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Mongabay Series: **Asian Rhinos**

Skewed sex ratio spells danger for rhinos in India's Gorumara National Park

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Although numbers are still increasing, when it comes to long-term viability, having more males than females could be as a big a threat as poaching.

- *Gorumara National Park, in India's West Bengal State, is home to a small but steadily growing population of greater one-horned rhinoceroses, currently numbering 51 individuals.*
- *Despite its overall growth, the sex ratio of the park's rhino population is severely imbalanced, with more reproductive-aged males than females.*
- *Ideally, there should be more females than males. A male-heavy population threatens the long-term reproductive and genetic viability of the population, as well as leading to increased conflict over mates.*
- *Until this spring, Gorumara had been relatively free of poaching since the 1990s. However, two dead rhinos were found in April, and another suspected poaching incident was reported May 18.*

WEST BENGAL, India — Nibbling at tender grasses, with its grey-brown skin partially camouflaged by the sandy river bed, a solitary rhinoceros slowly ambled along barely three feet away from us. Though it was not easy to discern the animal's sex with certainty, our forest guide guessed it was probably a female. His uncertainty soon gave way to excitement, as a calf emerged from the thicket to catch up with its mother.

It was a rare and lucky sighting, especially here in Gorumara National Park in the northern reaches of India's West Bengal state. Although the park hosts a steadily increasing number of greater one-horned rhinos, the sex ratio among the park's flagship species is heavily skewed in favor of males.

Spread across 80 square kilometers (30.8 square miles) of sal trees, grasslands and riverbanks, Gorumara is presently home to 51 rhinos according to park officials — up by two from the last official census in 2015. Of these, 22 are males (21 adults and one sub-adult) and 17 are females

(including 16 adults and one sub-adult). There are also nine calves too young to be identified and one individual whose sex could not be determined.

Official records show this male-heavy trend going back as far as 2006, when the population included 12 bulls and nine females. The disparity grew in 2010, with 17 adult males against 12 adult females, out of a population of 35. In 2012, the park reported of 14 adult males against 11 females, with a total population of 43. The gap widened further with 19 males and 15 females in 2014, followed by the present figures.



The entrance to Gorumara National Park, featuring a statue of its flagship species. Photo by Moushumi Basu for Mongabay.

The park recently came into the spotlight after two the bodies of two rhinos were discovered in April — one male, one too badly decomposed to be identified. The deaths came as a shock and were the first known cases of poaching since October 2014. Despite wildlife crime being a persistent problem elsewhere in India, Gorumara has been relatively free of poaching since the 1990s and is celebrated as one of the country's best-managed parks, winning a national award in 2009.

Last week, Gorumara again made news for a suspected poaching-related incident: On May 18, according to [local reports](#), shots were exchanged between poachers and a joint patrol of forest guards and paramilitaries in the Dhupjora Beat of the park's South range. While one person was arrested, the other two managed to flee.

However, the much lower-profile question of the balance between the sexes is potentially just as serious a threat to the long-term health of the population.

A quiet threat

Current figures put the sex ratio among Gorumara's reproductive-age rhinos at 1.31 males per one female. According to Udayan Borthakur, a member of the IUCN Species Survival Commission's Asian Rhino specialist group, this is heavily skewed. Based on statistics from healthy rhino populations and their mating behavior, the ideal ratio is one male per three females he explained.

The sex ratio of a species is a key indicator of its reproductive potential, added Jayanta Mallick, a former employee of the West Bengal wildlife department who has authored more than 100 scientific papers on wildlife conservation. Rhinos are largely polygynous in nature, with a single adult male capable of mating with least three to four females in the area. "Hence, a predominant female count is essential, to maintain a long term viable breeding population of the species," Mallick told Mongabay.

"The skewed sex ratio of Gorumara's rhinos is a matter of chance, which would probably get corrected with time," said Nisha Goswami, Divisional Forest Officer, Gorumara Wildlife Division. Their steadily increasing population indicates that the situation is still not out of hand, she said. But at the same time, in a rhino population as small as Gorumara's, there could be risks of inbreeding and consequent depletion of the species' gene pool.



Greater one-horned rhinos, pictured here in Kaziranga National Park in India's Assam State.
Photo by Udayan Dasgupta.

