

Short Communication

First census of the white-shouldered ibis *Pseudibis davisoni* reveals roost-site mismatch with Cambodia's protected areas

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Abstract The population size of the Critically Endangered white-shouldered ibis *Pseudibis davisoni* has always been poorly known. The first-ever census across Cambodia in 2009–2010 using simultaneous counts at multiple roost sites found substantially more birds than previously estimated, with a minimum of 523 individuals. The census allowed us to make a revised global population estimate of 731–856 individuals, increasing hope for the species' long-term survival. However, the largest subpopulations are imminently threatened by development and c. 75% of the birds counted in Cambodia were outside protected areas.

Keywords Cambodia, population estimate, protected area, *Pseudibis davisoni*, traditional management, white-shouldered ibis

Cambodia is a stronghold for threatened biota in South-East Asia (CEPF, 2007), with a protected-area system covering 31% of the country's land area (FAO, 2010). However, with status and distributional data lacking for much of Cambodia's wildlife (Neou, 2004), protected areas may not provide adequate coverage for certain key species, a common problem elsewhere (Brooks et al., 2004; Rodrigues et al., 2004; Beresford et al., 2010). The first ever census of the Critically Endangered white-shouldered ibis *Pseudibis davisoni* reveals a new instance of this issue.

Considered one of the most threatened waterbirds in Indochina (BirdLife International, 2001), the white-shouldered ibis was widespread in the region until the 20th century. Now confined to Cambodia and adjacent southern

Laos, plus one river in Indonesian Borneo (BirdLife International, 2011), in 2000 it was categorized as Critically Endangered, with the population assessed at only 330 mature individuals in 2010 (BirdLife International, 2011). Four major subpopulations were identified in Cambodia as biodiversity surveys achieved greater coverage of the country (BirdLife International, 2006; Timmins, 2008). However, population assessments remained informal, with no previous coordinated censuses.

In 2009 we implemented the first coordinated census to quantify subpopulations throughout Cambodia. White-shouldered ibises are solitary dry-season breeders, becoming gregarious in the wet season (July–October) when they roost together in trees. Simultaneous wet-season roost counts can therefore provide minimum population numbers. We located roosts in and around the four sites known to hold most ibises: Kulen Promtep Wildlife Sanctuary, Lomphat Wildlife Sanctuary, the central section of the Mekong River between Kratie and Stung Treng towns, and Western Siem Pang Important Bird Area (Fig. 1). Although complete coverage of these sites (totalling more than 960,800 ha) could not be achieved, all locations known or believed to hold important numbers of ibises were prioritized and intensively searched with assistance from local informants.

Nine coordinated counts took place over July–December 2009 and July–October 2010 at approximately monthly intervals. Observers remained a suitable distance from roosts to avoid disturbance, although this prevented distinguishing immatures from adults. Knowledge of roost locations steadily improved (from 18 in July 2009 to 39 in October 2010), making the counts increasingly comprehensive.

The largest total count was 523 in October 2010, the final census; however, few additional birds were accumulated in the final three censuses. Despite only including four areas, this new minimum number exceeds the global population estimates of 330 mature individuals (BirdLife International, 2011) and < 500 individuals of all ages (Timmins, 2008). However, 74% of the ibises were at roosts outside the boundaries of protected areas. Western Siem Pang and the central section of the Mekong River, currently unprotected, together accounted for 58% of the ibises censused. At Lomphat 46% of birds were at roosts outside the demarcated Sanctuary.

