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LAMPIRAN

Lampiran 1. Struktur ukuran panjang dan bobot ikan kerapu macan

I. Struktur ukuran panjang (cm) ikan kerapu macan

Kelas	Tengah Kelas	Gabungan	Jantan	Betina
10-20	15	0	0	0
20-30	25	4	0	4
30-40	35	67	0	67
40-50	45	228	1	227
50-60	55	343	177	166
60-70	65	205	199	6
70-80	75	134	131	3
80-90	85	52	52	0
90-100	95	9	9	0

II. Struktur bobot (kg) ikan kerapu macan

Kelas	Tengah Kelas	Gabungan	Jantan	Betina
0.5-2.5	1	166	1	165
2.5-4.5	3	455	157	298
4.5-6.5	5	170	162	8
6.5 - 8.5	7	123	121	2
8.5-10.5	9	85	85	0
10.5-12.5	11	29	29	0
12.5-14.5	13	9	9	0
14.5-16.5	15	3	3	0
16.5-18.5	17	2	2	0

Lampiran 2. Ukuran pertama kali matang gonad ikan kerapu macan

a. Ikan kerapu macan (gabungan)

No.	Size Class Min.	Size Class Max.	Size Class Avg.	N	Nmat	Freqmat	Predfmat	Sqerr
1	30.1	40	35	1	0	0	0.002588916	6.70249E-06
2	40.1	50	45	1	0	0	0.018639431	0.000347428
3	50.1	60	55	4	1	0.25	0.1220244	0.016377754
4	60.1	70	65	5	2	0.4	0.504216181	0.010861012
5	70.1	80	75	3	3	1	0.881543446	0.014031955
6	80.1	90	85	2	2	1	0.981967649	0.000325166

L50= 64.91526183 \longrightarrow **Lm**
L95= 79.7094831
SS= 0.041950018

b. Ikan kerapu macan Jantan

No.	Size Class Min.	Size Class Max.	Size Class Avg.	N	Nmat	Freqmat	Predfmat	Sqerr
1	50.1	60	55.2	4	0	0	2.27843E-05	5.19123E-10
2	60.1	70	65.2	4	1	0.25	0.25016592	2.75293E-08
3	70.1	80	75.2	2	2	1	0.999795341	4.18852E-08

L50= 66.34445697 \longrightarrow **Lm**
L95= 69.41423837
SS= 6.99337E-08

c. Ikan kerapu macan betina

No.	Size Class Min.	Size Class Max.	Size Class Avg.	N	Nmat	Freqmat	Predfmat	Sqerr
1	30.1	45	37.7	1	0	0	3.93555E-50	1.5489E-99
2	45.1	60	52.7	1	1	1	1	0
3	60.1	75	67.7	2	2	1	1	0
4	75.1	90	82.7	2	2	1	1	0

L50= 45.42802396 **→** **Lm**
L95= 45.62804905
SS= 1.5489E-99

Lampiran 3. Hasil analisis penentuan kelompok umur ikan kerapu macan jantan dan betina

Interval kelas = 3

Kelas Panjang (cm)	Tengah kelas (cm)	Frekuensi (ekor)		
		Gabungan	Jantan	Betina
9 - 12	10.5	0	0	0
12 - 15	13.5	0	0	0
15 - 18	16.5	0	0	0
18 - 21	19.5	0	0	0
21 - 24	22.5	1	0	1
24 - 17	25.5	0	0	0
17 - 30	28.5	3	0	3
30 - 33	31.5	6	0	6
33 - 36	34.5	20	0	20
36 - 39	37.5	32	0	32
39 - 42	40.5	36	0	36
42 - 45	43.5	49	0	49
45 - 48	46.5	85	1	84
48 - 51	49.5	115	6	109
51 - 54	52.5	103	25	78
54 - 57	55.5	111	77	34
57 - 60	58.5	81	69	12
60 - 63	61.5	69	67	2
63 - 66	64.5	65	62	3
66 - 69	67.5	62	61	1
69 - 72	70.5	33	32	1
72 - 75	73.5	34	32	2
75 - 78	76.5	51	51	0
78 - 81	79.5	47	47	0
81 - 84	82.5	15	15	0
84 - 87	85.5	10	10	0
87 - 90	88.5	5	5	0
90 - 93	91.5	6	6	0
93 - 96	94.5	2	2	0
96 - 99	97.5	1	1	0

Lampiran 4. Pendugaan hasil yield per recruitment (Y/R) sebagai fungsi pada Laju Eksploitasi (E) ikan kerapu macan di perairan Taman Nasional Takabonerate.

