

**Need to underground High-tension
transmission line crossing through one of the
roosting sites of migratory bird Demoiselle
Crane, in khichan area of Phalodi, Rajasthan**



July 2023

© BNHS 2023: All rights reserved. This publication shall not be reproduced either in full or in part in any form, either in print or electronic or any other medium, without the prior written permission of the Bombay Natural History Society.

Bombay Natural History Society, Hornbill House, S.B. Singh Road, Mumbai – 400 001, Maharashtra, India. Tel.: (91–22) 2282 1811 Fax: (91–22) 2283 7615 Email: director@bnhs.org

Disclaimer

Please note that the maps displayed here are solely for illustrative purposes and do not reflect the views or opinions of the Bombay Natural History Society regarding boundary delimitation. It should be noted that these maps are not verified for accuracy and should be used as a reference only. Additionally, the list of birds provided follows the nomenclature standards established by BirdLife International. Please be aware that maps may differ depending on the region.

Maps The maps were created using ArcMap 10.6.1 software and Google Earth software by Sujit Narwade and Neelkanth Bora. They overlaid shapefiles of the village, roads, and district onto polygons of Khichan and associated areas of Phalodi and Bap tehsil.

Concept and design – Sujit Narwade

Citation

Narwade, S., N. Bora, P. Bishnoi and K. Rithe (2023): Need to underground High-tension transmission line crossing through one of the roosting sites of migratory bird Demoiselle Crane, in Khichan area of Phalodi, Rajasthan. 14 Pp.

**Need to underground High-tension transmission line
crossing through one of the roosting sites of migratory bird
Demoiselle Crane, in Khichan area of Phalodi, Rajasthan**

Guidance

Mr Kishor Rithe, Interim Director and Honorary Secretary, BNHS

The BNHS field team

Sujit Narwade, PhD., Assistant Director

Dr Neelkanth Bora, Programme Officer

Mr. Pankaj Bishnoi, Community Engagement Officer

Technical inputs

Dr Asad R Rahmani, a member of Governing Council and Former Director of BNHS

Local resource person

Sevaram Mali, Khichan village

July 2023

Bombay Natural History Society



Need to underground High-tension transmission line crossing through one of the roosting sites of migratory bird Demoiselle Crane, in Khichan area of Phalodi Rajasthan

Contents

Introduction – Khichan, an abode to the Migratory Kurjan.....	5
A Brief on Demoiselle Crane	5
Migratory Path/Route	5
The Historical Aspect	6
Threats to the migratory cranes.....	8
Malhar Rann – A roosting site of cranes facing threats from high-tension powerlines	10
Recommendations	13
References	13



Image 01 Cranes fly very low during landing and take-off at foraging and resting sites © Sujit Narwade.

Introduction – Khichan, an abode to the Migratory Kurjan

Every year, as the monsoon retreats from India, a remarkable natural event takes place. Avian winter visitors, originating from breeding grounds in Mongolia and northeastern China, flock to the Indian Subcontinent in large numbers. This phenomenon, known as winter migrations, sees these visitors follow dedicated routes or corridors in the Central Asian Flyway (CAF), which is one of eight global flyways of birds. Most of these birds avoid the towering Himalayas, choosing instead to travel through the Hindu Kush Ranges in the west and northeast Himalayan valleys in the east to reach the Indian Subcontinent. The Great Indian Desert or the Thar Desert are popular routes they take. One of the visitors is the red-eyed, tall, and delicately-built Demoiselle Crane *Grus virgo* - also known as the Kurjan. These birds winter in northwest India - from Rajasthan to Gujarat, western Madhya Pradesh, and Maharashtra - and in small numbers in other states. However, a small village called Khichan becomes the second home to thousands of Demoiselle Cranes for the whole winter, thanks to the kind villagers who feed them and provide protection.

A Brief on Demoiselle Crane

The Demoiselle crane is the smallest in Europe; the word demoiselle has a French origin, which means small and beautiful. It is called Karkarra in Hindi and, more profoundly, *Kurjan* in Marwari. The males measure around 453 to 508 mm with a weight of 2.3 to 2.4 kgs, whereas the females measure around 449 to 490 mm and around 1.9 to 2.7 kgs (Walkinshaw, 1973 Dementiev and Gladkov, 1968). The wintering birds in India weighed around 2.2 to 3.06 kgs (Ali and Ripley, 1969). An egg weighs 130 gm (Heinroth and Heinroth, 1926-28). Sexual dimorphism is absent in these birds.

