



ASOSIASI PENGELOLAAN
RAJUNGAN INDONESIA



Ghost Gear Clean Up/Removal Program on Blue Swimming Crab Fishery

2025

Asosiasi Pengelolaan Rajungan Indonesia (APRI)
Indonesian Blue Swimming Crab Association

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Indonesian Blue Swimming Crab Association
Surabaya, East Java, Indonesia
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SUMMARY

The blue swimming crab fishery is still considered traditional or small-scale, considering that the vessels are <5 GT and use a one-day fishing method, where fishermen leave for the sea early in the morning and return in the afternoon. Blue swimming crab fishing activities use traps and gillnets. Ghost fishing is the ability of fishing gear to continuously catch fish for a period of time after the gear has been lost (Poon, 2005). Many factors contribute to the loss of this gear, including environmental factors and human activity. Choppy waters and strong currents can cause the gear to break. In order to manage the crab fishery comprehensively, particularly in relation to reducing the impact of fisheries on the environment, management measures related to ghost gear/ghost fishing are necessary. Reducing ghost gear in the environment can reduce the potential for entanglement of protected biota, including marine mammals.

This program was implemented from 2020 to 2025 in several locations in Indonesia and will continue in the future. In 2020, the data collection program was conducted in two locations: Rembang (Central Java) and Pamekasan (East Java). Then in 2024, the program was expanded to Batubara (North Sumatera), Lampung (Lampung), Cirebon (West Java), Rembang (Central Java), Gresik (East Java), Pamekasan (East Java), and Muna Barat (Southeast Sulawesi). In 2025, the ghost gear data collection was expanded to include marine debris, thus improving the program's coverage. This program is carried out in collaboration with local governments, fisheries extension workers, and fishermen's groups. This program generally has two main activities, namely socialization about ghost gear/ghost fishing to fisher communities and activities to record the loss and discovery of ghost gear by fishermen.

Socialization of ghost gear and ghost fishing was carried out with fisher communities in Rembang (Central Java) and Pamekasan (East Java). In addition, socialization was also carried out in other locations by installing posters at blue swimming crab landing locations such as in Batubara (North Sumatera), Lampung (Lampung), Cirebon (West Java), Pemalang (Central Java), Pati (Central Java), Rembang (Central Java), Gresik (East Java), Pamekasan (East Java), Pangkajene dan Kepulauan (South Sulawesi), and Konawe Selatan (Southeast Sulawesi).

Rembang and Pamekasan are two locations which dominantly removing the ghost gear from the waters, it is because the program already implemented longer time than other locations. Ghost gear that removed, dominated by metal+plastic materials. The ghost gear found are relatively low and the impact of the ghost gear tend to be minimal. Over the course of more than five years, the ghost gear found in the fishery is low, indicated that the ghost gear was at low risk for the habitat and ecosystems, especially marine mammal interactions and entanglement. Furthermore, these activities have demonstrated that the involvement of fishermen in socialization, reporting, and collection plays a crucial role in reducing the impacts of ghost fishing while supporting sustainable marine resource management efforts.

INTRODUCTION

The blue swimming crab fishery is still considered traditional or small-scale, considering that the vessels are <5 GT and use a one-day fishing method, where fishermen leave for the sea early in the morning and return in the afternoon. Blue swimming crab fishing activities use traps and gillnets with a proportion of approximately 75% traps and 25% gillnets. Traps and gillnets are passive fishing gear placed on the water floor. In general fishing practices, sometimes the fishing gear used is damaged due to various factors, including strong waves and ocean currents that then cause the fishing gear to break or become loose. This broken or loose fishing gear is then left at sea and has the potential to become ghost fishing gear and play a role in the process of ghost fishing.

