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VEGETATION STRUCTURE OF SEAGRASS IN SARONDE ISLAND, PONELO ARCHIPELAGO SUBDISTRICT, NORTH GORONTALO DISTRICT, GORONTALO PROVINCE Abstract This research aims to determine the structure and condition of vegetation seagrass beds in the Saronde Island, Ponelo Archipelago Subdistrict, North Gorontalo District. The research activities carried out on November 10 until December 10, 2012. This research is explanatory by using the survey method. Observations were made at three stations, covering 5 plot transects, spaced transects of 10 meters. To obtain supporting data also performed measurements of the physical parameters of water, such as current brightness, depth, temperature, salinity, and substrate type. Analysis was conducted on the composition of vegetation of species, frequency of species, relative frequency of species, density of species, relative density of species, closure of species, relative closure of species, dominance of species, relative dominance of species, diversity index, and the important value index. Research found five types of seagrass, which is Cymodocea serrulata, Enhalus acoroides, Halophila minor, Halophila ovalis, and Thalassia hemprichii. The first station which is located in the north of the island has the highest value for the vegetation analysis of all the research station. Keywords: Vegetation Structure, Seagrass, Saronde Island I. INTRODUCTION The waters of eastern Indonesia, have marine biodiversity is very complex. The high diversity is strongly supported by oceanographic conditions across the region. Globally, the circulation of sea water in this region is part of the trajectory oceanis called oceanic conveyor belt. This trajectory brings warm surface sea water and has low salinity of the East to the West, into the deep waters of the North Atlantic with high salinity and low temperature, then flows from West to East and appeared again in the Pacific Ocean (Susetiono, 2007). This makes the territorial waters of eastern Indonesia has a high biodiversity, including diversity of seagrass because this track brings a number of nutrients needed by marine organisms, including sea grass. . Attention to seagrass ecosystems (seagrass beds) is still very less compared to the mangrove ecosystem (mangrove) and coral reefs ecosystem (coral reefs). Perhaps because of the shape and color of seagrass not beautiful as coral reefs. For most people, seagrass just looks like grass which is not useful. So most people, especially the ordinary people who perform activities on the coast, passing in coastal areas without being aware of the importance of seagrass beds in a coastal ecosystem. While pressure on seagrass ecosystem that serves to hold and bind sediments as well precipitate a solid material to the base so that the water remains clear waters and coral reefs are not covered by sediment is seagrass beds. Seagrass beds also serve to protect coastal areas from threats Saronde Island abrasion and maintain the morphology or shape of the beach as well as a habitat for several species of fish. Saronde Island has a natural beauty, including the beauty of the sea. So that the visitors came and went to enjoy the panorama. However, coastal development plan to boost tourism activities often ignore the carrying capacity of coastal ecosystems. So that such a plan could have potentially negative impact on the presence of seagrass beds in the island. This research aims to determine the vegetation structure of seagrass in Saronde Island waters, and determine the ratio of seagrass vegetation structure of each research station. II. MATERIALS AND METHODS Research activities which basically consists of sample collection, measurement of physical parameters of waters, and the identification of the samples, performed dunng one month, from November 10 December 2012 in me waters of Saronde Island, at Ponelo Archipelago Subdistrict. North Goronlalo District. The u used in this «search is the roll meter, sample plots (plot), relradometer muHiparamater enal)rsis. magnilyrng glass, tins, snorkels. masts, slaSonar, in ,he water, data book camera compass, scope, drawrng «canon ol seagrass which has been laminated, secoh, disk, and plastic bags Observation of the seagrass is done with the line transect technique. Transect line is made by means of a rope stretched first discovered seagrass perpendicular to the shoreline to the seaward extent of coral reefs or no longer found seagrass (Fachrul 2007) In each transect placed sample plots or plots measuring 50 x 50 cm. sample plot or plots are placed at a distance 100m from the shoreline. The distance between the plot is 10 m, the number of plots that can be placed on any transect is not the same, depending on the limits or boundaries of coral reeft where seagrass be found (Fachrul 2007)

Sources	Similarity
Plot sampling - WikipediaCompare text in ecology, plot sampling is a method of abundance estimation in which plots are selected from within a survey region and sampled; population estimates can then be made using the horvitz–thompson estimator.	3%

