REPORT

SEAGRASS AND DUGONG HABITAT MONITORING

KOTAWARINGIN BARAT DISTRICT, CENTRAL KALIMANTAN 2017

This Project is executed by the Mohamed bin Zayed Species Conservation Fund, with financing from the GEF, implementation support by UNEP and technical support from the CMS Dugong MoU Secretariat.

FOREWORD

Dugong (*Dugong dugon*) or dugong is one of 35 marine mammals that often be found in seagrass habitat. It is one of marine animals that is protected by law, both nationally and internationally. Efforts for conserving dugong and its habitat in Indonesia are not only done by government, but also supported by any other organizations, like *United Nation Environment Programme-Conservation Migratory Species* (UNEP-CMS) who collaborated with *Muhamed bin Zayed Species Conservation Fund* (MbZ) through *Dugong dan Seagrass Conservation Project*.

ID3 Implementation in Kotawaringin Barat collaborated with scholars for scientific importance. In that case, WWF Indonesia together with Antakusuma University (UNTAMA) conducted community participative using UNEP-CMS questionnaire method and dugong and seagrass ecosystem observation in Kotawaringin Barat District. Students who involved were also given chance to do their field work practice/ Praktek Kerja lapang (PKL) in WWF Indonesia.

Kotawaringin Barat, December 2017

Author

TABLE OF CONTENTS

FOREWORD i
LIST OF TABLES iii
LIST OF IMAGES iv
INTRODUCTION 1
Background 1
Objectives 2
Time and Locations 2
Monitoring Method 3
RESULTS AND DISCUSSIONS 4
General Condition 4
Seagrass Coverage 6
Dugong Monitoring 11
CONCLUSION 14
CLOSURE 14
REFERENCES 15

LIST OF TABLES

Table 1. Observation date and locations …… 3

Table 2. Standard criteria to determine the status of seagrass padding…… 3

Table 3. Seagrass observation location in Kotawaringin Barat District ..…… 6

Table 4. Physical parameters of Kotawaringin Barat waters…… 7

Tabel 5. Species composition and seagrass distribution in Kotawaringin Barat…… 7

Table 6. Coverage percentage of seagrass in monitoring location in Kotawaringin Barat…….8

Table 7. The condition of seagrass bed ecosystems in Kotawaringin Barat District…….. 12

Table 8. Dugong's feeding trail location……..13

LIST OF IMAGES

Image 1. Map of seagrass observation area in Kotawaringin Barat District..... 5

Image 2. Seagrass condition in Senggora Terendam sandbar..... 8

Image 3. The condition of seagrass in Senggora Besar sandbar 9

Image 4. The condition of seagrass in Sepagar sandbar..... 10

Image 5. The condition of seagrass in Beras Basah sandbar 10

Image 6. The condition of seagrass in coastal area of Sungai Bakau village 10

Image 7. The condition of seagrass in coastal area of Teluk Bogam village 10

Image 8. Distribution map of Dugong's feeding trail.....13

Image 9. Dugong's feeding tail in Beras Basah sandbar 13

Image 10. Dugong's feeding trail in Sepagar sandbar..... 14

Image 11. The crossed feeding trail of dugong 14

INTRODUCTION

Background

Dugong (*Dugong dugon*) is a herbivore mammal that lives in swallow water, its distribution ranges from East Africa to Vanatu, on the southwest New Guinea Papua. Dugong's distribution in Indonesia is very thorough and almost spread in all of shallow water of Indonesian sea. The presence of dugong is completely related with seagrass ecosystem distribution, since seagrass hold a role as the main food of this marine mammal. Seagrass is categorized as flowering plants (*Angiospermae*) that live fully submerged in the water and highly reproduce in shallow water and estuaries.

Dugong is one of sea mammals which spend its life in the sea. Population growth of this species is very low, and pressure towards this species is so huge, causing dugong population in threat. According to IUCN criteria, dugong is classified as vulnerable to extinction. Meanwhile, based on CITES, dugong is classified as Appendix 1 which means it could not be traded. In Indonesia itself, dugong is one of protected animals, according to PP No. 7 year 1999.

In attempts of dugong and its habitat conservation in Indonesia, Ministry of Marine Affairs and Fishery collaborated with Indonesian Institute of Sciences, Bogor Agricultural University, and WWF Indonesia which was supported by United Nation Environment Programme-Conservation Migratory Species (UNEP-CMS) and Muhammed bin Zayed Consevation (MbZ), joined in Dugong and Seagrass Conservation Project (DSCP) Indonesia since 2016, and was planned to finish at the end of 2018, with three main activities, they are:

1. Proposal 1 (ID1) *Strengthen and Operationalize National Policy Strategy and Action Plan for Dugongs and Seagrass Conservation*,
2. Proposal 2 (ID2*) Improving National Awareness and Research of Dugong and Seagrass in Indonesia*, and
3. Proposal 3 (ID3*) Community Based Conservation and Management of Dugong and Seagrass Habitat in Bintan, Kotawaringin Barat, Alor and Tolitoli*.