Ghost fishing is the ability of fishing gear to continuously catch fish for a period of time after the gear has been lost (Poon, 2005). Many factors contribute to the loss of this gear, including environmental factors and human activity. Choppy waters and strong currents can cause the gear to break. Ghost fishing or ghost gear are related to the abandoned, lost and discarded fishing gear (ALDFG). The best practices for the management of fishing gear are broadly categorized between measures that prevent (avoiding the occurrence of ALDFG in the environment); mitigate (reducing the impact of ALDFG in the environment); and, remediate (removing ALDFG from the environment) (Global Ghost Gear Initiative, 2021).

In order to manage the crab fishery comprehensively, particularly in relation to reducing the impact of fisheries on the environment, management measures related to ghost gear/ghost fishing are necessary. Reducing ghost gear in the environment can reduce the potential for entanglement of protected biota, including marine mammals. The Indonesian Blue Swimming Crab Association/Asosiasi Pengelolaan Rajungan Indonesia (APRI), together with local government and fisher communities, has carried out various activities to reduce ghost gear/ghost fishing, namely by conducting Ghost Gear Clean Up/Removal activities from 2020-2025. This activity aims to increase fishermen's awareness of the risks of ghost gear/ghost fishing, encourage fishermen to improve practices in preventing and mitigating ghost gear/ghost fishing, and encourage fishermen to reuse unused fishing gear, thereby reducing fishing gear waste that causes ghost fishing.

METHOD

This program was implemented from 2020 to 2025 in several locations in Indonesia and will continue in the future. In 2020, the data collection program was conducted in two locations: Rembang (Central Java) and Pamekasan (East Java). Then in 2024, the program was expanded to Batubara (North Sumatera), Lampung (Lampung), Cirebon (West Java), Rembang (Central Java), Gresik (East Java), Pamekasan (East Java), and Muna Barat (Southeast Sulawesi) (Fig 1). In 2025, the ghost gear data collection was expanded to include marine debris, thus improving the program's coverage. This program is carried out in collaboration with local governments, fisheries extension workers, and fishermen's groups.



Fig 1. Ghost gear clean up/removal program location distribution

This program generally has two main activities, namely socialization about ghost gear/ghost fishing to fisher communities and activities to record the loss and discovery of ghost gear by fishermen. The activity begins with socialization to fishermen about ghost gear/ghost fishing and its risks to the sustainability of fisheries in the waters through discussions with fishermen groups, as well as distribution and installation of posters. Then continued with socialization related to the technical reporting and recording of ghost gear/ghost fishing by fishermen to field staff and fisheries extension workers. Fishermen who go out to sea and find ghost gear will bring the ghost gear to land and then assisted by field staff and fisheries extension workers to be able to identify the ghost gear including what type of gear, how much it weighs, and what components it consists of.

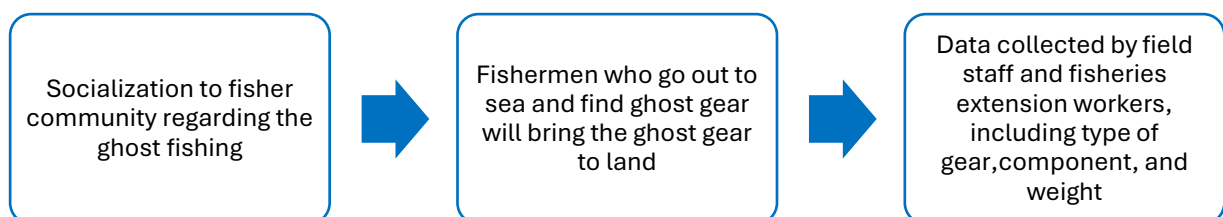


Fig 2. Ghost gear clean up/removal activity flow

In the future, this program will be further developed, especially with reference to mechanisms proposed by MacFadyen et al. (2009), that the measures can be included to prevent, mitigate, and remediate. Some references also will be used to develop the ghost fishing management such as FAO (2009) for basic principles, FAO (2019) 'Voluntary Guidelines on the Marking of Fishing Gear', and The revised 2021 Global Ghost Gear Initiative (GGGI) 'Best Practice Framework for the Management of Fishing Gear'.