Gabungan Jantan dan Betina			Jantan			Betina		
E	Y/R	m	E	Y/R	m	E	Y/R	m
0	0	0.599	0	0	0.599	0	0	0.599
0.05	0.006	0.568	0.05	0.006	0.615	0.05	0.011	0.416
0.1	0.011	0.538	0.1	0.012	0.583	0.1	0.022	0.394
0.15	0.016	0.508	0.15	0.017	0.551	0.15	0.032	0.372
0.2	0.021	0.478	0.2	0.021	0.518	0.2	0.042	0.350
0.25	0.025	0.448	0.25	0.026	0.486	0.25	0.051	0.329
0.3	0.028	0.418	0.3	0.030	0.454	0.3	0.060	0.307
0.35	0.032	0.388	0.35	0.033	0.421	0.35	0.069	0.285
0.4	0.034	0.358	0.4	0.036	0.389	0.4	0.076	0.263
0.45	0.037	0.329	0.45	0.038	0.356	0.45	0.084	0.241
0.5	0.038	0.299	0.5	0.040	0.324	0.5	0.091	0.219
0.55	0.040	0.269	0.55	0.041	0.292	0.55	0.097	0.197
0.6	0.041	0.239	0.6	0.042	0.259	0.6	0.103	0.175
0.65	0.041	0.209	0.65	0.043	0.227	0.65	0.108	0.153
0.661	0.041	0.203	0.66	0.043	0.220	0.661	0.109	0.149
0.75	0.040	0.149	0.75	0.042	0.162	0.75	0.116	0.110
0.8	0.039	0.119	0.8	0.041	0.130	0.8	0.120	0.088
0.85	0.038	0.090	0.85	0.039	0.097	0.85	0.122	0.066
0.9	0.036	0.060	0.9	0.038	0.065	0.9	0.125	0.044
0.95	0.034	0.030	0.95	0.035	0.032	0.95	0.127	0.022
1	0.032	0	1	0.033	0	1	0.128	0
0.687	0.041	0.187	0.73	0.042	0.175	0.66	0.109	0.149
0.67	0.041	0.197	0.67	0.043	0.214	0.67	0.110	0.145

Lampiran 5. Hasil analisis kemampuan tangkap (*Capacity to Harvest*) ikan kerapu macan di Taman Nasional Takabonerate.

Schaefer		
a	0.120411254	
b	-0.0000007	
MSY	5497	
Fopt	91297	
TAC	439726.7818	
	4397.267818	
Tingkat Pemanfaatan	439726.7818	4397.27

Lampiran 6. Uji t (Regresi) ikan kerapu macan jantan dan betina di Taman Nasional Takabonerate.

a. Uji t (Regresi) ikan kerapu macan jantan dan betina

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.945276771
R Square	0.893548174
Adjusted R Square	0.893445817
Standard Error	0.088020134
Observations	1042

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	67.63355925	67.63356	8729.677	0
Residual	1040	8.057445678	0.007748		
Total	1041	75.69100493			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	-3.983281113	0.048610609	-81.9426	0	-4.078667166	-3.887895061
Log L	2.595461664	0.02777893	93.43274	0	2.540952524	2.649970805

Keterangan: pola pertumbuhan alometrik negatif ($p > 0.05$)

S. deviasi	0.0982	0.2696
a =	-3.9833	
b =	2.5955	
sb =	0.0278	
t _{hit} =	14.5628	
t _(0.05;1041) =	1.96	

Keterangan: t_{hit} > t_(0.05;1041) maka b berbeda dengan 3
sehingga:
pola pertumbuhannya allometrik
pola pertumbuhannya allometrik negatif

b. Uji t (Regresi) ikan kerapu macan jantan

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.878404433
R Square	0.771594348
Adjusted R Square	0.771191516
Standard Error	0.083968407
Observations	569

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	13.50507738	13.50508	1915.425	5.9488E-184
Residual	567	3.997743139	0.007051		
Total	568	17.50282052			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	-3.74595181	0.102612213	-36.5059	5.5E-151	-3.947498271	-3.54440534
Log L	2.47310158	0.056507921	43.76557	5.9E-184	2.362111169	2.584091991

Keterangan: pola pertumbuhan alometrik negatif ($p > 0.05$)

$$\bar{X} = 2.2081$$

$$\Sigma(X - \bar{X})^2 = 0.00011 \quad 0.00029$$

Test Ho : $b_1 = b_2$ (jantan vs betina)

$$db = 1038$$

$$Sp^2 = 0.0070$$

$$\text{Var}(b_1 - b_2) = 0.0065$$

$$t = 4.5634$$

$$\text{nilai } p = 5.63483E-06 \quad (p < 0.05)$$

$$\text{Hasil} = \text{tolak } H_0$$

Kesimpulan= **garis regresi berbeda**

(laju pertumbuhan antara betina dan jantan adalah tidak sama)

dalam hal ini laju pertumbuhan ikan jantan lebih cepat dibanding dengan ikan betina

c. Uji t (Regresi) ikan kerapu macan betina

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.861156336
R Square	0.741590234
Adjusted R Square	0.741041594
Standard Error	0.082843435
Observations	473

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	9.276671628	9.276672	1351.686534	1.6926E-140
Residual	471	3.232489359	0.006863		
Total	472	12.50916099			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	-3.1857429	0.095478277	-33.3662	3.7681E-126	-3.373358993	-2.998126807
Log L	2.10565028	0.057272778	36.76529	1.6926E-140	1.993108503	2.218192056

Keterangan: pola pertumbuhan alometrik negatif ($p > 0.05$)

$$\sum(X - \bar{X})^2 = 2.0923 \qquad \qquad \qquad 0.00042 \qquad \qquad 0.00100$$

Lampiran 7. Persentase ukuran layak tangkap dan ukuran ikan layak tangkap ikan kerapu macan berdasarkan lokasi penangkapan.

