

Nature-assisted re-establishment of Greater one-horned rhinoceros, *Rhinoceros unicornis* in its historical distribution range

The Greater one-horned rhinoceros or Indian rhinoceros, *Rhinoceros unicornis* (Figure 1) has been listed as 'Vulnerable' by the International Union for Conservation of Nature, and presently, 2575 individuals of the species inhabit Nepal and the Indian states of West Bengal, Uttar Pradesh and Assam¹. Population of the species is increasing overall due to strict protection, especially in India. However, populations especially in Nepal and parts of Northeast India are decreasing. Threats before the species include fragmented population, habitat degradation, and poaching¹. And, conservation measures cover bolstering the stressed population, starting a new population, anti-poaching action, habitat improvement, strengthening the management, and reducing conflict with humans¹.

Existing population of the species can broadly be categorized into: (i) naturally occurring sub-population in protected areas in the northeastern part of India (Kaziranga, Orang, Pabitora in Assam, and Gorumara and Jaldapara in West Bengal), and south-central Nepal (Chitwan National Park); (ii) reintroduced sub-population in India (Dudhwa in Uttar Pradesh (UP)) and southwestern Nepal (Bardia National Park and Suklaphanta Wildlife Reserve), and (iii) transient population in Katarnia Ghat Wildlife Sanctuary (UP). In recent years, the rhinoceros population in Manas, Assam was extirpated by poaching during civil unrest in the region, which is now being reintroduced under Indian Rhino Vision 2020 (ref. 2).

Apart from the sub-populations mentioned above, in recent years, a small



Figure 1. Greater one-horned rhinoceros, *Rhinoceros unicornis*.

population of the one-horned rhinoceros has settled in Valmiki Tiger Reserve (VTR), situated in the Himalayan foothills in the West Champaran District, Bihar, India (Figure 2). The VTR is contiguous with the Chitwan National Park of Nepal in the north, where rhinos are found in high densities along the floodplain grasslands and riverine forests bordering the Rapti, Narayani, Reu, Dunge and Icharni rivers³. The Narayni River, joined by Rapti from eastern side inside Nepal, flows southwards and enters India at Valmikinagar forming the western border of the Madanpur Forest of VTR. A barrage has been constructed across the Narayani (known as 'Gandak' in India) at the Indo-Nepal border.

Rookmaaker⁴ has summarized the historic records of the species in northern India and illustrated that the rhinos were occasionally found in Champaran and the adjoining Gorakhpur District in Bihar and UP respectively. Rhinos were shot in Champaran in 1939 and 1960. In 1982, a male rhinoceros was caught in VTR and sent to Patna Zoo. These rhinos supposedly wandered from the Chitwan National Park, Nepal.

During 2001–02, a few rhinos from Chitwan National Park drifted down in the floodwater of the Gandak and crossed the barrage through its gates raised due

to high water level. The rhinos floated downstream and took refuge in the Madanpur Forest on the left bank of the river. The forest spread across over 100 sq. km is characterized by West Gangetic moist mixed deciduous forest, khair–sisso forest, eastern wet alluvial grasslands, cane brakes and *Barringtonia* swamp forest⁵. Agricultural lands mainly cultivated with paddy, wheat, oil seeds and sugarcane surround the forest area. All these provided suitable habitat to the species. A calf was also born in 2003, and indirect signs suggested five individuals of the species in the area. In April 2006, a female rhinoceros died after being hit by a train on Bagaha–Chhitauni Railway line passing through the forest. In January 2008, one male rhinoceros was drowned to death in a canal, in the adjoining area of UP. Evidences suggest the presence of three rhinos in VTR.

Apart from the settled population in Madanpur Forest, rhinos often stray out of the Chitwan National Park to the eastern as well as western portion of VTR, and take refuge in the grasslands and moist areas along Pandai and Sonha-Pachnad Rivers respectively. A female rhinoceros came to the western portion of VTR from Chitwan in March 2011 and got poached. Carcass of the animal

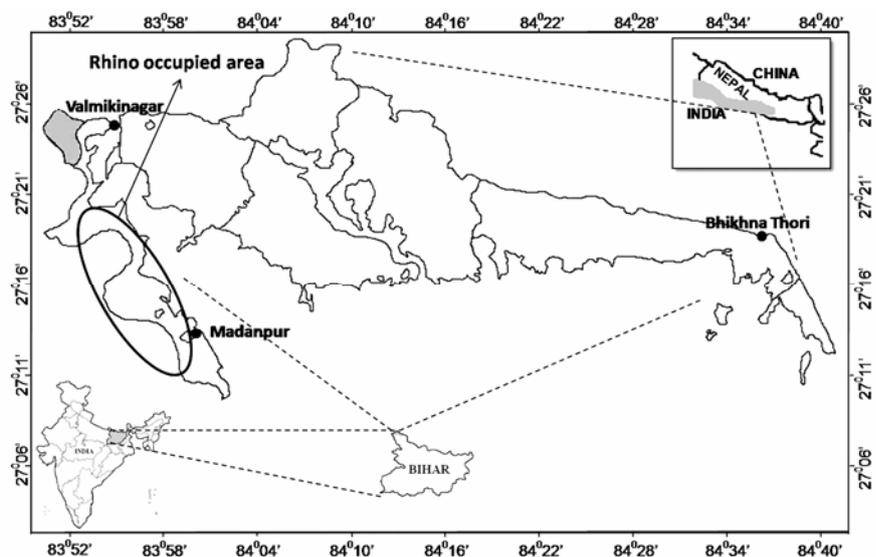


Figure 2. Map showing location of Valmiki Tiger Reserve and rhinoceros-occupied area.

