

# Probable breeding of Little Bittern *Ixobrychus minutus* at Nalsarovar Bird Sanctuary, Gujarat, western India, with notes on identification of juveniles

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## Introduction

The Little Bittern *Ixobrychus minutus* is a widely distributed species in Europe, Africa, and South Asia. The nominate subspecies is found in central- and southern Europe, northern Africa, eastern to western Siberia, and through Iran to north-western India; it winters in Africa. In the Indian Subcontinent, the Little Bittern is a resident (breeding) only in Kashmir and Baluchistan, but is widely recorded as a migrant elsewhere in India, and Pakistan. In India, there are isolated sightings from the northern states like Rajasthan, Delhi, Punjab, Uttaranchal, and Uttar Pradesh, extending up to Assam. Its records from the south-western states are from Maharashtra, Karnataka, and Kerala (Grimmett *et al.* 1998; Ali & Ripley 2001; Grimmett *et al.* 2011; BirdLife International 2018; Martínez-Vilalta *et al.* 2018). None of the field guides show records of the species from Gujarat. However, from Gujarat there are at least four published records in recent past (Bhatt 2003; Trivedi 2015; Bendre 2017; Sudhir 2017; Magiawala 2018), with photographic support.

In India, the species is resident in Kashmir and Assam, with scattered records elsewhere (shown as single cross on map), including some that imply possibly breeding records, mainly from the plains. Sight records of the species are still scanty in the country; the species is recorded from several north-western and southern states (Grimmett *et al.* 1998; Ali & Ripley 2001). Though Grimmett *et al.* (1998) proposed the possibility of it breeding in plains, there is, as yet, no breeding record from any other states of Indian Subcontinent except Kashmir, and Baluchistan. In this paper, we provide evidence of its breeding at Nalsarovar Bird Sanctuary, Gujarat, western India.

## Study area

We observed the Little Bittern at a marsh near Vekaria village (22.82°N, 72.06°E), at north-eastern end of Nalsarovar Bird Sanctuary, Gujarat, India. This marsh was spread over c. 3000 m<sup>2</sup> and was 50–100 cm deep. *Typha angustata*, *Cyperus* sp., *Ipomea aquatica*, and *I. carnea* comprised the main emergent vegetation, interspersed with *Prosopis juliflora*. Thorns of *P. juliflora* made it difficult to enter the marsh to check the nest. Adjoining the marsh were paddy *Oryza sativa* fields, in early stage of growth during September. The Nalsarovar Bird Sanctuary and its surrounding area is a shallow depression forming a natural lake. This freshwater lake gets inundated after the south-western

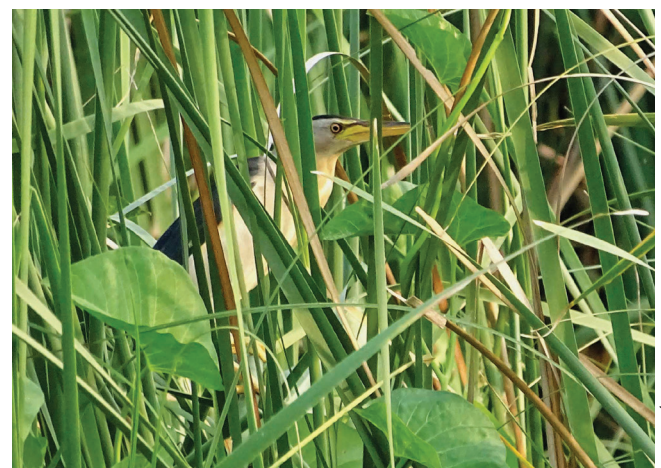
monsoon. The entire lake is covered by aquatic vegetation (Rathod & Parasharya 2018).

## Methods

In this marsh we observed the activities of the Little Bittern, and the Yellow Bittern *I. sinensis* from July to September 2017, from a distance of about 20 m. We also shot photographs and circulated them among experts, for confirmation of our identifications.

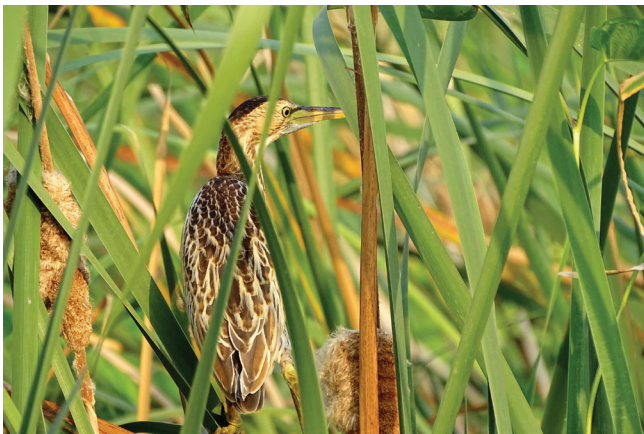
## Observations

We first noticed an adult Little Bittern landing in the middle of the marsh on 22 July 2017. When we saw both the sexes of Little Bittern entering the marsh regularly, we began to wonder, at a particular point, whether they were nesting. However, due to the water's depth, and the interspersed growth of *Prosopis*, it was not possible to search for a nest. However, we observed both the sexes of the bittern in the marsh regularly from July to September. Kasam Sama Sidani (RT's field assistant) is familiar with the adults of bitterns in the marsh, as he lives in front of the marsh (at Vekaria village). Kasam, who kept a watch on the activities of the bitterns daily, informed us about its presence from late July to October 2017. A few photographs of the adults in marsh [16] and the juveniles [17–20] could be taken only on 08 and 09 September 2017.



