

## CODRS Data from Tuna Fishing Boats in Indonesian Archipelagic Waters

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Peter J. Mous, Shinta Yuniarta, Wawan B. IGede, Mika Winata, Yeremia Apridianto, Dimas G. Fergiawan,  
Aris Muhammad, Jos S. Pet

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**Yayasan Konservasi Alam Nusantara**

Ikat Plaza Building - Blok L  
Jalan By Pass Ngurah Rai No.505, Pemogan, Denpasar Selatan  
Kota Denpasar 80221  
Bali, Indonesia  
Ph. +62-361-244524

**People and Nature Consulting International**

Jalan Tukad Pancoran 15X, Panjer, Denpasar Selatan  
Kota Denpasar 80225  
Bali, Indonesia

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## 1 Introduction

Fisheries for tropical tuna in Indonesia are among the most diverse and complex in the world. Indonesian catch statistics include five major species of oceanic tunas, as well as several coastal tuna species. Large numbers of fishing boats, ranging in size from small canoes to industrial scale vessels, caught a reported 712,668 Metric Tons (MT) of oceanic tuna in 2016 (MMAF-a, 2017). The most common fishing gears used in Indonesian tuna fisheries include pole-and-line, purse seine, longline and various types of handlines and trolling lines. Information on the status of tuna stocks in Indonesia is fragmented, but available data indicate that Indonesia's Archipelagic Waters (IAW), comprising Fisheries Management Areas (FMAs) 713, 714 and 715 are of major importance, especially for the production of yellowfin and skipjack tuna (MMAF-a, 2017).

Led by the Ministry of Fisheries and Marine Affairs (MMAF), the development of a Harvest Strategy (HS) for tropical tuna in the IAW (MMAF-a, 2018) was started as a science-based and participatory process, which included data collection and analysis, expert consultations, and modelling in support of decision-making processes (Satria and Sadiyah, 2018). A series of technical and consultative stakeholder workshops have ensured a collaborative process, while an operating model for evaluation of harvest strategies has been developed (Anon., 2018; Hoshino et al., 2018). MMAF has committed to continue collaboration with stakeholders including government, experts, fishers, fishing associations, industry and NGOs, and to adopt a participatory approach to the implementation of their framework for harvest strategies (Satria and Sadiyah, 2018).

Involvement of Indonesian and international experts through consultation and technical workshops is an ongoing part of harvest strategy development. New data collection and -processing technologies are being developed, with new roles for NGOs and the private sector, feeding information into government databases (Satria and Sadiyah, 2018). The Nature Conservancy (TNC) is one of the NGOs actively working with government within this process of collaborative fisheries management, with contributions to information systems on demersal fisheries delivered in 2018 (Satria et al., 2018). TNC is exploring an expanding role in the development and implementation of the harvest strategy for tropical tunas in the IAW (Mous, 2018).

TNC Indonesia in recent years has been supporting government and industry with the development of cost-effective and scientifically sound approaches to management-informing data collection that can be taken to scale. Lessons learned in the Crew Operated Data Recording System (CODRS) approach which TNC has developed for demersal fisheries, are now used to improve the fragmented information on catch and effort in the tuna fisheries (Proctor et al. 2003; Bailey et al. 2012; Yuniarta et al. 2017). A CODRS approach to on-board image-based monitoring of tuna fisheries in the IAW has been developed, with new sub-sampling approaches introduced for high volume pole and line and purse seine fisheries. The current report provides a first overview of the type of information that is being generated by the innovative crew operated and image-based monitoring approach.

## 2 Gear Types, Categories and Codes

We combine the high resolution of gear types used in the tuna fisheries of IAW with the categories of boat size to provide catch monitoring of the contracted CODRS boat. We listed below the high resolution of gear types as we provided in the report of Tuna Fishing Gear Used in Indonesian Archipelagic Water.

