन लिखते हैं कि, किस प्रकार उनकी यह पहली यात्रा उनके जीवन में मील का पत्थर साबित हुई, जिसने उनके भविष्य की दिशा तय की। उन्होंने प्रकृति के विभिन्न पहलुओं को नजदीक से देखा और ब्लैटर और हॉलबर्ग जैसे विशेषज्ञों की मदद से उनका विश्लेषण किया।

चार्ल्स मैकैन 7 अक्टूबर 1941 को सपत्नी अपने बच्चों से मिलने माउंट आबू आये जो वहां पढ़ते थे। उनका विचार था स्वयं के लिए एवं परिवार के लिए खाली समय निकालने का और कार्य मुक्त होकर आराम करने का। परन्तु उन्होंने इस समय में भी एक शानदार शोध पत्र लिखा और बड़े मजेदार ढंग से उसे एक अनोखा शीर्षक दिया – A 'Busman's' holiday in the Abu Hills जो 1942में बॉम्बे नेचुरल हिस्ट्री सोसाइटी के जर्नल (JBNHS) में प्रकाशित हुआ था।

'Busman's holiday' एक ब्रिटिश मुहावरा है जिसका मतलब है कि, किस प्रकार एक बस चालक छुट्टी मनाने जाता है तब भी उसे बस चलाते हुए ही छुट्टी पर जाना होता है और इस कारण उसका वह छुट्टी का दिन भी आम कामकाजी दिन की तरह ही हो जाता है।

यह शोध पत्र असल में प्रकृति की गहन समझ रखने वाले जीववैज्ञानिक की विभिन्न प्राणियों और पौधों पर अवलोकन का दस्तावेज है जिसे देख कर प्रेरणा मिलती है की एक जमाने में किस प्रकार के कठोर परिश्रम से लोग एक-एक जीव की पहचान और उनके व्यवहार की व्याख्या करते थे। यह कहा जा सकता है कि, प्रकृति पर डायरी लिखने वाले शोधार्थी, यात्रा वृतांत लिखने वाले यायावर या वन्य जीवों का संरक्षण करनेवाले संरक्षणवादी सभी इनकी लेखनी से प्रभावित होंगे और नए विचारों के प्रवाह को रोक नहीं पायेंगे।

उनका इसी क्रम में दूसरा शोध पत्र एक वर्ष पश्चात 1943 में बॉम्बे नेचुरल हिस्ट्री सोसाइटी के जर्नल में The rains come to the Abu Hills शीर्षक से प्रकाशित हुआ। यह शोध पत्र अत्यंत खूबसूरती से लिखा गया है जो मानसून की बारिश से होने वाले बदलाव को रेखांकित करता है।

चार्ल्स मैकैन ने 1946 तक BNHS के साथ काम किया और उसके बाद, देश आजाद होने से पहले वह न्यूजीलैण्ड चले गए। उन्होंने खुद के द्वारा संकलित किये गए सरीसृपों के 700 स्पेसिमेन को वहां के दो मुख्य संग्रहालयों को भेंट कर दिये जो आज भी उनके द्वारा किये गए उल्लेखनीय कार्यों की श्रेणी में आते हैं।

इन पक्षीविदों या प्रकृतिविदों का कार्य आज भी प्रासंगिक है क्योंकि इनके द्वारा लिखे गए शोध पत्रों को पढ़ कर दक्षिण राजस्थान के पक्षी एवं उनके आवासों में कालांतर में आये बदलावों को समझा जा सकता है।

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## POTENTIAL OF ECO-TOURISM IN SOUTHERN RAJASTHAN

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Eco-tourism has the potential to generate economic benefits, as well as socio-cultural and environmental advantages, for both the public and commercial sectors, as well as for local communities. However, eco-tourism may also help with environmental management and conservation. Awareness of environmental issues and conservation education can be facilitated by eco-tourism. There have been requests to increase tourism despite environmental consequences caused by the rapid rise of mass tourism and environmental negligence. Eco-tourism is the best long-term approach to protecting and promoting local natural and cultural variety, and it also has positive impact on the environment, society, culture, and economics of attraction regions and local communities. Nonetheless, many eco-tourism projects fall short because they don't accurately gauge visitor interest (Lonn *et al.* 2018). Protecting and preserving natural ecosystems and renewable resources are at the core of eco-tourism. Eco-tourism is a form of ethical travel to natural areas that benefits local ecosystems, provides opportunities for education and personal growth, raises public awareness, and helps indigenous peoples economically (TIES 2015). Tourism services are a growing portion of the industrialised world's service economy, and as such, they have received increased focus in recent years.

When it comes to giving eco-tourism in Rajasthan a much-needed boost, southern Rajasthan is in an ideal location. Southern Rajasthan has a lot of potential to be developed as an Eco-tourism spot because its rich flora and fauna, as well as its naturally endowed features like stunning lakes, wooded areas, and rolling hills, make for breath-taking scenery and the large number of tourists that visit the cities of Udaipur, Mt. Abu, Chittorgarh etc. annually from various states of the country. Many cities in southern Rajasthan viz; Banswara, Dungarpur, Pratapgarh and Rajsamand are still unexplored in terms of eco-tourism. Banswara is a city which is also known as city of 100 islands. (Vikram, 2022) Eco-tourism emerged as a new strategy for protecting bio-diversity in the 1990s. Eco-tourism has been advocated for by environmentalists all over the world as a means of protecting natural areas and empowering local populations (Stronza, 2007). Since the 1990s, eco-tourism has been actively promoted as a conservation technique in many countries and regions that are both rich in bio-diversity and poor economically (He et al., 2008). The world as a whole need to work together to solve the growing environmental disasters and the increasing demand for ecological preservation. Environmental issues such as noise, air quality, water pollution, bio-diversity loss, wetland drainage, coral reef destruction, etc. have all increased alongside the tourism industry's sudden rise. The natural world suffers as a result of all these issues.

