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*Pacific Conservation Biology*

### Supplementary Material

#### **An extralimital *Ixobrychus* record from the Solomon Islands**

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**Figure S1.** Photo of unidentified *Ixobrychus* bittern on Tetepare Island showing black primary flight feathers. The colour of the primaries was an important identification feature.

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### Subject bird plumage notes

#### *Upperparts/head*

Crown feathers are black, with light rufous margins, extending to hindneck. Ear coverts are finely spotted, with lower cheek mostly rufous to buff. Black chevrons commences on upper part of hindneck and upper scapulars, becoming fine and pointed towards wing coverts. Buff tertials and black primaries are visible when stationary. Primaries are all black in flight, with no pale margins.

Lore skin is light green/yellow. Upper mandible has a black dorsal ridge, green edge. Lower mandible colour was difficult to determine in field.

#### *Underparts*

Breast is light rufous, with fine spots/streaks extending from throat to upper belly (streaking may extend further, however, was not visible in field). Legs are dark yellow/green, possibly darker on shins than hindleg.

#### *Other*

The subject bird is considered to be immature, based on plumage similarities with other *Ixobrychus* species, and features including pale margins on black crown feathers and chevrons. Plumage is unique, regardless of life history stage, with no direct comparison to any currently described *Ixobrychus* species.

### Hybridisation notes

The possibility of the subject bird being the result of hybridisation has been considered, though is thought to be unlikely. If an immature bird, this would suggest a bird of local origin. *Ixobrychus flavicollis* and *I. sinensis* breed in the region and overlap in parts of Southeast Asia, however hybridisation between these species has not been reported. Furthermore, plumage of the subject bird does not appear to be intermediate between these two species. Prominent chevrons on the upperparts is a unique feature, with no known *Ixobrychus* species displaying such a feature (pers. Comm. G. Dutson and R. Hutchinson 2024). Feathers in the subject bird are not worn, ruling out a moulting phase as an explanation for this plumage (Jenni and Winkler 2020). Hybridisation among other *Ixobrychus* species in northern Asia has apparently resulted in intermediate features on wing coverts (Gamova *et al.* 2022). Comparison to other *Ixobrychus* species that occur in Southeast Asia and the South Pacific is provided below.

*Ixobrychus cinnamomeus* has a broad distribution from Pakistan east to Japan and south to Indonesia. The nearest record is from Jayapura, Indonesia, 1,900km northwest of Tetepare (eBird 2023).

*I. cinnamomeus* displays limited similarities with the subject bird. Immature *I. cinnamomeus* lack any chevrons, rather have mostly brown scapulars with pale patterning over wing coverts. Adults are a uniform cinnamon/buff. Adult and immature *I. cinnamomeus* have complete cinnamon-coloured primaries. The subject bird has all black primaries.

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*Ixobrychus eurhythmus* has a patchy distribution from eastern Russia, south to Indonesia, with vagrant records south to Christmas Island. The nearest record to Tetepare is approximately 3,900km west, on Sulawesi, Indonesia (eBird 2023).

*I. eurhythmus* may be considered superficially similar, however distinct differences are present in immature plumage including pale spotting across the scapulars and wing coverts, while adults are uniform brown with pale wing coverts. Neither plumage displays any chevrons. A solid black crown is present in both immature and adult birds, while the subject bird has pale margins on black crown feathers.

*Ixobrychus dubius* is found across Australia and into Papua New Guinea. This species is generally pale in immature plumage, while adults display an eponymous black back. Neither adult or immature birds have chevroned plumage, nor dark streaking on the throat.

*Ixobrychus flavicollis* is generally dark in both immature and adult plumage, with no prominent chevrons in either phase. Immature birds have light brown to dark legs, while adults have dark grey to black legs. The subject bird has dark yellow/green legs. Generally light upperparts on the subject bird are in stark contrast to *I. flavicollis* in both immature and adult stages.

*Ixobrychus sinensis* is generally pale in both plumages, with limited patterning. Immature birds display darker brown feathers on wing coverts than adult birds. Chevrons are not present in either stage. Immature birds have brown streaking on the throat, adults have pale vertical striping on the throat.

Other *Ixobrychus* species are present beyond Southeast Asia and the Pacific region, however, do not have plumage features that align with the subject bird and have therefore not been considered further here.

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### Supplementary material references

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