2. Trolling line for large tuna with large hook
  - 2.1. Trolling line without kite, one large hook, artificial lure (TrollOneLargeArtificial)
  - 2.2. Trolling line without kite, one large hook, dead natural bait (TrollOneLargeNatural)
  - 2.3. Trolling line without kite, multiple large hooks, artificial lures (TrollMultipleLargeArtificial)
  - 2.4. Trolling line with kite, one large hook, artificial lure (KiteOneLargeArtificial)
  - 2.5. Trolling line with kite, one large hook, dead natural bait (KiteOneLargeNatural)
  - 2.6. Trolling line with kite, multiple large hooks, artificial lures (KiteMultipleLargeArtificial)
3. Trolling line for small tuna with small hook
  - 3.1. Trolling line without kite, multiple small hooks, artificial lures (TrollMultipleSmallArtificial)
4. Handline for large tuna with large hook
  - 4.1. Drift line with buoy, one large hook, natural bait (DriftOneLargeNatural)
  - 4.2. Weighted drift line with buoy, multiple large hooks, artificial lures (DriftMultipleLargeArtificial)
  - 4.3. Weighted drop line with one large hook, artificial lure (DropOneLargeArtificial)
  - 4.4. Weighted drop line with one large hook, natural bait (DropOneLargeNatural)
  - 4.5. Surface line with one large hook, live bait (SurfaceOneLargeLive)
5. Handline for small tuna with small hook
  - 5.1. Weighted drop lines with one small hook, artificial lure (DropOneSmallArtificial)
  - 5.2. Weighted drop lines with one small hook, natural bait (DropOneSmallNatural)
  - 5.3. Weighted drop lines with multiple small hooks, artificial lures (DropMultipleSmallArtificial)
  - 5.4. Weighted drop lines with multiple small hooks, natural baits (DropMultipleSmallNatural)
6. Longline
  - 6.1. Long lines with multiple large hooks, natural baits (LongMultipleLargeNatural)
7. Pole and line
  - 7.1. Pole and line with artificial lure, live chum (PoleAndLine)
8. Gillnet
  - 8.1. Drifting gillnets with buoys at the surface (Gillnet)
9. Purse seine
  - 9.1. Boat operated surface encircling nets with purse lines (PurseSeine)
10. Rod and reel (RodAndReel)
11. Explosives (Explosives)
12. Other (Other)
13. Mixed gears (MixedGears)