Six Cities in the southern Rajasthan have potential to become the main eco-tourism spots. It can be helpful to protect endemic birds and other wild fauna as well. In terms of diversity and population there is a vast range of birds permanently habituated or temporarily migrated in southern Rajasthan. Conservation of bio-diversity, cultural diversity, opportunities for income generation and gainful employment, sustainable use of natural resources, and the development and upkeep of harmonious relationships between humans and their natural surroundings are also emphasised as central goals of eco-tourism.

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## STATUS OF VULTURES IN VARIOUS LANDSCAPES OF SOUTHERN RAJASTHAN

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Out of ten species of vultures found in India (*based on taxonomy*), seven vulture species were recorded in different parts of Rajasthan. Of these, the four species, Long-billed vulture (*Gyps indicus*), White-rumped vulture (*Gyps bengalensis*), Red-headed vulture (*Sarcogyps calvus*), Egyptian vulture (*Neophron percnopterus*), observed as resident which breed in the study area. Whereas griffon (*Gyps himalayensis*), Eurasian griffon (*Gyps fulvus*) and Cinereous vulture (*Aegypius monachus*) were recorded as winter visitors and seen from October to March (some time up to the middle of April) in different parts of southern Rajasthan. The size and sighting status of all the recorded vultures species in the study area is given in table 1. Generally most of the vulture populations of different species were observed in the areas with good livestock and wildlife population, permanent water bodies and also observed near Municipal Carcass Dumping Grounds of villages, town and cities. The vulture breeding populations were observed in an area with safe nesting and roosting trees and cliffs, especially in and around the protected areas like national parks and wildlife sanctuaries, temples, sacred groves, archeological monuments, forts and old buildings.

Table 1: Observed vulture species and their status in the study area

S. No.	Common Name	Scientific name	Size	Sighting	Status
1.	Long-billed vulture	<i>Gyps indicus</i>	80-95 cm	Common	Resident, breeding
2.	White-rumped vulture	<i>Gyps bengalensis</i>	75-85 cm	Rare	Resident, breeding
3.	Red-headed vulture	<i>Sarcogyps calvus</i>	80-85cm	Rare	Resident, breeding
4.	Egyptian vulture	<i>Neophron percnopterus</i>	60-70 cm	Very common	Resident, breeding
5.	Himalayan griffon	<i>Gyps himalayensis</i>	115-125 cm	Common	Migrant, non breeding
6.	Eurasian griffon	<i>Gyps fulvus</i>	95-105 cm	Very common	Migrant, non breeding
7.	Cinereous vulture	<i>Aegypius monachus</i>	100-110 cm	Rare in winters	Migrant, non breeding

A total of 1392 vulture of seven different species were observed in 5 districts in different parts of southern Rajasthan. District wise observation of vulture population along with the vulture species are given in Table 2.

Table 2 : District wise observed vulture population in different parts of Rajasthan

S. No.	District	Vulture Population	Species Observed*
1.	Banswada	164	LBV, WRV, RHV, EV
2.	Bheelwara	185	LBV, WRV, RHV, EV, HG, EG, CV
3.	Chittorgarh	277	LBV, WRV, RHV, EV, HG, EG, CV
4.	Dungarpur	178	RHV, EV
5.	Rajsamand	225	LBV, WRV, RHV, EV, EG
6.	Udaipur	263	LBV, WRV, RHV, EV, HG, EG, CV
	<b>Total</b>	<b>1392</b>	

\*LBV: Long-Billed Vulture, WRV: White-rumped Vulture, RHV: Red-headed Vulture, EV: Egyptian Vulture, HG: Himalayan Griffon, EG: Eurasian Griffon, CV: Cinereous Vulture



Six species of vultures sighted at Jodbeed Dumping Ground, Bikaner: Long-billed vulture, White-rumped vulture, Egyptian vulture, Himalayan griffon, Eurasian griffon and Cinereous vulture



Red-headed vulture observed in the study area

**Resident vultures:** Long-billed vultures were observed in all geographical regions of southern Rajasthan. LBV were observed while feeding on carcasses, nesting, flying, drinking, etc. Most of the Long-billed vultures breeding colonies were observed in the protected areas like Wildlife sanctuaries and protected forests. Similarly each Long-billed vultures population or breeding colonies are in the close proximity to one of the permanent water sources ("Nadi", Dam, River, & Lake). White-rumped vultures were observed performing different activities like feeding, drinking, breeding, roosting and flying. It is interesting to know that maximum observed White-rumped vultures population's are out of the protected areas and near human habitations, infect none of the breeding colonies during the present survey recorded in any of the Wildlife Sanctuary. Similarly most of the breeding colonies of the White-rumped vultures are located out of the protected area and near human habitation or agricultural lands with some in the community lands. Usually the Red-headed vultures were sighted either single or in pair in the southern Rajasthan. Most of the sightings were in the undisturbed areas, either in or around the protected area like wildlife sanctuary or in the village forests (sacred grove) like "orans" and "gauchars". Observed and recorded Red-headed vulture locations, numbers found, activities, etc. A most widely distributed and highly adaptable vulture species is found in all geographical regions of the southern Rajasthan. Egyptian vultures were observed in all the districts of study area including protected and unprotected areas. Usually they are seen in the small groups or pairs, but at large dead animal dumping grounds they are recorded in hundreds.

**Migratory vultures:** The migratory vulture population was representing about 20% of the total vulture population observed in the southern Rajasthan. The numbers of the two resident vultures, the Long-billed vulture and White-rumped vultures, but interestingly the migratory Himalayan Griffon, Eurasian Griffon and Cinereous Vultures populations are increasing at many large carcass dumping grounds. These migratory vultures are coming from

northern India, the Himalayas, Afghanistan, Tibet, China and Mongolia. Their numbers gradually increase from October and reach its peak during January and February including juveniles, subadults and adults.