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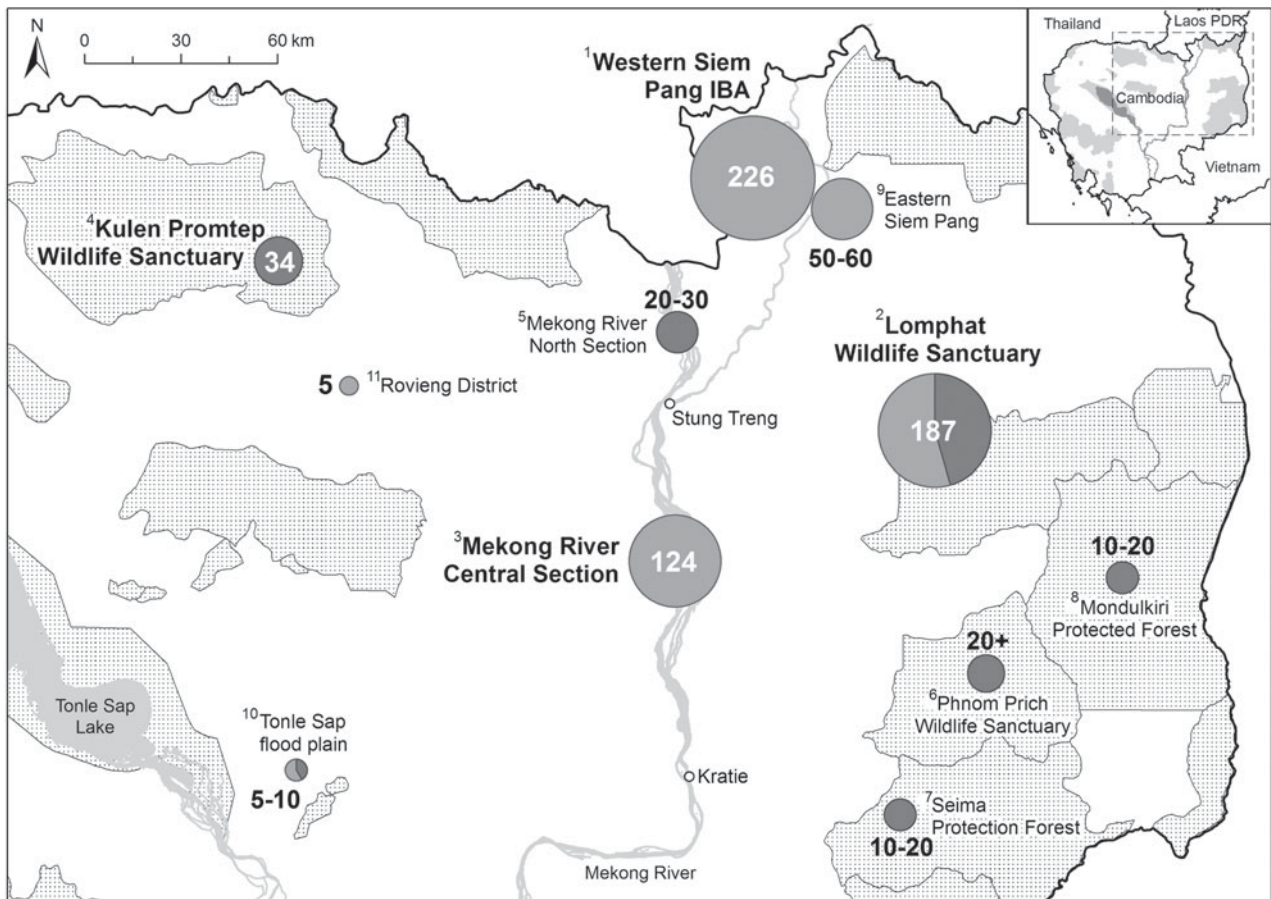


FIG. 1 Known white-shouldered ibis *Pseudibis davisoni* subpopulations in Cambodia and their recorded/estimated size. Pie-charts are scaled to population size and show percentage of birds occurring within protected (dark grey) and unprotected (pale grey) areas. Figures inside pie-charts were obtained from roost counts, figures beside are estimates. Stippled polygons represent protected areas. Rectangle on inset indicates the location of the main map. ¹Roost count September 2010; ²roost count October 2010; ³roost count October 2010; ⁴roost count September 2010; ⁵Timmins (2006); ^{6,8}T. Gray pers. comm., 2011; ⁷Bird et al. (2007); ⁹H. Wright, unpubl. data; ^{10,11}Wildlife Conservation Society, unpubl. data.