### 3 Specification of Boat and Length Frequency Distribution of Catches

Table 3.1: CODRS Boat that Fishing in Indonesian Archipelagic Waters

Row	Program Site	Boat Name	Fishing Gear	GT Estimate	Fishing WPP
1	Kota Sorong	KM. Pusaka Indah 7	Gillnet	11.0	715 717
2	Kota Sorong	KM. Harapan 77	Gillnet	11.3	715
3	Donggala	KMN Rehobot 01	PurseSeine	26.9	713
4	Kota Kendari	KMN Wahyu Salama	PurseSeine	24.5	714
5	Kota Kendari	KM. Amanah 10	PurseSeine	19.4	714
6	Kota Ambon	KM. Kurnia Ilahi 05	DriftOneLargeNatural	20.1	714 715
7	Bitung	Rajawali	DropMultipleSmallArtificial	0.8	715
8	Sikka	KMN Nur Asifa	DriftOneLargeNatural	3.8	713
9	Sikka	KMN ATM	DriftOneLargeNatural	2.0	713
10	Bitung	Venio	PoleAndLine	52.8	715
11	Lombok Timur	KMN INDRAKU	TrollMultipleSmallArtificial	19.3	573
12	Kota Sorong	KM. Aspac-3	PoleAndLine	40.9	715 717
13	Kota Tidore Kepulauan	Tuna Jaya	DropOneLargeNatural	2.2	715
14	Kota Ternate	KM Virgo - 03	PoleAndLine	16.2	715
15	Donggala	KMN Sapina Tunnaja 01	DropMultipleSmallArtificial	14.9	713 716
16	Kota Tidore Kepulauan	KM. Lumba-lumba	DropOneLargeArtificial	1.3	715
17	Donggala	KMN Cici Umrah	DropMultipleSmallArtificial	11.6	713
18	Buleleng	KMN Rocky	DropMultipleSmallArtificial	0.6	713
19	Kota Sorong	KM. Karya Lestari 01	Gillnet	9.2	715
20	Kota Ambon	KM. Tatari 03	PoleAndLine	23.5	714 715
21	Donggala	KM Rosita	PurseSeine	26.7	713
22	Sikka	KMN Mitra Samudera	DriftOneLargeNatural	2.9	713 714
23	Bulukumba	KMN Halkim Jadid	DropMultipleSmallArtificial	2.4	713
24	Kota Ambon	KM. Berkah Samudra	PurseSeine	68.5	714 715
25	Maluku Tengah	KM. Safa	SurfaceOneLargeLive	1.6	714
26	Sikka	KMN AMAR MAKRUUF	DriftOneLargeNatural	1.7	713
27	Bitung	DEWI TUNA	DropOneLargeNatural	18.5	715
28	Halmahera Selatan	KM INKA MINA 778	PoleAndLine	26.3	715
29	Lombok Timur	KMN SAMPOERNA 05	TrollMultipleSmallArtificial	28.0	573
30	Kota Kendari	KMN Usaha Labuan 01	PurseSeine	27.0	714
31	Flores Timur	KMN FLOTIM 7	PoleAndLine	15.1	714 573
32	Bitung	BITUNG TUNA JAYA 89	DropOneLargeNatural	10.8	715
33	Bitung	KM. Nelayan 2017-953	DropOneLargeNatural	19.0	715
34	Kota Kendari	KMN Amalia	PurseSeine	19.7	714
35	Sinjai	KMN Asnawi	TrollOneLargeArtificial	19.4	713 714
36	Kota Ambon	KM. Asri Jaya 04	DriftOneLargeNatural	23.6	715
37	Sikka	KMN Sinar Bahari	TrollOneLargeNatural	2.5	713 714
38	Kota Ambon	KM. Yosep	TrollOneLargeArtificial	1.3	714
39	Kota Tidore Kepulauan	PMN. Bersatu Hati	DropOneLargeNatural	1.5	715
40	Kota Tidore Kepulauan	PMN Gumele	DropOneSmallArtificial	0.7	715
41	Bone Bolango	KM. INKA MINA 928	PurseSeine	30.0	715
42	Bitung	OMEGA STAR 99	PurseSeine	41.3	715
43	Wakatobi	KM. Hamzah Laut	SurfaceOneLargeLive	1.3	714
44	Sikka	KMN. CINTA BAITULLAH	PoleAndLine	25.5	713 714
45	Minahasa Utara	KM. Ledy Star 01	DropOneLargeNatural	24.1	715
46	Alor	KMN Lestari	TrollMultipleLargeArtificial	2.0	714
47	Sikka	KMN Alamat Palsu	DriftOneLargeNatural	3.8	713 714
48	Sikka	KMN Darusalam	PoleAndLine	31.5	713
49	Balikpapan	KMN Satria 1A	KiteMultipleSmallArtificial	5.8	713
50	Halmahera Selatan	KM. Nelayan 2017 986	PoleAndLine	34.8	715
51	Kota Ambon	KM. Cakrawala SJ 01	DriftOneLargeNatural	16.3	714 718
52	Bulukumba	SAHABAT SEJAHTERA	PurseSeine	21.0	713
53	Sikka	KMN Salsabila	DriftOneLargeNatural	1.1	713
54	Sikka	KMN Dragon	DriftOneLargeNatural	1.7	713 714
55	Kota Tidore Kepulauan	PMN Serba Usaha	DriftOneLargeNatural	1.2	715
56	Sikka	KMN Gadis Manja	TrollOneLargeArtificial	0.7	713
57	Kota Ambon	KM. Manurusi Indah	PurseSeine	22.1	714 715
58	Buleleng	KMN Dika	DropMultipleSmallArtificial	0.6	713