Traditionally very little attention has been paid to the identification, importance and conservation status of vultures (Birdlife International 2001). Some studies suggest there has been a 95-97 percent fall in vultures in the past decade. This estimate was made after analyzing road surveys for vulture in 1990-93 and in 2000. But do I have a detailed ecological analysis to find out why 3-5 percent vultures survived? (Chhangani, 2007b). No systematic study on the population, ecology and nesting habits have been carried out on vultures in India except Gir (Grub, 1974), Jodhpur and present one (Chhangani, 2002 & 2004; Chhangani *et al.* 2002; Chhangani and Mohnot, 2004; Chhangani, 2005) and a pilot study in Assam (personal communication, A. Choudhary, 2005). This is perhaps the most systematic vulture population and breeding colony survey carried out in the last 3 years from July 2004 to July 2007 covering wide and different geographical areas of Rajasthan, India. Since the early 1990's the 98% population decline in white-backed, long-billed and slender-billed vultures reported in some parts of India (Prakash, 1999; Prakash *et al.*, 2003). It would appear that these quoted estimates based on the survey reports by Samant *et al.* 1995 which states for the white-backed vulture that "No specific data on this species was collected as it was not possible to count" which is in reference to Prakash *et al.* 2003 have no empirical basis (Risebrough, 2006). A total of 52 breeding colonies of resident vulture species with 244 nests of long-billed vultures, 43 nests of white-backed vultures, eight nests of red-headed vultures and 25 nests of Egyptian vultures were found in Rajasthan (Chhangani 2007a). The resident vulture population is distributed in whole of the study area whereas the migratory vulture populations were observed at major feeding sites (carcass dumping ground) in Rajasthan.

Egyptian vultures are widely distributed in Asia, Europe and Africa (del Hoyo, *et al.*). But some concern have been raised about population trends (Liberatori and Penteriani, 2001 and Donazar, *et al.*, 2002). Whereas repeated surveys in and near protected areas widely spread across India show that population of Egyptian vulture and Red-headed vulture have also decline markedly and rapidly (Cuthbert *et al.*, 2006) needs more systematic field study and data then unwanted statistics analysis and modeling. But in my present study and in earlier study the Egyptian vulture population in many parts of Rajasthan increased (Chhangani 2004, 2005, 2007 a, b, c) whereas Red-headed vulture shows rather static population. Because red-headed vulture was in limited numbers and most vulnerable in India (Walker, 1992) because of its specific habitat, feeding on fresh carcasses, which are available in the area with good population of predators (like tiger, leopard and wolf). Since the number of these large predators are also in decline (Chhangani, 2007a). So it is quite likely that red-headed vulture population is might be declining. Therefore a regular monitoring and study needed to understand the population trend of these threatened vulture species. There is an urgent need to include Red-headed vulture in Wildlife Act 1972 under schedule 1st and in the IUCN Red List for the better conservation and management. Our research has shown that in the last decade, habitat loss due to massive mining, quarrying, blasting and logging have affected vultures in Rajasthan and Gujarat (Chhangani, 2007b). Nesting and roosting sites of vultures have also declined. Other reasons include scarcity of food and water, predation by wild dogs and accidents. Changes in agriculture, livestock rearing land use practices have also affected vultures' breeding ecology. It is equally important to study the genetic diversity of all Gyps vulture in India to ascertain if there has been a loss of genetic diversity, leading to a decline in vulture population.

Captive breeding should not be the only way to conserve all the vultures with the little effort and low cost by involving local community and forest officials. My team has saved more than 80 long-billed and white-romped vultures in the last five years in Rajasthan and Gujarat. I am quite certain that a country wide rescue programme can save lives of many threatened vultures every year.

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## A COMMUNAL ROOSTING SITE OF HOUSE SPARROWS (*Passer domesticus*) IN UDAIPUR CITY

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During period of Covid-19 in 2019 pandemic, human activities were very limited. During this period, birds roosting, feeding and breeding inside human habitats were more disturbance free. During this period, I saw an interesting roosting behaviour of House Sparrow (*Passer domesticus*) and Indian Silverbill (*Euodice malabarica*) in a babool (*Acacia nilotica*) grove in Paneriyon-ki-madri area of Udaipur city where 3000-4000 birds roost regularly.



Two types of branching pattern seen in the babool trees there. Many trees were with more dense branching with 'compact' crown having a spindle-shaped outline while others having more diffused, less 'compact' crowned. Dense crowns are seen in younger trees while 'loose' crowns are seen in relatively mature trees. The inter-branch distance was less in 'compact-crowned' trees while it was more in 'loose-crowned' trees.

During roosting time, it was noticed that Indian Silverbill and House Sparrows used to prefer 'compact-crowned' trees situated in central location. The Indian Silverbill used to occupy more

central position while House Sparrows opt relatively peripheral location. At the time of attack of Shikra (*Accipiter badius*), it was not easy for the predator to reach upto House Sparrows or Indian Silverbills easily as dense twiggy condition was providing extra protection to the roosters. When Shikra tried to reach close by, roosting birds used to penetrate more deeper in the same tree or towards near by trees. More twiggy condition proved more safe to the roosting birds. Sometimes a Black Drongo pair (*Dicrurus macrocercus*) pair and Oriental Magpie Robin (*Copsychus saularis*) were seen mobbing the Shikra continuously. Roosts of many birds are seen in Udaipur city. A big roost of Rose-ringed parakeet (*Psittacula krameri*) is situated in and around M B Hospital. Many birds roost in Gulab Bagh and on riverine strips along the banks of Ayad River. A survey should be conducted to identify the big roosts and planning should be done to protect them effectively.





## IS RAJSAMAND LAKE A POTENTIAL IBA SITE?

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India has 467 Important Bird Areas (IBAs) (Rahmani *et al.*, 2016) marked under the Global Program of BirdLife International to identify the priority sites for conservation of avifauna. In the first phase of the IBA Program, Twenty-four sites were identified in Rajasthan as IBAs (Islam & Rahmani, 2004) whereas seven sites were added in the second phase with the total thirty-one IBAs (Rahmani *et al.*, 2016). There are many sites in the State which have the international importance and need to be protected under the IBA Program. Among such sites, 'Lake Rajsamand' has its unique importance due to its multi-fold values.

