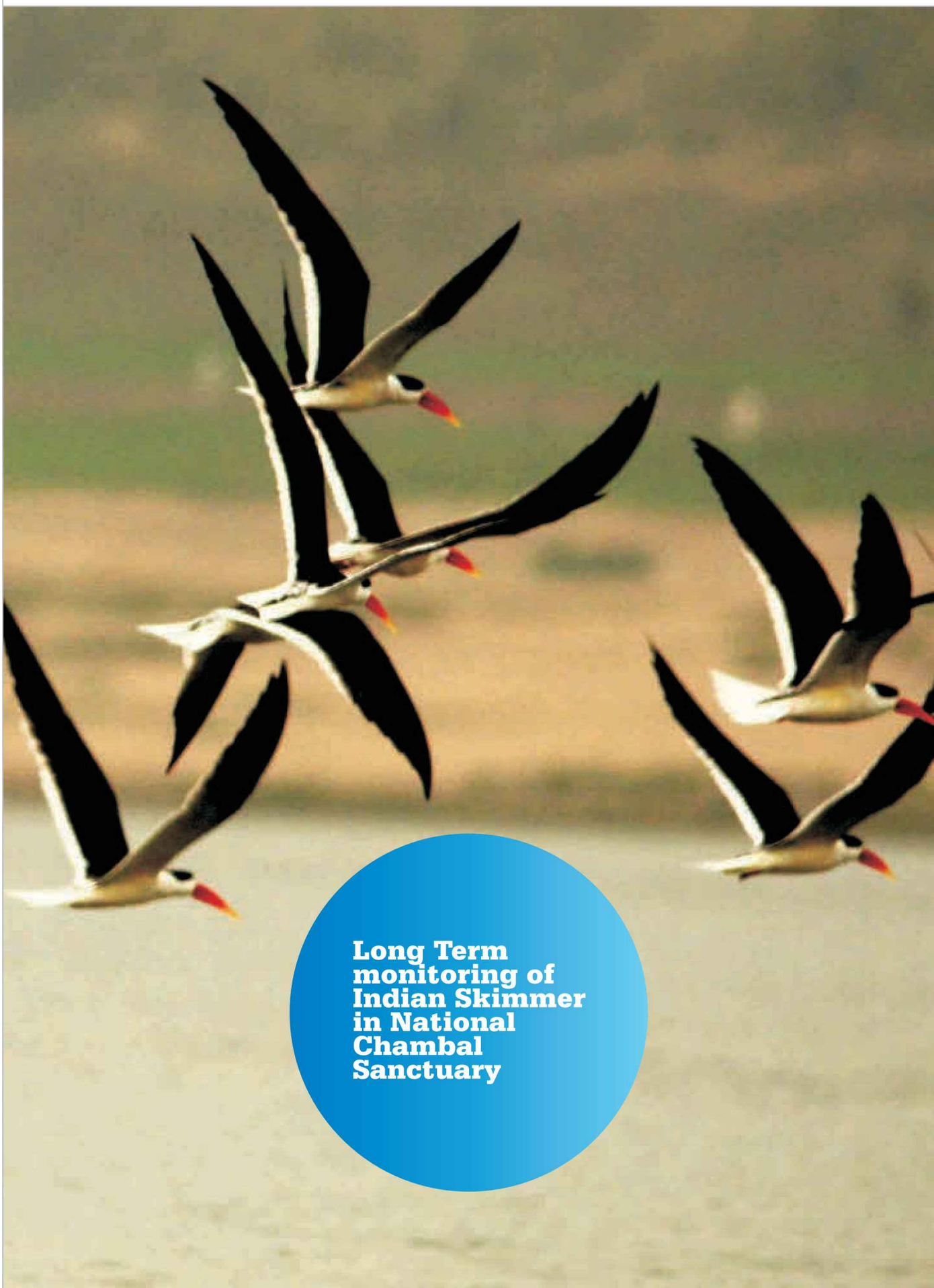



# Long Term monitoring of Indian Skimmer in National Chambal Sanctuary

## Abstract

Regular monitoring of aquatic wildlife was conducted in the National Chambal Sanctuary every year in February from1986 to 2014 using a motor boat. This paper presents the status of Indian skimmers (*Rynchops albicollis*) in the sanctuary during the period from 2003 to 2014. The monitoring indicated that the population of Indian Skimmers showed a fluctuating trend. Between 2003 and 2005 the population showed a declining trend, but it increased rapidly till 2008, when the population was the highest in this decade. The population declined again, and only 224 individuals were observed in 2011. After that, the population remained almost stable between 2012 and 2014. The Skimmers are not evenly distributed in the sanctuary; their distribution is very patchy. This could be due to the presence of undisturbed nesting beaches in certain stretches. Along the Chambal River, potential threats for this species are cultivation on the islands and sand bars, which causes intense disturbance, with the birds possibly not finding suitable nesting beaches, and damming of the river, which caused low flows in the breeding/nesting season, making the islands accessible to humans and vulnerable to interference in the form of agriculture, grazing, etc. and to predation by stray dogs and other predators. A sudden release of water from the dams could result in flooding of the nesting beaches.