Currently, the breeding range of these birds extends from the south of Ukraine and Crimea in Eurasia to Mongolia and northeast China. The breeding range can be divided into European, Central Asian, and East Asian. The European population includes the Azov-Black Sea, Middle Don, Caspian, and Volga-Ural regions (Belik *et al.*, 2011). The Central Asian Population spreads from South Ural, south of Central Siberia and the Altai region in Russia to the southeast of Kazakhstan and the foothills of Kyrgyzstan (Davygora and Gavlyuk 1991, Zavyalov *et al.*, 2003, Berezovikov and Kovashar 2006, Kulagin 2014). The East Asian population extends from Tyva and south of East Siberia in Russia to Mongolia and Northern China (Ryabtsev 1999, Goroshko 2012).

Migratory Path/Route

The Central Asian Population, along with the East Asian population, migrates to the wintering grounds in Rajasthan and Gujarat Provinces in the Indian Subcontinent (Kanai *et al.*, 2000, Guo and He 2017). They fly over the regions of Uzbekistan, Kyrgyzstan, Tibetan Plateau in China, Afghanistan, and Pakistan (Lanovenko *et al.* 2011, Toropova and Kulagin 2011, Ahmad and Shan 1991, Kanai *et al.* 2000). The largest gathering occurs in Kazakhstan from where birds take off for their wintering grounds (Bragin 2011). It has been observed from satellite telemetry that the population in east Kazakhstan takes two separate routes to enter the Indian Subcontinent, as one population directly flies over the Himalayas. In contrast, the other part takes a round across the Hindu Kush Mountains (Kanai *et al.* 2000). The East Asian Population comes to India through Nepal crossing the Himalayas. The major stop oversight for this population is near the Torey Lake in the Transbaikalia region in Russia, Buyant River Valley in Mongolia, and Brakol Lake in China (Goroshko 2012, Bukreev *et al.* 2011 and Kanai *et al.* 2000).

This population crosses the huge mountain ranges of Dhaykagiri-Annapurna in Nepal through the Kali Gandaki River valley (Martens 1981).

The early arrival of the cranes near the Kohat region in Northwest Pakistan in late August was regularly observed (Ali and Ripley, 1969). The first individual of the winter visitors was recorded on the 26th of August 2021 at 03:23 pm at Khichan, Rajasthan. A group of 16 birds was seen at 9:43 am on the 03rd of September 2021 at Khichan (per comm. Sevaram Mali).

The Historical Aspect

The story of a positive interaction between humans and wildlife in Khichan dates back 40 years. A young man Ratanlal Maloo (a recipient of the Salim Ali Nature Conservation Award in 2009 by BNHS), is returning from Orissa on a note from his uncle to look after his ailing mother. Mr. Maloo and his wife Sundarbai considered it their duty to feed the birds. Mr. Maloo saw how cranes increased from September to peak in December-January and moved in search of food. Ratanlal approached the Gram Panchayat (village council) to allot some land for the Kurjan, as the cranes are known locally. He raised funds from the high-income families of the village to get the allotted land, fenced it, and called it a feeding spot or *Chuggah Ghar*. Fencing was done with 6 feet of wire mesh channeling to protect the foraging birds.

The Khichan village is five kilometres east of the Phalodi city. Phalodi has become a separate district now). The village is situated 140 kilometres north of the district headquarters. Khichan gained popularity in the 19th century as most of its inhabitants were traders from the Jain Community. Recently the village of Khichan has been recognized by the Rajasthan Tourism Development Corporation (RTDC) as a tourist hot spot.



