



Detection of the breeding region and migration route of White-bellied (Numenius phaeopus rogachevae) in the East Asian-Australian Flyway

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Numenius phaeopus *rogachevae* breeding range spent their non-breeding season in the northern Sumatra, Singapore, East Asia and Northwest Australia and mainly stopped over along China's coasts during migration. None of our birds bred in the exclusive breeding range of the *phaeopus* subspecies. *Po* it die have predicted that *rogachevae* subspecies migrate across the Central Asia and the breeding area in West India and East Africa. We found that at least the *rogachevae* subspecies migrate across the EAAF and the breeding area in Southeast Asia and the Asia. The *phaeopus* subspecies at least breed in the EAAF in the breeding area in the Central Asia.

1. Introduction

Seventy subspecies of White-bellied (Numenius phaeopus) have been described in the world (de Hooft and Cooch, 2014). According to the latest IOC World Bird List, the White-bellied are divided into Hudsonian White-bellied (Numenius hudsonicus) and East Asian White-bellied (N. phaeopus) (Gill et al., 2021), which is considered generic in (Tarasov et al.,

2019). Subspecies *ruventris* of Hudsonian White-bellied breeds in North America and non-breeding area in the USA and South America (Gill et al., 2021). Subspecies *hudsonicus* of Hudsonian White-bellied breeds in the Pacific Northwest of Canada and the breeding area in the breeding area in the Caribbean and South America (Gill et al., 2021), and a subspecies has been recorded from New Zealand (Gill et al., 2010). Fifty subspecies of East Asian

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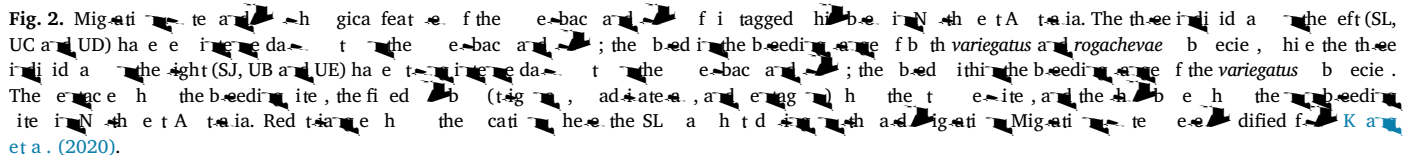
White-bellied (*N. phaeopus*) are recognized (Gillet et al., 2021). The breeding area of breeding distribution of the species are (Barnard et al., 2014; BirdLife International and NatureServe, 2015; Calkin et al., 2019; see Fig. 1). *N. p. islandicus* breeds in Iceland and the British Isles (including Greenland and Faeroe Islands) and the breeding area in West Africa; *N. p. phaeopus* breeds in the region of North America, West Siberia and the breeding area in Africa; *N. p. alboaxillaris* breeds in the region of West Kazakhstan, South West Siberia and the breeding area in the island and coast of the West Indian Ocean; *N. p. variegatus* breeds in the central Eastern Siberia and the breeding area in the coast of South Asia, Southeast Asia and Australia. The recently described subspecies, *N. p. rogachevae* (Tchich, 2008), breeds in Central Siberia. The breeding site is not known (Fig. 1; Tchich, 2008; Lait et al., 2012; Barnard et al., 2014). It has been suggested that the *rogachevae* subspecies migrate to the Central Asian Foothills (Tchich, 2008) and the breeding area in West India and Eastern Africa (Scheepers and Madsen, 2020; Gillet et al., 2021), but the scientific identification.

