carried out with environmental conscientiousness to avoid negative impacts on the wilderness areas of the parks and the culture of the local community.

Conclusion

Myanmar's richness in biodiversity and unique biogeographical features constitute an ecological island that will serve as a genetic reservoir in Asia. The diverse array of biological resources offer an unmatched opportunity to establish a network of protected areas for the protection and preservation of critical species and ecosystems, which are the source of ecotourism. The splendid scenic views and the richness of the flora and fauna will serve a variety of purposes, giving aesthetic, cultural, economic and ecological benefits. Thus, forest-based ecotourism will be the integrated into the scenario of the development of protected areas and will contribute substantial income to the local community. The current Minister of Forestry, Lt. General Chit Swe, is committed to ensuring the conservation of the natural environment for future generations.

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STATUS OF *Rhinoceros unicornis* IN PABITORA WILDLIFE SANCTUARY, ASSAM

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by Bibhab Kumar Talukdar

Introduction

The conservation and protection of the Great Indian One-horned Rhinoceros (*Rhinoceros unicornis*) has been the subject of much discussion, both at national and international levels, since the beginning of this century. In India, the state of Assam presently shelters around 1,500 *Rhinoceros unicornis* within its geographical boundaries.

Pabitora Wildlife Sanctuary in Assam provides a conducive habitat to the Indian rhinos. The Sanctuary constitutes an area of 16 km^2, lying midway between latitudes 26° 12'N to 26° 15'N and longitudes 92° 2'E to 92° 5'E, at an altitude of 15-25 meters above mean sea level.

Until 1971, Pabitora was a "Grazing Reserve" for the surrounding villages. It was declared a "Reserved Forest" in November 1971, and covered an area of 15.84 km^2. As the population of Indian rhinos increased over the years, in 1987 the State Government of Assam upgraded Pabitora to "Wildlife Sanctuary" status.

Climate and Vegetation of Pabitora Wildlife Sanctuary

The climate of Pabitora can be typically termed as "sub-tropical moist". The annual average rainfall varies from 2,500 mm to 3,200 mm. The mean annual temperature ranges from 8°C in winter to about 37°C in summer. The heaviest rainfall occurs mostly during the hot months from May to September. The relative humidity ranges between 70-86%.

The vegetation types of Pabitora WS can be classified into the following categories: a) the Eastern Wet Alluvial Grasslands; b) Low

Alluvial Savannah Woodland; and c) Tropical Riparian Fringing Forests. Forest constitutes around 13% of the total area of the sanctuary, wetlands around 14.5%, and grasslands cover around 72.5%.

According to the records, the first rhinos visited Pabitora in the summer of 1923. They came from the adjacent areas and gradually settled in Pabitora. Due to better protection received since 1971, the rhino population in Pabitora increased favorably. The 1993 census in Pabitora Wildlife Sanctuary recorded 56 rhinos in the sanctuary. There were 40 adults (18 males, 21 females, 1 unsexed), 5 sub-adults (1 male, 2 females, 2 unsexed), and 11 calves.

Poaching presents the greatest threat to the survival of Indian rhinos in Pabitora WS. Nineteen rhinos were killed by poachers in the sanctuary between 1987 and 1993. Another twelve died of natural causes.

The sanctuary is surrounded by villages on all sides and it was observed that the rhinos stray out of the sanctuary to forage, especially during the night. About 25-30% of the rhinos of Pabitora stray out of the core notified area to forage in the surrounding villages and as far out as 30-40 km from the sanctuary boundaries. The poacher fully utilize this opportunity to kill the rhinos for their horns. To cope with the problem, the Forest Department set up 14 camps outside the sanctuary to complement the 13 camps inside the sanctuary. Despite the constant vigilance of the forest staffs, around 10% of the total poaching occurred outside the sanctuary area. In addition to using guns and poison to kill the rhinos, in recent years poachers have successfully killed four rhinos by electrocution. The poachers utilize the high tension electric line passing through the sanctuary by connecting a wire to it and setting the wire on a rhino path.

