

March 2025

Data Collection and Biological Parameters of Octopus in Sulawesi

Introduction

Octopus (*Octopus cyanea*) fisheries data collection is implemented with the support of octopus fishers, community members, partners, and the Indonesia Research and Innovation Body (Badan Riset dan Inovasi Nasional/BRIN) (Table 1). The data collection's main purpose is to understand the octopus fisheries condition and trends across communities in Sulawesi. Partners train and work with community data collectors/enumerators to record octopus fisher's catch using KoboCollect. The collected data is sent into a database, validated by partners, and automatically analysed and visualised in an interactive dashboard.

Table 1 Octopus fisheries communities and partners list in Sulawesi

No.	Province	Regency	District	Community	Supporting Partner
1	Sulawesi Utara	Minahasa Utara	Likupang Barat	Bulutui	YAPEKA
2	Sulawesi Utara	Minahasa Utara	Likupang Barat	Gangga Satu	YAPEKA
3	Sulawesi Utara	Minahasa Utara	Likupang Timur	Likupang Dua	YAPEKA
4	Gorontalo	Pohuwato	Popayato	Torosiaje	JAPESDA
5	Sulawesi Tengah	Tojo Una-Una	Talatakko	Kadoda	JAPESDA
6	Sulawesi Tengah	Banggai	Luwuk Timur	Uwedikan	JAPESDA
7	Sulawesi Tengah	Banggai Kepulauan	Totikum Selatan	Kalumbatan	LINI
8	Sulawesi Tengah	Banggai Kepulauan	Totikum Selatan	Lobuton	LINI
9	Sulawesi Tengah	Banggai Laut	Banggai Utara	Popisi	LINI
10	Sulawesi Selatan	Kepulauan Selayar	Buki	Mekar Indah	LINI
11	Sulawesi Selatan	Kepulauan Selayar	Bontoharu	Kahu-Kahu	LINI
12	Sulawesi Tenggara	Wakatobi	Wangi-Wangi Selatan	Kapota	KOMANANGI

No.	Province	Regency	District	Community	Supporting Partner
13	Sulawesi Tenggara	Wakatobi	Wangi-Wangi Selatan	Kapota Utara	KOMANANGI
14	Sulawesi Tenggara	Wakatobi	Wangi-Wangi Selatan	Kabita	KOMANANGI
15	Sulawesi Tenggara	Wakatobi	Wangi-Wangi Selatan	Kabita Togo	KOMANANGI
16	Sulawesi Tenggara	Wakatobi	Kaledupa	Sombano	FORKANI
17	Sulawesi Tenggara	Wakatobi	Kaledupa Selatan	Tanomeha	FORKANI
18	Sulawesi Tenggara	Wakatobi	Kaledupa Selatan	Darawa	FORKANI
19	Sulawesi Tenggara	Wakatobi	Binongko	Kampo-Kampo	FONEB
20	Sulawesi Tenggara	Wakatobi	Binongko	Lagongga	FONEB

Octopus Fisheries Across Sulawesi

The octopus fisheries data period is ranging from 01 January 2022 to 28 February 2025. During that period, there are 324,095kg of octopus recorded with a total value of IDR12,564,341,814 and the average per cent mature catch of 91%. The average Catch per Unit of Effort (CPUE) is 4kg/trip and the fisher's average Income per Unit of Effort (IPUE) is IDR 131,681/trip.

Total landings of octopus spiked every March in 2022 and 2023, and in 2024 it spiked in February (Figure 1). The octopus total landings in January 2025 and February 2025 are relatively lower than January 2022, indicating a decreasing octopus production in Sulawesi.