No.	Lokasi	Ukuran Layak Tangkap (%)	Ukuran Tidak Layak Tangkap(%)
1	Taka Dangka	9.23	90.77
2	Taka Bubbe	49.05	50.95
3	Taka Bajang	6.67	93.33
4	Taka Silebu	5.77	94.23
5	Taka Latondu	17.42	82.58
6	Taka Rajuni	58.21	41.79
7	Taka Tumbor	54.90	45.10
8	Taka Sepe	57.14	42.86
9	Taka Subu	65.00	35.00
10	Taka Mattongkoang	70.00	30.00
11	Taka Gantarang	0.00	100.00
12	Taka Tarupa	3.85	96.15
13	Taka Lamungan	14.29	85.71
Persentase		31.66	68.34

Lampiran 8. Standarisasi upaya penangkapan

Tahun	Catch	Effort	C/E	Effort	In C/E
2010	433.70	172563.94	0.00	172563.94	-5.986
2011	843.30	163985.65	0.01	163985.65	-5.270
2012	4366.60	121185.58	0.04	121185.58	-3.323
2013	2443.60	87686.14	0.03	87686.14	-3.580
2014	2801.80	25563.29	0.11	25563.29	-2.211
2015	3505.30	94337.44	0.04	94337.44	-3.293
2016	2777.9	31742.25	0.09	31742.25	-2.436
2017	145984.1	314510.63	0.46	314510.63	-0.768
2018	1838.4	414751.92	0.00	414751.92	-5.419
2019	12992.6	96391.68	0.13	96391.68	-2.004

Lampiran 9. Koordinasi dengan stakeholder di Kawasan Taman Nasional Takabonerate

- a. Koordinasi dengan staf seksi Pengelolaan Taman Nasional Takabonerate Wil. I Tarupa



- b. Koordinasi dengan Kepala Desa Pulau Tarupa dan Staf Seksi Pengelolaan Taman Nasional Takabonerate Wil. I Tarupa



- c. Koordinasi seksi Pengelolaan Taman Nasional Takabonerate Wilayah I Rajuni



Lampiran 10. Wawancara Dengan Nelayan di Taman Nasional Takabonerate

- a. Wawancara nelayan Pulau Jinato, Taman Nasional Takabonerate



- b. Wawancara Dengan Panges Pulau Rajuni Kawasan Perairan TN Takabonerate



Lampiran 11. Armada kapal dan alat tangkap yang digunakan nelayan di perairan Taman Nasional Takabonerate

- a. Perahu yang digunakan nelayan di perairan Taman Nasional Takabonerate



- b. Perahu yang digunakan nelayan di perairan Taman Nasional Takabonerate



c. Alat tangkap nelayan Tombak (*Spear gun*)



d. Alat tangkap nelayan pancing ulur



e. Alat tangkap nelayan pancing ulur

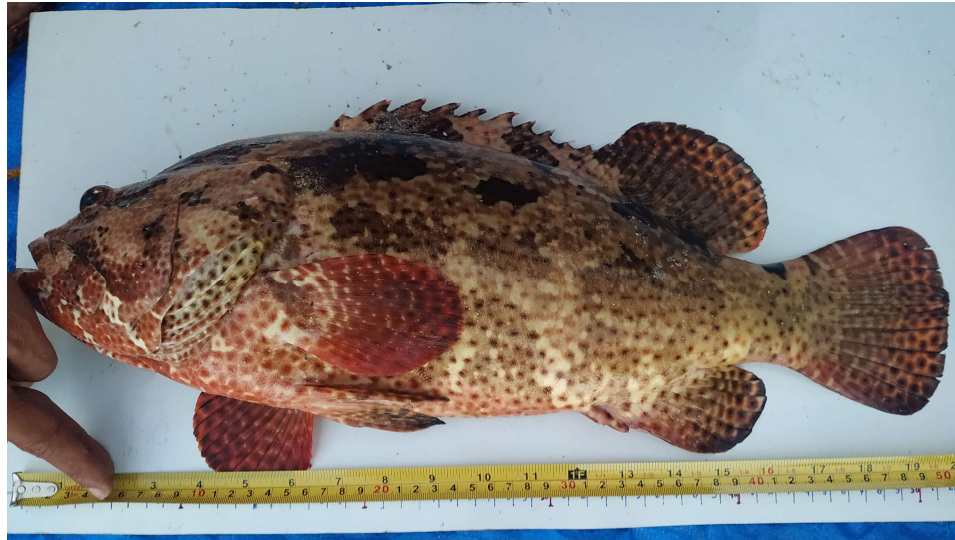


f. Alat tangkap nelayan bubu



Lampiran 12. Pengukuran panjang berat ikan kerapu macan

- a. Pengukuran panjang ikan kerapu macan (*Epinephelus fuscoguttatus*)



- b. Pengukuran panjang ikan kerapu macan (*Epinephelus fuscoguttatus*)



c. Pengukuran berat ikan kerapu macan (*Epinephelus fuscoguttatus*)



d. Pengukuran berat ikan kerapu macan (*Epinephelus fuscoguttatus*)



e. Pengukuran berat ikan kerapu macan (*Epinephelus fuscoguttatus*)



f. Pengukuran berat ikan kerapu macan (*Epinephelus fuscoguttatus*)



Lampiran 13. Pengambilan sampel gonad ikan kerapu macan, analisis laboratorium dan jenis makanan.