Image 1 A Flock of Kurjan landing in the Chuggah Ghar. © Neelkanth Bora

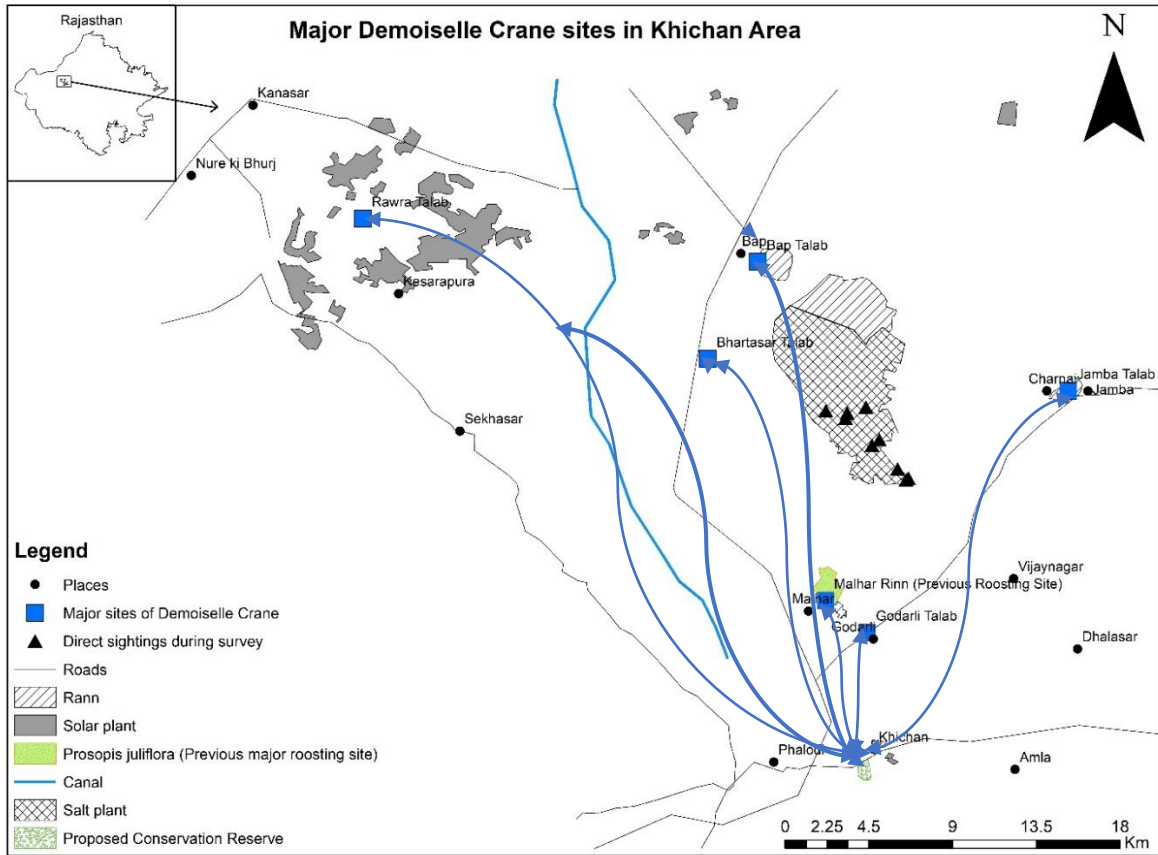


Figure 01 The area intensively used by the demoiselle cranes in Khichan and its surroundings. Arrows indicates probable flight routes of the cranes to roosting areas from Khichan and back



Image 03. Roosting habitat is becoming unsuitable for the cranes all over © Sujit Narwade



Image 2 Cranes use surrounding areas of Khichan such as Kanasar, Jambha, Rawara as foraging and roosting sites © Pankaj Bishnoi

Threats to the migratory cranes

Vijaysagar, the major water source for the birds to quench their thirst, attracts major congregations, which in turn attracts predators such as Free-Ranging Dogs. The powerlines passing close to the Talab region have also been responsible for obstructing the flight of the birds and causing mortality (Narwade 2021).

