

Brahmaputra River Islands: Corridors for the Tigers

Jimmy Borah^{1*}, Tridip Sharma²,
Rabindra Sharma³ and
Niranjan Kumar Vasu⁴

^{1,2} WWF-India, ^{3,4} Kaziranga National Park

*Email: jborah@wwfindia.net

Introduction

The Brahmaputra Valley in Assam is an important stronghold of the Royal Bengal Tiger (*Panthera tigris*) in India. The valley is mainly governed by the dynamics of river Brahmaputra, on the banks of which are present important forested habitats including the Kaziranga National Park (KNP) and the Orang National Park (ONP). These two sites itself hold the major population of tigers with Kaziranga being the main source site for the entire region. The islands dotted on the Brahmaputra river act as the stepping stones for the tigers and other wildlife to disperse and move from one place to another.

For long term conservation of tigers, understanding the connectivity and meta-population concept becomes imperative in the Brahmaputra valley. Very little effort has been made for connectivity of one tiger habitat area to different tiger habitat areas in the

Brahmaputra valley for long term survival of wild tigers. The only previous study showcased the importance of the Kaziranga Orang Riverine Landscape as an important area for survival of tigers in the region (Borah et al. 2010). The floodplain of the central Assam therefore is very important landscape for tigers in its best of the habitats that include the ONP in the west and the KNP on the east with Laokhowa and Buhrachapori Wildlife Sanctuary in between. The intervening islands in the Brahmaputra River are more or less occupied by cattle grazers (mostly toward the western part of the landscape) and villagers (mostly toward the eastern part).

Due to human use of the river banks and islands, and degradation of Laokhowa and Buhrachapori wildlife Sanctuary over the last few decades, the connectivity between the tiger bearing areas also has become fragmented. It is hence very imperative and



Figure 1: Locations of the islands surveyed. Bhokte Tapu in right and Dimbu Chapori in left being the extreme most location sampled between Kaziranga and Orang National Park.

crucial that the Brahmaputra floodplain ecosystem, which include areas like Kaziranga to Orang through Laokhowa and Buhrachapori and the river islands within are well protected as well as connected. The connectivity would ensure that there is a proper gene flow of tigers and other wild animals between these areas which would provide the impetus for their long term survival.

With above mentioned background, the main objective of the present study was to comprehend the use of Brahmaputra islands by tigers and other associated animals as well as to understand the communities living in those islands. We present here the preliminary findings from the rapid survey that was carried out across the islands.

Study Area: The survey was carried out in the islands of Brahmaputra River between the eastern end of KNP and western end of ONP. The survey covered the river stretch starting from Bhokte Chapori under Agaratoli Range, the eastern most part of KNP to Dimbu Chapori, the western most part of ONP, covering around 150 km long stretch (Figure 1).

The survey was carried out in two phases. The 1st phase covered the islands between Laokhowa and Burachapori WLSs (LB WLS) and KNP. In the 2nd phase the islands between ONP and LB WLS were covered. A total of 45 numbers of islands were covered in the survey. Bordering the river islands are different protected areas like Laokhowa and Burachapori Wildlife Sanctuaries, Singri RF, Panpur RF, etc.

An elaborate account on each of the PA's in the river stretch of interest is given below.

1. **Kaziranga National Park:** The Kaziranga National Park (26° 34 N to 26°46 N and 93° 08 E to 93° 36 E) spreads over Nagaon and Golaghat districts in Assam and is situated on the floodplains in between the Brahmaputra River to the north and Karbi Anglong hills to the south. The total area of the park including all the proposed additions is 860 km². The sixth addition to the Kaziranga NP, the river islands on the north covers an area of 376 km² providing buffer spaces and movement opportunity to tigers and other wildlife dispersing from the source site.

The vegetation of the park has been classified into grassland (66%), woodland (28%) and aquatic vegetation (6%) (Vasu 2003). All together there are 191 small and large wetlands or beels in the park. Diffolu River originating from Karbi Anglong Hills flows through the park and 58 other rivulets and streams constitutes the drainage systems of the park.