Marsh (2002) predicted that at 1970, dugong population in Indonesia was 10.000 dugongs. But at 1994, its population decreased to 1000 dugongs. Nevertheless, the number of

population is still on debate and can not be used as a reference to see the population decreasement rate in some intervals of time.

As dugong's main food, the distribution of seagrass becomes important to be found, especially in Teluk Kumai, Kabupaten Kotawaringin Barat. Seagrass bed monitoring will also give some images about the presence of dugong that may live and show some activities in the seagrass ecosystem.

In order to collect informations that related to dugong's population, which can be used in supporting dugong and seagrass conservation, monitoring activity have to be conducted. We hope that this dugong and seagrass monitoring activity can provide informations about the distribution of both dugong and seagrass in Beras Basah Sandbar, Senggora Sandbar, Sepagar Sandbar, coastal area of Sungai Bakau village, and coastal area of Teluk Bogam village in Kecamatan Kumai, Kabupaten Kotawaringin Barat, Kalimantan Tengah. Academics, government, and local people will be involved in this activity.

Objectives

The objectives of this activity are:

1). Determine the condition, distribution, and species of seagrass in Beras Basah, Senggora Besar, Senggora Kecil, dan Sepagar Sandbar.
2). Determine dugong distribution in Kotawaringin Barat waters and its surroundings.

Time and Locations

Dugong and seagrass monitoring activity was conducted on a schedule given in Table 1.

Table 1. Observation date and locations.

Time	Location
Wednesday, November 8 2017	Senggora Terendam
Thursday, November 9 2017	Senggora Besar
Saturday, November 11 2017	Sepagar
Sunday, November 12 2017	Beras Basah
Wednesday, November 15 2017	Sungai Bakau
Thursday, November 16 2017	Teluk Bogam

Monitoring Method

a) Seagrass

Seagrass monitoring location was determined from previous observation point that has been marked in 2016 and fixed as permanent station (t_0). Method used in this observation is quadrat transect method (perpendicular to the shoreline), which adapted from *Seagrass Watch*. Quadrat transect method consisted of transect and a quadrat frame. Transect is a straight line established for 50 m long over the seagrass bed, started from the first presence of seagrass from the coast. There were 3 sub-stations (each 25 m apart) in a station. Seagrass observation that was conducted included species identification, percentage of seagrass coverage estimation, and associate vegetation observation. This observation was limited to the quadrat transect area. Frame used in this activity was 50x50 cm square-shaped frame and was placed on the straight line (McKenzie e*t al*, 2003).

Table 2. Standard criteria to determine the status of seagrass padding

Condition		**Coverage**
Good	Rich/healthy	≥ 60
Damaged	Less rich/less healthy	30– 59,9
	Poor	≤ 29,9

Source : Decree of Ministry of Environment No: 200 Year 2004

b) Dugong

Dugong monitoring activity was conducted near the seagrass observation location. Monitoring was done by visual observation and feeding trail identification. Measurement of length, wide, and depth would be conducted in each feeding trail.

RESULTS AND DISCUSSIONS

General Condition

Most of the waters in Kabupaten Kotawaringin Barat are part of Teluk Kumai and strongly influenced by the water input from the land. The high level of water discharge in Kumai River (the biggest river in this area), has made its turbidity very high all over the year. However, we still got information about dugong's presence. Furthermore, since the presence of dugong in this area has been known, seagrass community structure observation needed to be conducted, regarding to the role of seagrass as a primary food for this mammal.