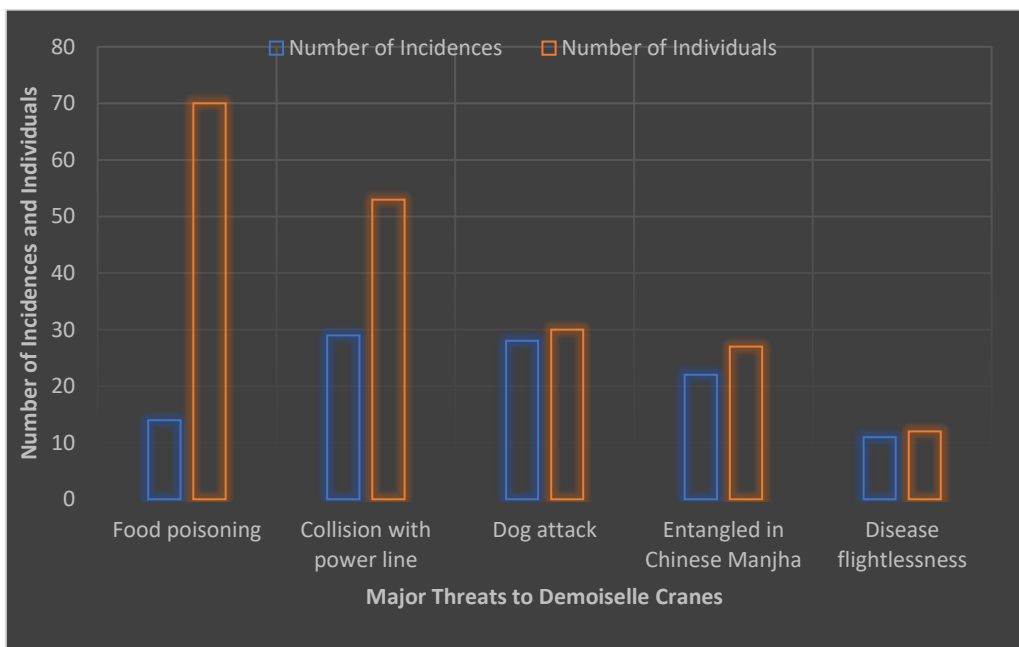


Figure 02 Cranes are getting injured or killed due to the primary five reasons

The bar graph shows (Fig. 2) that the second highest number of incidences of bird mortality is due to collision with the power lines, followed by attacks from free-ranging stray dogs. At the same time, the incidences of food poisoning due to pesticide poisoning have caused many mortalities (Source - records available with Mr Sevaram Mali, Khichan).



Image 04 - A free-ranging dog killed a demoiselle crane and carried a carcass at Khichan. © Sevaram Mali



Image 05 - On left carcass of demoiselle crane lying underneath a powerline © Sevaram Mali

Malhar Rann – A roosting site of cranes facing threats from high-tension powerlines

The area near Phalodi known as the salt tract is made up of two units - the Malhar and the Bap Rann - and is a Playa formation, characterized by flat, dried-up land that quickly evaporates water, particularly in desert basins. This region has a long history of being an important source of salt production in Rajasthan, along with other significant sites such as Sambhar Lake, Pachbhadra Lake, Degana, and Pokhran. Covering an area of approximately 52 square kilometers, the shallow waters and open habitat of the salt pans, locally referred to as Khatiya, are ecologically crucial, attracting many winter migratory Demoiselle Cranes. These salt pans serve as the yearly roosting grounds for thousands of birds. However, a recent survey conducted in the Rann by BNHS staff and Mr. Sevaram Mali revealed that a new powerline is currently being constructed in these roosting grounds of the cranes. Further investigation found that the powerline is being commissioned by PGCIL (Power Grid Corporation of India Ltd.), a Schedule 'A', 'Maharatna' Public Sector Enterprise of the Government of India, which was incorporated on October 23, 1989, under the Company Act, 1956. Presently, pylons are being erected on the ground, and both on-site visits and Google Earth imagery estimate a stretch of 24 kilometers of lines passing through the Rann.