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was recovered in May 2011 in Valmikinagar Range of VTR. Cases of crop raiding by the rhinos in Madanpur have been reported by villagers. Initially, there were some human casualties since the villagers were unaware of the behaviour of the rhinos, which used to attack them on approaching closer.

However, naturally settled rhinos along the Gandak floodplain in VTR provide an interesting case of species occupying its historic distribution range as a result of natural forces. This newly settled population needs to be managed for long-term conservation of the species in the landscape. Based on the ecological conditions and anthropogenic influences, the IUCN Rhino Specialist Group and the Rhino Sub-committee of the Indian Board for Wildlife suggested Dudhwa National Park (UP), Jaldapara (West

Bengal), Intaki (Nagaland), Lalighabri Sanctuary (Arunachal Pradesh) and Champaran forest (which is restricted to the present VTR area) in Bihar as potential areas for re-introduction of the one-horned rhinoceros in India. Based on this, rhinos were re-introduced in Dudhwa National Park in 1984–85 (ref. 6). Strengthening of the recently established population through translocation of rhinos from other populations in Northeast India, providing adequate protection to the species and its habitat, and taking measures to reduce its conflict with human beings would be helpful in long-term conservation of the species in its new-found home in VTR.

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An exposition on environmental ethics

In 1854, when the environmental ethics was not yet conceived, Chief Seattle in his letter to the then President of the United States of America penned warnings as environmentally pensive and poignant as any uttered in the 150 years since: 'continue to contaminate your bed and you will one day lay in your own waste'.

More than 150 years later today, Chief Seattle's words echo in every Superfund site, landfill and oil spill. Public opinion has swung to the greenside and a new ethics known as 'environmental ethics' has evolved. Recently, with the environmental movements gaining strong ground all over the world, the concept of common good has expanded and been emphasized. Specifically, it lies at the heart of determining if an action is ethical.

'Ethics' in fact is defined as the science of human duty – the moral science; it expresses the basic principles of right action. 'Environmental ethics' thus means the principles of right action to sustain the environment in its pristine state.

Historically moral theories and philosophies have governed ethics. Also, historically ethics can be grouped into one of the following as it has expanded and emphasized (not a new ethic at all): (i) Utilitarianism focuses on good consequences for all. (ii) Duties ethics focuses on one's duties. (iii) Rights ethics

focuses on human rights. (iv) Virtue ethics focuses on virtuous behaviour.

The modern mainstream involves two facets of environmentalism: Pure environmentalism for its own sake and Environmentalism for humanity's sake.

Both share a concern for the well being of the natural world, but there are fundamental differences between the two: (a) Environmentalism for its own sake is primarily ecological – 'A thing is right when it tends to preserve the integrity, stability and beauty of the total biotic community (redefining community to include non-human habitats of the land) and the existing landscape which includes the "land ethic".' (b) Environmentalism for humanity's sake displays the inherent egocentric attitude of human kind. Thus, it is secondarily ecological.

What is needed is a widespread adherence to a perfectly familiar ethic, already defined. However, it is important to continuously remind ourselves that the major sources of ecological disasters, apart from ignorance are greed and shortsightedness, having no concern for the biotic community and the elements of nature.

The mainstreaming of the environment is, however, not by any means worldwide. The countries in which the greatest impact has been felt are the most industrialized countries. Actually industrial-

ization itself has been crucial to the development of the environmental movement. Not only do its environmental problems and pollution create concern, the citizens of the industrialized nations enjoy lives with the luxury of free time and options necessary to be able to devote themselves to such a concern. In poorer communities, the struggle of everyday survival far outweighs any aesthetic concern for the environment. Abraham Maslow's (in Barbour¹) concept of a 'hierarchy of needs' can be applied in explaining the difficulty of establishing the environmental movement in poor countries. However, the exponential increase in population in the said communities and countries is a serious add-on problem. The questions sometime do arise in this context, whether a sense of ethics can be instilled into the minds of the poorer section of the human world. On the basis of five levels of need in the hierarchy of needs for every human being, the corporate social responsibility (CSR) concept in poor countries may be accommodated. The five levels of need in the hierarchy from the bottom to top are: (i) Survival (physiological needs): food, shelter and health. (ii) Security (safety needs): protection from danger and threat. (iii) Belonging (social needs): friendship, acceptance and love. (iv)