- a. Pengambilan gonad ikan kerapu macan (*Epinephelus fuscoguttatus*)



- b. Analisis laboratorium ikan kerapu macan (*Epinephelus fuscoguttatus*)



- c. Jenis makanan ikan kerapu macan (*Acanthochromis* sp)



- d. Jenis makanan yang tidak bisa teridentifikasi (*Unidentified decapoda*)



e. Jenis makanan yang tidak bisa teridentifikasi (*Unidentified fish*)



A study of brown-marbled grouper (*Epinephelus fuscoguttatus*) population dynamics in Takabonerate National Park Waters, South Sulawesi, Indonesia

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² Department of Marine Science and Fisheries, Faculty of Marine Science and Fisheries, Universitas Hasanuddin, Jl. Perintis Kemerdekaan, Tamalatea, Makassar 90245, South Sulawesi, Indonesia

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Manuscript received: 6 August 2021. Revision accepted: 22 September 2021.

Abstract. Fatma, Mallawa A, Najamuddin, Zainuddin M, Fachrie R. 2021. A study of brown-marbled grouper (*Epinephelus fuscoguttatus*) population dynamics in Takabonerate National Park Waters, South Sulawesi, Indonesia. *Biodiversitas* 22: 4298–4307. Understanding aspects of the population dynamics of groupers such as the brown-marbled grouper can provide valuable insights into how to manage grouper stocks effectively. Conducted from February 2020 to February 2021 in Takabonerate National Park waters, Selayar Islands District, South Sulawesi, Indonesia, this study sought to elucidate the size structure and cohorts, population growth rate, total mortality rate, fishing mortality rate, natural mortality rate, exploitation rate and yield per recruit (Y/R) of the brown-marbled grouper. Grouper samples were caught using several fishing gears (i.e., hand line fishing, spearfishing, and trapping) with a total catch of 1042 specimens. The sampled specimens exhibited significant size structure and were classified into five age-specific cohorts. The growth rate coefficient was 0.46/year, with the brown-marbled grouper population tending to exhibit slow growth ($K < 0.5/\text{year}$). The estimated asymptotic length was 169.0 cm. The fishing mortality was higher than the natural mortality, with an exploitation rate of 0.65, indicating that brown-marbled groupers in the waters of Takabonerate National Park have been subjected to extensive and intensive fishing, as also indicated by an estimated Y/R lower than the optimum Y/R rate.

Keywords: Cohorts, exploitation rate, growth, mortality, Takabonerate, yield per recruit

INTRODUCTION

Indonesian Fishing Management Area (FMA) 713 comprises the Makassar Strait, Bone Bay, and Flores Sea. According to the Indonesian Ministry for Marine Affairs and Fisheries (MMAF), the estimated maximum sustainable yield (MSY) for reef fish in FMA 713 is 292,336 tons per year with an estimated annual exploitation rate of 0.34 (MMAF 2016).

Within FMA 713, the waters of Takabonerate National Park (TNP), Selayar Islands District, South Sulawesi, Indonesia, in the Flores Sea are rich in reef fish species, including the brown-marbled grouper. In general, local fishing activities entail commercial purposes, with fish marketed in domestic and global trades. Fishers operating in the TNP still use traditional fishing gears, and fishing is generally carried out in the traditional fishing zones with an area of 481,334 ha. These zones within the TNP are specifically designated as fishing grounds where traditional fishing communities have fished for generations. The utilization of reef fish is subject to the regulatory framework in vigor, including general and specific fisheries laws and policies. Legal instruments include Act Number 5 of 1990 concerning the Conservation of Biological Natural Resources and Ecosystems, Act Number 31 of 2004 on

Fisheries, Act Number 45 of 2009 amending Act Number 31 of 2004, Government Regulation of the Minister of Environment and Forestry of the Republic of Indonesia Number P.92/MENLHK/SETJEN/KUM.1/8/2018 regarding Amendment to Regulation of the Minister of Environment and Forestry Number P.20/MENLHK/SETJEN/KUM.1/6/2018 Regarding Protected Plant and Animal Species; Regulation of the Minister of Marine Affairs and Fisheries PER.2/MEN/2011 concerning Fishing Lanes, Placement of Fishing Equipment and Fishing Aids in the Fisheries Management Areas of the Republic of Indonesia (Balai Taman Nasional Takabonerate 2019).

The implementation of rational utilization and sustainable management calls for data as a basis for understanding fish population dynamics. These data should include key parameters related to population growth rates, population recruitment processes, and the decreases in biomass or abundance in a given population due to natural mortality and fishing mortality (Mallawa 2011). Furthermore, data and information that highlight size structure, the number of age groups or cohorts present, the population growth rate, recruitment and exploitation rate of a given population are central to the fundamental understanding and implementation of fish stock assessments (Mallawa et al. 2014, 2015).