**Keywords :** *Indian Skimmer, Chambal River, National Chambal Sanctuary, population, island-nesting birds*

## Introduction

Indian Skimmer (*Rynchops albicollis*), once widely distributed in the Indian Sub-continent, is now restricted to India, Bangladesh, Pakistan and Myanmar. It was common during the 19th century in Myanmar, Laos, Cambodia and Vietnam, but there are very few recent records from Myanmar (Sundar 2004) and none from Laos, Cambodia or Vietnam.

The Indian Skimmer is around 40-43 cm in length. It looks like a typical skimmer, blackish above, with a white forehead and collar, and white below. It has a long, thick, deep orange bill with a yellow tip and a longer lower mandible. In flight, there is a white trailing-edge to the wing, and the short, forked tail has blackish central feathers. Non-breeders are duller and browner above. The juvenile has a dusky orange bill with a blackish tip. It has a paler, brownish-grey crown and nape with dark mottling and a paler, more brownish-grey mantle. The scapulars and wing-coverts are whitish to pale buff fringed (Birdlife International 2001). The population of Indian Skimmers has declined in India and Pakistan. Its population is estimated at only 6000-10,000 mature individuals. BirdLife International (2001, 2008) justifies listing the Indian Skimmer as Vulnerable (IUCN 2010) as its population is undergoing a rapid decline as a result of widespread habitat degradation and disturbances in riverine and lake ecosystems. India is now the most important country in the world for the conservation of this species as it holds the largest population. In India, it is mainly found in the north, from Punjab (rare) through Uttar Pradesh, Madhya Pradesh and Bihar to West Bengal, extending up to Orissa (Chilika) and the Brahmaputra. Possibly, there is a separate population in the Narmada, Mahanadi, Tapti, Godavari and Krishna rivers, in Andhra Pradesh and Orissa. As a winter migrant, it is reported from Saurashtra and the western coast of Gujarat and Maharashtra.

Although, this magnificent bird is protected under the Wildlife (Protection) Act, 1972, it is on the whole threatened by anthropogenic activities. Strictly an island nesting bird, the Indian Skimmer is vulnerable to habitat destruction. The Chambal River, protected as part of the National Chambal Sanctuary (NCS) through the Wildlife (Protection) Act 1972, has been a safe abode for the species from historical times. This paper discuss results of a long-term study on the population dynamics and nesting activities of the Indian Skimmer in the Chambal River, which will help with the development of conservation strategies for this vulnerable species.

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## Study Area

The study was carried out within the NCS along the Chambal River (Figure 1). The river was divided into12 zones according to the dominant hydro-geological features (Table 1). The Chambal River is perennial, having its origin in the Vindhyan Range, near Mhow, Indore in Madhya Pradesh (Hussain 1999, 2003). It flowsin anorth-eastern direction, passing through Rajasthan up to the point where its major tributary, the Parbati, joins it, near Pali. Thereafter, it flows eastward, forming the boundary between Madhya Pradesh and Rajasthan and between Madhya Pradesh and Uttar Pradesh. It joins the Yamuna River near Bareeh, of Etawah District, of Uttar Pradesh. The Kali Sindh, Parbati, Banas and Kunoo are the important tributaries of the Chambal River. A series of multipurpose dams have been erected at Gandhi Sagar, Rana Pratap Sagar, Jawahar Sagar and Kota Barrage in the upper reaches of the Chambal River (WII 2011). The depth and river morphology of the fast flowing Chambal vary considerably (Hussain 1999, 2009). At places the river is shallow and fast, and there are many shallow riffle areas. The substrate ranges from mud and silt to sand and rock. The temperature ranges from 2°C to 46°C. The annual precipitation largely depends on the south-western monsoon. The mean annual rainfall over the Chambal basin was found to be 797 mm, of which about 93% falls during the four monsoon months (Hussain 1993).