KNP has one of the highest densities of tigers and also act as the source site for tigers for the region (Jhala *et al.* 2011). The park also has largest population of Indian one-horned rhinoceros (*Rhinoceros unicornis*) as well as sizeable population of Asian elephant (*Elephas maximus*), swamp deer (*Cervus duvaucelli ranjitsinghi*) and Asiatic water buffalo (*Bubalus arnee*).

2. **Laokhowa Wildlife Sanctuary:** The Laokhowa wildlife sanctuary is situated in the flood plains of the mighty river Brahmaputra on the south bank in the central part of Assam. It is located in the extreme north boundaries of Nagaon district along the southern boundaries of Sonitpur district. The sanctuary is surrounded by thickly populated villages on almost all side except on the northern side which is bounded by the southern boundary of Burachapori wildlife sanctuary. The configuration of the area is more or less a flat land interspersed with *nallas* and *beels*. The elevation of the areas varies from 60 m to 90 m above mean sea level.

The vegetation and forest type of the Laokhowa wildlife sanctuary has been classified into a) Tropical moist mixed deciduous forest (55%) and b) Alluvial Grassland (35%) (Champion and Seth 1968). A numbers of perennial and seasonal water bodies like beels and nallah are distributed throughout the sanctuary. The area was famous for rhinos till early 80s with about 70 rhinos, all of which were killed by poachers followed by the Assam agitation during 1983-84. Though there is no known resident population of tigers currently, although occasional incidents of tiger movement has been recorded from the sanctuary time to time, either from nearby KNP or ONP.

3. **Burachapori Wildlife Sanctuary:** Burachapori wildlife sanctuary is situated in the flood plains of

the mighty river Brahmaputra on south bank and shares a common boundary with Laokhowa WLS. The sanctuary is a river island within the Brahmaputra River. The vegetation and forest type of the Burachapori wildlife sanctuary has been classified into, a) Tropical moist mixed deciduous, b) Alluvial Grassland, and c) Swampy and wetlands (Source: Management Plan). The grassland comprises about 44% of the total area of the sanctuary.

- 4. Orang National Park:** The Orang National Park is located at the floodplains on the north bank of the River Brahmaputra mostly covered with alluvial grassland, woodlands and wetlands. The vegetation comprises of a mosaic form of biomes of Woodlands (16.2%), Tall Grass (59.2%), Water bodies/Swamps (12.6%) and Chapori (River island)(11.5%).

The park currently harbours about 100 rhinos along with sympatric species like – Hog deer (*Axis porcinus*), Wild Pig (*Sus scrofa*), Fishing Cat (*Felis viverrina*), Jungle Cat (*Felis chaus*), Leopard Cat (*Prionailurus bengalensis*). The Brahmaputra River and its islands in the south boundary provide the dispersing route for the tigers since all the other sides are covered by human settlements. An estimated twenty tigers inhabit the ONP that covers an area of 78.80 km² (data source: Park Authority). The tiger population in ONP is considered a healthy breeding population.

Field survey: The survey was carried out as a ‘rapid survey’ to determine presence of major carnivores and prey species. The field survey was carried out during the month of December, 2013. The pugmarks/hoof mark and pellets as well as indirect signs were used as evidence of animal's presence. Line transect method was used for determining prey species. The sign survey was done over a stretch of 5 to 10 km in each island and transect walk was done covering 500 m to 1.5 km per transect depending on field conditions, accessibility and based on size of the islands. Direct sighting of animals during the survey period indicated active use of the islands. Community survey was also undertaken during the study period.

Remote sensing data are being used to categorize the land cover classification and would be compared with the earlier study (Borah et al. 2010) to detect any change

over the years. With the changing and shifting dynamics of river Brahmaputra, it becomes important to understand how the animals use the changing scenarios to disperse from one area to another.