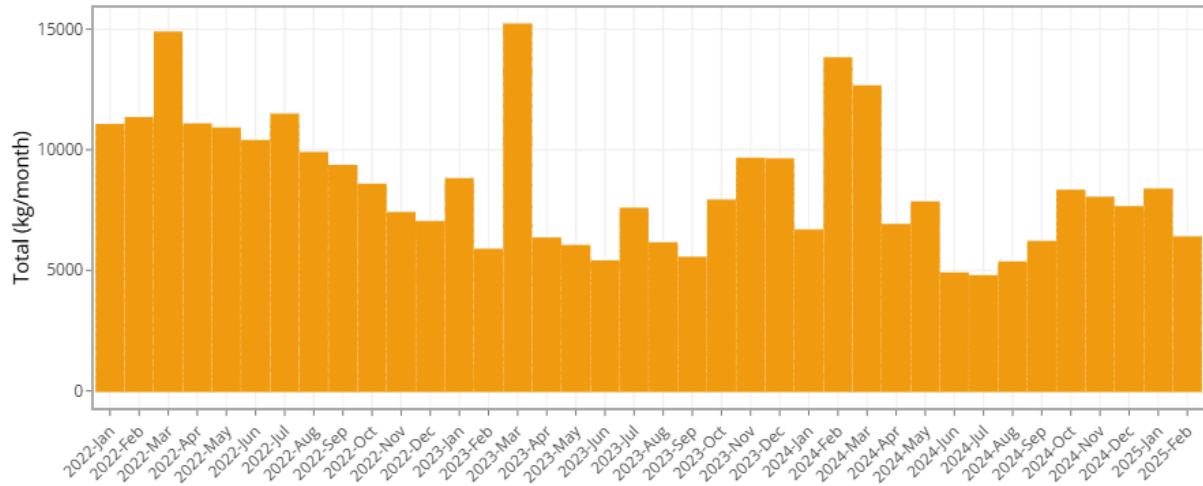


Figure 1 Total landings of octopus across 20 communities in Sulawesi from January 2022 to February 2025

However, looking at the average CPUE in Figure 2, the octopus fisheries in Sulawesi are undergoing an increasing CPUE trend and a stable trend of the average mature percentage of octopus in Figure 3. The total landings might be decreasing, but the octopus size that is caught by fishers is stable throughout the years. Increasing CPUE and stable mature percent catch trends indicate an improving octopus fisheries health across Sulawesi.

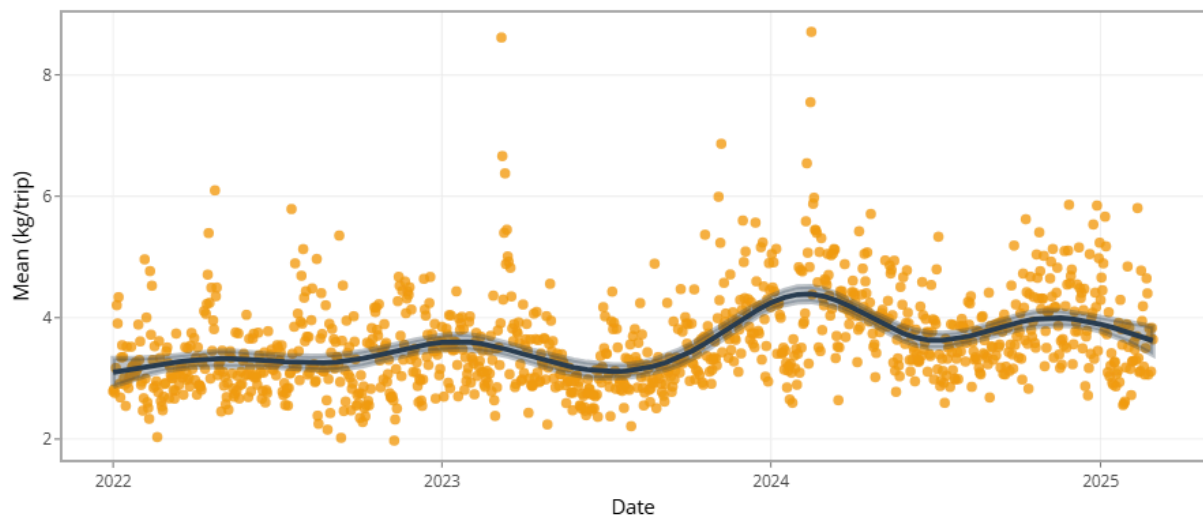


Figure 2 Mean catch per unit of effort (CPUE) of octopus across 20 communities in Sulawesi from January 2022 to February 2025