IMPLEMENTATION AND RESULTS

Socialization of Ghost Fishing to the Fisher Communities and Supply Chain

Socialization of ghost gear and ghost fishing was carried out as an initial step in the implementation of this program. In 2020, socialization was conducted with fishing groups in Rembang (Central Java) and Pamekasan (East Java) (Fig 3). Socialization activities with fishing groups are carried out routinely through monthly group meetings. In these socialization activities, fishing groups are equipped with an understanding of what ghost gear and ghost fishing are, the risks arising from the presence of ghost gear, and how the community can participate in reducing the impact of ghost fishing. The activities also socialized reporting and data recording mechanisms, and fishermen were encouraged to reuse recovered fishing gear to reduce waste generated from damaged fishing gear.



(a)



(b)

Fig 3. Regular socialization of ghost fishing with fisher groups in (a) Rembang (b) Pamekasan

In addition, socialization was also carried out in other locations by installing posters at blue swimming crab landing locations such as in Batubara (North Sumatra), Lampung (Lampung), Cirebon (West Java), Pematang (Central Java), Pati (Central Java), Rembang (Central Java), Gresik (East Java), Pamekasan (East Java), Pangkajene dan Kepulauan (South Sulawesi), and Konawe Selatan (Southeast Sulawesi) (Fig 4, Fig 5).

Ghost Fishing

CLEAN UP

Sekitar
640.000
Ton/tahun

Sampah di laut adalah jaring dan alat tangkap ikan lain yang dibuang atau hilang di laut. Alat tangkap yang terbuang atau hilang (Ghost Gear) dapat menjebak ikan-ikan di laut. Kejadian tersebut yang terjadi berulang-ulang dikenal dengan istilah **Ghost Fishing**. Tidak hanya mengancam kehidupan di laut, **Ghost Fishing dapat merugikan nelayan karena hasil tangkapan yang semakin berkurang.**

Cara Mencegah dan Mengurangi Ghost Fishing

- 1 Selalu perbaiki alat tangkap yang rusak
- 2 Tidak mengoperasikan alat tangkap di daerah terumbu karang agar mengurangi resiko tersangkutnya alat tangkap
- 3 Tidak membuang alat tangkap jenis apapun ke laut
- 4 Membersihkan dan mengangkat alat tangkap tidak bertuan di laut dan Laporkan ke Enumerator/Penyuluh guna pendataan
- 5 Mendaur ulang (Recycle) alat tangkap yang ditemukan di laut
- 6 Selalu gunakan alat tangkap ramah lingkungan

**AYO
JAGA LAUT
KITA !!!**



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Fig 4. Ghost fishing poster



Fig 5. Socialization of ghost fishing at blue swimming crab landing sites in several locations

Ghost Gear Removal and Data Collection

Ghost gear cleanup/removal program carried out in Rembang and Pamekasan as piloting sites in 2020, and then developed to cover more areas in 2025. In Rembang, the program already removed a total 8,413 grams of ghost gear which is dominated by the metal+plastic material in 2020. In 2021, 1,556 grams of ghost gear with metal+plastic material are removed, while in 2022 is 2,192 grams and 2023 is 17,107 grams. In 2025, a total of 1,240 grams (metal) and 9,130 grams (metal+plastic) ghost gear are removed from the waters (Table 1).

