



# Global lessons from successful rhinoceros conservation in Nepal

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## Introduction

Global populations of rhinoceros (white [*Ceratotherium simum*], black [*Diceros bicornis*], greater one-horned [*Rhinoceros unicornis*], Javan [*Rhinoceros sondaicus*], and Sumatran rhinoceroses [*Dicerorhinus sumatrensis*]) have declined alarmingly, from about 500,000 at the beginning of the 20th century to 29,000 in 2016, largely because of an escalation in poaching for rhinoceros horn (Biggs et al. 2013; TRAFFIC 2016). The current global rhinoceros population is composed of 3 Asian species and 2 African species. In Africa, they occur in South Africa, Kenya, Tanzania, Namibia, and Zimbabwe. In Africa, the southern white rhinoceros population is estimated at 20,700, and there are approximately 4885 black rhinoceroses. The greater one-horned rhinoceros occurs in Nepal and India and has a population of approximately 3555. The other Asian species are confined to Indonesia, and the populations are much smaller: <100 Sumatran and 58–61 Javan rhinoceroses (Save the Rhino International 2016a).

Approximately 5957 African rhinoceroses have been killed by poachers since 2006 (Emslie et al. 2013; Poaching Facts 2016; TRAFFIC 2016). About 1338 of these were taken in 2015, a year in which the highest number of rhinoceroses were poached since the late 1980s (Gaworecki 2016; TRAFFIC 2016) (Fig. 1). At current poaching rates, Africa's rhinoceros populations may be extinct within 20 years (Di Minin et al. 2015). Habitat destruction, poaching, and inbreeding (Save the

Rhino International 2016b) have driven Sumatran and Javan populations to the brink of extinction.

In sharp contrast, populations of the greater one-horned rhinoceros in Nepal and India are increasing, providing a source of optimism for rhinoceros conservation. Numbering only 200 individuals in the late 19th century, the combined Indian and Nepalese population of this species has increased 17-fold (Talukdar et al. 2008; Subedi et al. 2014; WWF 2016a). In India, 4 key protected areas (Manas, Orang, Pobitora, and Gorumara) had zero poaching in 2015, and poaching in Kaziranga National Park, Assam, home to over 2401 individuals, also dropped to a historic low in 2015 (Lopes 2014; Das et al. 2015; Esterman 2016; WWF 2016b). Rhinoceros conservation has been particularly successful in Nepal, where in 2016 the government announced its fourth year of zero poaching (Acharya 2016) and a 21% increase in the population (from 534 in 2011 to 645 in 2015) (DNPWC 2015). We believe that the 2 primary factors in the success of rhinoceros conservation in Nepal are institutional and legislative changes that allow strict enforcement of laws and effective involvement of local communities in rhinoceros conservation. Nepal's experiences may provide lessons for rhinoceros conservation elsewhere.

## Institutional and Legislative Changes

Nepal has adopted tough penalties for poaching and has streamlined its judicial system in relation to poaching

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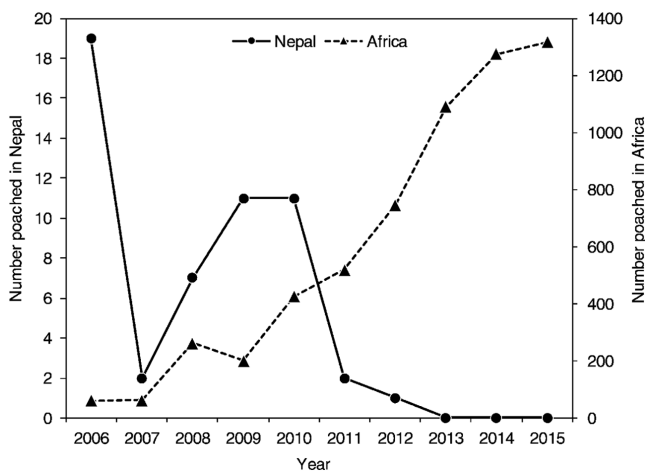


Figure 1. Number of rhinoceroses poached in Nepal and Africa from 2006 to 2015.

and wildlife crimes. Park authorities now have special judicial powers, including the power to issue fines to and imprison people committing crimes against wildlife (Acharya & Kandel 2012; Martin et al. 2013). The changes in conservation policy have resulted in increased arrests of alleged rhinoceros poachers, faster prosecution of cases, and hence much more effective and efficient control of rhinoceros poaching. In contrast, the number of rhinoceros-poaching arrests in South Africa has declined from 2010 to 2013 (Mongabay 2016). In Mozambique, there are no strict penalties for rhinoceros poaching or possession of rhinoceros horn, and poaching is considered as a misdemeanor (Save the Rhino International 2016c).