16. Little Bittern, adult male.





17. Little Bittern juvenile dorsal view.



18. Little Bittern juvenile showing pale wing panel.



19. Little Bittern juvenile showing pale wing panel.

All pics: Rajni Trivedi

Some Yellow Bitterns were also breeding in the same marsh. A pair on nest [21], and a damaged nest in Typha [22], probably of Yellow Bittern, were photographed on 21, and 24 August 2017, respectively. In flight, the adult Little Bittern could be clearly distinguished from the Yellow Bittern by its black (not brown) back, and white to grey buff (not yellow buff) wing patch. During the study period, at least eight to ten pairs of Yellow Bitterns and two or three pairs of Black Bitterns *I. flavicollis* were



20. Little Bittern juvenile showing ventral markings.

simultaneously breeding in the same patch of marsh. RT managed to take several photographs of two juvenile Little Bitterns on 08 and 09 September 2017; they looked quite different from the juveniles of the Yellow Bittern [XX8]. Otherwise dark plumaged, the Little Bittern juveniles had a distinctly light cream coloured patch on their wings. We reviewed images of Yellow and Little Bittern on [www.orientalbirdimages.org](http://www.orientalbirdimages.org) to differentiate juvenile plumages of these sympatric bitterns. We also compared our photographs of juvenile Little Bittern with photographs of juvenile Yellow Bittern [23] we had from central Gujarat. A comparison of the juvenile plumage and soft body part colouration of Yellow and Little Bittern is given in Table 1, as no other work covers this feature comprehensively. Based on the review, we suspected these two juveniles to be of the Little Bittern based on the following characters: Black on forehead, crown, and nape prominent; dark brown stripes on ventral side of the neck (absence of orange tone); and a wing panel that was light cream / whitish with few light brown streaks (not brown splashes). To confirm our identification, several images were sent to Krys K., administrator of [www.orientalbirdimages.org](http://www.orientalbirdimages.org). Confirming our identification as juvenile Little Bittern, he wrote, "I would agree with your diagnosis of this bird as a juvenile Little Bittern. Note in particular the contrast between the back [17] and the wing. The pale wing panel [18, 19] is fairly characteristic of this species, compared to the otherwise similar juvenile of Yellow Bittern. This panel is also less streaked [XX4]. The streaking on the underparts [XX5] also lacks the orange tones of juvenile Yellow Bittern" (Krys K., *in litt.*, e-mail dated 03 January 2018).



21. Yellow bittern pair on nest at Vekaria village (Nalsarovar), 21 August 2017.





Rajni Trivedi

22. Yellow Bittern damaged nest at Vekaria village (Nalsarovar), 21 August 2017



Vishal Mistry

23. Yellow Bittern juvenile at Vaso (Kheda District), 11 April 2017.

On close examination of the images, we could see the presence of some down feathers on the head, and a few feathers behind eye, and the mandibular gap that is present during the developing stage. Obviously, if the juvenile plumage was still in the developmental stage, the young ones might have been born at this particular site and might have left the nest a few days before. This is strong, indirect evidence that helps establish that the species had probably bred in the particular patch of marshland during the south-western monsoon period of July to September 2017. Krys K. also concurred, stating, "...the possibility of nesting should not be discounted."

## Discussion

In the past, the Little Bittern was photographed in Gujarat on 15 April 2009 (Trivedi 2015), 05 September 2017 (Bendre 2017), and 13 October 2017 (Magiawala 2018). Though the bird could not be photographed there, its sighting at Gavier Lake; Surat was also on 01 September 2002 (Bhatt 2003). Considering the published records, editorial remarks in Bendre (2017) concluded that the sighting data was insufficient to determine its status, but, at the same time suspected that the species may be a passage migrant in Gujarat.

An unpublished photograph of the species, on a wetland in Kheda District by Team WildArt (WildArt 2018; Manjit Jadeja, *verbally* on 20 July 2018) was on 26 August 2012. All published and unpublished records suggest that the species was present at suitable sites in Gujarat during the south-west monsoon, exactly during the period of the present breeding record at Nalsarovar. In our study, a pair of Little Bittern was observed during July to

September 2017, engaged in breeding activity. Though the nest of Little Bittern could not be located, its young ones, with feathers in the sheath, that started roaming around, could be photographed, and led us to suspect its breeding. Our observations indicate that the species must have bred during south-west monsoon; the period preferred by other Ardeids in north-western India (Parasharya & Naik 1990; Ali & Ripley 2001). This timing is in contrast to its reported breeding period of May to July in Kashmir (Ali & Ripley 2001; Martínez-Vilalta *et al.* 2018).