Table 1. Ghost gear removal data summary in several locations

No	Location	Year	Ghost Gear Removed (weight-g)				Total Weight (g)
			Metal	Plastic	Metal+Plastic	Bamboo+Plastic	
1	Rembang	2020	0	592	7,821	0	8,413
		2021	0	0	1,556	0	1,556
		2022	0	0	2,192	0	2,192
		2023	0	0	17,107	0	17,107
		2025	1,240	0	9,130	0	10,370
2	Pamekasan	2020	0	70	1,350	1,500	2,920
		2021	0	1,859	1,275	0	3,134
		2025	2,200	13,050	0	0	15,250
3	Lampung	2025	1,122	0	0	0	1,122
4	Muna Barat	2025	500	0	0	0	500
Total			5,062	15,571	40,431	1,500	62,564

In Pamekasan, a total of 2,920 grams ghost gear were removed from the waters in 2020 which is contained ghost gear with plastic, metal+plastic, and bamboo+plastic materials. While in 2021, as many as 1,859 grams and 1,275 grams ghos gear were removed. In 2025, the program is able to remove 2,200 grams metal and 13,050 grams metal+plastic ghost gear from the waters. In other areas such as Lampung and Muna Barat, ghost gears with metal material are removed which is in total 1,122 grams in Lampung and 500 grams in Muna Barat.



Fig 6. Documentation of ghost gear clean up/removal activities

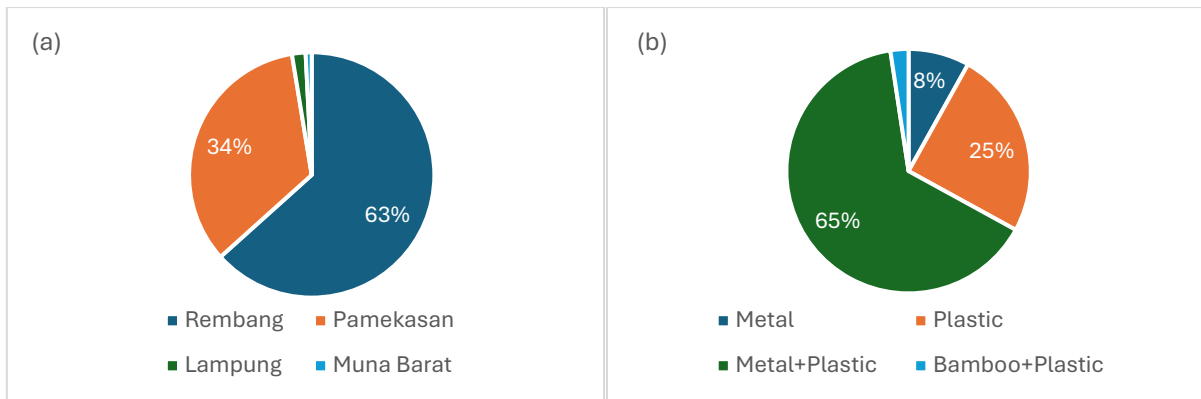


Fig 7. (a) Percentage of ghost gear removed in each location; (b) Percentage of ghost gear materials that removed

Rembang and Pamekasan are two locations which dominantly removing the ghost gear from the waters, it is because the program already implemented longer time than other locations. In Lampung and Muna Barat, the program initiated this year. In other areas such as Batubara, Cirebon, and Gresik, the program also already implemented, but there are no data recorded for lost gear or removal of ghost gear. Ghost gear that removed, dominated by metal+plastic materials which is 65% of total ghost gear. The ghost gear found are relatively low and the impact of the ghost gear tend to be minimal. However, the ghost gear clean up/removal program still need to be carried out to reduce the risk of marine mammal interaction and entanglement.

CONCLUSION

A total of 62,564 grams ghost gear were removed from the waters which is contained ghost gear from metal, plastic, metal+plastic, and bamboo+plastic materials. Over the course of more than five years, the ghost gear found in the fishery is low, indicated that the ghost gear was at low risk for the habitat and ecosystems, especially marine mammal interactions and entanglement. The program continued to be carried out to reducing the environmental impact. Furthermore, these activities have demonstrated that the involvement of fishermen in socialization, reporting, and collection plays a crucial role in reducing the impacts of ghost fishing while supporting sustainable marine resource management efforts.

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