Biological aspects of brown-marbled grouper (*Epinephelus fuscoguttatus*) from Taka Bonerate National Park, District of Selayar Islands, South Sulawesi, Indonesia

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Manuscript received: 13 November 2021. Revision accepted: 29 January 2022

Abstract. Fatma, Mallawa A, Najamuddin, Mukti Zainuddin, Ayyub FR. 2022. Biological aspects of brown-marbled grouper (*Epinephelus fuscoguttatus*) from Taka Bonerate National Park, District of Selayar Islands, South Sulawesi, Indonesia. *Biodiversitas* 23: 1140-1153. Knowledge regarding biological aspects of fishes such as the brown-marbled grouper can provide important information for fisheries management. This research was conducted from February 2020 to February 2021 to determine the length-weight relationship, condition factor, gonad maturity stage and spawning pattern, size at first maturity and feeding habits of brown-marbled groupers in Taka Bonerate National Park. The sample caught comprised 1042 brown-marbled groupers with a total length (TL) range of 23-97 cm and a weight range of 0.5-17.6 kg. The length-weight equation was $W = 0.0001L^{2.5955}$ ($R^2 = 0.8935$). For male brown-marbled grouper ($n = 569$), TL range was 47-97 cm, weight range 1.65-17.60 kg, regression equation $W = 0.0002L^{2.4731}$ ($R^2 = 0.7716$), condition factor range 0.56-2.36 (mean 1.236 ± 1.019), and length at first maturity 66.34 cm. For female brown-marbled grouper ($n = 473$) TL range was 23-73 cm (mean 46.84 cm), weight range 0.50-6.6 kg (mean 2.23 kg), regression equation $W = 0.0007L^{2.1057}$ ($R^2 = 0.7416$), condition factor range 0.55-2.17 (mean 1.225 ± 1.018), and length at first maturity 45.43 cm. The growth pattern was negative allometric with regression coefficient $b < 3$ for both sexes separately and combined. The majority of both male and female fish caught had mature gonads with indications of a partial spawning pattern. The fish diet was carnivorous, predominantly piscivorous (74%) with gut contents comprising 64% unidentified fish and 26% unidentified decapod crustaceans. Over-exploitation of fish can cause negative impacts on populations, so the relationship between length and weight, condition factors and maturity level gonad of fish can be used in fisheries management.

Keywords: Condition factor, *Epinephelus*, feeding habit, length-weight

INTRODUCTION

The Taka Bonerate National Park is situated in the Flores Sea, with waters rich in fisheries resources. Local fishermen are still using traditional fishing gears and capture fish mainly in the traditional fishing zone, which has an area of 481,334 ha. This zone was designated for the benefit of the local communities who have used these marine resources for the needs of their generations. The utilization of reef fish resources by the local community should be in accordance with the agreements and provisions of the legislation in vigor (Taka Bonerate National Park Authority 2019). Andon fishing in Indonesia is a system whereby fishermen/fishing vessels from one administrative area in Indonesia can fish in waters under the aegis of another administrative area within Indonesia.

Many fishermen in coastal communities benefit directly from catching groupers (both live and dead grouper trades), which are important for their livelihoods and also contribute to national food security (Khasanah et al. 2019). The ever-increasing market demand and high economic value of groupers have led to an increase in fishing

intensity so that an increasing number of grouper stocks are vulnerable to extirpation (Cheung et al. 2013). There has been a decline in the abundance of many Indonesian grouper populations due to heavy fishing pressure (Hakim et al. 2020; Khasanah et al. 2020). However, there is a lack of data on the biological aspects of brown-marbled grouper (*Epinephelus fuscoguttatus*) in Taka Bonerate National Park, South Sulawesi, Indonesia.

Based on the situation described above, research is needed on biological aspects of brown-marbled grouper is needed in the Taka Bonerate National Park, including their growth pattern, condition factor, gonad maturity stage, size at first maturity and spawning pattern, and eating habits. This study provides important basic data on the biological condition of fish in the Serranidae family, specifically brown-marbled grouper. These data can be used to inform policymaking and support the sustainable management of groupers in the waters of the Taka Bonerate National Park, Selayar Islands District, South Sulawesi Province, Indonesia.

Lampiran 15. Sertifikat presentasi seminar internasional



Lampiran 16. Daftar riwayat hidup

DAFTAR RIWAYAT HIDUP

Nama : **Dr. Fatma, S.Kel, M.Si**
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Pekerjaan :



- Konsultan Lingkungan PT. Pandit Eka Nusa Agrata (ATPA)
- Dosen Institut Teknologi dan Bisnis Maritim Balik Diwa (NIDN: 0920088403)

PENDIDIKAN

No	Pendidikan	Tahun	Pembimbing/Promotor
1.	S1 Ilmu Kelautan, Fakultas Ilmu Kelautan dan Perikanan, Universitas Hasanuddin	2002-2007	Prof. Dr. Ir. Jamaluddin Jompa, M.Sc
2.	S2 Pengelolaan Lingkungan Hidup, Konsentrasi Manajemen Lingkungan, Universitas Hasanuddin	2011-2014	Prof. Dr. Ir. Sharifuddin Bin Andy Omar, M.Sc
3.	S3 Ilmu Perikanan, Universitas Hasanuddin	2017-2022	Prof. Dr. Ir. Achmar Mallawa, DEA

KURSUS/ PELATIHAN KEAHLIAN YANG PERNAH DIKUTI

No	Kursus/ Pelatihan	Tahun	Pelaksana
1.	Pendidikan dan Pelatihan Selam Profesional Sertifikat CMAS-POSSI	2005	Marine Science Diving Club, Universitas Hasanuddin
2.	Kursus Penyusun Analisis Mengenai Dampak Lingkungan (AMDAL)	2012	Pusat Penelitian dan Pengembangan Lingkungan Hidup, Universitas Hasanuddin
3.	Desk Course For Coral Identification Using Coral Finder	2018	Fakultas Kelautan dan Perikanan, Universitas Hasanuddin
4.	Sertifikasi Anggota Tim Penyusun AMDAL	2016	LSP Lingkungan Hidup Indonesia-LHI
5.	Sertifikasi Anggota Tim Penyusun AMDAL	2019	LSP Lingkungan Hidup-INKALINDO
6.	Sertifikasi Anggota Tim Penyusun AMDAL	2022	LSP Lingkungan Hidup Indonesia-LHI