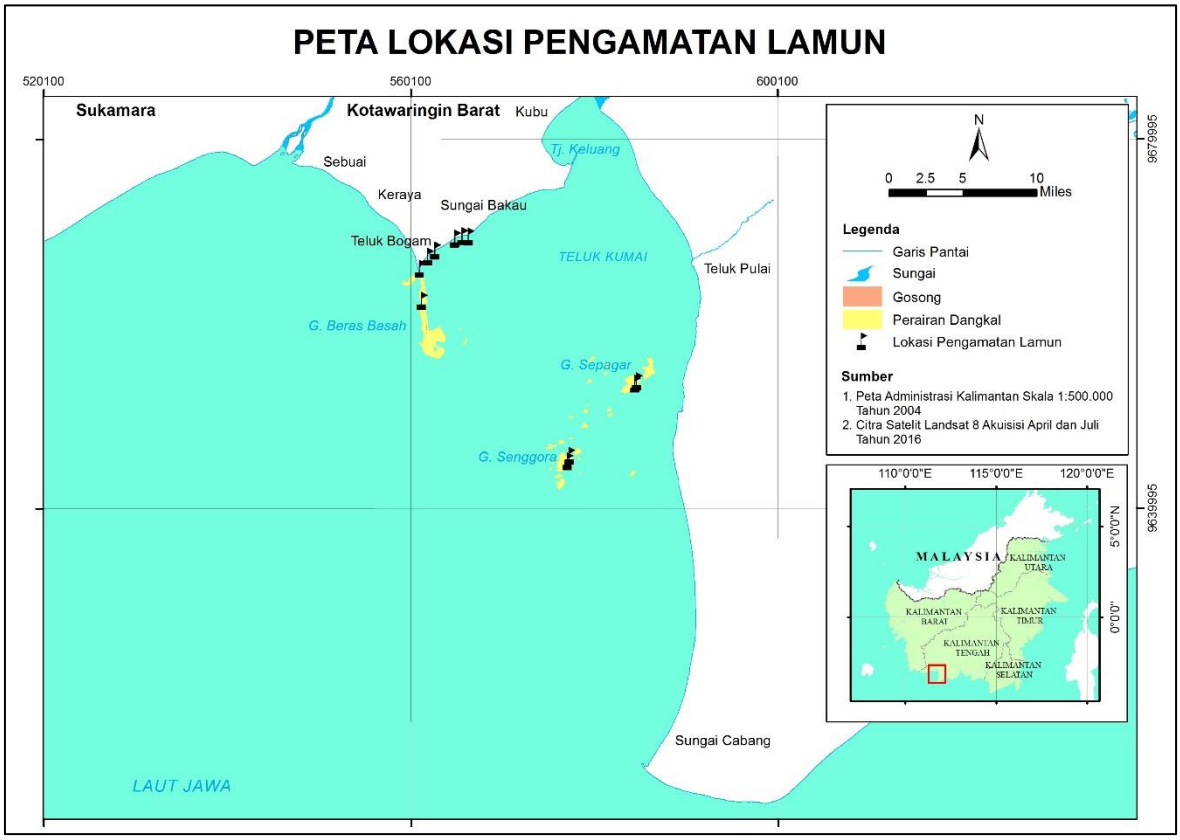

Image 1. Map of seagrass observation area in Kabupaten Kotawaringin Barat

Sandbar cluster of Senggora is located on the south of Kubu village and the west of Teluk Pulai and Sungai Cabang village. Since the distance between waters and Kubu village is far, fishermen from the village often make this Sandbar as a shelter to rest or avoid the storm. Sepagar Sandbar is located on the northeast of Senggora Sandbar and closer to Teluk Pulai village. Beras Basah Sandbar is located on the south of Teluk Bogam village and has a structure that stretched from the north side near the shore to the west side that adjacent with Java Sea. In this observation, we added some survey points in the waters of Sungai

Bakau and Teluk Bogam village to compare the condition of the area that is located far from the shore with the closer area.

Previous observation has been done by BPSPL Pontianak, in collaboration with PPO-LIPI in 2015 and DSCP Indonesia in October 2016. Survey points that were used in the prior observation were located on different areas to give variative results. However, survey points in this observation were located on the same area that was used in 2016 to give a clear image of the change of seagrass community structure in that area.

Table 3. Seagrass observation location in Kabupaten Kotawaringin Barat

Location	Station	Geographic Position	
		Longitude (E)	Latitude (S)
Senggora Terendam	1	111° 41' 48.671"	3° 12' 20.340"
Senggora Besar	2	111° 41' 42.094"	3° 12' 38.747"
Sepagar	3	111° 45' 40.874"	3° 8' 4.902"
	4	111° 45' 46.768"	3° 7' 56.327"
Beras Basah	5	111° 33' 7.801"	3° 3' 12.312"
Teluk Bogam	6	111° 33' 54.623"	3° 0' 15.390"
	7	111° 33' 28.966"	3° 0' 37.408"
	8	111° 33' 0.403"	3° 1' 18.818"
Sungai Bakau	9	111° 35' 52.832"	3° 59' 25.559"
	10	111° 35' 31.153"	3° 59' 24.180"
	11	111° 35' 5.298"	3° 59' 33.097"

Waters condition on the survey locations varied from the depth, water clarity, and substrate. Substrate in all Sandbar area consisted of sand, while in coastal area consisted of mud. As the area was located further from the coast, the sand substrate could be seen again. The sand substrate reappeared since the sediments from the river were carried to the seashore and accumulated in that area, most of the area that was located along the coast in Teluk Kumai showed similar substrates. The sediments also affected the clarity of waters in coastal area, which was lower than the clarity in the Sandbar. Waters clarity in coastal area showed only 0.2 – 2 m while in the Sandbar was 3 – 5 m. The surface condition in coastal area was very slope since the depth throughout the transect was slightly different, with the shallowest was 0,1 m and the deepest was 0.4 m. In Sandbar area, the shallowest was 0,1 m while the deepest reached 2 m depth. Further details can be seen in Table 4.

