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# LAMPIRAN

Lampiran 1. Frekuensi panjang total, frekuensi terhitung, logaritma natural frekuensi terhitung dan selisih logaritma terhitung pada ikan kakap merah (*Lutjanus malabaricus*) di Perairan Pangkep

No.	Interval kelas	TK	F	FxTK	TK-L	(TK-L) <sup>2</sup>	F(TK-L) <sup>2</sup>	(TK-L) <sup>2</sup> /2S <sup>2</sup>	EXP - (TK-L) <sup>2</sup> /2S <sup>2</sup>	Fc	LnFc	ΔLnFc	TK+dL/2
1	30-33	31,5	18	567	-20,8804	435,9926	7847,8660	3,6294	0,0265	3915,7805	8,2728	-0,9680	33
2	33-36	34,5	6	207	-17,8804	319,7099	1918,2597	2,6614	0,0698	1487,3950	7,3048	-0,8181	36
3	36-39	37,5	24	900	-14,8804	221,4273	5314,2561	1,8433	0,1583	656.,100	6,4866	-0,6683	39
4	39-42	40,5	46	1863	-11,8804	141,1447	6492,6576	1,1750	0,3088	336,4081	5,8183	-0,5185	42
5	42-45	43,5	80	3480	-8,8804	78,8621	6308,9698	0,6565	0,5187	200,3081	5,2999	-0,3686	45
6	45-48	46,5	106	4929	-5,8804	34,5795	3665,4284	0,2879	0,7499	138,5496	4,9312	-0,2188	48
7	48-51	49,5	245	12127,5	-2,8804	8,2969	2032,7416	0,0691	0,9333	111,3235	4,7124	-0,0689	51
8	51-54	52,5	260	13650	0,1196	0,0143	3,7169	0,0001	0,9999	103,9066	4,6435	0,0809	54
9	54-57	55,5	185	10267,5	3,1196	9,7317	1800,3621	0,0810	0,9222	112,6611	4,7244	0,2307	57
10	57-60	58,5	111	6493,5	6,1196	37,4491	4156,8477	0,3117	0,7322	141,8991	4,9551	0,3806	60
11	60-63	61,5	65	3997,5	9,1196	83,1665	5405,8205	0,6923	0,5004	207,6155	5,3357	0,5304	63
12	63-66	64,5	39	2515,5	12,1196	146,8839	5728,4706	1,2227	0,2944	352,8701	5,8661	0,6803	66
13	66-69	67,5	19	1282,5	15,1196	228,6013	4343,4238	1,9030	0,1491	696,6980	6,5464	0,8301	69
14	69-72	70,5	11	775,5	18,1196	328,3186	3611,5051	2,7331	0,0650	159,8978	7,3764	0,9799	72
15	72-75	73,5	6	441	21,1196	446,0360	2676,2162	3,7130	0,0244	425,2401	8,3564	1,1298	75
16	75-78	76,5	10	765	24,1196	581,7534	5817,5343	4,8428	0,0079	13.175,9515	9,4861	1,2796	78
17	78-81	79,5	10	795	27,1196	735,4708	7354,7082	6,1224	0,0022	47.370,7803	10,7658	-	81

n	1.241
dL	4,3713
n x dL	5424,7993
S√2π	34,4298
S	7.7501

$2S^2$	120,1281
$S^2$	60,0635
L	52,4226

$$L = \frac{\Sigma(TK \times F)}{\Sigma F}$$

$$\Pi = 3,1415$$

n = Jumlah individu setiap kelas

$$S^2 = \frac{\Sigma(TK - L)^2}{\Sigma F - 1}$$

$$Fc = \frac{n \times dL}{S\sqrt{2\pi}} \times \exp - \left( \frac{TK - L^2}{2S} \right)$$

$$dL = \frac{\text{panjang tertinggi} - \text{panjang terendah}}{\text{jumlah individu kelas}}$$