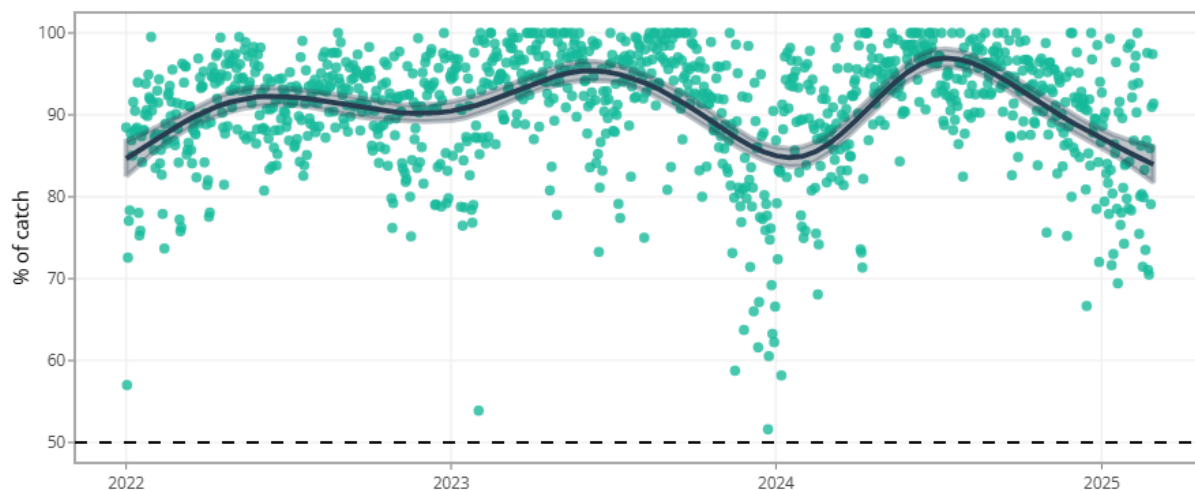


Figure 3 Mean percentage of mature octopus caught across 20 communities in Sulawesi from January 2022 to February 2025. The horizontal dashed line at 50% is a Limit Reference Point (LRP) for the percentage of the mature catch.

Octopus Fisheries in Minahasa Utara

The octopus fisheries data collected in Minahasa Utara is ranging from 01 January 2022 to 28 February 2025. Data is collected from three communities, namely Gangga Satu, Bulutui, and Likupang Dua. The fisher's total landings recorded is 62,651kg and the fisher's total income recorded is IDR1,893,832,691 with the average percentage of mature octopus caught is 96%. Fisher's average CPUE is 4kg/trip and the average IPUE is IDR126,071/trip.

The total landing trend of octopus fisheries in the three communities in Minahasa Utara has fluctuated over the years (Figure 4). There were declines from December 2022 to February 2023, but it increased in March 2023 and spiked in October 2024. The total landings gradually decreased until February 2025.

