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Fish Structure Community in Sea.grass Bed of Gili Asa.ban West Lombok

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Abstract

Seagrass beds are one of the coastal ecosystems that have a very important role, because their function asnursery ground, feeding ground and spawning ground of various organism. However, the management of seagrass ecosystems has not been done optimally. One reason is the lack of data. This study aims to examine the structure of fish communities in seagrass beds on GiliAsahan waters, West Lombok. This research was carried out by observed the percentage of seagrass cover and the composition of fish species in the two selected stations. To find out the percentage of seagrass cover, the research method refers to the monitoring standards set by the Seagrass Watch. Whereas to find out the composition of fish is done by identified all species of fish caught by gill nets that are installed parallel to the island. The results of the study found five types of seagrass species namely Enhalusacoroides, Thalassiahemprichii, Syringodiumisoetifolium, Halophilaovalis and HaJoduleuninervis percentage of seagrass cover ranging from 27 - 42%. The numbers of fish species found were 15 species from IO families. The diversity of fish, besides being affected by the density and number of seagrass species, may also be affected by the depth of the water.

Keywords: fish, structure community, seagrass, GiliAsahan

1. Introduction

Seagrass ecosystems are one of the typical ecosystems in tropical waters. This ecosystem is characterized by the presence of seagrasses that form overlays. Generally found in calm waters with a depth of O - 40 m (Hemminga and Duarte 2000). Seagrass ecosystems are a suitable place for the survival of various biota because of its function as a feeding ground, nursery maintenance and as a place for spawning ground (Aswandy dan Azkab, 2000).

The seagrass community structure in a waters consists of different compositions, with different densities (percentage closures). There are seagrass beds that are composed of a

single type, but most of the seagrass beds are mixed communities. The difference in composition and density of seagrassin a waters is thought to affect the structure and composition of seagrass associations in these waters.

One of the association biota of seagrass is fish .. Certain types of fish occupy seagrass ecosystems both during and part of their life cycle. Although the types of fish and seagrass associations are not clear, but there is a tendency for higher levels of seagrass diversity, the higher the abundance of fish (Faiqoh et al., 2017). Therefore, besides the percentage of cover, the level of seagrass diversity can be one indicator of the condition of the ecosystem. The relationship between the diversity index is directly proportional to the condition of the ecosystem. The better the ecosystem condition, the higher the seagrass diversity index.

Seagrass ecosystems can be found almost all over the coast of the island of Lombok which has a protected beach. For example in Sire Beach, GiJiMatra Waters, Maringke Island and its surroundings and on the islands around Sekotong, West L..ombok. However, very little is known about the condition of the ecosystem, including its associated associations

2. Materials and Method

Research was conducted in October 2018, in Gili Asahan Waters, Lombok Island (Figure 1). Gili Asahan is one of 25 Small Islands in West LombokRegency. Gili Asahan is located in the Southwest of Lombok Island whichadministrativelyincludes the area of BatuPutihVillage, West SekotongDistrict, West LombokRegency. The island is inhabited and is one of the island'stouristdestinations on the island of Lombok.

Method of collectingseagrass data with the Line Intercept Transect (LIT). Steps to measure the structure of seagrass vegetation are transects mounted perpendicular to the shoreline, from the boundary to the start of seagrass until seagrass is not observed. Every 10 meters on the transect line is squared with a size of 50x50 cm, up to 30 m long.

Fish samples were obtained using gill nets mounted parallel to the shoreline at the seagrass observation location. Fish caught, if they can be identified directly, are recorded by type and number. If it cannot be identified, fish are grouped according to similarity, counted in number, then two samples are inserted into the sample plastic and given

fonnalin / alcohol, then taken to the laboratory to be identified according to Carpenter (2016) and fishbase.org