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Then do the counting and recording of data on seagrass. Examples of different types of seagrass at each location transect taken, marked or labeled, rinsed with water and cleaned of sand stuck, and Identified by Den Hartog (1970 In Takaendengan, 2010). Data analysis was performed to determine the species composition, frequency of species, relative frequency of species, density of species, relative density of species, closure of species, relative closure of species, dominance of species, relative dominance of species, diversity Index, and importance value index. III. RESULTS AND DISCUSSION 3.1 Description of Saronde Island Saronde Island located In the Subdistrict of Ponelo Archipelago, North Gorontalo District at coordinates 00" 55' 32" North latitude -122 " 51' 54" East longitude. To get to the Saronde Island, we have to go to North Gorontalo District which is about 65 km from the city center of Gorontalo, with a travel time of approximately one half hours using a private car. Saronde Island is 12 miles from the docks of the Port of Kwandang. After arriving at the Port of Kwandang, proceed by boat which is called 'katinting', or better known as the water taxi takes about 45 minutes. This island is one of the tourism activities destinations, with a flat and hilly topography with flat convex slopes (CTF, 2011). 3.2 Composition Species of Seagrass Seagrass species composition throughout the research station is Cymodocea sernjlata, Enhalus acoroides, Halophila minor, Halophlla ovalis, and Thalassia hemprichii. With seagrass beds that form is mixed vegetation. Thalassia hemprichii seagrass species has the percentage composition of the highest kind in the entire research station. More clearly, the calculation results of the composition of seagrass species in the entire research station can be seen in Table 1 below: Table 1. Composition Species of Seagrass in the Entire Research Station C. serrulata 15,778 33,946 29,674 E. acoroides 13,582 9,954 18,355 H. minor 1,578 0,453 1,861 H. ovalis 0.B01 0,435 0,356 T. hemprichii 68,260 55,212 49,754 Source Results of Primary Data Processed, 2012 3.3 Frequency of seagrass frequency is used as a parameter to indicate the distribution of vegetation or the distribution plant species in the ecosystem, or show the pattern of distribution of plant (Fachrul 2007) more clearty the calculation results of the frequency of seagrass in the entire research station can to be seen in table 2 below : C. serrulata 0,7520 0,8800 0,7120 E. acoroides 0,5680 0,4240 0,6320 H. minor 0,1520 0,0400 0,0880 H. ovalis 0,1600 0,0320 0,0720 T. hemprichii 1,6720 1,2160 1,0640 Source: Results of Primary Data Processed, 2012 Table 2 shows that seagrass distribution in first station have a broader, more equitable, and more dense than the second station, and third station. 3.4 Relative Frequency of Seagrass The relative frequency is the ratio between the frequency of seagrass species with the number of frequencies for all types of seagrass. The relative frequencies used for comparison lowest value and the highest value reached by the frequency of each seagrass observed, to the amount of the overall frequency of seagrass species. More clearly, the calculation results of the relative frequency of seagrass species in the entire research station can be seen in Table 3 below Table 3. Relative Frequency Seagrass in the Entire Research Station C. serrulata 0,3473 0,5716 0,4400 E. acoroides 0,2593 0,2507 0,3780 H. minor 0,0649 0,0288 0,0560 H. ovalis 0,0701 0,0230 0,0456 T. hemprichii 0,8583 0,7260 0,6803 Source: Results of Primary Data Processed, 2012 3.5 Density of Seagrass Species The density of seagrass species (Ki) is the total number of individual types of seagrass in a unit area measured. The density of seagrass species In first station Is the highest among all the research station. Because the first station had no direct influence on the activities of the people in the Ponelo village and Dudepo village, and not the access in and out of boats or fishing boats and tourists. Because more often exposed to the activity of the tourists only in the South, East, and West. Seagrass species Thalassia hemprichiiis a seagrass species which Is spreading most extensive, and often grow on substrates that depth is low, has a distribution vertical, ranging from zones near shore up zone subtidal bottom, and able to survive in all types of habitat (Nainggolan, 2011). Density calculation results for all types of seagrass in the entire research station can be seen in Table 4 below: Table 4. The density of Seagrass Species in the Entire Research Station C. serrulata 4,308 6,772 3,616 E. acoroides 3,324 1,744 1,908 H. minor 0,424 0,080 0,212 H. ovalis 0,212 0,048 0,052 T. hemprichii 15,632 8,472 5,804 Source: Results of Primary Data Processed, 2012