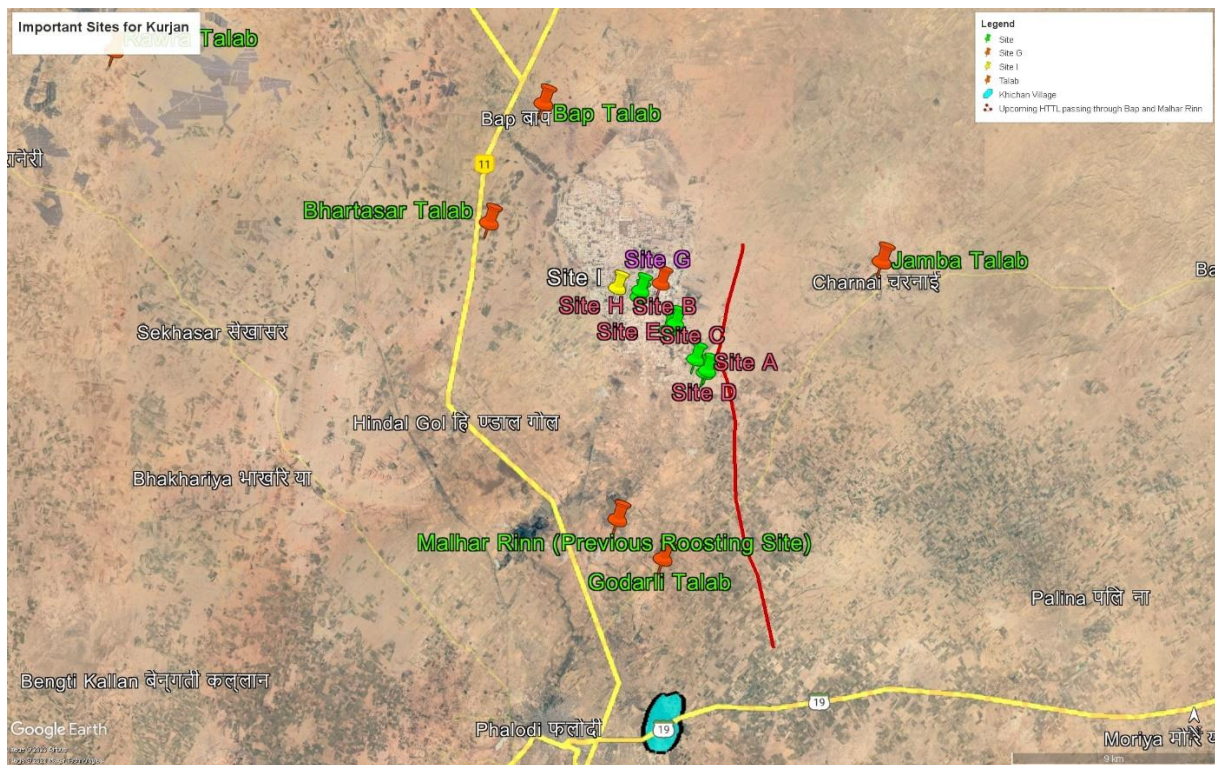


Figure 03 - Map showing the location of Khichan, which is mainly the feeding site and evening roost sites of the migratory Demoiselle Crane and proposed high-tension transmission lines



Image 06 – A carcass of demoiselle crane entangled in wires © Sevaram Mali



Image 07 – Landscape view showing huge flocks of cranes before landing and lines crossing through Malhar Rann (flocks have been highlighted in circles) © Neelkanth Bora

