

Mangroves reduced storm death toll

Chris Emery

Mangrove forests saved lives by shielding villages from the storm surge of a deadly super cyclone that hit the eastern shores of India in 1999, according to a new study (*P Natl Acad Sci USA* in press).

The storm made landfall on October 29, killing nearly 10 000 people, more than 70% of whom drowned in the storm surge. By comparing the number of fatalities in villages protected by mangrove forests to those in villages where mangroves had been removed, the researchers estimated that the death toll would have been nearly three times higher if the mangroves had not been there.

"We have robust evidence that mangroves save lives during storms", says Jeffrey Vincent, a professor of forest economics and management at Duke University (Durham, NC). "When you lose these forests, you lose the protection they provide." Mangrove forests are composed of trees and



Mangrove forest in Bhitarkanika National Park, India.

shrubs that grow in brackish coastal swamps in the tropics and sub-tropics. Their dense root systems form a woody mesh that blunts the physical impact of storms by absorbing the energy of the waves as they hit coastal areas.

Vincent worked with Indian researchers from the University of Delhi to estimate the width of mangrove forests along the Indian coastline, using satellite photos taken just before the storm. Using US Army maps from World War II to determine which settlements were historically protected by mangroves, the scientists found that, in many places,

mangrove forests had shrunk – or disappeared altogether – as they were replaced by croplands. In 1944, for example, villages in the Kendrapada District were protected by, on average, 3.2 miles (~5.1 km) of mangrove forest growing between those communities and the sea; the average width of the Kendrapada mangroves has since shrunk to three-quarters of a mile (~1.2 km).

Vincent cautions that the study does not speak to whether mangroves provide protection during a tsunami – a topic that's been heatedly debated since the 2004 Indian Ocean tsunami – but he believes that these results show that, in addition to economically important roles as fish breeding grounds, fish nurseries, and sites for ecotourism, mangroves provide physical protection to villages during storms. "They are pretty amazing forests", remarks Vincent. "There are a variety of species that grow in them, some in the saltwater and others farther upstream. People want to come and see them. And now we've shown that they can also save lives." ■

Assam rhino population on the rise

Dinesh C Sharma

Populations of the greater one-horned (or Indian) rhinoceros in India's Kaziranga National Park have increased from 1885 animals in 2006 to 2048 as of April of this year, according to a census carried out by Indian state wildlife and forest authorities, in conjunction with the non-governmental organizations (NGOs) Aaranyak (Guwahati, India) and World Wildlife Fund-India (New Delhi). These efforts were in accordance with proposals by the Asian Rhino Specialist Group of the International Union for Conservation of Nature and Natural Resources (IUCN, Gland, Switzerland), which suggested conducting censuses every 3 years instead of every 6 years, so as to better understand rhino popula-

tion dynamics and trends.

Although researchers believe that rhino numbers are increasing primarily because of growth in the Park's breeding population – a result of sustained conservation efforts – Bibhab Kumar Talukdar, a coordinator with the Asian Rhino Program of the International Rhino Foundation (Yulee, FL), suggests that it also reflects a decrease in poaching within Kaziranga. As a result of human encroachment, much of the preferred habitat in the region has been converted to cropland, pushing existing populations into isolated sites, which are more prone to poaching. Aaranyak, with help from international NGOs like the David Shepherd Wildlife Foundation (Cranleigh, UK), trained government staff working in Kaziranga and provided radios and solar panels to help protect the rhinos from poachers. It was, says Talukdar, "A perfect blend of

partnership between government departments with local and international voluntary agencies, as well as involvement of local communities in conservation efforts", which has, he adds, "yielded good results".

A conservation project called the "Indian Rhino Vision 2020" aims to build a 3000-strong rhino population, spread across seven protected areas in Assam by the year 2020. In its first phase, 20 animals from Kaziranga and the Pobitora Wildlife Sanctuary will be translocated to nearby Manas National Park. The International Rhino Foundation and the US Fish and Wildlife Service are helping forest department officials to erect an 8-km-long electric fence in Manas, to discourage rhinos (as well as elephants and wild buffalo) from crossing into adjacent farmlands and thereby coming into conflict with local communities. ■