Table 3.1: CODRS Boat that Fishing in Indonesian Archipelagic Waters

Row	Program Site	Boat Name	Fishing Gear	GT Estimate	Fishing WPP
59	Kota Ternate	KMN. Putra Putri Prataya	PoleAndLine	32.6	715
60	Sikka	KMN Tiga Putri 02	KiteOneLargeArtificial	1.4	713
61	Lombok Timur	KMN RIZKY MAULANA	TrollMultipleSmallArtificial	20.3	573
62	Kota Ternate	M RAFA	DropOneSmallArtificial	6.1	715
63	Bitung	QUBAIS	DropOneLargeNatural	11.6	715
64	Donggala	KM Sinar Samudra 07	PurseSeine	26.6	713
65	Donggala	KMN Insy Allah Baru	DropOneLargeNatural	6.6	713 716
66	Balikpapan	KMN Armada Jaya 01	KiteMultipleSmallArtificial	6.2	713
67	Kota Sorong	KM. Bone Karya	Gillnet	17.1	715
68	Kota Ternate	KM Maitara Star	DropOneLargeNatural	22.1	715
69	Flores Timur	KMN FLOTIM 24	PoleAndLine	15.1	714 573 713
70	Bontang	KMN King Ocean	DropOneLargeNatural	1.9	713
71	Kota Ternate	KM Nelayan 2017 695	DriftOneLargeNatural	7.0	715
72	Sikka	KMN Usaha Baru	DriftOneLargeNatural	3.1	713 714
73	Bone Bolango	KM. Frima Expres	PurseSeine	21.3	715
74	Alor	KMN Fatin	TrollOneLargeNatural	2.0	714
75	Wakatobi	KM. Zahra Wakatobi	SurfaceOneLargeLive	2.7	714
76	Sikka	KMN Tiga Putri 02	DropOneLargeNatural	2.2	713 714
77	Sikka	KMN. Berkat Madina	PurseSeine	6.1	713
78	Lembata	KMN Jaman Now	DriftOneLargeNatural	1.6	714
79	Bitung	Fauziah	DriftOneLargeNatural	5.9	715
80	Wakatobi	KM. Dina	SurfaceOneLargeLive	1.6	714
81	Donggala	KMN Sumber Nelayan 77	DropOneLargeNatural	13.0	713
82	Kota Tidore Kepulauan	PMN. KONAYA	DropOneSmallArtificial	2.0	715
83	Donggala	KMN Sumber Nelayan 77	DropOneLargeNatural	13.0	713
84	Kota Kendari	KMN Subur 06	PurseSeine	27.8	714
85	Bulukumba	Bukit Tiro 01	PurseSeine	22.1	713
86	Maluku Tengah	KM. Manu Indah	PurseSeine	23.7	714 715
87	Lombok Timur	KMN PERMATA MERAH 01	TrollMultipleSmallArtificial	23.2	573
88	Sikka	KMN KCBS - 15	PoleAndLine	24.6	713 714
89	Bitung	KM. Dioskuri 09	PoleAndLine	40.0	715
90	Kota Ambon	KM. Samudera Indah 033	DriftOneLargeNatural	15.4	714
91	Donggala	KMN Cahaya Kiswa	DropOneLargeNatural	5.8	713
92	Kota Ternate	KMN. Indah Permata	PoleAndLine	23.1	715
93	Kota Tidore Kepulauan	KM. Putra Tubulehu	DropOneSmallArtificial	1.3	715
94	Bitung	KM. FISH GATE 1	DropOneLargeNatural	22.6	715
95	Buleleng	KMN Starlight	RodAndReel	1.0	713
96	Sikka	KMN Salsabila	DropOneLargeArtificial	1.1	713
97	Wakatobi	KM. Uci	SurfaceOneLargeLive	2.5	714
98	Alor	KMN Musafir	TrollOneLargeArtificial	2.4	714
99	Kupang	KMN.CEP 04	DropOneLargeNatural	2.0	573
100	Kota Gorontalo	KM. Bulls Indoraya 03	PurseSeine	24.5	715 716
101	Sinjai	KMN Salawati 03	TrollOneLargeArtificial	24.1	713 714
102	Kota Ambon	KM. Air Manis 01	DriftOneLargeNatural	22.4	714 715
103	Kota Sorong	KM. Pangkajene	Gillnet	15.7	715
104	Alor	Kmn Adil	TrollMultipleLargeArtificial	2.4	714
105	Kota Ambon	KM. Ceria	TrollOneLargeArtificial	0.6	714
106	Kota Ambon	KM. Samudra Indah 088	TrollMultipleSmallArtificial	17.6	714
107	Bulukumba	KMN Citra Laut 99	DropOneLargeNatural	8.8	713
108	Maluku Tengah	KM. Maya Mandiri 02	LongMultipleLargeNatural	22.5	714
109	Bitung	KMN. Feronika	DropOneLargeNatural	8.0	715
110	Kota Tidore Kepulauan	PMN. KONAYA	DropOneLargeNatural	2.0	715
111	Buleleng	KMN Omplong	RodAndReel	0.9	713
112	Donggala	KM Lintas Samudra 212	PurseSeine	26.4	713
113	Halmahera Selatan	INKA MINA - 990	PoleAndLine	37.0	715
114	Buleleng	KMN Starlight	DropOneSmallNatural	1.0	713
115	Bontang	KMN Sumber Laut	DropOneLargeArtificial	9.1	713
116	Lembata	KMN Pujaan Hati	DriftOneLargeNatural	2.1	714
117	Bitung	KM. Inka Mina 713	DropOneLargeNatural	22.9	715
118	Buleleng	KMN Maheswara	DropOneSmallNatural	1.2	713

