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Original Research Article

Habitat Use of Migratory Shorebirds on the Coastline of Deli Serdang Regency, North Sumatra Province

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ABSTRACT

Mangrove forests an intertidal mudflat in the eastern coastal region of Deli Serdang are important habitats for migratory shorebirds. Land-use change and forest conversion threaten this important stopover point for migrating species. The lack of data and information of shorebirds habitats in this area limits conservation efforts and further threatens the survival of these species. The objective of this study is to investigate trends in habitat use by migratory shorebirds. Field work was conducted during migration season starting from October 2014 until April 2015. The presence of migratory shorebirds was assessed using binoculars and a monocular. Scan sampling was used to describe habitat use by shorebirds. The difference in behaviour among habitat was analyzed using analysis of variance. There were 30 species of shorebirds distributed across seven different habitat types in our study area. The most widely used habitat by shorebirds was mudflats, followed by marshes and plantations. This study revealed that mudflat habitat has high potential in supporting the existence of migratory shorebirds in this area.

1. Introduction

Sumatra is an important stopover site for migratory shorebirds, but the available information is limited to population dynamics and distributional records (Crossland *et al.* 2012; Iqbal *et al.* 2010; Putra *et al.* 2015; Silvius 1988; Verheugt *et al.* 1993). Mangrove forest and intertidal mudflat along the eastern coastline of Sumatra provides habitat for migratory shorebirds is being converted to human land-use (Crossland *et al.* 2009; Putra *et al.* 2015; Silvius 1988; Verheugt *et al.* 1993). Mangrove forests in the North Sumatra province have decreased 85% since 1987 (±200.000 Ha) to 2001 (±31.885 Ha) (Susilo 2007). This trend also occurs in Deli Serdang coastal of North Sumatra Province, which is known as an important stopover region for migratory shorebirds (Crossland *et al.* 2006; Crossland *et al.* 2012; Iqbal *et al.* 2010; Putra *et al.* 2015). Loss of the protective mangrove buffer zone causes environmental changes in mudflat habitats, which threaten shorebird feeding and roosting areas (Green *et al.* 2015). The majority of habitats have been converted into oil palm plantations (Crossland *et al.* 2012; Putra *et al.* 2015), rice fields and aquaculture (Crossland *et al.* 2006). Jumilawaty (2012) identified at least eight habitat types that existed in Deli Serdang, those are mangrove forests (mudflat), marshes, agriculture, plantation, rice fields, fishponds, river banks and settlements.

Observation on shorebird behaviour can reveal how habitat use varies in response to environmental changes (Davis and Smith 1998; De Leon and Smith 1999; Goss-Custard and ditDurell 1990). In this study, we examined habitat use by migratory shorebird in Deli Serdang. The aims of this study were to (1) identify habitat and distribution of migratory shorebirds and (2) identify the use of habitat by migratory shorebirds. Identifying habitat use is an important conservation tool as it allows government and practitioners to build better informed strategies.

2. Methods

This study was conducted during the full migration season in October 2014 until April 2015 on the eastern coastline of Deli Serdang Regency of North Sumatra Province (Figure 1).

Identifying habitat, distribution and abundance of migratory shorebirds. Observations were carried out by exploring and recording the types of habitat used by migratory shorebirds along the eastern coast of Deli Serdang Regency, i.e. mudflats, marshes,