The present study was carried out between Pali, in Rajasthan (25.84747° N, 76.56454° E),andthe confluence with the River Yamuna, 10 km downstream, at Pachnada, in Uttar Pradesh (26.43892° N, 79.21320° E).

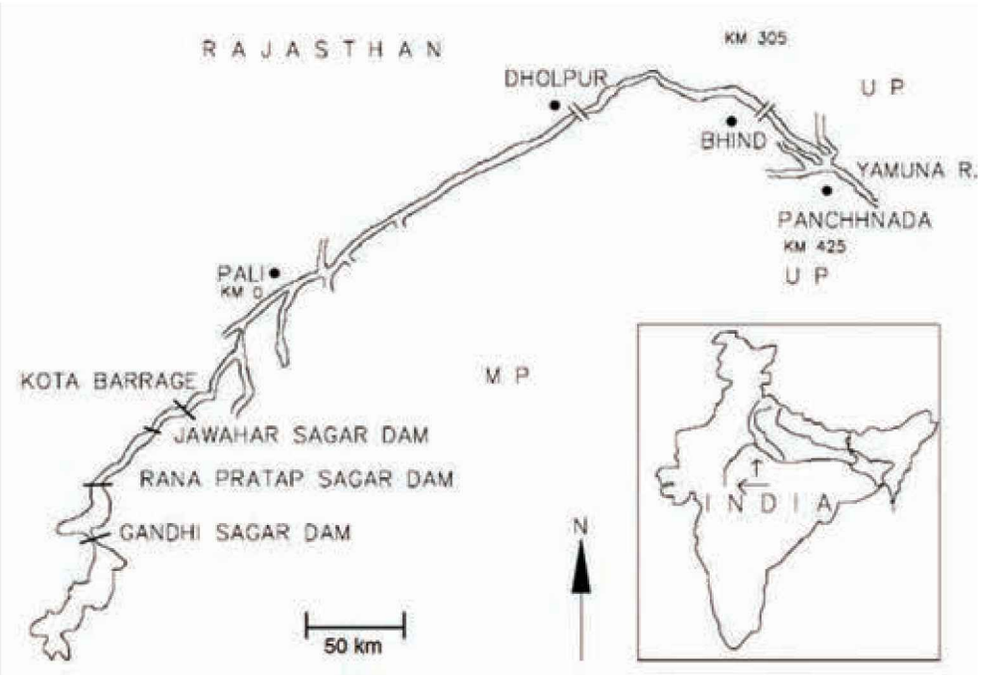


**Figure 1 :** *Map of the Chambal River with some of the important tributaries and landmarks. Pali is at river km 0, and Panchhnada is at river km 425.*

**Table 1:** Populations of Indian Skimmer in different sections of National Chambal Sanctuary from Pali to Pachnadabetween 2003 and 2014

| Zone | Stretch | Approximate length (km) | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| I | Pali-Rameshwar | 22 | - | - | 1 | 8 | 11 | 14 | - | - | - | - | 9 | 15 |
| II | Rameshwar-Khirkhiri | 15 | - | - | - | - | - | - | - | - | 27 | 18 | - | - |
| III | Khirkhiri-Baroli | 20 | - | - | - | - | - | - | - | - | - | - | - | - |
| IV | Baroli-Atar | 48 | 54 | 55 | 32 | 36 | 22 | 42 | 62 | 18 | 45 | 4 | 72 | 29 |
| V | Atar-Sarsani | 65 | 6 | 4 | 7 | 41 | 23 | - | - | 38 | 26 | - | 4 | 1 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VI | Sarsaini-Rajghat | 35 | 22 | 29 | 29 | 16 | 12 | 47 | 88 | 50 | 56 | 72 | 44 | 59 |
| VII | Rajghat-BabusinghGher | 35 | 56 | 26 | 24 | 24 | 36 | 19 | 15 | 10 | - | 16 | 13 | 26 |
| VIII | BabusinghGher-Usedghat | 40 | 38 | 59 | 46 | 58 | 60 | 54 | 52 | 18 | 32 | 50 | 26 | 51 |
| IX | Usedghat-Ater | 40 | 62 | 21 | - | 10 | 32 | 28 | 24 | 32 | 27 | 48 | 39 | 26 |
| X | Ater-Barhi | 40 | 20 | 82 | 53 | 29 | 42 | 102 | 39 | 50 | 6 | 41 | 30 | 24 |
| XI | Barhi-Chakarnagar | 38 | 66 | 20 | 78 | 60 | 70 | 26 | - | 14 | 5 | 52 | 21 | 9 |
| XII | Chakarnagar-Pachnada | 37 | 8 | 10 | - | - | 31 | 22 | 15 | - | - | - | - | 62 |
| | **Total** | **435** | **332** | **306** | **270** | **282** | **339** | **354** | **295** | **230** | **224** | **301** | **258** | **302** |

