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Research Article

Population size and factors affecting the distribution of *Pelecanus philippensis* (Pelecaniformes: Pelicanidae) in Colombo district, the Western province of Sri Lanka

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ABSTRACT

Spot-billed Pelican (*Pelecanus philippensis)* is a near-threatened bird found only in South and Southeast Asia. Colombo, the commercial capital of Sri Lanka, holds a naturalized population of *P. philippensis* released from captive collections of the National Zoological Gardens, Dehiwala. This study was conducted to investigate the distribution of *P. philippensis* and assess its population size in the Colombo district. We measured environmental variables and counted the number of birds foraging in all the water bodies with surface area >0.05Km^2. The rest of the water bodies were also observed to record the presence of pelicans. A roosting count of pelicans was conducted from April to December 2020 to assess their population size. *P. philippensis* was distributed in 14 lentic water bodies within the Colombo district and its minimum estimated population size was 193 individuals. Land-use patterns around the water body did not significantly impact (P>0.05) the distribution of pelicans. They were not recorded in water bodies with more than 10% vegetation cover. The abundance of *P. philippensis* in foraging sites was positively related to the chlorophyll-a content of the water (P<0.05). As it is the flagship faunal species in Colombo, its conservation needs immediate action from relevant authorities.

Keywords: Spot-billed Pelican, Abundance, Urban, Water bodies, Environmental variables

INTRODUCTION

Pelecanus philippensis (Gmelin, 1789), the spot-billed pelican, is a member of the Pelicanidae family, which includes eight living pelican species. This pelican was once common over much of Asia, including China, Pakistan, India, Nepal, Bangladesh, Sri Lanka, Myanmar, Vietnam, Laos, Thailand, Malaysia, Cambodia, Philippines, and Indonesia, with unconfirmed reports from Maldives, Hong Kong, Taiwan and Singapore (Crivelli & Schreiber, 1984; Stattersfield & Capper, 2000; Birdlife International, 2001; DENR, 2005; Li et al. 2006; Kannan et al. 2008; Gokula, 2011; Kannan & Jeganathan, 2016; Shankar et al. 2019). The current global population of *P. philippensis* is estimated to be 13,000-18,000 individuals and IUCN categorized this species as near threatened because its small population is continued to be declined (BirdLife International, 2017). The only known present-day breeding populations of *P. philippensis* occur in India, Sri Lanka and Cambodia and small numbers in Sumatra and Indonesia (Kannan & Manakadan, 2005; Bellio, Kingsford & Kotagama, 2009; Gokula, 2011; Birdlife International, 2017; Shankar et al. 2019). Kannan (2019) even proposed captive rearing as a conservation strategy because pelicans are extremely sensitive to environmental pollutants and face extinction in the wild.

In Sri Lanka, *P. philippensis* has been found naturally in coastal lagoons, large and small irrigation tanks and salt ponds in the dry zone (Bellio et al. 2009) for hundreds of years. However, the wet zone (Colombo) population was recently established after they escaped from the national zoological garden (NZG), Dehiwala, around the 1970s. The total population *P. philippensis* in Sri Lanka was around 5,000, perhaps overlapping with Sothern Indian population and the estimated breeding population size was fewer than 1000 pairs (Birdlife International, 2001). According to Kannan (2019), the estimated population of pelicans in southern India is almost 2850-3700. In order to introduce conservation measures, more recent data is needed on the population size and distribution of *P. philippensis* in Asia.

Even though their population is slowly declining in other parts of the world, the accidentally introduced *P. philippensis* has thrived for more than 50 years in the highly urbanized areas in the Colombo district. Irrespective of its importance for urban wildlife and its declining numbers in other parts of the world, no systematic study has been conducted to assess the population size and distribution of *P. philippensis* in the Colombo district. Therefore, this study aimed to investigate the environmental factors that affect the distribution and abundance, estimate the population size, and map the distribution of *P. philippensis* in the Colombo district in the wet zone, Sri Lanka.

MATERIALS AND METHODS

Study area:

The present study was conducted in the Colombo district ($6^0 75^{'}$- $6^0 94^{'}$ N, $79^0 82^{'}$- $79^0 94^{'}$ E) in the western province of Sri Lanka. Colombo is the most highly populated district in Sri Lanka and the commercial capital. Colombo district has mild weather conditions with a

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