Determining the sex ratio

The anomaly among Gorumara rhinos has also been scientifically established through a genetic census, conducted in 2011, using their dung samples. It was carried out by Aaranyak, an Assam-based nonprofit working on biodiversity conservation and research.

“Such an exercise was the first of its kind in the world, where unique genetic profiles of individual rhinos, were determined from dung DNA extracts,” said Udayan Borthakur, head of Aaranyak’s Wildlife Genetics Division, who led the field survey.

The results of the genetic survey confirmed the presence of 43 individuals from 60 dung samples. This tallied with the total rhino numbers recorded in the 2012 census, conducted by the Forest Department using the conventional method of counting individuals observed in assigned blocks of the park.

Aaranyak, together with the Cincinnati Zoo’s Center for Conservation and Research of Endangered Wildlife, was also able to determine the sex of each individual rhino based on genetic markers. The findings corroborated the earlier reports of a disproportionate male-female ratio, indicating the problem is likely more severe than previously thought. The genetic census identified 34 male and nine female rhinoceros, a male-female ratio of 3.8:1.

The study also pointed to low genetic diversity in Gorumara’s rhino population, as compared to those found in other protected areas in India. The rhinos in Gorumara are a rather isolated and confined lot, Borthakur explained. In this situation, a skewed sex ratio implies that a smaller and

smaller proportion of the reproductive-age population actually contributes to breeding. Hence, one cannot rule out loss of genetic diversity in the generations to come, he said.

“The need of the hour is thus to relocate female rhinos from either Jaldapara or Assam to Gorumara for the much-required genetic exchange,” said Deba Kumar Dutta, a member of IUCN’s Asian Rhino Specialist Group and senior project officer at WWF India.

However, more research needs to be done on the habitat and behavior of the park’s rhinos in order to get more area-specific ideas on rhino restocking and population management, Dutta said. “Not much study has been done on the profile of Gorumara rhinos so far and consequences of their skewed ratio can be challenging for their future conservation.”

According to Sumita Ghatak, conservator of forest Northern Circle (of West Bengal), [Jaldapara National Park](#), the region’s other rhino habitat, may not be an appropriate source for female rhinos. Jaldapara itself has just about managed to hold on to its threshold, with 78 adult females against 68 males.

A proposal for rhino relocation was sent to Assam State three years ago with the objective of improving gene diversity in the Gorumara rhinos Ghatak said. However, it continues to hang in the balance.



The nearby Chapramari forests and grasslands, where rhinos from Gorumara often stray due to infighting. Photo by Moushumi Basu for Mongabay.

Conflict between rhinos

Meanwhile, Gorumara's skewed ratio has resulted in frequent infighting between rhino bulls. The rhinos here are largely concentrated in no more than 12 square kilometers of the park — areas they favor due to better availability of grasslands, wallowing ponds and water holes.

Forest personnel have recorded at least 5-6 cases of injuries (2 major) in intraspecific fights in 2017, which was preceded by 7-8 such cases in 2016, said Goswami. There were two mortalities due to infighting — one each in 2014 and 2015. In addition, vanquished or weaker rhinos have also been found to stray into forests outside of the park.

According to Mallick, male rhinos have loosely defined territories to compete for estrous females. This is established by squirting urine at regular intervals on the trees and bushes or even scattering their dung in the area.

While a male can “smell” a female in heat, and try to keep her within the bounds of his territory, this territorial marking is also intended to keep other males from encroaching. But with fewer females than males, such intrusions are inevitable, leading to conflict especially if the resident

bull is with a female in heat. These clashes can be deadly, with serious horn-to-horn fighting causing deep injuries or even deaths. In some cases, the dominant rhino may also aggressively chase out competitors, or sometimes weaker males may choose to run away on their own.

The patrolling forest personnel, who monitor the migration of some of the deposed Gorumara rhinos, narrated the interesting “sojourns” of a lone male, whom they have named Champion.



A

sub adult rhino wallowing in a small pool in the park. Photo by Moushumi Basu for Mongabay.

Aged between 20 years – 22 years, he has spent the past five to six years being chased out of the park by his rivals in his quest for a mate. Since then, he has been known to travel for about 15 kilometers – 18 kilometers (9.3 miles – 11.1 miles) to reach the nearby Chapramari forests — where, unfortunately for him, there are no rhinos to be found, female or male. Here, he is observed to lie low on his own for a couple of days, foraging in the accompanying grasslands or stay immersed within the wallowing pond.