## Methods

Surveys were conducted in February during 2003-2014. The 425 km river stretch from Pali to Panchhnada was traversed by boat. Birds were located and identified according to the visual encounter method, with the help of a GPS device (Garmin 72), pair of binoculars (12×50), data sheet, field map, camera and range finder (Bushnel X900). All the probable nesting beaches were identified, and birds were located throughout the sanctuary. However, surveys were generally conducted according to the weather, with sightings becoming sparse.

Through preliminary surveys, the designated areas where the birds nest were identified. During the breeding season, these places were surveyed extensively. Before approaching any breeding and nesting island, it was ensured that the birds were not disturbed. Precautions were taken during counting and identification of the number of nests in a beach as not to stamp nests accidentally.

The eggs in each nest were counted, and the total number of nests in each nesting island estimated. Data on hatching were maintained. Predation, natural death of hatchlings and damage caused to nests by cattle were also recorded.

## Results

The population of the Indian Skimmers showed a fluctuating trend throughout the study period (Figure2). However, compared with the population in 1994, the population has declined overall. The population showed a declining trend from 2003 to 2005, but it increased rapidly till 2008, when it was the highest of the decade. The population declined again, and only 224 individuals were observed in 2011. After that, the population remained fairly stable in 2012 and 2014, with a decline in 2013.

Indian Skimmers are not evenly distributed in the NCS; their distribution is very patchy. Zones IV, VI, VIII, X and XI had the highest populations, whereas Zones I and XII always had very small populations (Figure 2).

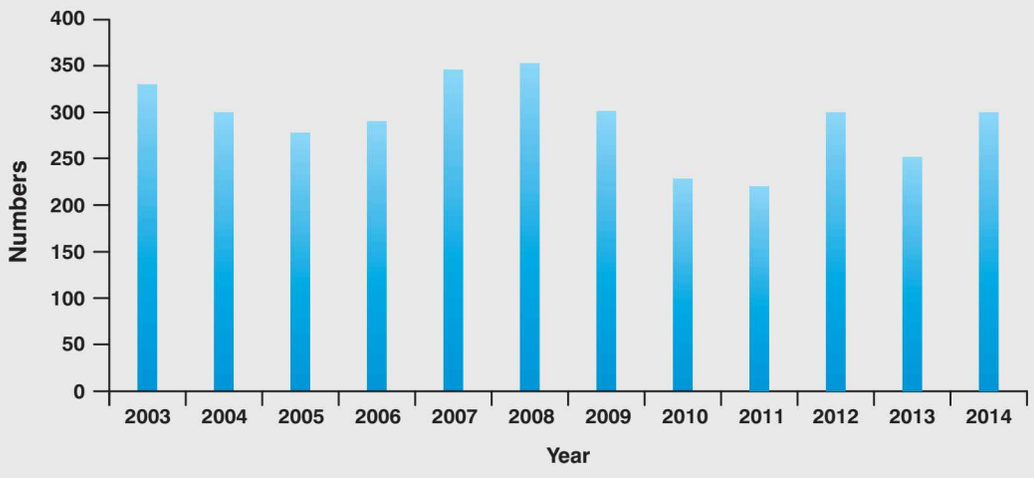


**Figure 2 :** *Annual variations in the population of Indian Skimmers in Chambal River in National Chambal Sanctuary during 2003-2014*

## Discussion

Indian Skimmers occur primarily along larger, sandy, lowland rivers, around lakes and adjacent marshes and, in the non-breeding season, estuaries and coasts. They breed colonially on large, exposed sandbars and islands (BirdLife International 2001). In the NCS, the islands and sand bars provide suitable nesting grounds during the breeding season for several species of bird, including the Indian Skimmer. Surveys for this bird have been carried out by the author from 1994, at which time the population was estimated at 555 individuals which has declined considerably over the years. Along the Chambal River, potential threats for this species are summer cultivation on the islands and sand dunes, which causes intense disturbance. The birds may possibly not find suitable nesting beaches. Damming of the river, which cause low flows during the breeding/nesting season, makes the islands accessible to humans. Sudden releases of water from dams, which could result in flooding of the nesting beaches (Hussain 2009, WII 2011) and interference in the form of agriculture, grazing, etc. and to predation by stray dogs and other predators are other existing threats.

## Acknowledgements

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