Lampiran 2. Penentuan nilai koefisien pertumbuhan (K), panjang asimtot ( $L^\infty$ ) di Perairan Pangkep dengan menggunakan metode ELEFAN I yang terdapat pada *software* FISAT II

K/Loo	80	81.5	83	84.5	86	87.5	89	90.5	92	93.5	95	96.5	98	99.5	101	102.5	104	105.5	107	108.5	110
0.1	0.001	0.001	0.003	0.005	0.007	0.005	0.007	0.011	0.008	0.048	0.042	0.029	0.051	0.029	0.017	0.026	0.025	0.021	0.021	0.086	0.153
0.15	0.005	0.009	0.008	0.008	0.01	0.068	0.068	0.086	0.068	0.04	0.04	0.061	0.061	0.065	0.046	0.072	0.072	0.062	0.049	0.202	0.23
0.2	0.011	0.017	0.025	0.023	0.04	0.028	0.042	0.041	0.041	0.253	0.233	0.202	0.202	0.131	0.145	0.226	0.217	0.217	0.217	0.217	0.247
0.25	0.016	0.028	0.112	0.166	0.166	0.075	0.133	0.127	0.127	0.145	0.139	0.217	0.217	0.217	0.199	0.173	0.173	0.173	0.095	0.095	0.269
0.3	0.064	0.087	0.083	0.083	0.127	0.127	0.145	0.217	0.17	0.175	0.175	0.173	0.173	0.173	0.059	0.168	0.168	0.144	0.144	0.594	0.676
0.35	0.083	0.083	0.127	0.127	0.096	0.17	0.175	0.175	0.108	0.108	0.108	0.059	0.168	0.594	0.594	0.594	0.676	0.676	0.384	0.369	0.204
0.4	0.041	0.1	0.096	0.112	0.175	0.109	0.108	0.108	0.108	0.594	0.594	0.594	0.594	0.384	0.384	0.384	0.369	0.204	0.204	0.204	0.204
0.45	0.1	0.099	0.109	0.109	0.095	0.443	0.443	0.594	0.594	0.338	0.338	0.384	0.384	0.369	0.204	0.204	0.204	0.204	0.177	0.177	0.177
0.5	0.039	0.109	0.448	0.389	0.443	0.217	0.338	0.338	0.338	0.384	0.369	0.369	0.204	0.204	0.204	0.177	0.177	0.177	0.177	0.177	0.499
0.55	0.159	0.448	0.389	0.217	0.217	0.338	0.338	0.338	0.369	0.369	0.369	0.204	0.204	0.177	0.177	0.177	0.177	0.177	0.499	0.499	0.499
0.6	0.255	0.221	0.19	0.217	0.338	0.338	0.384	0.369	0.369	0.204	0.204	0.177	0.177	0.177	0.177	0.499	0.499	0.499	0.499	0.499	0.569
0.65	0.139	0.19	0.217	0.338	0.338	0.324	0.369	0.369	0.204	0.177	0.177	0.177	0.177	0.177	0.499	0.499	0.499	0.499	0.569	0.569	0.569
0.7	0.12	0.19	0.338	0.338	0.324	0.369	0.369	0.204	0.177	0.177	0.177	0.177	0.499	0.499	0.499	0.499	0.569	0.569	0.569	0.569	0.313
0.75	0.12	0.338	0.338	0.324	0.369	0.369	0.369	0.177	0.177	0.177	0.177	0.499	0.499	0.499	0.569	0.569	0.569	0.569	0.569	0.313	0.313
0.8	0.12	0.338	0.324	0.369	0.369	0.369	0.177	0.177	0.177	0.499	0.499	0.499	0.499	0.569	0.569	0.569	0.569	0.313	0.313	0.313	0.313
0.85	0.12	0.324	0.324	0.369	0.369	0.177	0.177	0.177	0.499	0.499	0.499	0.499	0.569	0.569	0.569	0.313	0.313	0.313	0.313	0.313	0.313
0.9	0.338	0.324	0.324	0.369	0.32	0.177	0.177	0.499	0.499	0.499	0.499	0.569	0.569	0.569	0.313	0.313	0.313	0.313	0.313	0.313	0.313
0.95	0.324	0.324	0.369	0.32	0.32	0.177	0.177	0.499	0.499	0.499	0.569	0.569	0.569	0.313	0.313	0.313	0.313	0.313	0.313	0.313	0.313
1	0.204	0.324	0.369	0.32	0.177	0.177	0.499	0.499	0.499	0.569	0.569	0.569	0.313	0.313	0.313	0.313	0.313	0.313	0.313	0.313	0.313
1.05	0.204	0.324	0.32	0.32	0.177	0.499	0.499	0.499	0.569	0.569	0.569	0.313	0.313	0.313	0.313	0.313	0.313	0.313	0.313	0.313	0.313
1.1	0.204	0.369	0.32	0.32	0.177	0.499	0.499	0.499	0.569	0.569	0.569	0.313	0.313	0.313	0.313	0.313	0.313	0.313	0.313	0.313	0.313