Rhino Conservation Approach

The State of Assam has given protection to *Rhinoceros unicornis* since the beginning of the century. In 1915, the Government of Assam enacted the Assam Rhinoceros Prevention Act, which prohibits the hunting of rhinos in unclassed State Forests. Subsequently, the Assam Rhinoceros Preservation Act of 1954 came into force, providing protection to this rare species in all areas of the state. Further, the Indian Wildlife Protection Act 1972, adopted in Assam in 1976, provides stringent protection to the wildlife of Assam, including the rhinos.

The Indian Action Plan for Rhino Conservation includes the following components:

1. Habitat protection and restoration
2. Creation of corridors for migration
3. Proper communication network
4. Anti-poaching squads and strike force
5. Training of Wildlife Personnel
6. Arms training to protection staff
7. Research and monitoring
8. Eco-development works
9. Education and Public Awareness program
10. Relocation of enclaved villages through persuasion
11. Veterinary Care
12. Translocation of animals for rehabilitation and captive breeding
13. Development of Intelligence Network; and
14. Rewards for good work and case detection.

Despite having so many acts and action plans for rhinos in Assam, the killing of the animal in the state still goes on unabated. Rhino poaching in the Orang Wildlife Sanctuary of Assam was earlier documented by Talukdar (1995). The single most important reason for the increase in rhino poaching incidents in Assam is the loose implementation of the existing acts by the government. From the legal point of view, the penalties are not harsh enough and sometimes political interference is used to help the offenders escape punishment.

The primary reason for poaching is the high value for rhino horn in the international markets, as rhino horns are still used by traditional medicine manufacturers in some Asian countries (Martin, 1989, 1990; Martin and Martin, 1991; Nowell et al, 1992; Loh and

Loh, 1994). Due to the increased demand and cost of rhino horn in some international markets in Asia, rhino poaching is inevitable. However, poaching activities can be minimized if the existing laws are modified and, most importantly, implemented properly.

Pabitora Wildlife Sanctuary is threatened with encroachment and grazing of livestock within the sanctuary. Around 2,500-3,000 cattle graze in the area, damaging the habitat. Illegal collection of thatch and firewood is done throughout the year, as is fishing. Some of the fringe villages give shelter to poachers and act as guides to lead them to the rhinos. Poaching activities originating from these areas that serve as launching pads for illegal acts should be monitored properly by the management of the wildlife sanctuary in order to stop further poaching of rhinos in Pabitora.

The Great Indian One-horned Rhinoceros represents the epitome of the conservation movement in Assam. The present work reveals that the protected areas in Assam are receiving inadequate protection measures to conserve and protect rhinos from poachers. If the rhino becomes extinct from Assam due to poaching, the setback it will have on the conservation scenario in the state will be impossible to recover from. The conservation efforts made to protect the rhino in Assam since the beginning of the century have also helped many other threatened and endangered species of wildlife to survive in their natural habitats. Therefore, the loss of rhinos will also be a setback to these species. It is time to take serious steps to protect the rhinos from poachers in Assam before it is too late.

References

Loh, J. and K. Loh. 1994. **A spot check on the availability of rhino products in Guazgzhou and Shanghai, China.** *TRAFFIC Bulletin*, 14(2):70-80.

Martin, E.B. 1989. **Report on the trade in the rhino products in eastern Asia and India. Pachyderm,** 11:13-22.

Martin, E.B. 1990. **Medicines from Chinese treasures.** *Pachyderm*, 13:12-13.

Martin, E.B. and C.B. Martin. 1991. **Profligate spending exploits wildlife in Taiwan.** *Oryx*, 25(1):18-20.

Nowell, K., Chyi, W.L. and C.J. Pei. 1992. **The Horns of a Dilemma: The Market for Rhino Horn in Taiwan.** TRAFFIC International, Cambridge, UK.

Talukdar, B.K. 1995. **Rhino poaching in Orang Wildlife Sanctuary, Assam (India).** *Journal of Nature Conservation*, (7(1).

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ERRATA

The cover photo for Vol.25:No.4 Oct.-Dec.1999 of the common keel back snake (*Xenochrophis flavipunctatum*), and the photo on page 4 of the rainbow water snake (*Enhydris enhydris*), were both taken by Mr. John C. Murphy and not Harold K. Voris. We apologize for the mistake in photo credits.