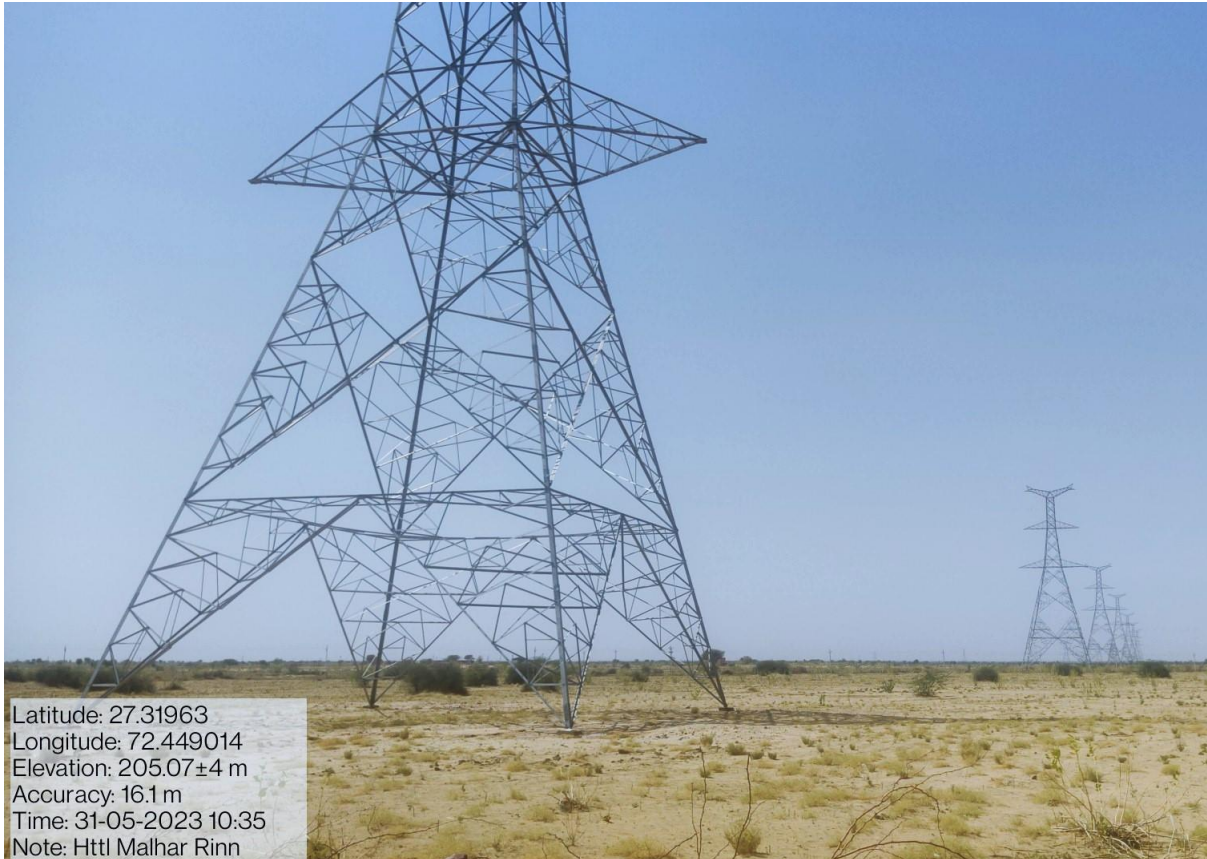


Image 08 The powerline will consist of 38 wires and have a capacity of 720 KV © Neelkanth Bora