Owing to the location and the historical importance, Rajsamand, also known as Rajsamudra, has a great potential to be identified as a heritage site for conservation of birds. Due to lack of advocacy for the site, it remained unnoticed. The present investigation highlights the importance of the avifaunal composition of the site and advocates for conserving this heritage site.

**Historical Value:** The erstwhile rulers of the Mewar were the great visionaries in terms of the natural resource conservation and management especially when it was concerned with the Green or Blue Spaces. Every fort and the associated habitation had the great connection with the surrounding forests and the water harvesting structures in the Aravallis. This might be due to the geography and the topographical features such as hilly terrains serving as barrier against water sources, vast stretches of forests, seasonal streams, natural depressions, and open pains for agriculture practices (Bhadani, 2012) offering much largesse to the erstwhile rulers. Due to such diverse resources, the rulers also wisely utilized the resources for the development of the well-knit water harvesting structures which not only served the purpose of the humans but also provided aquatic habitats for the other forms of life. It was over a decadal work from 1662 to 1676 when the then Ruler of Mewar, Maharana Raj Singh initiated the excavation and construction of the 'Rajsamudra' which later on known as Raj Samand (Bhadani, 2012). It was fed by the three rivers, viz. Gomti, Tal and Kelwa along with the seasonal streamlets. The bow-shape damming of these flows is one of the longest dams in Mewar with a length of near about five kms. With a capacity of 22 MCFt, it lies amidst Aravallis giving the glimpses of sea within the rocky terrain (Jugnu, 2018).

**Location:** It is located in the Rajsamand District of Rajasthan at 25°04'28.44" N and 73°53'09.89" E, the north of Udaipur at a distance of about 60 kms in the vicinity of Kankroli with an elevation ranging from 500 to 600 msl.

**Avifaunal Composition:** Along with the aquatic habitats in the form of the satellite wetlands, agriculture fields and surrounding terrestrial habitats, a great variety of the avifaunal diversity harbours in the area. The adjoining habitats covered in this investigation include aerial distance of 50 km from the central axis of the main wetland site. The first avifaunal checklist was given by Hume (1878) for the Rajsamand considered as Kunkrowlee Lake. More than fifty bird species were reported in this short study. The most important feature was the congregation of the flamingos followed by the ducks and geese. Other important aspects were presence of the globally important species such as Indian Skimmer, River Tern, Darter, etc. With a gap of over hundred years, the lake was hardly ever studied. In first decade of 21st century, Mehra (2012) studied the avifaunal diversity of the area for five years (2006 - 2010). Total 213 bird species are reported from the area which included 94 wetland or wetland dependent species (Mehra, 2012, Mehra et al. 2011). Further, Mehra et al. (2012) explored the wetland birds of Rajsamand Lake. With

the involvement of the common mass the frequency of the reporting increased. Now-a-days, local mass visualizes everyday and maintain the record. Thus, the present observations as per the local groups of birders, the latest reporting is near about 300 species, one-third of which are aquatic species (Team Raj-Parindey - Pankaj Sharma 'Sufi', Himanshu Singh, Narendra Paliwal, per comm. 2021).

The noticeable species of the site are the congregation of flamingos in thousands along with waterfowls. The number of individuals in the flock of Sarus Crane varies from few tens to over hundreds which is the largest congregation at particular site in Southern Rajasthan. Besides, permanent presence of Vulnerable species River Tern and the Near-threatened heronry species make the global significance of the site. The adjoining areas with habitat diversity also harbour globally important species of terrestrial habitats.

Criteria of IBA which fits for Rajsamand and its adjoining habitats: A large congregation of the aquatic bird species especially those which are enlisted in the IUCN Red Data makes it an important site for priority conservation. The adjoining habitats considered under investigation include the satellite wetlands, woody forests, agriculture fields, etc. The adjoining habitats harbour the vulnerable Green Avadavat *Amandava formosa* (Sugarcane and other agriculture fields in close proximity to Kumbhalgarh WLS) which are not included in the main list. Thus, the site is covered under A1, A3, A4 criteria.

**Globally Threatened Species at Rajsamand Lake & its adjoining habitats**  
(Shankar et al. 2021, IUCN Red Data List 2021)

Sr. No.	Species	Scientific Name	IUCN Status	Habitat & Abundance* (R, C,N)
1	White-rumped Vulture	<i>Gyps bengalensis</i>	CR	Surrounding hills, R
2	Long-billed Vulture or Indian Vulture	<i>Gyps indicus</i>	CR	Surrounding hills, R
3	Red-headed Vulture	<i>Sarcogyps calvus</i>	CR	Surrounding hills, R
4	Egyptian Vulture	<i>Neophron percnopterus</i>	EN	Surrounding hills, C
5	Steppe Eagle	<i>Aquila nipalensis</i>	EN	Adjoining habitats, C
6	Black-bellied Tern	<i>Sterna acuticauda</i>	EN	Main wetland, C
7	Pallas's Fish-eagle	<i>Haliaeetus leucoryphus</i>	EN	Adjoining habitats, R
8	Indian Skimmer	<i>Rynchops albicollis</i>	EN	Main wetland (Hume 1878), R
9	Common Pochard	<i>Aythya ferina</i>	VU	Main wetland, C
10	Lesser White-fronted Goose	<i>Anser erythropus</i>	VU	Main wetland, R (R Tehsin, <i>inlitt.</i> )
11	Sarus Crane	<i>Antigone antigone</i>	VU	Main wetland, A
12	River Tern	<i>Sterna aurantia</i>	VU	Main wetland, A
13	Tawny Eagle	<i>Aquila rapax</i>	VU	Adjoining habitats, C
14	Eastern Imperial Eagle	<i>Aquila heliaca</i>	VU	Adjoining habitats, R
15	White-naped Tit	<i>Parus nuchalis</i>	VU	Adjoining habitats, C
16	Ferruginous Duck	<i>Aythya nyroca</i>	NT	Main wetland, A
17	Lesser Flamingo	<i>Phoeniconaias minor</i>	NT	Main wetland, C
18	Painted Stork	<i>Mycteria leucocephala</i>	NT	Main wetland, C
19	Woolly-necked Stork	<i>Ciconia episcopus</i>	NT	Main wetland, C
20	Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>	NT	Main wetland, C

