

## Road kill of Black Bittern near Pariej Tank, Kheda District

**Vishal Mistry** : Near Haveli, Darbar Pole, Vaso-387380, Dist. Kheda. vmistry@vncindia.org

**B. M. Parasharya** : AINPVM: Agricultural Ornithology, Anand Agricultural University, Anand-388110. parasharya@yahoo.com



### Introduction:

Several studies on the impact of roads on the environment have shown that roads can be a serious threat to the maintenance of biological diversity (Geneletti 2003). If poorly planned and constructed, roads can eliminate and fragment habitats, cause accidental wildlife deaths, affect wildlife distribution and their movement patterns, and destroy wetland habitats (US EPA 1997). An estimate of annual mortality of birds on roads for some European countries varies from 350,000 to 27 million birds (Erritzoe *et al.* 2003). In India, incidences of roadside mortality of wild animals are increasing and being regularly reported (Sunder 2004, Parasharya & Tere 2007, Bhaskaran & Bhoominathan 2010).

The Black Bittern (*Ixobrychus flavicollis*) is a resident species in India with partly migratory behavior. It is crepuscular and inhabits reeds like *Typha*, but its sightings and breeding records in India are few (Kazmierczak 2000, Ali & Ripley 2001, Grimmett *et al.* 2011, Rasmussen & Anderton 2012). Ali (1954) did not record the Black Bittern in Gujarat. The species was sighted and confirmed breeding around Pariej Tank near Tarapur, Kheda district in 1990 along with Cinnamon Bittern (*Ixobrychus cinnamomeus*) and Yellow Bittern (*Ixobrychus sinensis*) (Khacher 1996, Mukherjee *et al.* 2002). Now it is listed as a resident breeding species in Gujarat, with records from many places (Parasharya *et al.* 2004, Ganpule 2016). However published records about its occurrence in the rest of the country are still scanty. In this paper, we report repeated mortality of the Black Bittern due to vehicular traffic on the road near Pariej Tank and discuss some feasible mitigation measures.

### Material and Methods:

Observations reported here were recorded during August to November 2015 (four months) on the state highway No.16 running between Khambhat and Kheda towns of Anand

and Kheda district respectively. The location on which these observations were recorded is approx. 8 km north of Tarapur town- a tehsil headquarter.

### Study Site:

Pariej Tank or Pariej Wetland (22°31'N to 22°33'N and 72°36' E to 72°38' E) is the largest wetland of Kheda district in central Gujarat. The tank is spread over 445 ha (4.45 sq. km.), and linked with Mahi Right Bank Canal (MRBC) since 1960. It is a shallow wetland with maximum water depth of four meters and serves the purpose of irrigation as well as drinking water. Seepage from the main tank and extensive canal network has created suitable habitat for several waterbirds, including the Sarus Crane (*Grus antigone*) (Parasharya *et al.* 2000). This wetland was declared as a 'Wetland of National Importance' in 2006 by MoEF, New Delhi. This wetland supports more than 20,000 waterbirds every year and has been identified as a potential Ramsar site (Vijayan *et al.* 2004).



We have been monitoring Pariej Tank and its surroundings since 1987. The State highway between Tarapur and Kheda is having heavy vehicular traffic. Since 2015, travelling on the state highway along Pariej Tank every month has become routine for us. The tank is on the western side of the road. The space between road and the main tank has shallow stagnant water with growth of the *Typha angustata*. The eastern side of the road has growth of *Typha* on the immediate fringe, followed by shallow water (Figure 1). This heavy growth of *Typha* attracts huge number of Baya (*Ploceous philippinus*) and Black-throated Weaver (*Ploceous benghalensis*), along with House Sparrow (*Passer domesticus*) for night roosting. Other birds which use this site for roosting are Common Starling (*Sturnus vulgaris*), Purple Heron (*Ardea purpurea*), Indian Pond

Heron (*Ardeola grayii*), Purple Swampphen (*Porphyrio porphyrio*) and bitterns (*Ixobrychus* spp.). The *Typha* growth also attracts Purple Moorhen, Black-throated Weaver and three species of bitterns for breeding. The bitterns also use this *Typha* for feeding.

#### Observations:

Following species of birds have been recorded as road kills: Indian Pond Heron, Purple Swampphen, White-breasted Waterhen (*Amaurornis phoenicurus*), Greater Coucal (*Centropus sinensis*), Red-wattled Lapwing (*Vanellus indicus*), Yellow Bittern, Cinnamon Bittern, Baya Weaver, Black-throated Weavers, etc. Besides birds, snakes and Flapshell Turtle (*Lissemys punctata*) regularly get killed on this road.

The most important information to be reported here is road kill of three Black Bitterns at the same site from August to November 2015. All the dead bitterns were seen during morning hours (0900 -1100 hr). Body of one of the birds was intact indicating a fresh collision (Photo 1). The other two birds were already crushed by vehicles (Photo 2 & 3); probably they might have died much before they were noticed by us. All the birds were adults. The dates of road kill were as follows: 22 August 2015, 27 August 2015 and 24 November 2015. Coordinates of the collision site were 22° 33'N 72° 37' E.

