

HOSTED BY



ELSEVIER

Contents lists available at ScienceDirect

Journal of Asia-Pacific Biodiversity

journal homepage: <http://www.elsevier.com/locate/japb>

Original article

Population structure, behavior, and current threats to the sarus crane (*Grus antigone antigone*) in NepalKamal Raj Gosai^a, Tej Kumar Shrestha^a, Samuel D. Hill^b, Surya Man Shrestha^a, Bigya Gyawali^a, Daya Nidhi Gautam^c, Achyut Aryal^{c,d,*}^a Department of Environmental Science, Khwopa College, Tribhuvan University, Kathmandu, Nepal^b Institute of Natural and Mathematical Sciences, Massey University, Auckland, New Zealand^c Waste Management New Zealand Limited, Auckland, New Zealand^d School of Life and Environmental Sciences, Faculty of Science, The University of Sydney, Sydney, Australia

ARTICLE INFO

Article history:

Received 5 March 2016

Received in revised form

8 June 2016

Accepted 17 June 2016

Available online 25 June 2016

Keywords:

behavior

habitat

Nepal

nesting

Rupendehi District

sarus crane

ABSTRACT

The sarus crane (*Grus antigone antigone*) is listed as “vulnerable” in the International Union for Conservation of Nature (IUCN) Red List of Threatened Species. Sarus cranes are distributed in the lowlands, but most live outside protected areas, especially in agricultural areas and wetlands of Nepal. The continuous expansion of agricultural land and the reduction of wetland habitats pose the greatest threats to the conservation of the species. We studied the sarus crane in the Rupandehi District of Nepal to understand their population structure, behavior, and current threats. We used the line (i.e., road) transect method from August 2013 to February 2014. The study area contained 147 sarus cranes. Agricultural land and wetland areas contained the highest number of sarus cranes. Our analysis showed that the population of sarus crane in the area has declined since 2007. Most sarus cranes lived in pairs. A single flock contained 13 cranes at maximum. Sarus crane behavior was not significantly different before and after the breeding seasons. Human–sarus crane conflict began when cranes started utilizing agricultural areas. The main threats to the hatching success and survival of sarus cranes in the Rupendehi District are egg theft and the hunting of cranes for meat. The findings of this study establish baseline information on the overall conservation status, habitat availability, and ecological behavior of sarus cranes in the district. We propose regular surveys to monitor sarus crane population levels in the face of multiple anthropogenic threats to their survival.

Copyright © 2016, National Science Museum of Korea (NSMK) and Korea National Arboretum (KNA). Production and hosting by Elsevier. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Introduction

The sarus crane (*Grus antigone*) has been listed as “vulnerable” in the International Union for Conservation of Nature (IUCN) Red List of Threatened Species. Approximately 8,000–10,000 individuals of the antigone subspecies inhabit Nepal, India, and Pakistan (Birdlife International 2012). However, the population is declining (Archibald et al 2003). They are sociable birds (Lloyd and Mitchinson 2009) and large flocks exist, especially during the breeding season (Johnsgard 1998). Sarus cranes have evolved to inhabit wetland areas and will predominantly nest in marshlands (Ali and Ripley 1983; Gole 1989; Latt 2001; Walkinshaw 1973). Nests are typically composed of aquatic vegetation and submerged in water. Nests are circular or oblong with a broad base and a

depression in the center (Mukharjee et al 2000). At dawn and dusk only, sarus cranes fly short distances at the tree canopy level between foraging areas and roosting sites (Ali and Ripley 1969).

With regard to potential threats to sarus cranes in Nepal, few studies have described the impact of human activities on the sarus crane habitat (Aryal et al 2009; Inskipp and Baral 2010). Studies have recommended enhancing conservation awareness within local communities around important sarus crane breeding sites (Aryal et al 2009; Sundar and Choudhary 2003), increasing the number of smaller wetlands (Archibald et al 2003), encouraging farmers to protect nests (Khacher 2006), and establishing baseline data on sarus crane ecology (Sundar et al 2000). However, there are limited studies focusing on habitat utilization, nesting, breeding success, and behavior of sarus cranes. In this study, we provide the current status of sarus cranes, their habitat utilization, and the perception of local people about sarus cranes. The findings from this study are expected to establish a baseline on the overall conservation status, habitat availability, and ecological behavior of sarus cranes in an area.

* Corresponding author.

E-mail address: savefauna@gmail.com (A. Aryal).

Peer review under responsibility of National Science Museum of Korea (NSMK) and Korea National Arboretum (KNA).

Materials and methods

Study species

Sarus cranes are distributed in the Terai region in southern Nepal. This region stretches from Shuklaphanta to Chitwan (Suwal and Shrestha 1992). The species is declining in this area because of the deterioration of wetlands (Suwal and Shrestha 1992). Studies suggest that the farmlands of the Rupandehi and Kapilvastu districts are the main areas where sarus cranes breed regularly (Aryal 2004). Jagadishpur Reservoir (also within the Terai region) and its surrounding areas are prime habitats for maintaining viable populations of sarus cranes and other water birds (Aryal et al 2009). The nonbreeding population generally exists in flocks using larger wetlands for roosting, whereas breeding pairs exist in discrete territories with an adequate water supply (Sundar 2009).