Table 3.1: CODRS Boat that Fishing in Indonesian Archipelagic Waters

Row	Program Site	Boat Name	Fishing Gear	GT Estimate	Fishing WPP
119	Wakatobi	KM. Zahra Wakatobi	SurfaceOneLargeLive	1.5	714
120	Sikka	KMN Mitra Samudera	KiteOneLargeArtificial	4.7	713 714
121	Kota Ambon	KM. Normayanti 01	DriftOneLargeNatural	17.9	714 715
122	Flores Timur	KMN YULIEN	PoleAndLine	19.6	714 573
123	Sikka	KMN Sabrina	DriftOneLargeNatural	1.3	713 714
124	Kota Ambon	KM. Dermaga Star 03	DropOneLargeNatural	21.7	714 715
125	Kota Ambon	KM. FMJ Satu Raya	PurseSeine	71.7	714 715
126	Kota Tidore Kepulauan	PMN. Bersatu Hati	DropOneSmallArtificial	1.5	715
127	Sikka	KMN AMAR MAKRUF	TrollMultipleSmallArtificial	1.7	713
128	Buleleng	KMN Omplong	DropOneSmallNatural	0.9	713
129	Sikka	KMN Alamat Palsu	TrollOneLargeNatural	3.8	713 714
130	Flores Timur	KMN FLOTIM 4	PoleAndLine	15.1	714 573
131	Bitung	KM. Gabungan Jaya Mina	PurseSeine	76.8	715
132	Bitung	KM. Bitung Tuna Jaya 88	DropOneLargeNatural	8.3	715
133	Lombok Timur	KMN ARYA JAYA 02	TrollMultipleSmallArtificial	23.8	573 713
134	Sikka	KMN Amista	DriftOneLargeNatural	1.6	713 714
135	Bitung	KM. Melstesye	PurseSeine	23.0	715 716
136	Bontang	KMN Cahaya Sukran	DropMultipleSmallArtificial	4.1	713
137	Kota Ambon	KM. Aru Permai	PurseSeine	21.6	715 714
138	Donggala	KMN. Lintas Samudra 212	PurseSeine	26.4	713
139	Kota Sorong	KM. Adi Karya	Gillnet	19.9	715
140	Bulukumba	KMN Pelita Jaya Tiro 02	DropOneLargeNatural	13.5	713
141	Alor	KMN Lestari	TrollOneLargeNatural	2.0	714
142	Sinjai	KMN Adi Jaya 06	TrollOneLargeArtificial	22.2	713 714
143	Kota Gorontalo	Bulls Indo Raya 05	PurseSeine	28.3	715
144	Alor	KMN Musafir	TrollMultipleLargeArtificial	2.4	714
145	Sikka	KMN Kumis Gatal	DriftOneLargeNatural	4.1	713
146	Bulukumba	KMN Cinta Rasul	DropOneLargeNatural	2.1	713
147	Donggala	KMN Mantap	DropMultipleSmallArtificial	2.4	713