The breeding season of the Black Bittern is during south-west monsoon, mainly from June to September, depending on local conditions (Ali & Ripley 2001). The birds recorded as road kills during August might be breeding birds.

#### Discussion:

There are two important issues: a) Status of Black Bittern around Pariej Tank and b) Feasible mitigation measures to avoid/minimize road kill of birds at this site.

#### Status of Black Bittern:

Bitterns are seen easily in the command area of MRBC which covers most parts of Kheda and Anand districts in central Gujarat. We have been recording breeding activity of Yellow, Cinnamon and Black Bitterns in this area since 1990. Extensive network of canals and seepage of water has created marshy areas with *Typha* growth along the canal network – an ideal habitat for bitterns. Moreover, the sighting places are all permanent water bodies or canals. The bitterns are crepuscular and active during dawn and dusk (Ali & Ripley 2001). During day time they sit silently in the *Typha* and are so well camouflaged that they are difficult to detect. This seems to be the main reason for the very few sighting reports. We had seldom seen any Black Bitterns in the *Typha* while travelling on road near Pariej Tank during the day. Nevertheless, three individuals were seen as road kills in the morning hours.



The bitterns might be colliding with fast moving vehicles while crossing the road during early morning or dusk. We do not think that abundance of Black Bittern at this site is higher compared to the other three sides of the tank. Its abundance might be uniform in all *Typha* covered areas of MRBC command area. Here, the bitterns were recorded as they collided with vehicles on road. Had there been no road here, there would not have been any mortality and no bittern sightings too.

As per the field guides, the Black Bittern is rarely seen in Gujarat and is not known to breed here. On the other hand, we saw three dead bitterns on road during their breeding season. This establishes that the species is not rare at this particular site. In fact, its breeding status at Pariej in central Gujarat has already been established (Khacher 1996, Mukherjee *et al.* 2002).

#### Mitigation measures to avoid road kill of birds:

Pariej Tank is a wetland of national importance. It harbours 115 species of waterbirds and the total number crosses 20,000 birds (Mukherjee *et al.* 2002, Vijayan *et al.* 2004). This wetland is being developed for eco-tourism by the state forest department. Hence, eco-tourism here is dependent on avian diversity and its abundance. If some mitigation measures are taken for reducing road side bird mortality by the government, it will be highly appreciated by the tourists as well as conservation agencies.

Factors leading to road mortalities relate largely to how conducive the roadside conditions are to feeding, resting and nesting for local fauna. Roadside vegetation, fruiting shrubs on median strips, and spilled grains along roadsides are the chief attractants for small mammals and birds. The wildlife's vulnerability varies with age, inherent behaviour and activity patterns of affected species (Rajvanshi *et al.* 2001).

Altering roadside habitat often discourages wildlife crossings. Most often this means cutting away vegetation and reducing roadside cover and potential food sources. Removal of heavy growth of *Typha* from both sides of the road may compel birds to shift to some other area. However, total eradication of *Typha*

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is almost impossible as the water here is perennial. Removal of *Typha* growth between the bund of the tank and either edges of the road can be managed using multiple approaches, i.e. reclamation, controlling water seepage, use of weedicides, mechanical removal etc. In order to reduce bird mortality, removal of immediate roadside vegetation and planting it further away is recommended by other studies also (Orlowski 2008).

The road as it is today is not safe for the birds, birdwatchers and their parked vehicles. If the road is slightly widened with a separate parking area on the eastern side, it will provide safety to tourists and create bird watching facilities. Placement of warning signs for drivers to slow down in areas of frequently used crossing points is one option for reducing collisions. However placing sign-boards for voluntary speed limit are hardly ever executed in practice. Six highways pass through Gir National Park, of which three are always open to traffic and therefore have a constant flow of vehicles. A large number of wild animals get run over while they attempt to utilize habitats across the highway for feeding and visiting water sources (Rajvanshi *et al.* 2001). When vehicular traffic cannot be controlled in a protected area like Gir NP, it is highly unlikely that it can be done in a non-protected area.

Further, safety to birds and birdwatchers can be provided by placing 'speed breakers' all along the length of the wetland, besides placing sign boards to limit vehicular speed. In winter, a large number of students attend nature education camps arranged by the state forest department. Hence, special measures should be taken to ensure their safety. The park management of Gir NP and Sanctuary in Gujarat is using this approach (Rajvanshi *et al.* 2001). How various mitigation measures can be integrated will depend on the realization of the problem by the local politicians, managers and also on the funds available. The wetland managers (local wetland management committee) as well as the road transport department of Gujarat Government should work together to address this conservation and tourism related issue around Pariej Tank and also in other similar wetlands in the state.

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