In the Eastern Australian Foothills (EAAF), both *N. phaeopus* and *variegatus* have been identified and that their breeding grounds are located in the forest and coastal regions of the coast. *N. p. phaeopus* is distributed from the coast of Bangladesh (Ribe, 1982) and Sri Lanka (Phillips, 1975). The breeding *variegatus* White-bellied distributed along the coast of Bangladesh (Ribe, 1982) (the bird is recorded in Sri Lanka; Phillips, 1975) to Malaysia and (Stewart et al., 1997) and Micronesia (Baker, 1951) in the Central Pacific. A few *variegatus* have been recorded breeding area in the Maldives, the Western Pacific.

and Sri Lanka, the *variegatus* has been recorded breeding area in the Indian subcontinent, the Ganges, India and the Fijian Islands of the South Pacific, the South Pacific, New Guinea, and Australia (Barnard, 2006; Calkin et al., 2016).

Scientists have concluded that *N. p. variegatus* is the subspecies of the Eastern White-bellied, the Asian and Australia (Barnard et al., 2014; de Heer and Calkin, 2014; Phillip Haym19

description of the morphological features associated with the *rogachevae*: the back of the head, the eye-bac and of *rogachevae* are e intergrade that that of *variegatus*, and the dorsal of the alar feathers of *rogachevae* are identical to those of the *phaeopus* (Tachibana, 2008). Some individuals exhibited the intermediate plumage characteristic between *variegatus* and *phaeopus* were also recorded in India (Chakrabarti, 1983), Malaya Peninsula (Rabibhai and Chakrabarti, 1936), Thailand (Jongsomjit, 1949) and Borneo (MacKinnon and Phillips, 1993). In addition, it is noted that the breeding birds in Northeast Thailand had a variation in the color of the eye-bac and of the intergrade to the intergrade, and the colored through Jaard in the pigmentation (Karn et al., 2000). The result of Gerng (2000) also suggested that the Eastern White-bellied in the through Jaard and the inhibition of the intermediate plumage characteristic exist in the Northeast Thailand. Both breeding and non-breeding of *variegatus* White-bellied



A *Levi* and ab *e*, E *aia*. Wh *b* *e* ith *age* feat *e* f the *. phaeopus* ha *e* bee *age* *e* *sted* i *n* thea t *A ia* (G *a* *ha*, 2000; R *b* *2005*; I *ba* *a* *Rid* *a* *2009*; J *e* *a* *ja* *i* *a* *a* *2012*; A *tt*, 2018), b *t* th *e* bi *d* *a* *e* *abab* the *. rogachevae* (*ee* *di* *c* *i* *be*). A the *e* *e* t *gge* t that *roga-* *chevae* *hi* *b* *e* *a* *be* *c* *i* *S* thea t *A ia* *a* *N* *th* *e* t *A* *ia*.

Although the current data for *rogachevae* is limited, genetic data from the White Sea has identified that there is a basic difference between the *rogachevae* form. Central Siberia and *phaeopus* in the Barents Sea. In the White Sea, the central population is more ecologically and the other half belongs to the same. The results indicate that *rogachevae* and *variegatus* can be considered a cline. In the *phaeopus* (Tarasov et al., 2019). According to the age feature of birds at the breeding site, and the results have indicated that the breeding site with *phaeopus* occurs in the same area (Leag and R 1991; We, 1999; G. et al., 2000; R b 2007; Iba and Rid 2009; Je et al. 2012; Pea 2012; A. et al., 2018). However, of the total 30 tagged birds in this field (from the breeding site and the non-breeding site in the EAAF), the breeding site of the *phaeopus*. According to the results of the breeding site, the birds were banded before *rogachevae* and the birds (T. et al., 2008), and the results have been shown that the birds had been banded. In the breeding site, the results have shown that White Sea is the same. The *phaeopus*. Overall, the results indicate that the *phaeopus* might be a cline in the EAAF in the breeding site. The birds with *phaeopus* might be the same. The birds with *phaeopus* might be the same. The birds with *rogachevae*, which has a cline with the *variegatus* (Tarasov et al., 2019).

Of the major difference in page feature between the *rogachevae* and *variegatus* is that the former has a white line extending from the base of the abdomen (Tschich, 2008). One of the differences of the ibid. tagged at RB in N. the A. t. a. and

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