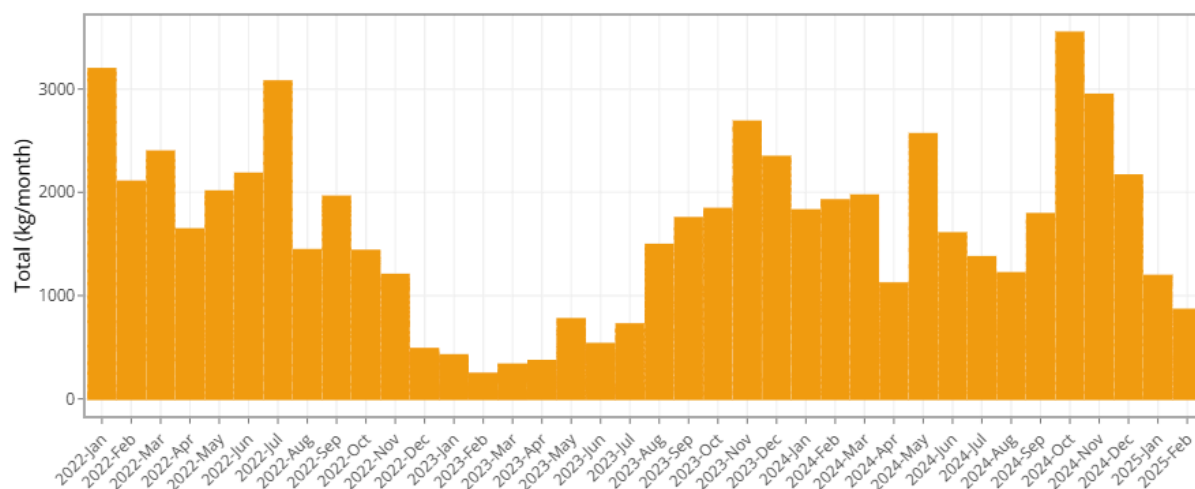


Figure 4 Total landings of octopus in Likupang Dua, Bulutui, and Gangga Satu from January 2022 to February 2025

The trends of CPUE in three communities in Minahasa Utara are stable from January 2022 to February 2025 (Figure 5). An increasing trend is observed in the percentage of mature octopus caught (Figure 6). From these two indicators, there are signs of improvement in octopus fisheries in the three communities of Minahasa Utara.

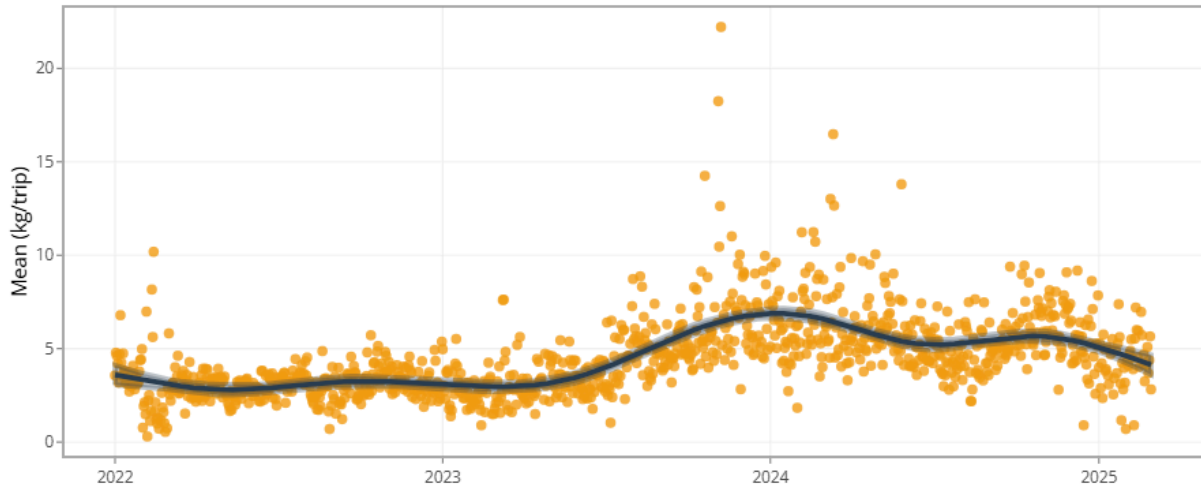


Figure 5 Mean catch per unit of effort (CPUE) of octopus in Likupang Dua, Bulutui, and Gangga Satu from January 2022 to February 2025