148	Donggala	KMN Cici Umrah	DropOneLargeArtificial	5.4	713
149	Lembata	KMN Jaman Now	DriftOneLargeNatural	1.6	714
150	Sikka	KMN Pahlawan Sejati 01	PoleAndLine	22.8	713 714
151	Sinjai	KMN Salawati 02	TrollOneLargeArtificial	25.7	713 714
152	Maluku Tengah	KM. Risky 22	SurfaceOneLargeLive	1.6	714
153	Bitung	KMN DEWI BAHARI	DropOneLargeNatural	6.8	715
154	Sikka	KMN. Ratu Rosari	PurseSeine	6.8	713 714
155	Lembata	KMN Pujaan Hati	DriftOneLargeNatural	0.4	714
156	Buleleng	KMN Segara Gunung	DropMultipleSmallArtificial	0.7	713
157	Maluku Tengah	KM. Lai Lai 02	PoleAndLine	23.7	714 715
158	Bitung	KM. Nusantara Jaya 8	PoleAndLine	60.0	715
159	Lombok Timur	KMN SAFIRA LB	TrollMultipleSmallArtificial	15.0	573
160	Kota Tidore Kepulauan	PMN Gumele	TrollMultipleSmallArtificial	0.7	715
161	Kota Ternate	KMN. Feybri Star	PurseSeine	28.7	715
162	Bitung	KM. Jaya Bali Bersaudara 10	PurseSeine	57.0	715
163	Denpasar	KM. NAGA MAS PERKASA - XI	LongMultipleLargeNatural	49.1	714
164	Kota Ambon	KM. INDO TIMUR	PoleAndLine	22.8	714 715
165	Bontang	KMN Cahaya Sukran	DropOneLargeNatural	4.1	713
166	Kota Tidore Kepulauan	Tuna Jaya	DropOneSmallArtificial	2.2	715
167	Kota Ambon	KM. Halilintar Ariqah 22	TrollMultipleSmallArtificial	13.3	714
168	Flores Timur	KMN FLOTIM 9	PoleAndLine	15.1	714 573
169	Wakatobi	KM. Uci	SurfaceOneLargeLive	1.3	714
170	Alor	Kmn Adil	TrollOneLargeArtificial	2.4	714
171	Kota Kendari	KMN Diva Bahari	PurseSeine	31.5	714
172	Sikka	KMN Sinar Bahari	DriftOneLargeNatural	2.5	713 714
173	Sinjai	KMN CH Hatijah	DropOneLargeArtificial	15.7	713 714
174	Halmahera Selatan	KM Inka Mina 984	PoleAndLine	32.3	715
175	Bitung	KM. Sinar Perdana 2	LongMultipleLargeNatural	23.5	716 715
176	Bontang	KM Lestari 08	PurseSeine	12.8	713
177	Donggala	KMN Alfat Sipasaro	DropOneLargeNatural	13.2	713
178	Kota Tidore Kepulauan	KM. Lumba-lumba	DriftOneLargeNatural	1.3	715