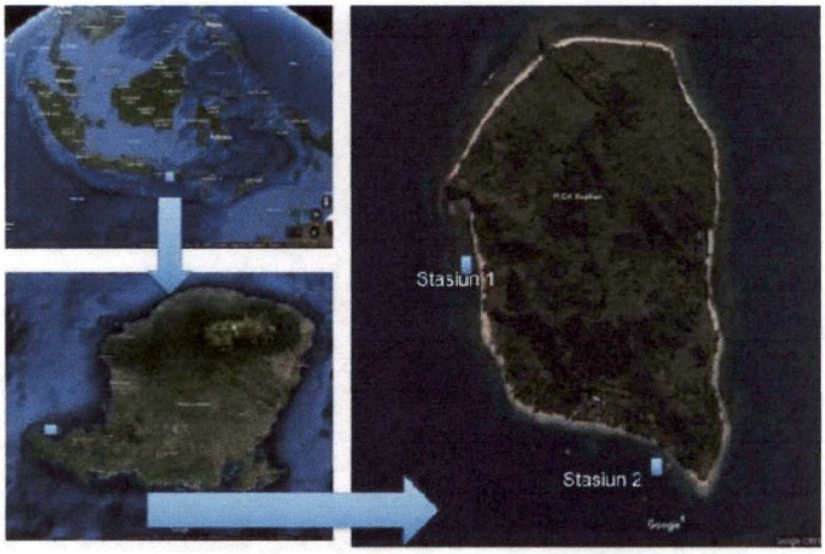

Figure 1. Site Study

The occurrence and the percentage of coverage seagrass were ca.lculated by using the formula proposed by English et al (1994). Species composition of fish was calculated by using formula in Rappe (2010).

3. Results and Discussion

The presence of seagrass species at each research station can be seen in Table 3. The table shows that all types of seagrass found at the two stations are the same except for Enhalusacoroideseagrass. This type of seagrass is only found at station 2.

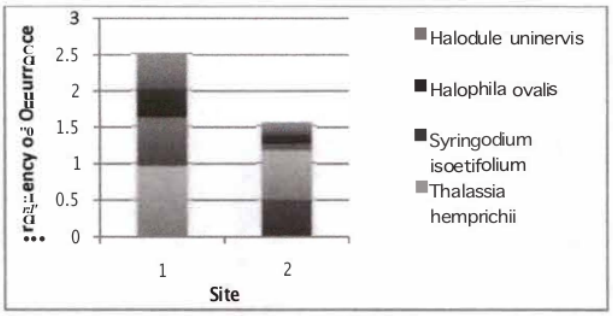

Figure 1. Frequency of Seagrass Occurrence in Study area

The number of seagrass species found in GiliAsahan is less than other waters on Lombok Island. The results of the research of Kiswara (1996) found 11 species in Gerupuk Bay, Central Lombok. The eleven species are E. acroides, T. hemprichii, H. minor, H. ovalis, H. spinulosa, Cymodocearotundata, C. serrulata, H. pinifolia, H. universis, S. isoetifilum and Thalassodendrumciliatum.

Based on the value of f_{req}uency and relative frequency, the type of seagrassThaJassiahemprichii is the type of seagrass most commonly found at both stations. However, the frequency of presence of other seagrass types differs between station 1 and station 2.

The absence of seagrass E. acroides at station 1 is closely related to the depth of the waters. As shown in Table 2, the depth of station I is less than 1 meter. Whereas E. acroidesseagrass is a type of seagrass that has long, stiff leaves that can reach more than one meter (Kiswara and Hutomo, 1985;

Then at station 1 found more Syringodiumisoetifolium compared to station 2. This shows that seagrass S. isoetifolium lives more in shallow waters. However, this is inversely proportional to the opinion of Kasim (2013) which states that S. isoetifoliumseagrass species were not found at <1 meter depth due to seagrass types Syringodiumisoetifolium is difficult to grow in shallow areas and can thrive in waters which are always flooded by water.

In seagrassHalophilaovalis and Haloduleuninervis showed high yields at station 1 (less than 1 meter) compared to station 2 (more than 1 meter), which showed that these seagrasses preferred to live in shallow waters. This is consistent with the statement of Romimohtarto and Juwana (2011) that species of seagrassHaJophilaovalis and Haloduleuninervis can grow in shallow waters with sandy and muddy substrates or sometimes on coral reefs.