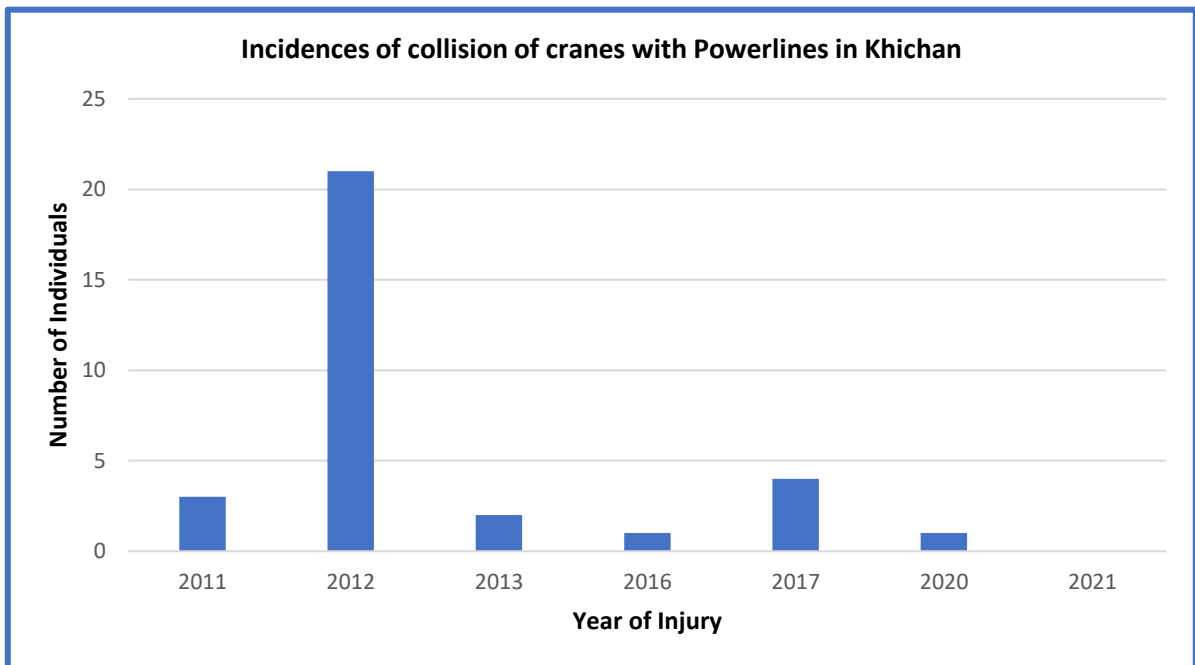


Figure 04 - The above data is arranged by year and displays the injuries incurred by demoiselle cranes as a result of powerline collisions (Source - Sevaram Mali, Khichan)

Recommendations

1. Undergrounding all powerlines going through foraging and roosting sites of the Demoiselle Crane
2. Prior to release, injured individuals who have recovered and can live a normal life should be tagged with satellite trackers. A research project focused on the movement ecology of Demoiselle Crane would provide valuable data on their migration paths and stopover locations, which would aid in the conservation of this species.
3. To prevent free-ranging dogs from disturbing the roosting and foraging areas of cranes, an intensive animal birth control program and elimination of a few, if required, should be implemented, along with regular garbage management and immigration control.
4. Experts should be consulted to create a long-term conservation action plan for the Demoiselle Crane conservation reserve in Khichan.
5. Regular surveys should be conducted to monitor the species distribution area.
6. To educate students about the importance of Demoiselle Crane and other wildlife in the ecosystem and the dangers they face, awareness programs should be held regularly in schools around the Malhar Rann region.

References

- Ahmad, A.S., & S.I. Shah (1991): The future of cranes in Pakistan with special reference to NWFP. In Proceedings of the 1987 International Crane Workshop, Quiqihar, Heilongjiang, China 1987. Baraboo, Wisconsin, USA: International Crane Foundation. p 335–339
- Ali, S., & S. D. Ripley (1969): Handbook of the birds of India and Pakistan. Vol. 2. Bombay: Oxford University Press.
- Belik, V.P., E.V. Guguyeva, V.V. Vetrov and Y.V. Milobog, (2011): The Demoiselle Crane in the northwestern Caspian lowland: distribution, number, and breeding success. In: Ilyashenko EI, Winter SV, editors. Cranes of Eurasia (biology, distribution, migrations, management), 4. Proceedings of the International conference “Cranes of Palearctic: biology, conservation, management (in memory of Academician P.S. Pallas),” Volgograd, Russia, 11–16 October 2011. *Moscow, Russia: Crane Working Group of Eurasia. p 157–174.* (In Russian with English abstract.)
- Bragin, E.A. (2011): Common and Demoiselle Cranes in Turgai Region (Kazakhstan) at the end of the 20th and the beginning of the 21st centuries. In: Ilyashenko EI, Winter SV, editors. Cranes of Eurasia (biology, distribution, migrations, management), 4. Proceedings of the International Conference “Cranes of Palearctic: biology, conservation, management (in memory of Academician P.S. Pallas)” in Volgograd, Russia, 11–16 October 2011. *Moscow, Russia: Crane Working Group of Eurasia. p 190–201.* (In Russian with English abstract.)
- Bukreev, S.A., B.M. Zvonov and S. Boldbataar (2011): Materials on the cranes of the Mongolia. In: Ilyashenko EI, Winter SV, editors. Cranes of Eurasia (biology, distribution, migrations, management), 4. Proceedings of the International Conference “Cranes of Palearctic: biology, conservation, management (in memory of Academician P.S. Pallas)” in Volgograd, Russia, 11–16 October 2011. *Moscow, Russia: Crane Working Group of Eurasia. p 202–211.* (In Russian with English abstract.)
- Davygora, A.V. and E.V. Gavlyuk (1991): The Demoiselle Crane in the south of Orenburg Region. In: Kovshar AF, Neufeldt IA, editors. *The Demoiselle Crane in the USSR.* Alma-Ata, Kazakhstan: Gylym. p 14–16. (In Russian.)