21	Black-headed Ibis	<i>Threskiornis melanocephalus</i>	NT	Main wetland, A
22	Dalmatian Pelican	<i>Pelecanus crispus</i>	NT	Main wetland, C
23	Oriental Darter	<i>Anhinga melanogaster</i>	NT	Main wetland, A
24	Great Thick-knee	<i>Esacus recurvirostris</i>	NT	Adjoining habitats, C
25	Eurasian Curlew	<i>Numenius arquata</i>	NT	Main wetland, R
26	Bar-tailed Godwit	<i>Limosa lapponica</i>	NT	Main wetland, C
27	Black-tailed Godwit	<i>Limosa limosa</i>	NT	Main wetland, C
28	Pallid Harrier	<i>Circus macrourus</i>	NT	Main wetland, R

\***Abundance** means **Rare (R)**: Sighting  $\leq 5$  times in a year, **Common (C)**: Sighting  $> 5$  times in a year or in a migratory season, **Abundant (A)**: Regular sighting at any time of a year

### Threats and Conservation Issues

The reservoir area is being prepared for the water sports activities. Paragliding project will affect the flying guests as well as residential waterfowls especially cranes, storks, pelicans, etc. The clearing of the nesting trees available for the local breeding aquatic birds as well as flattening of the mid-islands providing nesting ground for species like terns are important issues need immediate attention. Plantation of the exotic species or such species which are not the preferred plant for nesting will affect the heronry. Further, the mining waste water get mixed with the main reservoir water affecting the natural characteristics of water quality.

### Acknowledgments

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## MY SINGLE DAY EXPERIENCE DURING A BIRD RACE IN SITAMATA WILDLIFE SANCTUARY

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Sitamata Wildlife Sanctuary is situated in southern part of Rajasthan state. This is a teak dominated landscape with rich floral and faunal diversity. Avian life is also rich in this sanctuary.

To have an idea about the landscape and its varied avian fauna, I visited Sitamata Sanctuary on June 26, 2022 with my father. Our trip was just before the onset of monsoon rain. Finely season has been started hence greenery was good. During whole day, I spotted 115 species. The list of species seen during my single day 'Bird Race' as following :

Little grebe, Little cormorant, Indian darter (Snake bird), Gray heron, Pond heron, Cattle egret, Little egret, Painted stork, White-necked stork, Lesser whistling thrush, Cotton teal, Indian spot-billed duck, Knob-billed duck, Shikra, King vulture, White-backed vulture, Tawny eagle, Egyptian vulture, Painted partridge, Rain quail, Jungle bush quail, Indian peafowl, Sarus crane, White-breasted waterhen, Common moorhen, Grey-headed swamphen, Common coot, Pheasant-tailed jacana, Red-wattled lapwing, Black-winged stilt, Indian thickknee, Indian courser, Common sandgrouse, River tern, Green pigeon, Red-collared dove, Blue rock pigeon, Eurasian collared dove, Laughing dove, Spotted dove, Alexandrine parakeet, Rose-ringed parakeet, Plume-headed parakeet, Common hawk cuckoo, Jacobin cuckoo, Koel, Greater coucal, Spotted owl, Collared scops owl, Savanna nightjar, House swift, Palm swift, Pied kingfisher, Common kingfisher, White-breasted kingfisher, Asian green bee-eater, Jungle owl, Stork-billed kingfisher, Indian roller, Hoopoe Gray hornbill, Coppersmith barbet, Brown-headed barbet, Golden backed woodpecker, Yellow-crowned woodpecker, Indian pitta, Indian bush lark, Ashy-crowned sparrow lark, Rufous-tailed lark, Crested lark, Dusky crag martin, Wire tailed swallow, Red-rumped swallow, Gray shrike, Bay-backed shrike, Long-tailed shrike, Golden oriole, Black-hooded oriole, Black drongo, White-bellied drongo, Brahminy myna, Common myna, Bank myna, Rosy starling, Indian treepie, House crow, Jungle crow, Black-headed cuckoo shrike, Scarlet minivet Common iora, Red-vented bulbul, Common babbler, Yellow-eyed babbler, Large gray babbler, White browed fantail flycatcher Indian Paradise Flycatcher, Grey-breasted prinia, Common tailorbird, Indian robin, Crested bunting, Magpie robin, Brown rock chat, Large cuckoo shrike, Wood shrike, Grey tit, Yellow-cheeked tit, Purple sunbird, White eye, House sparrow, Baya weaver, Red munia, Indian silver bill, Scaly-breasted munia, Orange-headed thrush & Black-necked monarch.