SKRIPSI, TESIS DAN DISERTASI

No	Judul Penelitian	Lokasi	Tahun	Keterangan
1.	Studi Rekrutmen Karang Keras (Scleractinia) di Pulau Kayangan, Samalona dan Barrang Lompo Kota Makassar.	Kota Makassar, Prov. Sulawesi Selatan	2006	Skripsi
2.	Status Perairan Teluk Laikang dan Strategi Pengelolaannya di Sulawesi Selatan.	Kab. Jeneponto, Prov. Sulawesi Selatan	2013	Tesis
3.	Dinamika Populasi dan Keberlanjutan Sumberdaya Perikanan Kerapu Macan (<i>Epinephelus fuscoguttatus</i>) di Kawasan Perairan Taman Nasional Takabonerate.	Kab. Kepulauan Selayar, Prov. Sulawesi Selatan	2021	Disertasi

PUBLIKASI INTERNASIONAL DAN NASIONAL

No	Judul	Tahun	Penerbit	Keterangan
1.	A Study of Brown – Marbled Grouper (<i>Epinephelus fuscoguttatus</i>) Population Dynamics in Takabonerate National Park Waters, South Sulawesi, Indonesia	2021	Int. Journal : Biodiversitas Journal (Q3)	Penulis Pertama
2.	Biological Aspects of Brown – Marbled Grouper (<i>Epinephelus fuscoguttatus</i>) from Takabonerate National Park, District of Selayar Islands, South Sulawesi, Indonesia	2022	Int. Journal : Biodiversitas Journal (Q3)	Penulis Pertama
3.	Karakteristik Kandungan Mineral pada Tepung Cangkang Kerang Simping (<i>Placuna placenta</i> , Linnaeus, 1758)	2022	Jurnal Airaha Vol. 11, No. 01	Penulis Kedua
4.	Perkembangan Kegiatan Rehabilitasi Ekosistem Terumbu Karang Di Perairan Sulawesi Selatan	2020	Badan Penerbit UNM	Penulis Kedua
5.	Community Knowledge About the Functions of Coral Reefs in Barrang Caddi Island, Spermonde Islands	2022	Atlantis Press SARL	Penulis Keempat
6.	Strategy to Improve Coral Reef Rehabilitation Behavior in Spermonde Archipelago Communities	2022	IOSR Journal Of Humanities And Social Science	Penulis Keempat
7.	Community Perception Of Coral Reef Damage Caused By The Impact Of Mainland Coastal Development Activities	2021	International Conference On Social And Islamic Studies 2021	Penulis Keempat
8.	Pengetahuan Nelayan Tentang Kegiatan Illegal, Unreported And Unregulated (IUU) Fishing Di Kabupaten Mamuju Tengah	2021	Seminar Ilmiah Nasional 1 Fakultas Perikanan & Ilmu Kelautan, UMI	Penulis Keempat