Peak site counts provide a preliminary indication of the relative size of the four subpopulations (Fig. 1): 226 birds in Western Siem Pang, 187 at Lomphat, 124 on the central section of the Mekong River and 34 at Kulen Promtep. Although these peaks were not obtained simultaneously, all were in September–October 2010. The minimum distance between sites is 47 km, and as yet we have no evidence that the ibises move this far. Count fluctuations within sites appeared unrelated to counts at other sites, being attributable instead to short-distance movements and changes in favoured roosts.

Combining roost census data with estimates for other, smaller populations of white-shouldered ibis, we propose that there is a minimum Cambodian population of 691–736 (Fig. 1). Other populations have not yet been counted accurately but available data (for the north section of the Mekong River) and expert judgement (for Eastern Siem Pang, Mondulkiri Protected Forest, Rovieng district, Phnom Prich Wildlife Sanctuary, Seima Protection Forest and Tonle Sap floodplain) allow estimates to be made.

Given the increasingly comprehensive coverage of biodiversity inventories it is unlikely that further large subpopulations will be discovered in Cambodia. However, fuller coverage of the central section of the Mekong River could potentially reveal 100–200 more birds (R. J. Timmins, pers. comm., 2011) and diffuse, lower-density populations may remain undetected elsewhere, particularly in Mondulkiri and Ratanakiri provinces. These putative populations are not included in our estimates.

The Indonesian population of white-shouldered ibis has been estimated at only 30–100 (BirdLife International, 2011) and is decreasing (Meijaard et al., 2005); with no recent surveys its current size is uncertain. Although no records have come from Laos since the 1990s the proximity of Western Siem Pang to Xe Pian National Protected Area (across the border), plus minimal survey effort at the latter, suggests small numbers could still persist. We provisionally estimate there are 10–20 white-shouldered ibises in Laos. In Vietnam sightings have gone from few to almost none since

the 1990s (R. Craik, pers. comm., 2011). The species is now probably only a non-breeding visitor from Cambodia and thus Vietnam does not contribute to our figures. We therefore estimate a minimum global population of 731–856 birds.

This total is larger than previously estimated, providing hope that the long-term future of the species can still be secured. Nevertheless, these increased numbers reflect improved coverage and rigour of surveys rather than population recovery, and the species is still greatly threatened. Only 25.9–28.4% of white-shouldered ibises occur in legally protected areas in Cambodia; globally the percentage is 25.9–26.8. Western Siem Pang, currently the most important site, is unprotected and plantations will convert the majority of habitat by 2020 (BirdLife International, 2010). Proposed dams threaten Lomphat Wildlife Sanctuary (BirdLife International, 2010) and the unprotected central section of the Mekong River, which also faces encroaching human settlement (Timmins, 2008). With 63–73% of the known global population in three imminently threatened sites and probably continuing declines in other areas, the white-shouldered ibis is still Critically Endangered. Securing the Western Siem Pang and central Mekong subpopulations is now essential.

Given the large proportion of Cambodia already in reserves, the distributional mismatch between white-shouldered ibis roosts and the country's protected area system is unfortunate. Protected area designations have prioritized the least impacted habitats furthest from settlements, whereas the ibis requires human-influenced habitats, feeding in seasonal pools grazed by livestock and in traditional agricultural fallows (Wright et al., 2010a,b). If establishment of further protected areas are not possible, then special management zones (integrating human use and biodiversity protection) and conservation concessions, not yet attempted in Cambodia, could provide alternatives.

However, the white-shouldered ibis is not the only threatened species inadequately served by Cambodia's protected areas. The Critically Endangered *Gyps* and *Sarcogyps* vultures and Bengal florican *Houbaropsis bengalensis* also have close association with humans through traditionally managed habitat and resources (Houston, 1996; Gray et al., 2009). Such habitats and resources will be the first to deteriorate with economic development, putting these species at great risk of extinction. With the intensification of agriculture and expansion of cash-crop cultivation already a major threat in Cambodia, as across much of Indochina (CEPF, 2007), such species urgently need attention to ensure their survival.

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Biographical sketches

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