Indian pitta



Orange-headed thrush

## WHY THERE IS A GRADUAL DECLINE OF DISTRICT WISE BIRD FESTIVALS IN RAJASTHAN?

**Anil Rodgers**

Wildlife Conservationist and member Wildlife Crime Control Bureau  
State Co-ordinator Rajasthan for Stripes and Green Earth Foundation Society

Bird Festivals are tool for awareness about our avian friends. Our present and our upcoming generations learn a lot through bird festivals about birds, their names, habitat, and behavior. They also learn that birds are one of the best indicators of ecological balance. If a bird's habitat is disturbed or polluted, It will leave the place, or might die. No one has forgotten the Sambhar Lake tragedy in which thousands of birds died. Birds are slowly and gradually losing their habitats whether it be anthropogenic pressure, pollution in water bodies, encroachment in water bodies, destruction of forests, chopping down of trees and so on. As we talk locally about State, similar is the declining numbers of bird festivals in Rajasthan. It all started through private bird festival organized in Jaipur then in year 2013 Dungarpur officially organised it with local administration and the Forest Department kudos to the efforts of erstwhile District Collector of Dungarpur that it paved the way of official organization of the events like bird festivals. After this event, Udaipur and other districts initiated this event in their areas. And to name a few districts that officially organized bird festivals in Rajasthan after Dungarpur are Udaipur, Bhilwara, Jhalawar, Kota, Bharatpur, Ajmer, Dausa, Banswara, Bundi etc. As we all know there was a break in the event during corona pandemic, but after that very few districts came forward to continue the process of organizing bird festivals and to create awareness in the general mass about the avian bio-diversity.

Udaipur is one district, that is continuing the process since 2014. Bird festivals also gave recognition to some of the lesser-known water bodies which were earlier not on the tourism map for bird watching like Menar and Kishan Kareri, Piladar and Vallabh Nagar lake in Udaipur; waterbodies like Chawandiya and Gurlan in Bhilwara; Rajyawas in Rajsamand; Nolaw, Khandia, Mundaliya Kheri and Alnia in Kota and Getolav in Dausa. As a result, some of them became IBA sites and some are in the process of getting wetland status. Sambhar Lake of Jaipur, Ajmer and Nagaur Districts and Keoladev National Park, Bhartapur are the Ramsar Sites of Rajasthan. Some well-known lakes and dams are already birding destinations. Meanwhile coming to the point that I'll like to let you know that many districts after 1 or 2 Bird Festivals didn't continue the process, may be due to budget or some other reasons. It is very unfortunate that many districts dropped the process of organizing Bird Festivals, and then a question comes to the mind that "why not Govt. organize bird festivals in at least 15 districts out of 33 and slowly and gradually increase the district numbers. Regular budget must be allocated to District Administration, Forest Department and Tourism Department for organizing the bird festivals. Till now there is no official celebration of state level bird festival started in Rajasthan meanwhile states like Uttar Pradesh and for others states are organizing state level bird festivals officially.

Awareness is the key for Conservation of Nature and Wildlife. We must continue the process of organizing such events for the betterment of our future generation. This will help to conserve the many biotic resources also.

## “CHASING” BIRDS-OF-PREY IN AND AROUND UDAIPUR

Devendra Shrimali

My restaurant business keeps me grounded for most of my time in four walls of my hotel in Udaipur. Nevertheless, my passion and interest in bird watching for over last eight years, endures me to visit a small number of wild areas around Udaipur in most of my leisure time.

During my numerous trips, I have recorded nearly three hundred bird species across Udaipur district. But I have been obsessed with raptors in most of my birding journeys. This group of birds always kept me alive and kicking and I am fortunate to capture several of them in their natural habitation. The diurnal raptors have also led me to look for their nocturnal counterparts in recent years.

My first encounter with a raptor was a Spotted Owlet *Athene brama*, a common bird in urban and sub-urban areas. For me, the most difficult bird-of-prey to shoot was a Peregrine Falcon *Falco peregrinus*, which is a winter visitor in our area. There are many more migratory raptors species along with some resident ones photographed by me, which I would love to share in this bird fair souvenir.

### OWLS

**Spotted Owlet:** The most encountered owl species in India, in almost all kinds of open habitats. It can be identified by its white spots and yellow eyes. Starting from the common ones, this was my first species of prey to photograph. My memories shooting this first raptor species are still so afresh. I encountered this bird in early morning roosting in open thorny bushes.

**Indian Eagle-owl:** Seeing this owl species was like "love at first sight" when I first recorded it near a wetland. What inspired me the most was the camouflaging pattern of the great horned owls in palm trees. I observed them panting throughout the summers. Despite our many visits with fellow birders we could not trace the nesting location of horned owls around Udaipur. We would love to document them without any detrimental activity to their nesting. They also give a lot of funny expressions once they get used to our presence. Best time to look for this owl is often perches on rock pinnacles well before sunset or after sunrise.

Indian eagle owl



### VULTURES

**Indian Vulture:** Vultures have been declining all over the globe. With repeated attempts, I was lucky to photograph an Indian Vulture. A light brown medium-sized vulture. It has whitish feathers on a dark head and neck, a pale bill, and a pale collar which is more prominent behind the neck. Like many other vulture species, I observed them near human-occupied spaces in cities, towns and agricultural areas.

Long billed vulture



### EAGLES

**Steppe Eagle**

Sharing this picture is something I had always dreamed of. I saw this eagle perched on a dead tree. On one cold morning waiting for the air to heat up before it took flight, I managed to get close. I feel the noise of my camera shutter got its attention as it looked at me curiously for a while, before getting back to scanning the area on its wing. The magnificent steppe eagle has always been a delight to watch at the dumping station of Udaipur.

Short Toed Snake Eagle - In frame: Short-toed Snake Eagle in flight. They are beautiful great pale eagle species easy to see in the provincial blue sky. They feed mainly on snakes, so the arid and open environments are ideal for this great raptor.

Completely unaware of the surroundings, this 'guy' decided to swoop down out of nowhere in the grass. At first, I had no clue what it was upto, but the doubt got cleared as soon as it took a flight. I witnessed trying to prey upon Red Sand Boa. It took no time for the snake to escape, on seeing the eagle and got inside its pits. I have seen snakes such as rat snake and cobra beaming the main food for this species, although for protection from snake bite they have antler like shields on their legs. The legs and toes are covered with thick scales are particularly to protect them from such bites.