PENGALAMAN PEKERJAAN DAN PENGABDIAN MASYARAKAT

No	Pekerjaan dan Pengabdian Masyarakat	Lembaga/ Perusahaan	Tahun	Keterangan
1.	Studi AMDAL Rencana Pembangunan Pelabuhan Khusus LPG Kota Makassar	PUSLITBANG Lingkungan Hidup Universitas Hasanuddin	Tahun 2011	Asisten Ahli Biota Perairan
2.	Studi AMDAL Rencana Pembangunan Perkebunan dan Pengolahan Kelapa Sawit, Kec. Gilireng dan Maniangpajo, Kab. Wajo, Prov. Sulawesi Selatan	PUSLITBANG Lingkungan Hidup Universitas Hasanuddin	Tahun 2012	Asisten Ahli Biota Perairan
3.	Studi AMDAL Rencana Pengembangan Pelabuhan Kontainer Belang-Belang, Desa Belang-belang, Kab. Mamuju, Prov. Sulawesi Barat	PUSLITBANG Lingkungan Hidup Universitas Hasanuddin	Tahun 2012	Asisten Ahli Biota Perairan
4.	Studi AMDAL Rencana Pembangunan Perkebunan dan Pengolahan Kelapa Sawit, Kec. Majauleng, Tanasitolo, Penrang dan Bola, Kab. Wajo, Prov. Sulawesi Selatan	PUSLITBANG Lingkungan Hidup Universitas Hasanuddin	Tahun 2013	Asisten Ahli Biota Perairan
5.	Studi UKL-UPL Rencana Pembangunan Pembangkit Listrik Tenaga Mini Hidro (PLTMH) Masupu I, Kec. Tabang, Kab. Mamasa, Prov. Sulawesi Selatan	PUSLITBANG Lingkungan Hidup Universitas Hasanuddin	Tahun 2013	Asisten Ahli Biota Perairan
6.	Addendum ANDAL, RKL-RPL Pelabuhan Khusus industri pengolahan minyak kelapa sawit (CPO) Bone Manjeng, Desa Doda, Kec. Sarudu, Kab. Mamuju Utara, Prov. Sulawesi Barat	PUSLITBANG Lingkungan Hidup Universitas Hasanuddin	Tahun 2013	Asisten Ahli Biota Perairan
7.	Studi UKL-UPL Rencana Perbaikan Dermaga Mangkasa Jetty Point berupa pembangunan Jetty dan fasilitas pendukungnya, Sorowako, Kab. Luwu Timur, Prov. Sulawesi Selatan	PT. Rekayasa Engineering	Tahun 2014	Asisten Ahli Biota Perairan
8.	Studi AMDAL Reklamasi Pantai Manakarra, Kec. Mamuju, Prov. Sulawesi Barat	PUSLITBANG Lingkungan Hidup Universitas Hasanuddin	Tahun 2014	Asisten Ahli Biota Perairan
9.	Studi UKL-UPL Rencana Kegiatan Pertambangan Batu Sabak, Kec. Samaturu Kab. Kolaka, Prov. Sulawesi Tenggara	PUSLITBANG Lingkungan Hidup Universitas Hasanuddin	Tahun 2014	Asisten Ahli Biota Perairan
10.	Studi AMDAL Rencana Pembangunan PLTU 2 x 300 MW, Desa Baruga, Kec. Pa'jukukang, Kab. Bantaeng, Prov. Sulawesi Selatan.	PT. Bantaeng Sigma Energi	Tahun 2014	Asisten Ahli Biota Perairan
11.	Penyusunan Dokumen Evaluasi Lingkungan Hidup (DELH) Kegiatan Pangkalan Pendaratan Ikan (PPI) Dulan Pokpok,	CV. Multi Rekayasa	Oktober – Desember 2015	Ahli Lingkungan
12.	Studi AMDAL rencana kegiatan pembangunan Apartemen dan Kondotel Puspamaya Makassar, oleh PT. Wijaya Karya (WIKI) Realty	PT. Wijaya Karya (WIKI) Realty	Oktober 2015 – Januari 2016	Asisten Ahli

No	Pekerjaan dan Pengabdian Masyarakat	Lembaga/ Perusahaan	Tahun	Keterangan
13.	Adendum ANDAL, RKL-RPL Kegiatan pembangunan kawasan Centre Point Of Indonesia (CPI), oleh Joint Operation Ciputra Yasmin bumi Asri	Joint Operation Ciputra Yasmin bumi Asri	September 2015 – Januari 2016	Asisten Ahli
14.	Studi UKL-UPL rencana pembangunan SUTT 150 kV PLTU Barru 2 – Incomer Double Phi (Sidrap – Maros), di Kab. Barru Provinsi Sulawesi Selatan, oleh PT. PLN (Persero) UIP Sulbagsel	Centre of Technology, Fakultas Teknik Universitas Hasanuddin	April 2016 – Juni 2016	Asisten Ahli
15.	Studi AMDAL Rencana Pembangunan Pembangkit Listrik Tenaga Mesin Gas (PLTMG) Mobile Power Plant (MPP) Jayapura (50 MW) dan Pembangkit Listrik Tenaga Mesin Gas (PLTMG) Jayapura Peaker (40 MW) oleh PT. PLN (Persero) Unit Induk Pembangunan Papua	Lembaga Penelitian dan Pengabdian Masyarakat (LPPM) Universitas Hasanuddin	Desember 2016 – April 2017	Ahli Biota Perairan
16.	Studi Addendum ANDAL, RKL-RPL Rencana Pembangunan PLTU Takalar 2 x 100 MW oleh PT. PLN (Persero) UIP Sulawesi Bagian Selatan	PT. PLN (Persero) UIP Sulawesi Bagian Selatan	Mei – Juli 2017	Ahli Biota Perairan
17.	Studi UKL-UPL rencana pembangunan perumahan Citra Land Tallasa City, oleh PT. Parangloe Indah, JO PT Ciputra Nusantara	PT. Parangloe Indah, JO PT Ciputra Nusantara	Mei – Juli 2017	Ahli Biota Perairan
18.	Studi AMDAL Rencana Pembangunan PLTU Nii Tanasa 3 x 10 dan Rencana Pembangunan PLTMG MPP Kendari 50 MW beserta Bangunan Regastifikasinya oleh PT. PLN (Persero) Sektor Pembangkitan Kendari	PT. PLN (Persero) Sektor Pembangkitan Kendari	Februari – Juli 2017	Ahli Biota Perairan
19.	Studi AMDAL Rencana Pembangunan SUTT 150 kV Kendari – Andoolo – Kasipute dan Gardu Induk Terkait, Prov. Sulawesi Tenggara	PT. PLN (Persero) UIP Sulawesi Bagian Selatan	2017	Ahli Lingkungan
20.	Studi Penyusunan Laporan Pelaksanaan RKL-RPL Pembangunan Kawasan CPI, oleh PT. Yasmin Bumi Asri	PT. Yasmin Bumi Asri	April – September 2017	Ahli Biota Perairan
21.	Studi AMDAL Rencana Pembangunan Rumah Sakit Umum Daerah (RSUD) Tipe B, Provinsi Kalimantan Utara, oleh Dinas Pekerjaan Umum Penataan Ruang, Perumahan dan Kawasan Pemukiman Provinsi Kalimantan Utara	Dinas Pekerjaan Umum Penataan Ruang, Perumahan dan Kawasan Pemukiman Provinsi Kalimantan Utara	Juli – Desember 2017	Ahli Biota Perairan
22.	Studi Penyusunan Dokumen Pengelolaan Lingkungan Hidup (DPLH) Dermaga Tambatan Perahu, oleh Dinas Perhubungan Kabupaten Buol.	Dinas Perhubungan Kabupaten Buol., Provinsi Sulawesi Tengah	Oktober – Desember 2018	Ahli Biota Perairan
23.	Studi Penyusunan Dokumen Evaluasi Lingkungan Hidup (DELH), Kegiatan Rumah Sakit Umum Haji Makassar, di Kota Makassar, Provinsi Sulawesi Selatan oleh Rumah Sakit Umum Haji Makassar.	CV. Ghina Konsultan	September – November 2018	Ahli Biota Perairan