- Dementiev, G. P. and N. A. Gladkov (1968): Birds of the Soviet Union. Vol. 2 Translation published by NTIS, U.S. Dept. of Commerce, Springfield, Virginia. Originally published in Russian, 1951.
- Goroshko, O.A. (2012): The Demoiselle Crane. In: Vishnyakov EV, Tarabarko AN, Kirilyuk VE *et al.*, editors. Red Data Book of Transbaikalia Region. Animals. Novosibirsk, Russia: Novosibirsk Publishing House. p 124–125. (In Russian).
- Guo, Y., and F. He (2017): Preliminary results of satellite tracking on Ordos Demoiselle Cranes. *Chinese Journal of Wildlife* 38(1):141–143. (In Chinese and English).
- Heinroth, O. and M. Heinroth (1926-1928): *Die Vogel Mittel europas*. 4 vols. Berlin-Lichterfeld: H. Bermühler. 1958. The birds. Ann Arbor: University of Michigan Press.
- Kanai, Y., J. Minton, M. Nagendran, M. Ueta, B. Auyrsana, O. Goroshko, A. Kovshar, N. Mita, R. N. Suwal, K. Uzawa, V. Krever and H. Higuchi (2000): Migration of Demoiselle Cranes in Asia based on satellite tracking and fieldwork. *Global Environmental Research* 4:143–153.
- Kulagin, S.V. (2014): Conservation of crane habitats in Important Bird Areas of Kyrgyzstan. *Newsletter of Crane Working Group of Eurasia* 13:148–150. (In Russian and English.)
- Lanovenko, E.N., E.A. Filatova, A.K. Filatov and E. Shernazarov (2011): About crane migration through south Uzbekistan in the beginning of 21st Century. In: Ilyashenko EI, Winter SV, editors. *Cranes of Eurasia (biology, distribution, migrations, management)*, 4. Proceedings of the International Conference “Cranes of Palearctic: biology, conservation, management (in memory of Academician P.S. Pallas),” Volgograd, Russia, 11–16 October 2011. Moscow, Russia: *Crane Working Group of Eurasia*. Moscow: p 344–351. (In Russian with English abstract.)
- Martens, J. (1981): Zur Kenntnis des Vogelzuges im nepalischen Himalaya. *Die Vogelwarte* 26:113–128
- Narwade, S., N. Bora, U. Mitra, A. Mohan, Kamlesh Kumar, M. Khan, S. Ramesh and P. Sathiyaselvam (2021): Implementing the Central Asian Flyway National Action Plan with special focus on preparing a site-specific activity plan and developing a bird sensitivity map. Landscape Thar Desert, Jaisalmer. Site – 1) DNP; 2) Pokhran; 3) Deg Rai Mata Oran; 4) Western part of Thar Desert; 5) Khichan, Jodhpur. Published by the BNHS, Mumbai. 153 Pp.
- Ryabtsev, V.V. (1999): The Demoiselle Crane *Anthropoides virgo* in the forest-steppe of Baikal Region. *Russian Ornithological Journal (express issue)* 85:30. (In Russian).
- Toropova, V.I. and S.V. Kulagin (2011): Crane migration in Kyrgyzstan. In: Ilyashenko EI, Winter SV, editors. *Cranes of Eurasia (biology, distribution, migrations, management)*, 4. Proceedings of the International Conference “Cranes of Palearctic: biology, conservation, management (in memory of Academician P.S. Pallas),” Volgograd, Russia, 11–16 October 2011. Moscow, Russia: Crane Working Group of Eurasia. p 384–387.
- Walkinshaw, L. H. (1949): The sandhill cranes. *Cranbrook Institute of Science Bulletin* 29: 1–22. 1973 *Cranes of the world*. New York: Winchester Press. (Supplement of range maps and egg records privately published as *The Cranes*, vol. 1, no. 1, 1973.)