Crested Serpent Eagle The 'serpenticall' calls of this raptor have always enchanted me. A fascinating bird of prey, they are stealth attacker and mainly feed on snakes. Twice, I have witnessed it feeding on a snake. A rather large, heavily built eagle with a dark, white-tipped bushy crest that gives it a distinctive large-headed look. Feeds mainly on reptiles especially snakes, small mammals, crabs, eels, frogs and birds.

## **BUZZARDS**

### **Oriental Honey Buzzard**

I experienced the bathing sequence of Honey Buzzard near Vallab Nagar for almost 15 min. The combination of an unusually small and slender head, long striped tail, broad wings, and well-striped underwings make this species fairly recognizable across a wide area. True to its name, this species is a raider of wasp and bee nests, although it prefers bee and wasp larvae over their honey. Found in dense forests, open wooded areas or mixed woodland and open areas

### **Long Legged Buzzard**

I have seen Long Legged Buzzard basking solitary on Babul trees in my birding trips. In one of my winter field trips, I was taking the flying shots of crow near a wetland when suddenly this white color raptor flew over my head, emerging from the Babul tree. Two crows were chasing it - don't know why since I couldn't locate any crow nest nearby. May be a territorial defense! They chased this raptor till it vanished away. I got my first lifer shot of this buzzard species.



## **KITES**

### **Black-winged Kite**

Despite being a seasoned birdwatcher for almost eight years now, capturing the Black winged Kite has always been a challenge for any photographer like me. Sharp focused images are always an additional charm for me. Located in grasslands, with scattered bushes and small trees - wherever their prey is abundant.

## **HAWKS AND FALCONS**

Kestrel: I am thrilled to see the slow motion of a hovering kestrel over its prey. I have seen "action of its attack on Sparrow Lark". They inhabit open, farmlands, grasslands, and often seen over grassy areas beside roads and at airports. Perches on wires and posts, and typically hunts by hovering, at times fairly high overhead.

## **OSPREY**

Osprey: These are spectacular fish eating birds-of-prey. For most seasoned birders of Udaipur, the Osprey has been

a subject of photography as well as research. The most photographed bird of Udaipur by almost every long-lensed man. It cruises over lakes, rivers, and coastal waterways in search of fish. Often seen plunging its feet into water to grab fish.

## HARRIERS

### Eurasian Marsh Harrier

I witnessed chasing Marsh Harrier on Common Coot. It is best seen in and around marshes and wetlands with extensive reed beds. Has a dark brown overall coloration with variable creamy cap, throat, and narrow leading edge to wing.

I would like to end my article by sharing with the readers what inspired me the most for chasing the raptor was a Shloka from Bhagavad Gita.

*Prahladas casmi daityanami kalah kalayatam aham mrganarin ca mrgendro hami vainateyas ca pakṣinam* which translates to "I am Prahlad amongst the demons, amongst all that controls I am time. Know me to be the Lion amongst animals, and Garuda amongst the birds"

Marsh harrier



Common kestrel



Short-toed snake eagle



Oriental honey-buzzard





## कुरजां ऐ ! म्हारो भँवर मिला दो ऐ...

डॉ. शशि शर्मा

असोसिएट प्रोफेसर, आहार एवं पोषण, राज. कन्या महाविद्यालय, चित्तौड़गढ़, राजस्थान

सुपणो जगाई आधी रात में,तने में बताऊँ मन की बात  
कुरजां ऐ म्हारो भँवर मिला दो ऐ .....

उपर्युक्त पंक्तियाँ राजस्थान के एक प्रसिद्ध लोकगीत की हैं जिसमें आजीविका हेतु धन कमाने के उद्देश्य से परदेश गए अपने पिया की याद में व्याकुल नायिका कुरजां को अपने मन की व्यथा बताती है। कुरजां को वह अपनी धर्म की बहन बताते हुए विनती करती है कि उसका सन्देश उसके पति तक पहुँचा दे जो समुद्र पार जाकर अपनी पत्नी को भूल गया है। सन्देश में वह पति को जल्दी घर लौट आने के लिए कहती है। इस प्रकार लोकगीत के माध्यम से अपने आतिथ्य सत्कार के लिए प्रसिद्ध 'धोरां री धरती' राजस्थान ने समुद्र पार से आने वाले प्रवासी पक्षी के साथ अपने सदियों पुराने सम्बन्ध को भली-भाँति उजागर किया है।

राजस्थान की मूलनिवासी होने के नाते बचपन से कुरजां का नाम सुनती आयी हूँ पर इन्हें देखने का मौका कभी नहीं मिला था। सन २०१६ में जब मेरी पक्षियों में रुचि बढ़ी और मैं फोटोग्राफी करने लगी तब एक दिन अखबार में पढ़ा कि राजस्थान के खींचन गांव (जिला जोधपुर) में प्रतिवर्ष हजारों की संख्या में डेमोसिल क्रेन्स (कुरजां पक्षी) अपने शीतकालीन प्रवास के लिए आते हैं। यह जानकार इन्हें देखने और कैमरे में कैद करने की मेरी लालक और बढ़ गयी। लेकिन कब? यह सवाल मुझे लगातार परेशान कर रहा था।

जनवरी 2018 में जब मेरे पति का स्थानांतरण पुलिस अधीक्षक, जोधपुर ग्रामीण के पद पर हुआ तो मानो मुँह मांगी मुराद पूरी हो गयी थी क्योंकि खींचन इसी क्षेत्र में आता है। अब मैं आश्चर्य थी कि जल्दी ही इस अनूठे पक्षी को देख पाऊँगी जो सुदूर एशियाई देशों (साइबेरिया, मंगोलिया आदि) से हजारों मील की दूरी तय करके हिमालय के ऊपर से उड़ता हुआ विषम रास्तों एवं परिस्थितियों से जूझता हुआ हमारे देश पहुंचता है। लेकिन अभी मेरा इंतजार समाप्त नहीं हुआ था क्योंकि मैं जब तक जोधपुर पहुंची इनके वापस लौटने का समय हो चला था और लगभग सभी क्रेन्स अपनी यात्रा आरम्भ कर चुकी थीं। अब मेरे पास अगली सर्दियों के आने तक इनका इंतजार करने के अलावा और कोई विकल्प न था।