Table 3.1: CODRS Boat that Fishing in Indonesian Archipelagic Waters

Row	Program Site	Boat Name	Fishing Gear	GT Estimate	Fishing WPP
179	Sikka	KMN Amista	DropOneLargeNatural	1.6	713
180	Alor	KMN Fatin	TrollMultipleLargeArtificial	2.0	714
181	Maluku Tengah	KM. Vitri	SurfaceOneLargeLive	1.6	714
182	Bitung	PMN. Rajawali 02	DropMultipleSmallArtificial	0.7	715
183	Kota Sorong	KM. Mina Fintura 03	PoleAndLine	43.7	715 717
184	Halmahera Selatan	Inka Mina 286	PoleAndLine	32.4	715
185	Halmahera Selatan	KMN. Inka Mina 987	PoleAndLine	29.0	715
186	Sikka	KMN Gadis Manja	DropOneLargeNatural	2.3	713 714
187	Bontang	KMN Cahaya Madina	DropMultipleSmallArtificial	5.7	713 714
188	Donggala	KMN Nur Alif 01	DropOneLargeNatural	8.6	713 716
189	Bulukumba	KMN Cahaya Mutiara	DropOneLargeNatural	3.6	713
190	Kota Tidore Kepulauan	KM. Putra Tubulehu	DropOneLargeArtificial	1.3	715
191	Donggala	KMN Setia Amal	DropOneLargeArtificial	2.8	713
192	Bitung	KM. OMEGA STAR 88	PurseSeine	39.8	715
193	Bone Bolango	KM Nelayan 2017 959	PurseSeine	20.5	715
194	Kota Ternate	KMN. Dua Putra Raya	PoleAndLine	37.8	715
195	Halmahera Selatan	KM. Nishalni Prima Samudra 01	PoleAndLine	18.0	715
196	Bitung	KM POF 52	DropOneLargeNatural	12.6	715
197	Sikka	KMN Cahya Firli	KiteOneLargeArtificial	1.6	713 714
198	Lombok Timur	KMN RAHMA ABADI 02	TrollMultipleSmallArtificial	16.0	573
199	Sikka	KMN Cahya Firli	DriftOneLargeNatural	1.1	713 714
200	Kota Tidore Kepulauan	KM Cakarida 02	PoleAndLine	29.0	715
201	Bulukumba	ALDI PUTRA 77	PurseSeine	14.7	713
202	Kota Ambon	KM. Maya Mandiri 15	LongMultipleLargeNatural	20.5	714 715
203	Kota Ternate	M RAFA	TrollMultipleSmallArtificial	6.1	715
204	Wakatobi	KM. Dina	SurfaceOneLargeLive	3.1	714
205	Donggala	KMN Purnama Nurliati	TrollMultipleSmallArtificial	13.3	713 716
206	Kota Tidore Kepulauan	Sumleba Mayou	DropOneSmallArtificial	1.5	715
207	Donggala	KMN. Pelita Hidup	PurseSeine	18.8	713
208	Denpasar	KM Naga Mas Perkasa - 18	LongMultipleLargeNatural	38.3	714
209	Kota Tidore Kepulauan	Sumleba Mayou	DropOneLargeArtificial	1.5	715
210	Kota Sorong	KM. Mulia Karya	Gillnet	15.7	715
211	Halmahera Selatan	KM INKA MINA 518	PoleAndLine	28.9	715
212	Sikka	KMN ATM	DropOneLargeNatural	2.0	713
213	Bontang	KMN Pammase Puang	DropOneLargeNatural	4.5	713
214	Maluku Tengah	KM. Maya Mandiri 09	LongMultipleLargeNatural	22.6	714 715
215	Buleleng	KMN Maheswara	RodAndReel	1.2	713
216	Flores Timur	KMN FLOTIM 25	PoleAndLine	15.1	714 573
217	Kota Ambon	KM. Adi Jaya 03	TrollOneLargeArtificial	17.2	714 715
218	Bulukumba	KMN Aira Erbul 01	DropOneLargeNatural	6.0	713
219	Kota Ambon	KM. Air Manis 06	DropOneLargeNatural	23.7	714 715
220	Bitung	LA GRACIA 4	PurseSeine	56.2	715
221	Bontang	KMN Si Putih	DropOneLargeNatural	2.4	713
222	Kota Ambon	KM. Bintang Terang A 01	DropOneLargeNatural	25.3	714 715
223	Bitung	KMN NOAH	DropOneLargeNatural	6.0	715
224	Bulukumba	KMN Aira Erbul 02	TrollMultipleSmallArtificial	6.0	713 714
225	Kota Ambon	KMN. SELIA 02	PoleAndLine	17.0	714 715
226	Halmahera Selatan	INKA MINA - 522	PoleAndLine	32.3	715
227	Kota Tidore Kepulauan	PMN Serba Usaha	TrollMultipleSmallArtificial	1.2	715
228	Buleleng	KMN Manik Segara	DropMultipleSmallArtificial	0.7	713
229	Kota Ambon	KM. Kapernau	DriftOneLargeNatural	14.1	714 715
230	Kota Ambon	KM. Penjuru Bintang 02	TrollOneLargeArtificial	15.3	714 715
231	Balikpapan	KMN Armada Jaya	KiteMultipleSmallArtificial	6.5	713
232	Bontang	KM Mahardika Wahyu	PurseSeine	15.1	713
233	Kota Ambon	KM. Asri Jaya 02	DriftOneLargeNatural	19.3	715
234	Bontang	KMN Cahaya Madina	DropOneLargeNatural	5.7	713 714

### 3.1 Medium Boat using Pole And Line

```
## Error in eval(e, x, parent.frame()): object 'boat_id' not found
```