K	0,35
$L^\infty$	104
Log (- $t_0$ )	-0,4740
$t_0$	-0,3357
Rn	0,676

Lampiran 3. Hubungan antara panjang ikan kakap merah (*Lutjanus malabaricus*) pada berbagai tingkat umur di Perairan Pangkep

$$L(t) = L_{\infty} (1 - \exp^{-K(t-t_0)})$$

$L_{\infty}$	K	$t_0$	t	L(t)
104,00	0.35	0.3357	-0.3357	0
104,00	0.35	0.3357	0	11.5289
104,00	0.35	0.3357	0.5	26.3745
104,00	0.35	0.3357	1	38.8367
104,00	0.35	0.3357	1.5	49.2982
104,00	0.35	0.3357	2	58.0802
104,00	0.35	0.3357	2.5	65.4523
104,00	0.35	0.3357	3	71.6409
104,00	0.35	0.3357	3.5	76.8359
104,00	0.35	0.3357	4	81.1969
104,00	0.35	0.3357	4.5	84.8578
104,00	0.35	0.3357	5	87.9309
104,00	0.35	0.3357	5.5	90.5107
104,00	0.35	0.3357	6	92.6763
104,00	0.35	0.3357	6.5	94.4943
104,00	0.35	0.3357	7	96.0203
104,00	0.35	0.3357	7.5	97.3014
104,00	0.35	0.3357	8	98.3768
104,00	0.35	0.3357	8.5	99.2796
104,00	0.35	0.3357	9	100.037
104,00	0.35	0.3357	9.5	100.674
104,00	0.35	0.3357	10	101.208
104,00	0.35	0.3357	10.5	101.656
104,00	0.35	0.3357	11	102.032
104,00	0.35	0.3357	11.5	102.348

104,00	0.35	0.3357	12	102.613
104,00	0.35	0.3357	12.5	102.836
104,00	0.35	0.3357	13	103.023
104,00	0.35	0.3357	13.5	103.18
104,00	0.35	0.3357	14	103.311
104,00	0.35	0.3357	14.5	103.422
104,00	0.35	0.3357	15	103.515
104,00	0.35	0.3357	15.5	103.593
104,00	0.35	0.3357	16	103.658
104,00	0.35	0.3357	16.5	103.713
104,00	0.35	0.3357	17	103.759
104,00	0.35	0.3357	17.5	103.798
104,00	0.35	0.3357	18	103.83
104,00	0.35	0.3357	18.5	103.857
104,00	0.35	0.3357	19	103.88
104,00	0.35	0.3357	19.5	103.9
104,00	0.35	0.3357	20	103.916
104,00	0.35	0.3357	20.5	103.929
104,00	0.35	0.3357	21	103.941
104,00	0.35	0.3357	21.5	103.95
104,00	0.35	0.3357	22	103.958
104,00	0.35	0.3357	22.5	103.965
104,00	0.35	0.3357	23	103.97
104,00	0.35	0.3357	23.5	103.975
104,00	0.35	0.3357	24	103.979
104,00	0.35	0.3357	24.5	103.983
104,00	0.35	0.3357	25	103.985
104,00	0.35	0.3357	25.5	103.988
104,00	0.35	0.3357	26	103.99
104,00	0.35	0.3357	26.5	103.991



