

# Nesting habitat preference and breeding of Asian Woollyneck (*Ciconia episcopus*) in Nepal

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April 13, 2021

## Abstract

Background: Asian Woollyneck *Ciconia episcopus* is large wading bird whose conservation status has been recently down-listed, despite a lack of general knowledge on its nesting ecology and breeding success. Thus, in this study we conducted the most comprehensive survey on the nesting ecology of this species to date. Methods: We located 39 nesting sites across 18 districts of Nepal and recorded nest tree characteristics for the nine tree species they nested in. We also used Maxent modelling to further understand factors important for nesting habitat suitability and to identify new areas for future surveys. Results: They most commonly nested in Simal *Bombax ceiba* (n =21), followed by Sal *Shorea robusta* (n=6) and Salla *Pinus roxburghii* (n=4). The mean height of the nesting tree, nest height and tree diameter were  $29.8 \pm 5.8\text{m}$  ( $\pm\text{SD}$ ),  $1.03 \pm 0.35\text{m}$  &  $25.3 \pm 5.8\text{m}$  respectively. Nesting and fledging success were additionally recorded from 31 nesting attempts at 19 of these nesting sites between 2016 and 2020. Woollyneck had an estimated nesting success probability of  $0.81 \pm 0.07$  and a mean fledging success of  $1.94 \pm 0.25$  ( $\pm\text{SE}$ ) chicks per nest. MaxEnt modelling identified a total potential suitable nesting habitat area of 9.64 % (14228km<sup>2</sup>) of total area in Nepal, with this located within 72 districts (out of 77), mostly in the western part of Nepal. The modelling parameters suggest that slope, land-use, precipitation and forest were important determinants of nesting habitat suitability. Conclusions: The most likely district reported by the model for Woollyneck nesting habitat has not previously reported nests which suggests additional survey effort in this region is warranted. We recommend that priority should be given to conserve taller trees close to settlements and cropland, and future studies should consider the potential impact of climate change on nesting suitability of this species.

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