Nepal also established the National Wildlife Crime Control Coordination Committee (NWCCCC) in November 2010 and a centralized wildlife-crime control bureau that includes 16 district-level offices (DNPWC 2013; WWF 2015). The NWCCCC has facilitated, coordinated, and improved the sharing of intelligence concerning poachers and smugglers and implemented on-the-ground anti-poaching operations and law enforcement. This has allowed the Nepalese police to infiltrate criminal networks, resulting in the arrests of over 2400 people under Nepal's National Parks and Wildlife Conservation Act of 2009 (DNPWC's official record 2016). Similarly, the government has established the South Asia Wildlife Enforcement Network to control transborder poaching problems.

## Community Involvement

The involvement of military personnel, training, technologies, and partnerships in conservation efforts is often criticized (Lunstrum 2014). This so-called green militarization has in the short term lowered the intensity of poaching in high-pressure areas in India (Duffy 2014). In

Nepal, local community members are working alongside the authorities in anti-poaching efforts to great effect because locals perceive the benefits of conservation to their communities. Nepalese park authorities give about 33% of park income to adjacent communities. Local management committees expend these monies for conservation and development initiatives (DNPWC 2014).

In South Africa, government programs and social services in areas (e.g., Kruger National Park) where rhinoceroses remain abundant are lacking and the relationship between local people and the park authorities can be acrimonious (Froelich 2016).

## Challenges

Despite Nepal's success in combating poaching, rhinoceros populations continue to be threatened by an increasing human population, unabated habitat loss, and rapid infrastructure development in and around rhinoceros habitat. In 2001, the government implemented a corridor-management program, Terai Arc Landscape (WWF 2002), to support habitat connectivity for rhinoceros and tiger *Panthera tigris* populations, but the effectiveness of these corridors remains unknown.

Rhinoceroses in Nepal and India are also threatened by invasive bittervine (*Mikania micrantha*), which has reduced the quality of rhinoceros habitat. This weed has rendered 44% of former rhinoceros habitat in Nepal unsuitable (Murphy et al. 2013) and has forced rhinoceroses to move outside protected areas, where there is a risk of conflict with humans. As recently as 2015, one woman was killed by rhinoceros and recorded many incidents of crop raiding (Jack 2015; Nagarik News 2015). Reduced connectivity between rhinoceros populations has led to inbreeding and reduced genetic diversity. Attempts to address this problem by translocating animals from Chitwan National Park, where most Nepalese rhinoceroses occur (605) (DNPWC 2015), to Bardia National Park have not been successful, largely due to a breakdown in the capability of government conservation agencies during a period of political instability (1996–2006). From 1986 to 2003, 87 animals were translocated to Bardia. By 2006, large numbers of rhinoceroses had been poached; 37 were lost in 2002 alone. A recent census recorded only 29 individuals in Bardia (DNPWC 2015; Miya & Khatiwada 2016).

## Conclusions and Lessons for Global Rhino Conservation

The first of 4 zero-poaching years for rhinoceros in Nepal, 2011 was a landmark in Nepal's conservation history. Three additional years of zero poaching are a remarkable record considering the global increases in poaching and

illegal trade. Multiagency partnerships that include local communities; effective coordination, communication, and leadership at a central level; and strong legislation and effective enforcement are key aspects of Nepal's successful approach to rhinoceros conservation. These strengths are furthered by the communication of positive outcomes of wildlife conservation to local people and by their active involvement in conservation.

There is a clear need for a collaborative international approach to stop poaching of rhinoceroses and the trade in rhinoceros horn by enforcing national and international laws, sharing intelligence and experiences, fostering transborder planning, and linking existing initiatives. Although the political and conservation contexts may differ between Asia and Africa, rhinoceros-range countries on these continents share the responsibility for conservation of these iconic animals.

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