No	Pekerjaan dan Pengabdian Masyarakat	Lembaga/ Perusahaan	Tahun	Keterangan
24.	Studi AMDAL Rencana Pengembangan Bandar Udara Andi Jemma, oleh Direktorat Jenderal Perhubungan Udara, Kantor Unit Penyelenggara Bandar Udara Andi Jemma	PT. Arthayu Rali Perdana	Agustus – Desember 2018	Ahli Biota Perairan
25.	Studi UKL-UPL Rincik Rencana Pembangunan Smelter (Pabrik Pengolahan dan Pemurnian Bijih Nikel Laterit) di Kabupaten Bantaeng, Provinsi Sulawesi Selatan, Oleh PT. Titan Mineral Utama	PT. Pandit Eka Nusa Agrata	April – Juni 2019	Ahli Biota Perairan
26.	Studi AMDAL Rencana Pengembangan Kampus Politeknik Pertanian Negeri Pangkajene Kepulauan, di Kabupaten Pangkajene Kepulauan Provinsi Sulawesi Selatan, Oleh Politeknik Pertanian Negeri Pangkajene Kepulauan	Centre of Technology, Fakultas Teknik Universitas Hasanuddin	Juli – Oktober 2019	Ahli Biota Perairan
27.	Studi Addendum ANDAL dan RKL-RPL Rencana Pembangunan Instalasi Pengolahan Air Limbah (IPAL) Domestik Losari Beserta Jaringan Perpipaannya di Kota Makassar, Provinsi Sulawesi Selatan, oleh Dinas Pekerjaan Umum Kota Makassar	Centre of Technology, Fakultas Teknik Universitas Hasanuddin	Oktober – Desember 2019	Ahli Biota Perairan
28.	Studi AMDAL Rencana Pembangunan Destinasi Wisata Hutan Mangrove Tongke-Tongke Kabupaten Sinjai, di Kabupaten Sinjai Provinsi Sulawesi Selatan, Oleh Dinas Pariwisata Kabupaten Sinjai	Centre of Technology, Fakultas Teknik Universitas Hasanuddin	Maret – Agustus 2019	Ahli Biota Perairan
29.	Studi Penyusunan Dokumen Lingkungan Pelabuhan Laut Karast Kabupaten Fak Fak Provinsi Papua Barat, oleh Kantor Otoritas Pelabuhan Utama Makassar	PT. Pandit Eka Nusa Agrata	September – Desember 2019	Ahli Biota Perairan
30.	Studi AMDAL Rencana Pembangunan Pembangkit Listrik Tenaga Minihidro (PLTM) Tabulahan 2 x 5 MW, di Kabupaten Mamuju, Provinsi Sulawesi Selatan, Oleh PT Jindafa Investment Indonesia	PT. Pandit Eka Nusa Agrata	2020	Ahli Biota Perairan
31.	Studi AMDAL Rencana Pembangunan Pembangkit Listrik Tenaga Air (PLTA) Bonto Batu 72 MW, di Kabupaten Enrekang, Provinsi Sulawesi Selatan, oleh PT. Cahaya Energi Massenrempulu	PT. Pandit Eka Nusa Agrata	Desember 2019 – Februari 2020	Ahli Biota Perairan
32.	Studi DPLH dan UKL-UPL Rencana Pengembangan Dermaga LPP di Integrated Terminal Makassar – Regional Sulawesi di Kota Makassar, oleh PT. Pertamina – Marketing Operation Region VII	PT. Pandit Eka Nusa Agrata	2021	Ahli Biota Perairan
33.	Studi UKL-UPL Rencana Pengembangan Dermaga LPP di Integrated Terminal Bitung – Regional Sulawesi di Kota Bitung, oleh PT. Pertamina – Marketing Operation Region VII	PT. Pandit Eka Nusa Agrata	2021	Ahli Biota Perairan

PENGALAMAN ORGANISASI

No	Nana Organisasi	Keterangan
1.	Ikatan Pengkaji Lingkungan Hidup Indonesia	Anggota Wilayah Sul-Sel
2.	Ikatan Sarjana Kelautan Indonesia	Anggota Wilayah Sul-Sel
3.	Marine Science Diving Club, Universitas Hasanuddin	Anggota Luar Biasa

Daftar riwayat hidup ini saya buat dengan sebenar-benarnya dan penuh rasa tanggung jawab.

Makassar, 22 Juni 2022
Yang Membuat

Daftar Riwayat Hidup,



Fatma, S.Kel, M.Si