104,00	0.35	0.3357	27	103.993
104,00	0.35	0.3357	27.5	103.994
104,00	0.35	0.3357	28	103.995
104,00	0.35	0.3357	28.5	103.996
104,00	0.35	0.3357	29	103.996
104,00	0.35	0.3357	29.5	104
104,00	0.35	0.3357	30	104

Lampiran 4. Nilai hasil *Yield per recruitment relatif* ( $Y/R'$ ) dan laju eksploitasi ( $E$ ) ikan kakap merah (*lutjanus malabaricus*) di Perairan Pangke

$L_{\infty}$	104
$L'$	30
$M$	0,65
$K$	0,35
$M/K$	1,8517
$U$	0,7115
$U^{M/K}$	0,5324
$3U$	2,1345
$3U^2$	1,5186
$U^3$	0,3602
$Y/R'$	0,0223

<b>E</b>	<b>Y/R'</b>	<b>m</b>	<b><math>E \cdot U^{M/K}</math></b>	<b>1+m</b>	<b>1+2m</b>	<b>1+3m</b>
0,05	0,0052	0,5130	0,0266	1,5130	2,0261	2,5391
0,10	0,0100	0,4860	0,0532	1,4860	1,9721	2,4581
0,15	0,0142	0,4590	0,0799	1,4590	1,9181	2,3771
0,20	0,0178	0,4320	0,1065	1,4320	1,8641	2,2961
0,25	0,0209	0,4050	0,1331	1,4050	1,8101	2,2151

0,30	0,0235	0,3780	0,1597	1,3780	1,7561	2,1341
0,35	0,0255	0,3510	0,1863	1,3510	1,7021	2,0531
0,40	0,0270	0,3240	0,2130	1,3240	1,6481	1,9721
0,45	0,0279	0,2970	0,2396	1,2970	1,5940	1,8911
0,50	0,0283	0,2700	0,2662	1,2700	1,5400	1,8101
0,55	0,0282	0,2430	0,2928	1,2430	1,4860	1,7291
0,60	0,0277	0,2160	0,3194	1,2160	1,4320	1,6481
0,65	0,0266	0,1890	0,3461	1,1890	1,3780	1,5670
0,70	0,0252	0,1620	0,3727	1,1620	1,3240	1,4860
0,75	0,0235	0,1350	0,3993	1,1350	1,2700	1,4050
0,80	0,0214	0,1080	0,4259	1,1080	1,2160	1,3240
0,85	0,0193	0,0810	0,4525	1,0810	1,1620	1,2430
0,90	0,0170	0,0540	0,4792	1,0540	1,1080	1,1620
0,95	0,0148	0,0270	0,5058	1,0270	1,0540	1,0810
1,00	0,0127	0,0000	0,5324	1,0000	1,0000	1,0000

$$U = 1 - \frac{L'}{L_{\infty}} \quad m = \frac{1-E}{M/K}$$

$$Y/R' = E \times U^{M/K} \left( 1 - \frac{3U}{1+m} + \frac{3U^2}{1+2m} - \frac{U^3}{1+3m} \right)$$

Lampiran 5. Foto kegiatan pengambilan dan pengukuran sampel ikan kakap merah (*Lutjanus malabaricus*) di lokasi penelitian



Gambar 15. Pengukuran sampel ikan kakap merah



Gambar 14. TPI Paotere