Coverage of Seagrass

Based on the results of the study it was found that the closure of seagrass species at the two stations was different. In Table 4.it can be seen that the percentage of seagrass closure at station 1 is higher than station 2 which is 42.17% and 27.96%, respectively. Seagrass species T. hemprichii have the highest percentage of closure both at station 1 and station 2.

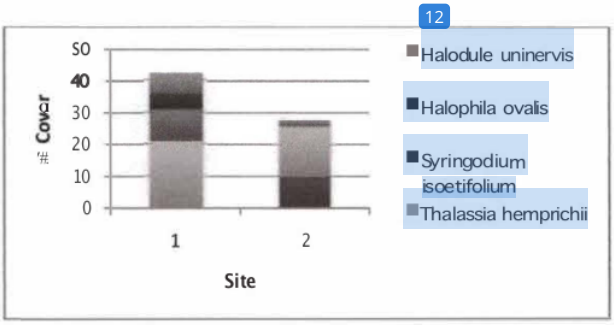

Figure 2. Percentage of Seagrass Cover in Study area

Seagrass ecosystems found in 2 Gili Asahan stations, West Lombok breed poorly in forming seagrass beds such as green carpet rugs. Referring to the Decree of the Minister of Environment No. 200 of 2004 concerning presenting damage criteria and guidelines for determining the status of seagrass beds where seagrass cover ≥ 60% is classified as rich; 30 - 59.9% classified as less; and ≤ 29.9% are classified as poor, then seagrass beds on Gili Asahan, West Lombok at station 1 are classified as poor and at station 2 are classified as poor.

Fish Structure Community

Species Composition

The results of the research conducted at the two research stations in the seagrass ecosystem of GiliAsahan found 1 species from the Mullidae family, 1 species from the Gerreidae family, 1 species from the Clupidae family, 1 species from the Carangidae family, 1 species from the Monach family, 1 species from the Scaridaefamily , 1 species from the l..ethrinidae family, 1 species from the Mullidae family, 1 species from the Pomacentridae family, and 6 species from the A$_{po}$gonoidae family. The total number of species found was 15 species from 10 families (Table 3)..

Table 1.Jenis[kan yang Ditemukan di SetiapStasiunPenelitianGiliAsahan Lombok Barat

Spesies	Family	Site 1	Site 2
Sphyriena barracuda	Mullidae	-	+
Gerresequulus	Gerreidae	-	+
Sardinellaaurita	Clupidae	-	+
Caranx hippos	Carangidae	-	+
Monachantustuckeri	Mouach	-	+
Leptoscarisvaigiensis	Scaridae	-	+
Leth.rinusorracus	Lethrinidae	+	+
Mulloidichnysmartinicus	Mullidae	-	+
Dascyll usmelanurus	Pomacentridae	+	-
Apogononichthyoidesgardineri	Apogonidae	+	+
Apagonlactivinacus	Apogonidae	-	+
Apogonoidaesp 1	Apogonidae	-	+
Apogonoidaesp 2	Apogonidae	-	+
Apogonoidaesp 3	Apogonidae	-	+
Apogonoidaesp 4	Apogonidae	-	+

+ = Found; - =not found

The number of fish species found in this study is less than the number of fish species found in seagrass ecosystems in other locations. As in Lom$_{po}$ Island, 28 species (Rappe, 2010) were found, and 31 species of Ambon Bay Lateri Beach were found (l..atuconsina,

2011). The methods used in the two previous studies respectively are visual census and beach seine. However, there are more species found in this research than those found by Assa et al. 2015 that used the same type of fishing gear in seagrass beds in Tongkaina waters.

The number of fish species found at station 2 is more than those found at station 1 (Figure 2). At station 1 only 3 types of fish were found from 3 families, while in station 2 there were 14 species from 10 families. Nonetheless, species from the Apogonidae family dominate in both stations.