Champion is even known to set out further — diving through the Jaldakha River, along the eastern precincts of the park to migrate further north and crossing over to the Bhutanese territory — in the process migrating up to 35 kilometers. “Champion had been going ‘abroad’ since 2013, followed by his straying in 2014 and 2016,” recalled Ghatak. In 2013, he had to be brought back from Bhutan through elaborate monitoring exercises, lasting for more than 10 days, with the help

of captive elephants, she said. However, in most cases, he has returned to Gorumara on his own — once again in pursuit of a mate, and once again to meet the same fate.

According to Badal Debnath, assistant divisional forest officer, Gorumara Wildlife Division, when a particular habitat approaches its carrying capacity, such competitions increase among the male population for females, food and territory. Infighting and dispersal are probably natural processes of elimination or ensuring the survival of the fittest in the habitat.

However, such incidents are also haunted by human perils. A male rhino that strayed out of Gorumara under similar circumstances, migrating for more than 15 kilometers (9.3 miles) to the nearby Baikunthapur and Mahananda forests, was killed by poachers on November 8, 2015.



A Gorumara forest patrol. Photo by Moushumi Basu for Mongabay.

External pressures

The threat of poaching looms large even within the park, following the recent recovery of two bullet-ridden carcasses in its South Range.

The bodies, which were found on April 19 and April 20, would have probably gone unnoticed, had it not been for the recovery of a rhino horn by Assam police and forest department in a March 14 car accident near Guwahati. While four alleged poachers died in the incident, the lone survivor admitted the seized horn belonged to a rhino they had killed in Gorumara a few weeks earlier.

The persons killed in the accident were learned to be residents of Churachandpur, Ghatak said. Churachandpur on the Indo-Myanmar border in Manipur State has become notorious for the wildlife trade. They were suspected to be taking the horn to either Manipur or Nagaland from where it could have been smuggled out to Myanmar.

The alleged poachers were found to owe allegiance to insurgent groups from India's Northeastern states, Ghatak said. Along with the horn, they were also said to be in possession of cocaine and were found to be a part of an interstate vehicle-theft gang.

The poaching case connected to the car accident has been handed to the West Bengal state Criminal Investigation Department (CID), while the other poaching case is being investigated by the forest department.

As for reports of a shoot-out on May 18, Ghatak denied such a gunfight occurred, saying there were some unnatural sounds resembling bullet shots from within the forest. However, she said, the patrolling team did fire blank rounds later when the suspects began to flee.

The entry and exit points of the park have been sealed and a thorough combing operation is on with a team of paramilitary forces, Ghatak added. According to her, the person arrested is a local, who said he had entered the forests for fishing.



An anti-poaching awareness poster inside the park rangers' office. Photo by Moushumi Basu for Mongabay.

“Along with these investigations, the park management also needs to enhance its protection level by raising a dedicated Armed Forest Protection Battalion with police, for fighting poaching of rhinos/ wildlife,” said Rahul Dutta, a consultant on wildlife trade and crime for the International Rhino Foundation. Parks like Gorumara are the emerging targets of the poachers, especially after neighboring Assam State tightened up its protection mechanisms.

Further, when a poaching case is detected, under India’s Wildlife Protection Act it is the responsibility of the forest department to file the complaint petition in the court, not the police, said Dutta. The forest department needs to take charge of the case from the beginning, carry out proper investigations and collect adequate evidence that can lead to prosecution and ultimately the conviction of poachers, he said.

In addition to stepping up protection, habitat improvement is also essential for long term rhino conservation, said Anirban Majumdar, secretary of local conservation organization Lataguri Green Label Welfare Society. “The quality as well as the variety of fodder intake by the rhinos can also impact their population and offsprings genetically, over a period of time,” he said.

“Hence, we also need to better the quality of grasslands through plantations of diverse varieties of more palatable fodder, rather than the commonly observed monoculture or plantation of few restricted varieties.”

More broadly, Deba Kumar Dutta called for meta-population management between the rhino range states, citing international cooperation in tiger conservation as a model. As the global stronghold for the species needs to formulate a national rhino management action plan, Dutta argued, through which there can be more organized and concerted population and protection strategies. “Accordingly, we can thus repopulate these magnificent species in their potential habitats once again and watch them revive in their areas of historic presence along the Ganga and Brahmaputra valleys,” he said on a wishful note of optimism.