Result and discussion

A length of around 150 km was covered in the stretch of the River Brahmaputra from eastern end of Kaziranga NP to western end of Orang NP. **45 islands** were extensively **sampled for tiger and prey presence**, habitat suitability as well as presence of humans and livestock's. Evidences of tiger presence were detected in **19 of the river islands**, including a direct sighting of a tiger in Hatibalu Chapori of Biswanath Ghat range. Though inconclusive, signs of tigers with cubs were recorded during the survey for e.g. at Kartika Chapori. This could be possible due to the high density tigers in KNP, which might force the breeding tigress with cubs to search for safer place for the cubs to survive. The Brahmaputra River islands in the Kaziranga stretch thus forms an important and vital habitat link for the tigers to disperse within the river islands and to the North Bank Landscape. There has been recent evidence of camera trap pictures where a tiger from Kaziranga was photo-trapped in Nameri Tiger Reserve (Figure 2), which indicates the **tigers are using the islands as stepping stone corridors to disperse and move**.

Presence of other carnivores was also detected in most of the islands. Wild ungulate prey species were detected in almost all of the river islands. Most of the islands showed presence for human or livestock's except for some islands near Kaziranga NP. The list of the names of the islands along with the animal signs recorded are given in Appendix-1.

Land use: Majority of the islands surveyed was found to be used by people/communities, some for the purpose of cropping while some others for cattle grazing (*khuti*). The islands falling under sixth addition part of KNP, however is relatively less occupied by people compared to others outside the addition area. Some of those islands have total human settlement and are also widely used for farming. The human settlement on the river islands in the western part of KNP is a major hindrance to for animal movement. The islands having human settlement were found to be agriculture dependent people, particularly in the stretch from Kaliabhomora