Table 4. Physical parameters of Kotawaringin Barat waters

Station	Parameter of Clarity		
	Depth (m)	(m)	Substrate
Senggora Terendam sb. (St. 1)	1,5 – 2	3 – 4	Sand
Senggora Besar sb. (St.2)	0,4 – 0,6	5	Sand
Sepagar sb. (St. 3)	0,5 – 1,8	4 – 5	Sand
Sepagar sb. (St. 4)	0,4 - 2	4	Sand
Beras Basah sb. (St. 5)	1 - 1,3	4 – 5	Sand
Sungai Bakau (St. 6)	0,1	2	Sand
Sungai Bakau (St. 7)	0,3	0,2	Clay
Sungai Bakau (St. 8)	0,1	0,2	Clay
Teluk Bogam (St. 9)	0,1 – 0,2	0,2	Sand, Clay
Teluk Bogam (St. 10)	0,5	0,2	Sand, Clay
Teluk Bogam (St. 11)	0,1 – 0,4	0,5	Sand, Clay

Note: sb=Sandbar

Seagrass Coverage

Seven species of seagrass (*Cymodocea serrulata, Enhalus acoroides, Halodule pinifolia, Halodule uninnervis, Halophila minor, Syngodium isoetifolium,* and *Thalassia hemprichii*) (Table 5) were found in observation area. Beras Basah and Senggora Besar Sandbar got the highest number of seagrass species, which were 6 species.

Tabel 5. Species composition and seagrass distribution in Kotawaringin Barat

Species	Seggora Terendam	Senggora Besar	Sepagar	Beras Basah	Teluk Bogam	Sungai Bakau
Cymodocea serrulata	+	+	+	+	-	+
Enhalus acoroides	+	+	-	+	+	+
Halodule pinifolia	+	+	+	+	-	-
Halodule uninervis	-	+	+	-	-	-
Halophila minor	+	-	+	-	-	-
Syringodiun isoetifolium	+	+	-	+	-	-
Thalassia hemprichii	-	+	-	+	+	+

*Note : (+) = found, (-) = not found

Seagrass species that commonly be seen were *Cymodocea serrulata* and *Enhalus acoroides*, which could be found in most of the stations. Nevertheless, the coverage percentage of both seagrass species did not dominate in every station (Table 5).

In Senggora Terendam Sandbar, the coverage percentage reached 14,88 ± 2,127 % (Table 6). Five species were found in this station. There were *Enhalus acoroides, Cymodocea serrulata, Halodule pinifolia, Halophila minor* and *Syringodium isoetifolium.* The coverage percentage of *Halodule pinifolia* reached 5,85 ± 1,223 % and dominated the area while *Syringodium isoetifolium* had the lowest coverage percentage (0.46%). Compared with the 2016 observation data, seagrass condition in the monitoring area decreased in the number of species and the coverage percentage, which previously six species and 18,83 ± 9,62 %, respectively (Mira *et al*, 2016).

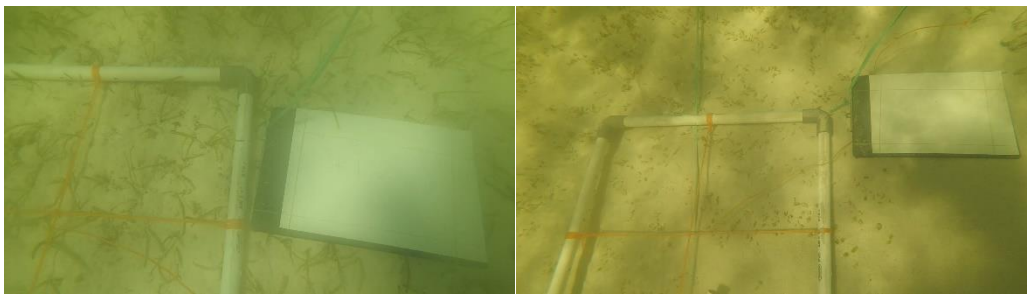

Image 2. Seagrass condition in Sandbar Senggora Terendam

Table 6. Coverage percentage of seagrass in monitoring location in Kotawaringin Barat