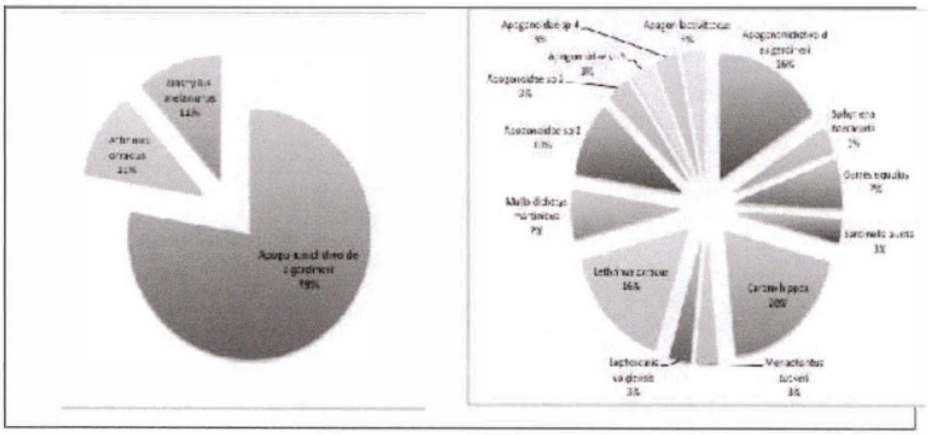

Figure 3. Fish Composition

The Apogonidae family can be identified by a smaJl body size (<20 cm), large eyes and varied colors such as brown, black, red and yellow. Usually there are dark marks (spots and l or stems) on the posterior end or below the base of the second dorsal fin and on the tail stem and sometimes black lines on the head. The Apogonidae species found in this study is known as a species that spreads in the waters of coral r e f's and surrounding areas such as fragments of coral and seagrass (Carpenter, 2016).

Some types of fish found at the study site are types of fish that can aJso be found in the area of coral reefs, and there are several types of pelagic fish, such as baracuda and Pompano fish. The existence of these fish in seagrass ecosystems is closely related to the

function of seagrass ecosystems as a place of care, a place to find food and shelter for several organisms (Azkab, 2006; Adrim, 2006).

The condition of seagrass ecosystem closure is good and the distance between ecosystems will greatly affect the presence of consumption of reef fish in the coral reef ecosystem. The closer the distance between seagrass ecosystems and coral reef ecosystems, and the better health conditions of these seagrass ecosystems, the more abundant consumption of reef fish (Dorenbosch, 2006). In the same research report, Dorenbosch (2006) explained that the interaction conditions were very close because consumption of reef fish would generally feel safer and more comfortable spawning around the seagrass ecosystem.

Diversity, Similarity and Dominance Index

The diversity index value, uniformity and dominance of fish found in the study sites are shown in Table 4. Based on the diversity index value it can be concluded that the level of fish diversity in station 1 is relatively low while at station 2 is high. This is because at station 1 only found 4 types of fish while at station 2 found 14 species of fish.

Likewise, the uniformity index value at station 1 is lower than in station 2. The uniformity index value explains the condition of the ecosystem at station 1 while being unstable while at station 2 is in a stable condition (Odum, 1983). Or in other words, the number of individuals for each type of fish in station 1 does not spread evenly as in station 2 (Rappe, 2010).

Conversely, the dominance index value at station I tends to be higher than station 2. However, this value is still relatively low, which means there are no species that dominate in both stations (Brower et al., 1990).

Tabet 2. Diversity, Similarity and Dominance Indexof Fish in Seagrass Bed GiliAsahan

Index	Site 1	Site2
Diversity	1,03	3,42
Similarity	0,65	0,89
Dominance	0,22	0,12

According to Rappe (2010) that fish diversity in seagrass areas is directly proportional to the level of density of seagrasses which are composed of one seagrass species (monospecific) and by more than one species. However, what we found in this study is different from that. At station 1, seagrass closure is higher (42.17%) than station 2 (27.%%) but the level of diversity of fish species is lower than station 2. We suspect that in addition to seagrass cover, water depth factors also influence the presence of fish.

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