

Comparison of true mangrove stands in Dudepo and Ponelo islands, Gorontalo Utara Regency, Indonesia

FAIZAL KASIM^{1,*}, MIFTAHUL KHAIR KADIM¹, SITTI NURSINAR¹, ZULKIFLI KARIM^{1,2}, ALDIN LAMALANGO^{1,2}

¹ Department of Aquatic Resources Management, Faculty of Fisheries and Marine Science, Gorontalo State University, Gorontalo, Indonesia. Jl. Jenderal Sudirman No. 6, Kota Gorontalo, 96128, Indonesia. Tel./Fax. +62-435-821125, *email: faizalkasim@ung.ac.id

² Gorontalo Coastal Ecological and Spatial Mapping Studies Club (GCESM), Dulalowo, Telaga Jaya, Gorontalo, Indonesia.

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Abstract. This study aims to investigate and compare the current status of mangrove areas, as well as the composition and species diversity of mangrove stands in both regions of Dudepo and Ponelo islands. The results showed that the analysis of mangrove area using the segmentation method on classify image of Landsat-8 OLI (acquisition on September 2017) were 279.46 ha (P.Dudepo) and 113.35 ha (P.Ponelo) respectively. A total of 13 species of true mangrove recorded from both islands, using survey method from a number of 9 transect lines (TL), distance ranging from 40 to 210 meters (1-6 quadrants) per transect. The mean density of trees category was $2133 \pm 329.78 \text{ ha}^{-1}$ (P.Dudepo) and $2111 \pm 234.28 \text{ ha}^{-1}$ (P.Ponelo), while the saplings and seedlings categories were follow: $58 \pm 13.48 \text{ ha}^{-1}$ and $1425 \pm 113.96 \text{ ha}^{-1}$ (P.Dudepo), and $79 \pm 14.51 \text{ ha}^{-1}$ and $2963 \pm 443.22 \text{ ha}^{-1}$ (P.Ponelo). The mean size of diameter and basal area were $19.73 \pm 10.65 \text{ cm}$ and $84.22 \pm 67.67 \text{ m}^2\text{ha}^{-1}$ (P.Dudepo), $17.04 \pm 1.46 \text{ cm}$ and $60.07 \pm 15.12 \text{ m}^2\text{ha}^{-1}$ (P. Ponelo), respectively. The Important Value Index (IVI) ranged between 3.97 - 114.87 (P.Dudepo) and 6.04 - 82.18 (P.Ponelo). The dominant and codominant of important value index (IVI) on both islands recorded on species *Rhizophora apiculata* Blume and *R. stylosa* Griff. The value of diversity, richness, and evenness of mangrove species on both islands are 0.34 - 1.70, 0.48 - 1.18, 0.47 - 0.94 (trees), 0.00 - 1.10, 0.00 - 1.82, 0.00 - 1.00 (saplings), and 0.00 - 1.48, 0.00 - 1.44, 0.72 - 1.00 (seedlings), respectively. A cluster analysis of Bray-Curtis similarity based on the overall value of vegetation measure between stations indicates the difference between Dudepo and Ponelo islands at a value of 0.75.

Key words: Basal area, Bray-Curtis, Diversity, Gorontalo, Mangroves.

Running title: Island's mangrove in North Gorontalo

INTRODUCTION

Until end 2000, the Indonesia's mangrove forest area was estimated of 3,112,989 ha or 22.6% of the total mangroves area in the world (Giri et al., 2011). Therefore, mangrove resources was the important biological wealth of Indonesia's coastal areas. The mangrove forest became a transitional ecosystem in almost all coastal areas in the Indonesian Archipelago, range from Sumatra, Java, Kalimantan, Bali, Sulawesi, Maluku, to Papua island (Kusmana et al., 2003; Rugayah, 2007; Marbawa et al., 2014; Prasetyo et al., 2014; Muhtadi et al., 2016; Setiawan et al., 2017; Wouthuyzen & Ahmad, 2018). Besides occupying the large area, mangrove species in Indonesia is also known has high diversity. Snedaker (1984) noted that there were at least 202 species of mangroves in Indonesia, 43 species (contain 33 species of trees and several types of shrubs) were true mangrove species, the rest were other species that lived around mangroves, known as associated mangroves. The mangroves existence is key to the land and sea transitional ecosystem which provides a variety of benefits either goods or services for most community in coastal areas. Among the essential ecological and economic functions of mangrove forests is that they provide materials needed by people for commercial, recreational, and also fisheries through environmental services as a spawning ground, nursery habitat for the life of marine fauna (Zhang et al., 2007; Giri et al., 2011; Nfotabong-Atheull et al., 2011; Joshi & Ghose, 2014; Hutchison et al., 2014).

Biodiversity of true mangroves in the northern Gorontalo coastal area (in term of species recorded) was reported quite high. Tracking by Kasim et al., (2017) in eastern coast area recorded 19 species, dominated by members of the *Rhizophoraceae* family both genus and species. Meanwhile, two other species in this region which important for global conservation are *Aegiceras Floridum* Roem. & Schult (local name Tongge) and *Ceriops decandra* (Griff.) Ding Hou (local name Posi-posi). The furthermore disclosure of mangrove forests condition is a necessity as part of resource conservation and coastal land management. For Gorontalo – which is geographically laid in the heart of the region of Wallace (Gorlinski 2012; Mano 2016) – the comprehensive disclosure of biodiversity in a wider areas of mangrove distribution could provide the precise choice of further management strategies. In context of mangrove complexity study, the significance of the results will be obtained by excluding the species of associated mangrove into the analysis (Blanco et al., 1999). Hence, in this study,