Station	Seagrass Species	Coverage Percentage (%)	
		Species	Average
Senggora Terendam Sandbar (St. 1)	*Enhalus acoroides*	0,21 ± 0,161	14,88 ± 2,127
	Cymodocea serrulata	4,09 ± 1,511	
	Halodule pinifolia	5,85 ± 1,223	
	Halophila minor	5,76 ± 1,391	
	Syringodium isoetifolium	0,67 ± 0,271	
Senggora Besar Sandbar (St.2)	*Enhalus acoroides*	11,21 ± 1,999	27,24 ± 2,750
	Thalassia hemprichii	0,06 ± 0,061	
	Cymodocea serrulata	13,15 ± 2,567	
	Halodule uninervis	1,91 ± 0,708	
	Halodule pinifolia	0,73 ± 0,305	
	Syringodium isoetifolium	0,18 ± 0,127	
Sepagar Sandbar(St. 3)	*Cymodocea serrulata*	0,30 ± 0,160	1,82 ± 0,451
	Halodule uninervis	0,48 ± 0,205	
	Halodule pinifolia	0,85 ± 0,409	
	Halophila minor	0,18 ± 0,154	
Sepagar Sandbar (St. 4)	*Halodule uninervis*	13,67 ± 1,261	13,67 ± 1,261
Beras Basah Sandbar (St. 5)	*Enhalus acoroides*	5,55 ± 0,992	14,06 ± 2,158
	Thalassia hemprichii	2,85 ± 1,449	
	Cymodocea serrulata	4,76 ± 1,467	

Station	Seagrass Species	Coverage Percentage (%)	
		Species	Average
	Halodule pinifolia	0,73 ± 0,305	
	Syringodium isoetifolium	0,18 ± 0,127	
Sungai Bakau (St. 6)	*Enhalus acoroides*	0,42 ± 0,242	8,94 ± 2,239
	Thalassia hemprichii	2,03 ± 0,242	
	Cymodocea serrulata	6,48 ± 2,288	
Sungai Bakau (St. 7)	*Enhalus acoroides*	0,79 ± 0,291	0,85 ± 0,292
	Thalassia hemprichii	0,06 ± 0,061	
Sungai Bakau (St. 8)	*Enhalus acoroides*	2,24 ± 0,561	2,24 ± 0,561
Teluk Bogam (St. 9)	*Enhalus acoroides*	4,30 ± 0,525	4,30 ± 0,525
Teluk Bogam (St. 10)	*Enhalus acoroides*	0,94 ± 0,226	0,94 ± 0,226
Teluk Bogam (St. 11)	*Enhalus acoroides*	1,82 ± 0,543	9,45 ± 2,277
	Thalassia hemprichii	7,64 ± 2,313	

Seagrass coverage in Senggora Besar Sandbar was 27,24 ± 2,750 %. Six species, consisted of *Enhalus acoroides, Thalassia hemprichii, Cymodocea serrulata, Halodule uninervis, Halodule pinifolia,* and *Syringodium isoetifolium*, were found in the survey location. Interestingly, *Halophila ovalis* was also found outside the observation transect. The highest coverage percentage was *Cymodocea serrulata,* which reached 13,15 ± 2,567 %, and the lowest coverage percentage was from *Syringodium isoetifolium*, which was 0,18 ± 0,127 %. There was no significant difference of seagrass coverage percentage, which was 26,42 ± 16,05 %, compared to the data of 2016 survey. However, the number of species that were found in the location was lower, which only 4 species (*Cymodocea serrulata, Halodule uninervis, Halophila ovalis,* and *Syringodium isoetifolium*) (Mira *et al*, 2016).

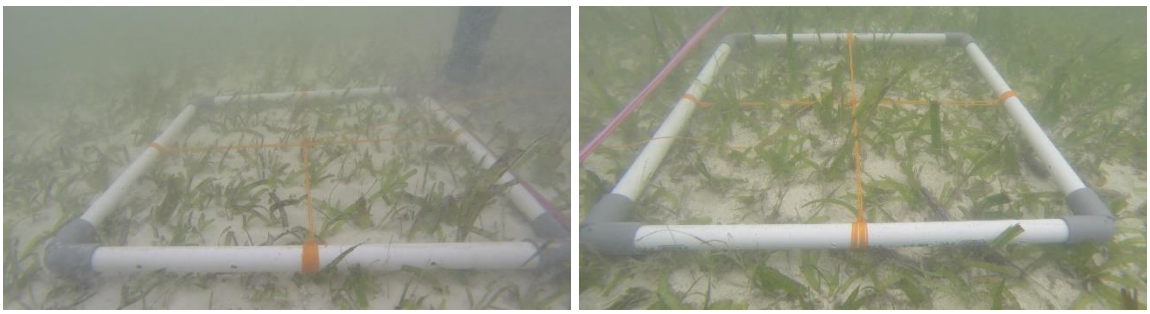

Image 3. The condition of seagrass in Sandbar Senggora Besar

In the first station on Sepagar Sandbar, the coverage percentage only reached 1,82 ± 0,451 % with 4 species of seagrass that consisted of *Cymodocea serrulata, Halodule uninervis, Halodule pinifolia,* and *Halophila minor,* in that area. In the second station, coverage percentage was 13.67 ± 1.261 % with only one species (*Halodule uninervis*) was found. The observation was done in two stations due to the difficulty to find representative seagrass

distribution area. The presence of seagrass that relevant to the existing data could not also be found in the previous observation area, resulting in the slight change of monitoring location to the east side of prior location. Coverage percentage that was obtained dramatically decreased compared to 2016 survey data (Mira *et al*, 2016).