नवम्बर माह (2018) में जैसे ही मुझे ज्ञात हुआ कि डेमोसिल क्रेन्स अच्छी संख्या में खींचन आ चुकी हैं, मैं तुरंत खींचन के लिए रवाना हो गयी। वहां पहुंचते-पहुंचते शाम ढल चुकी थी परन्तु मैं उनके सामूहिक कलरव को सुन पा रही थी। अगले दिन सुबह होने वाले इनके दीदार की कल्पना मुझे रोमांचित कर रही थी। इन्हीं सपनों में खोये-खोये मुझे नींद आ गयी। अगले दिन आँख भी इनके सामूहिक गान से खुली और मैं झटपट तैयार हो गाड़ी में बैठ गयी। यहाँ मुझे बताया गया कि हमें 'सेवाराम जी' के घर जाना है, वहीं क्रेन्स प्रतिदिन बड़ी संख्या में दाना चुगने आती हैं। निर्धारित स्थान के लिए जाते वक्त मैंने मार्ग में बहुत सारी क्रेन्स को जमीन पर से घास के दाने चुनते देखा। गाड़ी में बैठे बैठे ही मैंने कुछ तस्वीरें लीं, परन्तु मैं इनके बहुत करीब नहीं जा सकी क्योंकि ये बहुत चौकन्नी थीं और जरा पास जाते ही उड़कर या चलकर सुरक्षित दूरी बना लेतीं। खैर अब तक इनके सामूहिक चुगने का वक्त हो चला था और हम सेवाराम जी के घर के लिए रवाना हो गए। यहाँ गर्मजोशी से स्वागत के पश्चात् मुझे घर की छत पर ले जाया गया। अब सेवाराम जी ने पास के खाली पड़े चौक की ओर इशारा कर बताया कि चुग्गा यहाँ पर डाल दिया गया है और कुछ ही देर में कुरजां के झुण्ड के झुण्ड यहाँ चुग्गा लेने के लिए आने वाले हैं। करीब आधा



घंटा इंतज़ार के बाद क्रेन्स का एक समूह चौक के ऊपर मंडराता नज़र आया। सेवाराम जी ने मुझे फिर बताया कि समूह का सबसे उम्रदराज़ पक्षी जो इनका नेता होता है, पहले रेकी करता है। सुरक्षा के प्रति आश्वस्त होने के पश्चात् पहले वृद्ध पक्षी उसके बाद वयस्क और अंत में बच्चे दाना चुगने नीचे उतरते हैं। कुछ ही देर में अहाता पक्षियों से पूरा भर चूका था और वे तेजी से अपना पेट भरने में लगे थे। जरा सी आशंका होते ही पूरा झुण्ड एक साथ उड़ जाता और फिर से धीरे-धीरे नीचे उतर आता। लगभग डेढ़ से दो घंटे तक मैं इस दृश्य का आनंद उठाती रही। दाना खत्म करने के बाद इनका पानी पीने का समय था जिसके लिए ये यहाँ से पास के तालाब तक जाने वाली थीं। अतः हमने भी वहाँ जाने का निश्चय किया और निकल पड़े तालाब की ओर। वहाँ बड़ा ही खूबसूरत परिदृश्य देखने को मिला, तालाब के चारों ओर ढेर के ढेर क्रेन्स ने डेरा डाल रखा था। कुछ पानी पी कर प्यास बुझा रही थीं, कुछ पंख साफ़ करने में व्यस्त थीं तो कुछ खड़े-खड़े अलसा रही थीं। मैं छिपते-छिपाते जितना करीब जा सकती थी गयी और तस्वीरें लेने में व्यस्त हो गयी। अब तक दोपहर के 12.30 बज चुके थे, धूप तेज हो गयी थी और मुझे भी अब भूख -प्यास लगी थी अतः हम विश्राम स्थल लौट आए।

अब मैं आपको यह भी बता दूँ कि सेवाराम जी कौन हैं और उनका क्रेन्स से क्या रिश्ता है। दरअसल सेवाराम जी खींचन के निवासी हैं और लगभग 14 वर्ष की उम्र से कुरजां की देखभाल कर रहे हैं और यह कार्य करते हुए उन्हें 20 वर्ष से ऊपर हो चले हैं। उनके और गांव वालों के प्रयासों से प्रतिवर्ष आने वाली क्रेन्स की संख्या 2 -4 हजार से लगभग 30 हजार हो चली है। सेवाराम जी बीमार और घायल कुर्जाओं की देखभाल करते हैं। इनके निस्वार्थ पक्षीप्रेम और सेवा के कारण उन्हें देश - विदेश की कई जानी मानी संस्थाओं द्वारा वन्यजीव संरक्षण हेतु पुरस्कार भी दिए जा चुके हैं। उल्लेखनीय है कि उच्च न्यायालय ने प्रसंज्ञान लेकर इन पक्षियों के लिए करीब 1200 बीघा जमीन सुरक्षित कर दी है, यही नहीं गांव में बिजली के तार भी भूमिगत कर दिए गए हैं जिससे कोई पक्षी घायल ना हो सके। गांव का जैन समाज पक्षियों के लिए गुप्त दान द्वारा चुगने की व्यवस्था करता है। प्रतिवर्ष 35 से 40 लाख रुपये का दाना पक्षियों को डाल दिया जाता है। आज राजस्थान का यह छोटा सा गांव अपने पक्षी प्रेम और कुरजां के पसंदीदा प्रवासीय स्थल के रूप में विश्व में अपनी पहचान बना चुका है। अंत में यही कहूँगी ...

"कुरजां ऐ! आओ नी पधारो म्हारे देस... !!"





Image by Manoj Parashar



Baghdarrah Nature Park  
Image by Pankaj Singh



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