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Table 4 shows that the first station is a station that has the highest density value from all types of existing research station, which is 24 individuals/m2. Where as the third station is a station that has the lowest value of density types, with a density value for all types of seagrass species only 12 individuals/m-'. Because, at the third station there are many types of sea urchins such as Temnopleurus alexandrii and Diadema setosum. Sea urchins can also be found in algae growth areas (coral reef ecosystem). This is because in addition to eating the leaves of seagrass, sea urchins are also living from grazing activity or consuming algae (Lawrence, 1975 to Aziz, 1994). • 3.6 Relative Density of Seagrass Relative density of seagrass is a comparison between the number of individual types of seagrass to the total number of individuals of all types of seagrass. Calculation results of relative density of seagrass in the entire research station can be seen in Table 5 below: C. serrulata 18,0251 39,5653 31,1939 E. acoroides 13,9079 10,1893 16,4596 H. minor 1,7741 0,4674 1,8288 H. ovalis 0,8870 0,2804 0,4486 T. hemprichii 65,4059 49,4975 50,0690 Source. Results ol Primary Data Processed, 2012 Closure ol seagrass species illustrate the extent ol seagrass cover a body of water (Nainggolar 2011). Closing calculation results of seagrass species in the entire research station can be seen in Table 6 below Table 6. Closure Type of Seagrass In the Entire Research Station C. serrulata 0,3760 0,4400 0,3560 E. acoroides 0,2840 0,2120 0,3160 H. minor 0,0760 0,0200 0,0440 H. ovalis 0,0800 0,0160 0 0360 T. hemprichii 0,8360 0,6080 0.5320 Table 6 above shows that the type of Thalassia hemprichii has the highest closing species because it has a large shape or morphology. Although this type of Enhalus acoroides shape or morphology were great, but the kind Enhalus acoroides often found broken or damaged truncated propeller of the boat engines and ship visiting the island Saronde Judging from the doang of seagrass lound in the field, the criterion condition ot seagrass in island waters saronde according to the decree of the minister of environment No 200 of 2004, are included in the category of poor or less healthy (less than 29.9%). this suggests that the impaired saronde island waters originating from human activty, whether it be fishing activities as well as the visitors 3.8 Relative Closure of Seagrass Relative closure of seagrass Is the ratio between the closure of the individual seagrass types with a total closure of all types of seagrass. Relative closure used for comparison of lowest value and the highest value achieved by the closure of each seagrass observed, to the number of total closure of seagrass species. Calculation results of relative closure of seagrass In the entire research staflon can be seen In Table 7 below: Table 7. Relative Closing of Seagrass In the entire Research Station C. serrulata 4,3416 7,1445 5,5002 E. acoroides 3,2418 3,1332 4,7250 H. minor 0,8115 0,3597 0,7001 H. ovalis 0,8768 0,2878 0,5705 T. hemprichii 10,7283 9,0749 8,5041 Source: Results of Primary Data Processed, 2012 3.9 Dominance of Seagrass Species Dominance describe a type of plant that is able to influence the community by way of the large number of species and the dominant growth (Fachrul, 2007). The calculation result dominance in the entire research station can be seen in Table 8 below Table 8. Dominance of Seagrass Species in the Entire Research Station C. serrulata 0,1376 0,1147 0,1753 E acoroides 0,1264 0,0785 0,1442 H. minor 0,0157 0,0000 0,0062 H. ovalis 0,0075 0,0000 0,0017 T. hemprichii 0,3384 0,3814 0,1950 Source : Results of Primary Data Processed, 2012 Table 8 shows that seagrass species Thalassia hempnchii dominates all research stations. The station (in the West) and the thinl station (in the E»l) has a tow specific dominance, because they^ direct influence In the form of run-off from the Ponelo v&age and Pie Dudepo village as well as an , entry and exit of boats or fishing boats as well as visitors. 3.10 Relative Dominance of Seagrass Relative dominance is the ratio between the number of a type Of dominance by the number« all types of seagrass. Relative dominance used for comparison of lowest value and the highest valUe reached by the dominance of each seagrass observed, to the total number of seagrass species dominance The results of the calculation of the relative dominance for all types of seagrass In the entire research station can be seen in Table 9 below: Table 9. Relative Dominance of Seagrass in the Research Station C. serrulata 18,0251 39,5653 31,1939 E acoroides 13,9079 10,1893 16,4596 H. minor 1.7741 0,4674 1,8288 H. ovalis 0.8870 0,2804 0,4486 T. hemprichii 65,4059 49 4971 50,0690

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Google ПереводчикCompare text Бесплатный сервис google позволяет мгновенно переводить слова, фразы и веб-страницы с английского на более чем 100 языков и обратно. https://translate.google.ru/	4%