Image 4. The condition of seagrass in Sandbar Sepagar

The result of seagrass observation in Beras Basah Sandbar showed 14.06 ± 2,158 % coverage percentage, with only five species of seagrass were found. The spesies included *Enhalus acoroides, Thalassia hemprichii, Cymodocea serrulata, Halodule pinifolia,* and *Syringodium isoetifolium*. *Enhalus acoroides* got the highest coverage percentage, which was 5,55 ± 0,992 %, while *Syringodium isoetifolium* had the lowest percentage with only 0,18 ± 0,127 % coverage. Compared to the monitoring data in 2016, coverage percentage significantly decreased to 35,58 ± 16,30 %. The number of species that was found was the same as previous observation (5 species). However, *Thalassia hemprichii* were dominant in previous observation (Mira *et al*, 2016).

Image 5. The condition of seagrass in Sandbar Beras Basah

Three different stations were targeted in the coastal area of Sungai Bakau village. Station 1 showed 8,94 ± 2,239 % of coverage with three different seagrass species, which were *Enhalus acoroides, Thalassia hemprichi,* and *Cymodocea serrulata. Cymodocea serrulata* was dominant species in this stations (6,48 ± 2,288 % coverage) and the lowest coverage percentage was *Enhalus acoroides* (0,42 ± 0,242 %). In station 2, the coverage was 0,85 ±

0,292 % and two species (*Enhalus acoroides* and *Thalassia hemprichi*) was found in this point with similar percentage of coveage. *Thalassia hemprichi* was lower (0,06 ± 0,061 %) compared to *Enhalus acoroides* (0,79 ± 0,291 %). Station 3 showed only the presence of one species, which was *Enhalus acoroides* with 2,24 ± 0,561 % of coverage.

Image 6. The condition of seagrass in coastal area of Sungai Bakau village

The first station in coastal area of Teluk Bogam village showed 4,30 ± 0,525 % of coverage and only one species (*Enhalus acoroides*) appeared in this station. In the second station, the coverage percentage was 0,94 ± 0,226 % and only one species (*Enhalus acoroides*) was found. The third station showed 9,45 ± 2,277 % of coverage and consisted of two species, which were *Enhalus acoroides* (1,82 ± 0,543 % of coverage) and *Thalassia hemprichi,* which became dominant species (7,64 ± 2,313 % of coverage).

Image 7. The condition of seagrass in coastal area of Teluk Bogam village

The seagrass bed ecosystems in Kabupaten Kotawaringin Barat showed a decreasement in coverage percentage, compared with 2016 survey data. According to the standard criteria, the ecosystem in Senggora Besar Sandbar could be categorized as good, while in Senggora Terendam Sandbar, Beras Basah Sandbar, third station of Sepagar Sandbar, and sixth station of Sungai Bakau were classified as medium. The fourth station of Sepagar Sandbar, the seventh and eighth station of Sungai Bakau, and all stations in Teluk Bogam could be categorized as damaged/poor. Overall, the seagrass bed ecosystems were in the medium condition.

Table 7. The condition of seagrass bed ecosystems in Kabupaten Kotawaringin Barat

Station	Score			Seagrass Condition
	Number of Species	Coverage	Total	
Senggora Terendam sb. (St. 1)	3	1	4	Medium
Senggora Besar sb. (St.2)	3	2	5	Good
Sepagar sb. (St. 3)	2	1	3	Medium
Sepagar sb. (St. 4)	1	1	2	Poor
Beras Basah sb. (St. 5)	3	1	4	Medium
Sungai Bakau (St. 6)	2	1	3	Medium
Sungai Bakau (St. 7)	1	1	2	Poor
Sungai Bakau (St. 8)	1	1	2	Poor
Teluk Bogam (St. 9)	1	1	2	Poor
Teluk Bogam (St. 10)	1	1	2	Poor
Teluk Bogam (St. 11)	1	1	2	Poor

Note: sb=Sandbar

Dugong Monitoring

Monitoring activity was done visually by direct observation from the boat and snorkeling in Senggora Besa and Beras Basah. Dugong did not appear during the observation. Moreover, the limitation of our equipment increased the difficulty to see this mammal. Since the equipment is limited, the observation was only focused to find dugong's feeding trail. Feeding trail was found in the east side of Sandbar Beras Basah (111° 34' 3,421" E and 3° 5' 1,435" S) and in the east side of Sandbar Sepagar (111° 45' 40,658" W and 3° 8' 5,442" S) and (111° 45' 39,553" W dan 3° 8' 6,731" S) (Image 8).