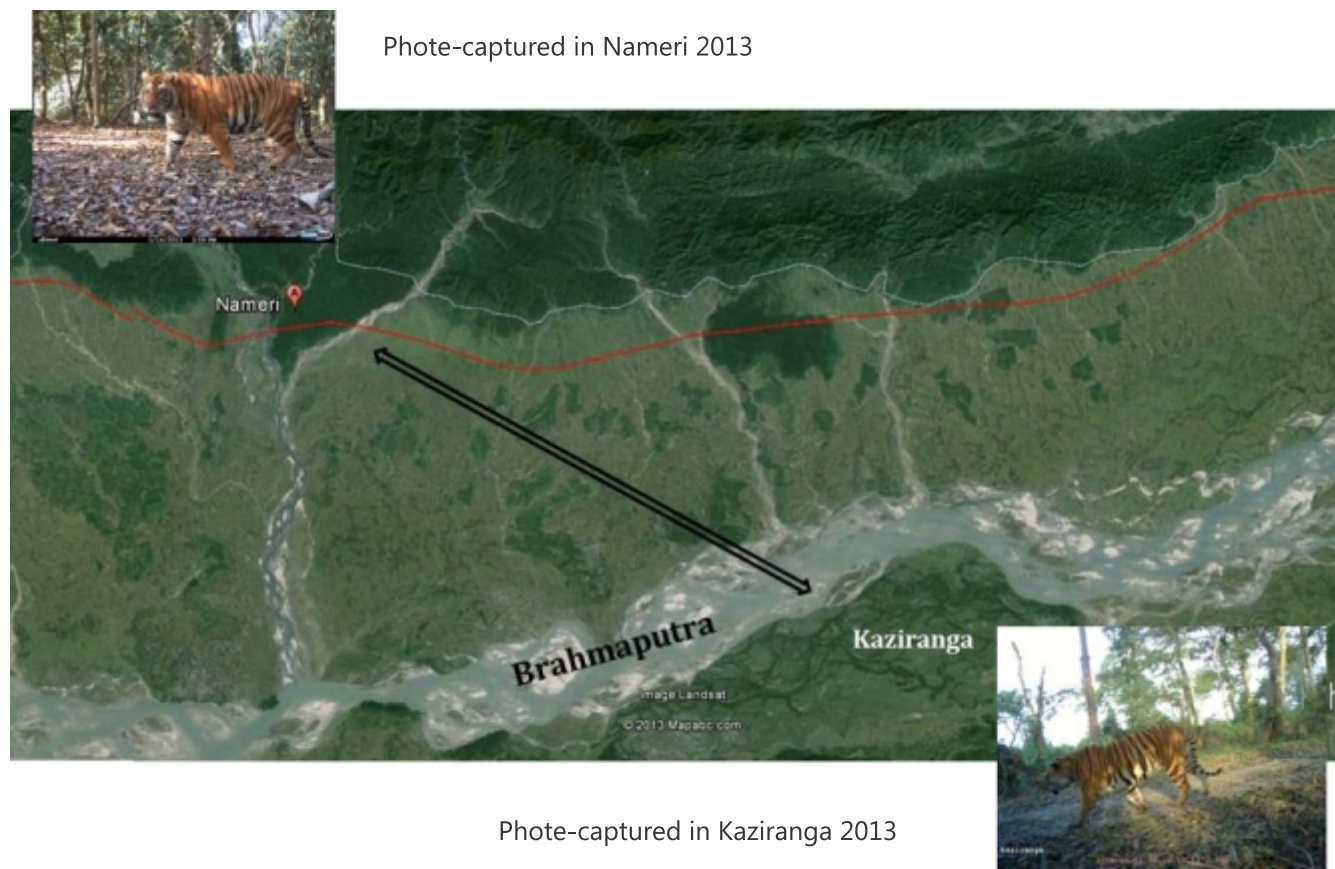


Figure 2: Evidence of camera trap pictures where a tiger from Kaziranga was photo-trapped in Nameri Tiger Reserve

bridge to western end of ONP. The people residing in these islands grow rice, green vegetables and legumes that are grown in different seasons. However, most of the river islands east of Kaliabhomora Bridge to eastern end of KNP were devoid of human settlement for agricultural purpose but use it for seasonal livestock's grazing. These livestock grazers mostly had temporary huts (called *Khuti*) on these river islands. Such islands have 10 to 15 numbers of grazing huts (*Khutis*) with different owners comprising of 500 to 3000 numbers of livestock in each island. The settlers and grazers depend on additional resources available in the islands like grasses and small trees. Grass cutting was a major concern in most of the islands inhabited by humans.

Socio-economics: Out of 45 river islands surveyed socio-economic survey was carried out in around 18 river islands having settlements and *khutis*. Most of the settlements were non-revenue *chars* (river islands) and

hardly received government aids for developments. The number of households in the settlements varied from and were mostly below hundred. As mentioned earlier, the principal livelihood of the settlers was agriculture while some involved themselves as daily wage labourers and also lived on fishing. The literacy rate of the surveyed households was very poor. This can be attributed to the non-availability of educational institutions in the islands and also due to the poor status of the families residing there.

Livestock's are one of the major sources of income for the villagers as well as *Khuti* owners. As per the information collected, the villagers earn more from selling their livestock's when compared to selling of milk and milk products. Human tiger conflict was reported from most of the surveyed islands in form of livestock depredations. One of the other complaints was damage to agricultural crops by wild pigs, deers and sometimes



Rhino foot print



Bear foot print



Tiger Pugmark



Rhino Dung



Jackal



Rhino



Human settlements in islands



Field Team with Research Officer, KTR, local NGO LBCS & Staff of Burachapori WLS



Field team after the completion of survey

by elephants. Interestingly, the livestock was the major prey for the tigers in the islands, and therefore has a significant role to play for the dispersing animals.

There seemed to be a slight negative attitude of the villagers and *Khuti* owners towards the forest department. One of the reasons could be due to late response from forest department to deal with the conflict cases, including the payment of compensation. Another apprehension was for the proposed 6th edition to KNP, since the *Khuti* owners fear being removed forcefully without consultation and in some cases compensation. Lack of managerial activities as well as communications by forest department has acted as a fuel in fire.

Conclusion

The information collected during the survey revealed that the tigers are using the river islands as stepping stone for dispersing from one area to another and might even be using it for establishing territories, as per evidences of breeding females. Besides tigers, other large mammals like rhinos and elephants also use these islands to reside and move. Further, the Brahmaputra River is also a safe home to Gangetic Dolphin *Platanista gangetica*, the national aquatic animal of India. This emphasizes the importance of the islands as far as long term conservation of mega charismatic faunas like tigers, elephants, rhinos and dolphins is concerned.