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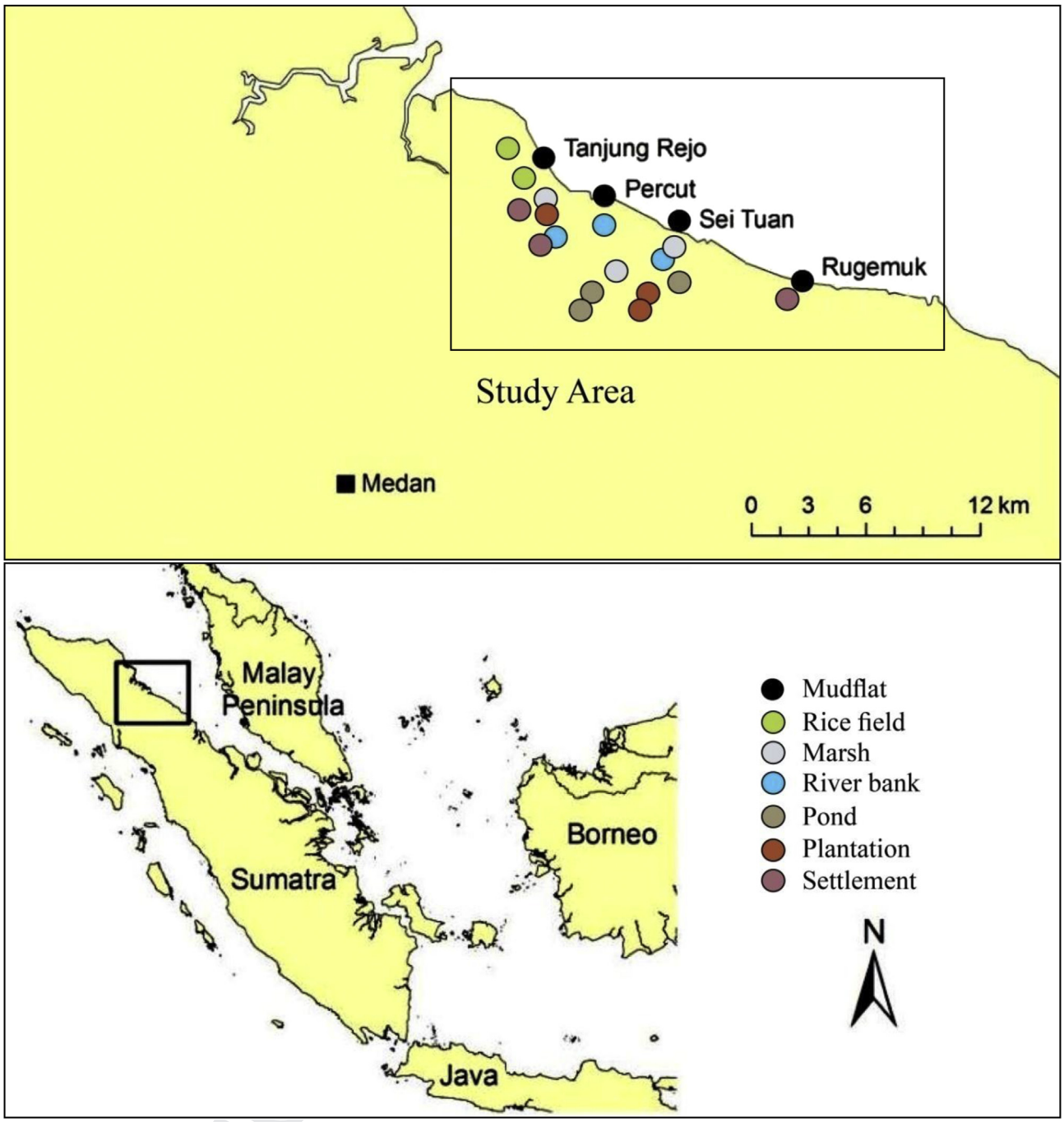

Figure 1. Study area in eastern coast of Deli Serdang, North Sumatera.

plantations, ponds, rice fields, human settlements and river banks (Table 1). Monthly observation was conducted in each habitat for 7 months. Data collected include geographic coordinates, species and number of individuals. The number of individuals was estimated by using "block method" (Howes *et al.* 2003). Scientific name of shorebirds followed Sukmantoro *et al.* (2007).

Habitat use of migratory shorebirds. Monthly observations were carried out on mudflats, marshes and plantations. Data were collected in three periods, early morning (6:00–10:00 h), midday (13:00–15:00 h) and late afternoon (16:00–18:00 h) using scan sampling (Altmann 1974). Recording of behaviour was performed in 1-h interval for 20 min (Burger *et al.* 1997). Behaviour recorded were classified into six categories: 1) feeding (actively feeding by pecking and probing), 2) resting (motionless with bill tucked under wing, head and neck held stationary or eyes closed), 3) alert (standstill with bird visually scanning surroundings), 4) body maintenance (bathing, preening or wing and neck stretching), 5) aggression (chasing, pecking or threatening another individual) and 6) locomotion (wading, walking, running, swimming or flying to another place) (Figure 2). The behaviour categories were based on works by Baker (1971), Davis and Smith (1998), De Leon and Smith (1999).

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