Feeding trail in Sandbar Beras Basah could be categorized as new, since the trail had not been planted by newborn seagrass yet. The trail reached ± 4,75 m in length, 25 – 27 cm in wide, and 2 – 4 cm in depth, while the depth of water reached 2,5 m (Image 8). The only seagrass that was found in this feeding trail was *Halodule uninervis*.

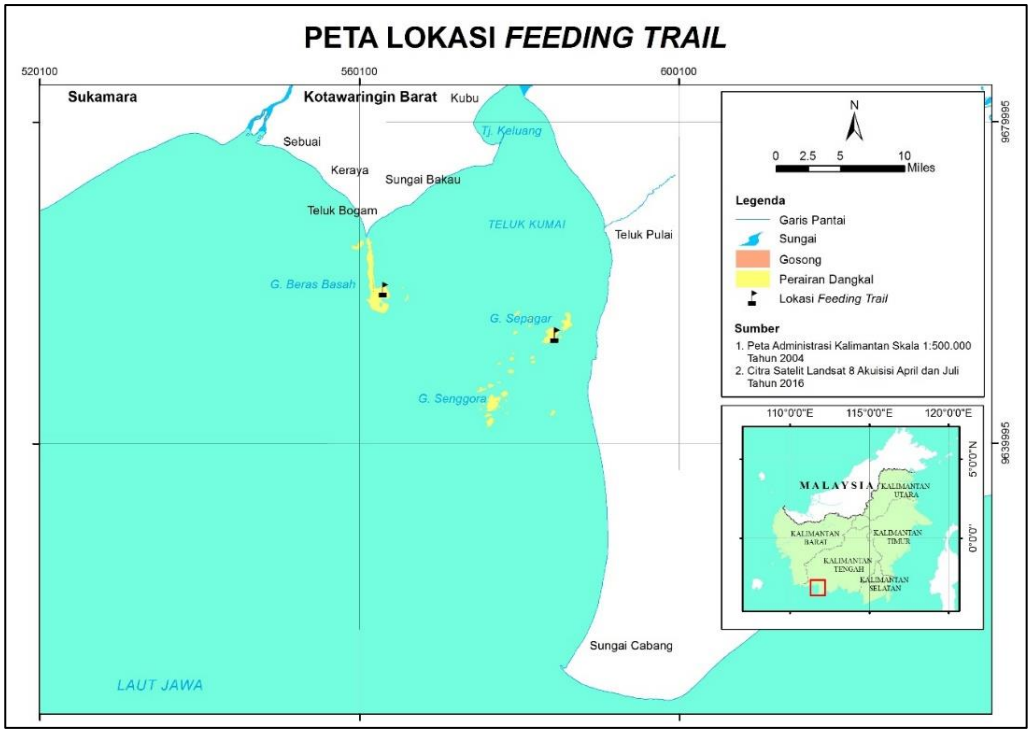

Image 8. Distribution map of Dugong's feeding trail

Table 8. Dugong's feeding trail location

No	Location	Latitude	Longitude	Lngth (m)	Wide (cm)			Depth (cm)			Depth of Waters (m)
					Beginning	Middle	End	Beginning	Middle	End	
1	Sepagar sb.	3° 8' 6,731"	111° 45' 39,553"	2.3	0.15	0.15	0.15	0.03	0.03	0.03	1.1
2	Sepagar sb.	3° 8' 6,731"	111° 45' 39,553"	5.4	0.23	0.23	0.2	0.04	0.05	0.04	1.1
3	Sepagar sb.	3° 8' 6,731"	111° 45' 39,553"	5.2	0.18	0.25	0.17	0.02	0.05	0.02	1.1
4	Sepagar sb.	3° 8' 6,731"	111° 45' 39,553"	5.4	0.17	0.23	0.2	0.02	0.07	0.04	1.1
5	Sepagar sb.	3° 8' 6,731"	111° 45' 39,553"	1.91	0.17	0.2	0.18	0.03	0.05	0.03	1.1
6	Sepagar sb.	3° 8' 5,442"	111° 45' 40,658"	5.18	0.15	0.18	0.15	0.02	0.04	0.02	1.2
7	Beras Basah sb.	3° 5' 1,435"	111° 34' 3,421"	4.75	0.25	0.27	0.25	0.03	0.04	0.02	2.5

Image 9. Dugong's feeding tail in Sandbar Beras Basah

In contrast with the feeding trail in Sepagar Sandbar, only one feeding trail were found in the first location and it can be categorized as an old feeding trail, regarding to the presence of newborn seagrass. The size of feeding trail reached ± 5.18 m in length, 15 – 18 cm in wide, 2 – 4 cm in depth, while the depth of waters was 1.2 m (Image 10).