The human settlements on the river islands towards west of the Kaliabhomora Bridge of Brahmaputra river is major hindrance for animal movement. The islands further west, toward the Orang National Park are more thickly populated by humans that results in continuous disturbances to animal movement due to agricultural activities and livestock's grazing. However, it was observed that the new river islands that are regularly formed due to the river dynamics are not yet encroached upon and those islands can be immediately brought under administrative control of the forest department for protection and management purposes. This would require strategic planning, intervention and strong will from the officials and departments involved.

The socioeconomic status of the human settlers and/or communities residing in the islands was found to be poor, illiterates and economically backward. They

are mainly dependant on agriculture, livestock's and fisheries for their livelihood. Due to the ever increasing human population, pressure on these river islands for various resources, particularly land is bound to increase manifolds. On the other hand, for some of the *Khuti* owners, keeping the livestock's are a side business as many of them are settled in the mainland. However, a good number of *Khuti* owners are practically dependent on the livestock's raised in the river islands. Understanding the needs of these people is highly recommended while preparing strategies for rehabilitation of the *Khuti* owners.

As confirmed by the present study, the basic and vital information on the tiger, prey animal and anthropogenic pressures is crucial for monitoring and for planning conservation and management of wildlife at a broad level in the Brahmaputra River islands. The entire landscape would need improvised conservation and management strategies for long term survival of the different threatened faunal species. This warrants collective and sincere efforts from all different stakeholders, including the forest department, NGO's, and others involved in wildlife conservation and landscape management. To understand the ecological perspective in the landscape, it is therefore important to study the changing river dynamics, importance of land use land change as well as to regularly collect information on river islands use by different animals.

Acknowledgments

At the outset our sincere gratitude goes to the Department of Forests and Environment, Govt. of Assam for the necessary permission to conduct the study. We are thankful to the Director, Divisional Forest Officer, ACFs, Range Officers and field staff of the Kaziranga National Park/Tiger Reserve, Laokhowa and Burachapori Wildlife Sancturay, and Orang National Park for their support during the study. We are thankful to our team members Imtaz Uddin Ahmed, Monjit Kalita and Shyamal Kashyap for volunteering during the survey. Thanks to Kailash Mali (Burachapori Wildlife Sanctuary), Pranjal Matak (Biswanath Ghat Range), Faizul Haque (RG Orang National Park); Forest Battalion/Home Guards Babar Ali Khan, Moheswar Gogoi, Sampa Deka; Boatmens Isual Ali, Moizuddin Ali, Pran Das, Satish Boro; and cook men's Pulin Urang, Bitul Rabha. We also express our heartfelt

gratitude to Dr. Dipankar Ghose, Director, Species & Landscapes, WWF-India Secretariat for the necessary support to carry out the study. Thanks to Dr. Pranab Bora and Dr. Anupam Sarmah for their ever support

and guidance during the survey. We also thank all our colleagues in KKL & NBL offices, who supported us during the study. The island survey work was supported by WWF-Sweden.

References

- Borah, J., Ahmed, M. F. and Sarma, P. K. (2010). Brahmaputra River islands as potential corridors for dispersing tigers: A case study from Assam, India. *International Journal of Biodiversity and Conservation*, 2(11): 350-358.
- Champion, H. G. and S. K. Seth. (1968). *A revised survey of the forest types of India*, Government of India Printing, Delhi.
- Jhala, Y. V., Qureshi, Q., Gopal, R. and Sinha, P.R. (2011). *Status of Tigers, Co-predators and Prey in India, 2010*. National Tiger Conservation Authority, Government of India, New Delhi, and Wildlife Institute of India, Dehradun, India.
- Vasu, N. K. (2003). *Management Plan: Kaziranga National Park, World Heritage Site*. Forest Department, Govt. of Assam, India. Pp. I-VII and 1-158.