Study area

The field study was performed in the Rupandehi District in western Nepal (Figure 1). The elevation in this area ranges 95–1,219 m above sea level. The study area primarily consists of forests,

grasslands, wetlands, and paddy fields. There are also numerous large ponds in the area, including Jagadishpur Reservoir (Aryal et al 2009).

The study consisted of surveys conducted between August 2013 and February 2014. This was followed by detail surveys across a 5-month period. This detailed study coincided with the egg-laying season for sarus cranes. This helped minimize pseudoreplication because the birds remained close to their nests during this time to protect the nesting area and eggs (Aryal 2004).

Population and nest monitoring

We used the “road transect” method to count the sarus crane population. We established 114 transects (1–5 km long each) that covered 23 village development committees (VDCs) in Rupandehi District. Any sarus crane observed with the naked eye and/or with binoculars within 1,000 m on either side of transects were recorded. The sex, number of birds, presence/absence of juveniles, number of nests, habitat type, and potential threats to sarus cranes were also noted. The global positioning system (GPS) coordinates of the location of the sarus cranes were recorded. We also created a prepared distribution map based on these GPS points using ArcMap (version 9.1; ESRI Inc., Redlands, CA, USA).

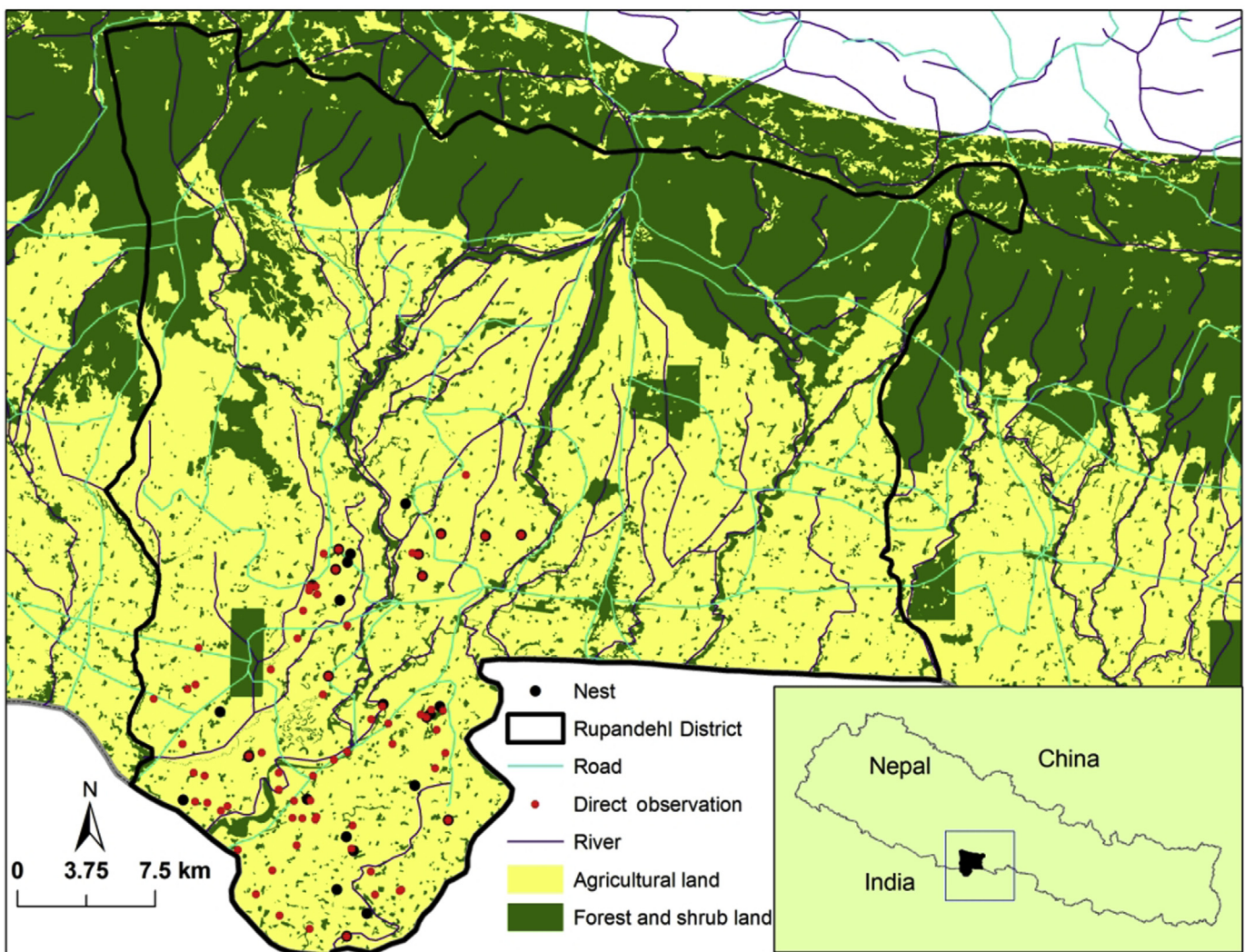


Figure 1. The study areas where sarus crane were directly observed and nest sites were recorded.

Download English Version:

<https://daneshyari.com/en/article/4394925>

Download Persian Version:

<https://daneshyari.com/article/4394925>

[Daneshyari.com](https://daneshyari.com)