Image 10. Dugong's feeding trail in Sandbar Sepagar

The next trails in Sepagar Sandbar was only in one location, with five feeding trails that were located close to each other and even crossed (Image 11). Both new and old trails existed in this location. The longest feeding trail reached 5,4 m in length while the shortest was only 1,19 m. The widest feeding trail was 25 cm and the most narrow was 15 cm. The deepest feeding trails was 7 cm and the shallowest was 2 cm while the deepest waters area was 1,1 m (Table 7).

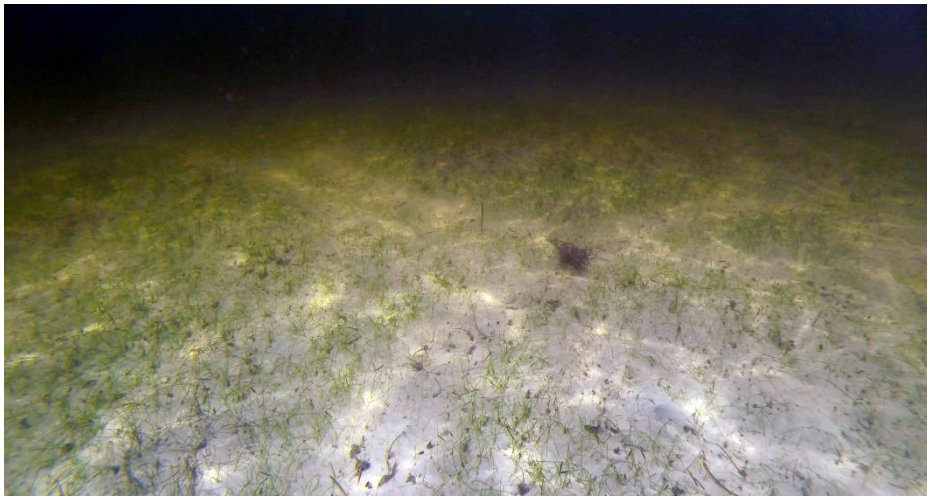

Image 11. The crossed feeding trail of dugong

CONCLUSION

The coverage precentage of seagrass bed ecosystem in Kotawaringin Barat waters, particularly in Songgora Sandbar, Sepagar Sandbar, and Beras Basah Sandbar decreased in 2016 and 2017. In 2017, the highest percentage was only 27,24 ± 2,750 % and the lowest was 0,85 ± 0,292 % while in 2016, the highest coverage percentage reached 35,58 ± 16,30% and the lowest was 18,83 ± 9,62 %. The coverage percentage of seagrass in the area could be categorized as damaged/poor. It could also be noticed that the number of species decreased from 10 species in 2016 to 7 species in 2017, which consisted of *Cymodocea serrulata, Enhalus acoroides, Halodule pinifolia, Halodule uninnervis, Halophile minor, Syngodium isoetifolium,* and *Thalassia hemprichii*.

Dugong could not be found during the monitoring activity but the presence of its feeding trails, both the old and the new feeding trails, could be used as the proof of dugong's existence in Kotawaringin Barat waters. Feeding trails were found in two locations, which were Beras Basah and Sepagar Sandbar.

CLOSURE

We wish that seagrass bed ecosystems observation in Kotawaringin Barat waters can provide data about the potency of marine sector. We also hope that this data can be used as a preliminary data in the document preparation implementation of the proposal of dugong and seagrass conservation area in Kotawaringin Barat, particularly in Beras Basah Sandbar, which have not been used as the backup area for conservation yet.

REFERENCES

Marsh, H., H. Penrose, C. Eros, and J. Hugues, 2002. Dugong Status Report and Action Plan for Countries and Territoriea. UNEP. Early Warning and Assessment Report Series.

McKenzie, L.J., Campbell, S.J., Roder, C.A. 2003. Seagrass-Watch: Manual for mapping & monitoring seagraa resources by community (citizen) volunteers. 2nd Edition. Departement of Primary Industries Queensland, Northern Fisheries Centre. Townsville.

Keputusan Menteri Negara Lingkungan Hidup. Nomor : 200 Tahun 2004. Tentang : Kriteria baku Kerusakan dan Pedoman Penentuan Status Padang Lamun.

Rr. S. Mira,. Juraij, M. Khalifa, Riswanto, A. Arifin, F. Anggraeni, Suhardi, C. Tania, S. Yulius H. 2016. Laporan survei pendahuluan untuk monitoring dugong dan habitat lamun kotawaringin Barat, 10-16 Oktober 2016