A pair of Yellow Bitterns on nest, a damaged nest, and an adult with crimson facial skin could be photographed as evidence of the species breeding in the same marsh. There were at least eight to ten pairs of Yellow Bitterns in this marsh during July to September 2017, all showing some evidence of breeding. Our several photographs of juveniles (see 23, taken on 11 April 2017 at Vaso, Kheda District), and adults in breeding plumage (see XX6, taken on 21 August 2017 at Nalsarovar), with soft part colour changes, suggest that the Yellow Bittern breeds in central Gujarat during March–September. There is a photograph of a nestling Yellow Bittern, taken by Viral Patel and Punkaj Maheria at Vandhay Lake, Kachchh, on 01 May 2016 (Patel & Maheria 2016). The age of the chick (hardly five to six weeks, with down on head still present) suggest that the adults might have nested in early March. So, summer breeding of Yellow Bittern is also evident for the Kachchh region of Gujarat, India. Though both the species of bitterns bred in the same small marshy area in Nalsarovar, nothing is known about the distance between the nests of the two species, or niche specifications. The fact is that other aquatic birds also utilize the same marshy area for breeding during south-west monsoon.

Specific documentation on the breeding evidences of Yellow Bittern, Black Bittern, and Cinnamon Bittern *I. cinnamomeus* in Gujarat is not published separately. However, their breeding status has been mentioned in several works (Khacher 1996; Mukherjee *et al.* 2002; Mistry & Parasharya 2016) and updated periodically (Parasharya *et al.* 2004; Ganpule 2016). This breeding record of the Little Bittern adds to the information we have on the breeding bitterns of Gujarat, including the extension of its breeding range.

All the sightings of the Little Bittern are from well-irrigated areas with a dense growth of aquatic plants. Hence, the species is likely to be recorded from other similar habitats in the state. The presence of the species during August, at the wetlands of Kheda (WildArt 2018), and during August and during September/October at Surat (Bhatt 2003; Bendre 2017) suggests that its breeding is possible at those sites also. However, additional records are needed to determine its status.

There is evidence of the Little Bittern being rather nomadic, and turning up in odd places to breed in the rains, but not staying very long. In Delhi, there were regular sightings and suspected breeding, of the species between 1964 and 1968 between June and August (Ganguli 1975), then a single sighting in Badli (north Delhi) in 1988 with nothing since (Harvey *et al.* 2006). Just six records of the species in Gujarat in past eighteen years, with a single instance of breeding, suggests that it may be nomadic and breeding occasionally at suitable habitats in Gujarat; quite far from its known breeding range in Baluchistan or Kashmir. Focused monitoring of the Little Bittern population will help to determine its status in Gujarat.

The distribution of the Little Bittern, in Gujarat, has not been shown in recent works (Hancock & Kushlan 1984; Kazmierczak 2000; Grimmett *et al.* 2011; Rasmussen & Anderton 2012). Now this needs to be updated.

**Table 1.** A comparison of the juvenile plumage and soft body part colouration of Yellow Bittern *I. sinensis* and Little Bittern *I. minutus*

Sr. No.	Body Part	Colouration	
		Yellow Bittern [23]	Little Bittern [18 & 19]
1	Iris	Yellow	Yellow
2	Lower mandible	Yellow	Yellow
3	Upper mandible	Black	Black, continues with black forehead and crown
4	Head	Buff brown forehead with slight grey on crown (not on forehead)	Black forehead, crown, and nape prominent.
5	Orbital skin	Greenish yellow	Yellow
6	Plumage on head, upper neck & back	Very light brown. Feathers with light buff or cream colour edges	Dark brown. Feathers with dark buff or light brown on edges
7	Ventral side of neck	Alternate white and light orange-brown stripe	Alternate white and dark brown stripes with some lighter tone on gular region. Orange tone absent in plumage
8	Sides of the neck	Light buff, without scaly feathers	Dark brown, with scaly feathers
9	Wing panel	Buff or dark cream with dark broad splashes	Light cream / whitish with few light brown streaks
10	Upper wing coverts	Greater coverts on secondaries buff or dark cream with brown central vein ('Rachis'). Median and lesser coverts light brown with narrow buff margin. Appear as brown scaly feathers	Greater coverts on secondaries light cream or whitish, central vein also light cream. Median and lesser coverts light cream with light brown restricted to rachis, and its nearby small area of vane. Except central area, remaining area of feather is light cream or white. Appearing as brown streaks.
11	Abdomen	White	White
12	Tibia	Covered with feathers, cream with small light brown marking	Covered with feathers, buff-brown with relatively light brown markings
13	Tarsii and feet	Light green	Light green

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1 Rachis: The typical feather consists of a central shaft (rachis), with serial paired branches (barbs) forming a flattened, usually curved surface—the vane.