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3.11 Diversity index species Diversity index species is very useful parameter to compare different plant comr espeoaly for studyvtg disorders enwonmental factors (abotic) to the community or to know the succession ana stability ot the communty. Because in a community, in general, there are many types of plants. Then the older or more stable circumstances of a community, the higher the diversi plant (Fachrul, 2007). Diversity index calculation results n the entire reseaxh staton can be seen in Table 10 below: Table 10. Diversity Index of Seagrass In the Entire Research Station C serrulata 0,0890 0,1146 0,0799 E. acoroides 0,0758 0,0295 0,0422 H. minor 0,0169 0,0014 0,0047 H. ovalis 0,0097 0,0008 0,0011 T hemprichii 0,1566 0,1434 0,1283 Source : Results of Primary Data Processed, 2012 3.12 Importance Value Index Importance value Index is used to calculate and predict the overall role of seagrass species in the seagrass beds community. The higher value of important value index of a type of the other types, have the role of these types communities they occupy (Kordi, 2011). The value of the Index Value Important heavily dependent on the value of the relative density, relative closure, and the relative frequency of each type of seagrass (Nainggolan, 2011). Results of calculation of the Importance value index (or the entire research station can be seen in Table 11 below: Table 11. Importance Value Index o, Seagrass in the Entire Research Station C. serrulata 22,7141 47,2813 37,1342 E. acoroides 17,4091 13,5731 21,5627 H. minor 2,6504 0,8559 2,5850 H. ovalis 1,8340 0,5912 1,0647 T. hemprichii 76,9924 59,2984 59,2535 Source: Results of Primary Data Processed, 2012 Table 11 shows that seagrass Thalassia hemprichii is a type of seagrass that has the highest important value index of all the existing research station, with important value index for the seagrass Thalassia hemprichii is 76.99. Thus, seagrass Thalassia hemprichii types have the highest role of all types tabel 11 shows that seagrass thalassia hemprichii is a type of seagrass that has the highest important value index of all the existing research station, with important value index for the seagrass thalassia hemprichii is 76.99 thus, seagrass thalassia hemprichii types have the highest role of all types of existing seagrass ecosystems in maintaining stability on any existing research station, and the flow of enegry in the community seagrass growing on saronde island waters 3.13 Comparison seagrass vegetation struture in each station seagrass vegetation structure formed in the saronde island as follow 1. to a depth of less than 1 meter grew thalassia hemprichii cymodocea serrulata, enhalus acoroides, helophila ovalis and halophila minor, but thalassia hemprichii growing along enhalus acorodes meanwhile cymodocea serrulata found growing along seagrass species halophila ovalis and halophila minor becouse the root form of halophila ovalis and minor not as strong as seagrass species that dominates the surface of the subsrate such as thalassia hemprichii or enhalus acorodes 2 to a depth of 1 to 3 meters below sea level growing seagrass species enhalus acorodes thalassia hemprichii and cymodocea serrulata but didn't found halophila ovalis and halophila minor The first station had the highest form of the vegetation structure analysis of all existing research station. Overall value vegetation structure analysis of the most high compared to the second station and the third, for the first station has the highest level of depth than the second and third stations. Where the depth of the substrate plays a role in the stability of the sediment that is as protective plant of ocean currents, and as a supplier of nutrients. Substrate at the first station was preferred seagrass because it consists of fine sand mixed with a little mud, rubble, rubble and molluscs compared to the type of substrate in the second and third stations are almost the same as the first station just not mixed with a little mud. This is in accordance with the opinion of Kiswara (2004) in Nainggolan (2011) which states that the seagrass growing on mud and sand substrate density will be higher than the seagrass growing on dead coral substrate Therefore, the type of Thalassia hemprichii that found dominance in all station. Because Thalassia hemprichii is a seagrass species which is spreading most extensive, and often grow on substrates that depth is low, has a distribution vertical, ranging from zones near shore up zone subtidal bottom, and able to survive in all types of habitat (Nainggolan, 2011). More clearly, the comparison seagrass vegetation structure in each station can be seen in Table

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IV CONCLUSIONS the conclusions from this research is: 1. saronde island waters has five types of seagrass which is cymodocea serrulata enhalus acoroides, halophila minor, halophila ovalis and thalassia with seagrass vegetation types forming a mixed vegetation, 2. seagrass vegetation structure formed in the saronde island is : a. 1. to a depth of less than 1 meter grew thalassia hemprichii cymodocea serrulata, enhalus acoroides, helophila ovalis and halophila minor, but thalassia hemprichiigrowing along enhalus acorodes meanwhile cymodocea serrulata found growing along seagrass species halophila ovalis and halophila minor becouse the root form of halophila ovalis and minor not as strong asseagrass species that dominates the surface of the subsrate such as thalassia hemprichii or enhalus acorodes 2 to a depth of 1 to 3 meters below sea levelgrowingseagrass species enhalus acorodes thalassia hemprichii and cymodocea serrulata but didn't found halophila ovalis and halophila minor 3. the first station have the highest vegetation analysis among all research stations

Sources	Similarity