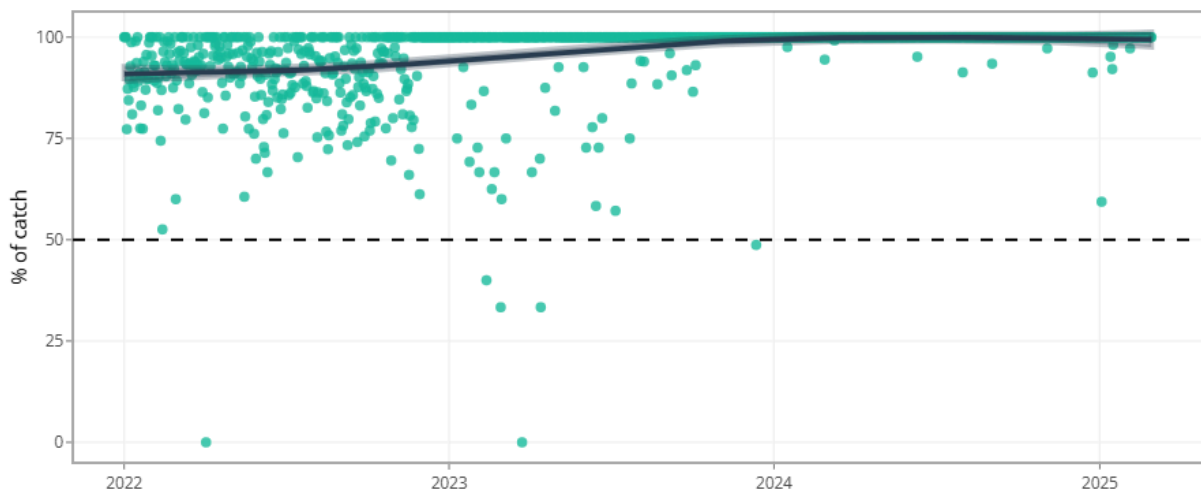


Figure 6 Mean percentage of mature octopus caught in Likupang Dua, Bulutui, and Gangga Satu from January 2022 to February 2025. The horizontal dashed line at 50% is a Limit Reference Point (LRP) for the percentage of the mature catch.

Octopus Fisheries in Pohuwato

The octopus fisheries data collected in Pohuwato is ranging from 01 January 2022 to 28 February 2025. Data is collected from Torosiaje Village. The fisher's total landings recorded is 37,694kg and the fisher's total income recorded is IDR1,644,256,495 with

the average percent mature octopus caught is 97%. Fisher's average CPUE is 5kg/trip and the average IPUE is IDR204,019/trip.

The decline of the total landing trend of octopus fisheries in Torosiaje started in August 2022. The trend fluctuates along the months with an observable decline in December 2023, then gradually increasing until February 2025.

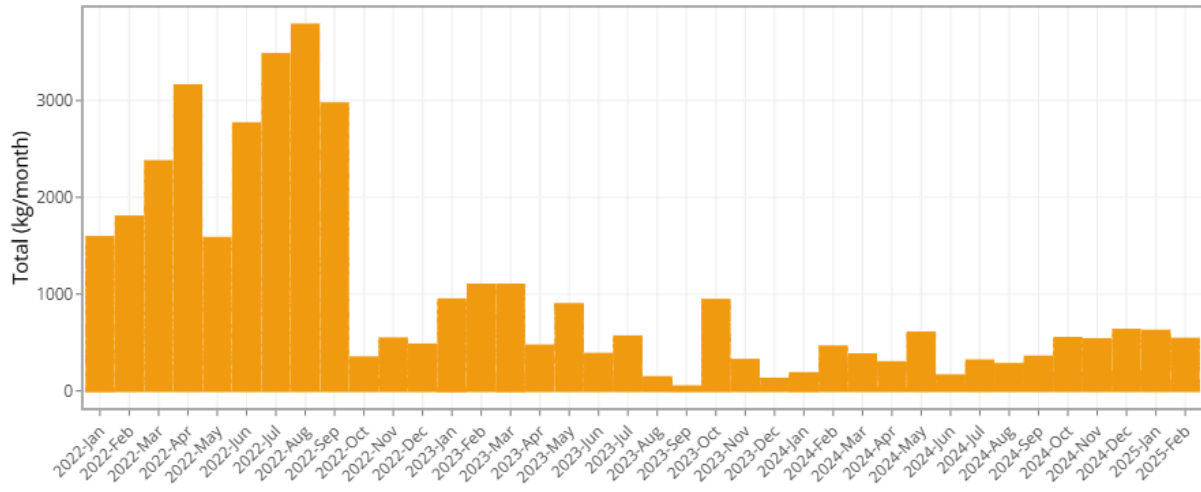


Figure 7 Total landings of octopus in Torosiaje from January 2022 to February 2025

The trend of CPUE in Torosiaje is stable from January 2022 to February 2025. The percentage of mature octopus caught is also showing a stable trend. From these two indicators, the octopus fisheries in Torosiaje are showing a stable condition with average percent mature catch above 90%.

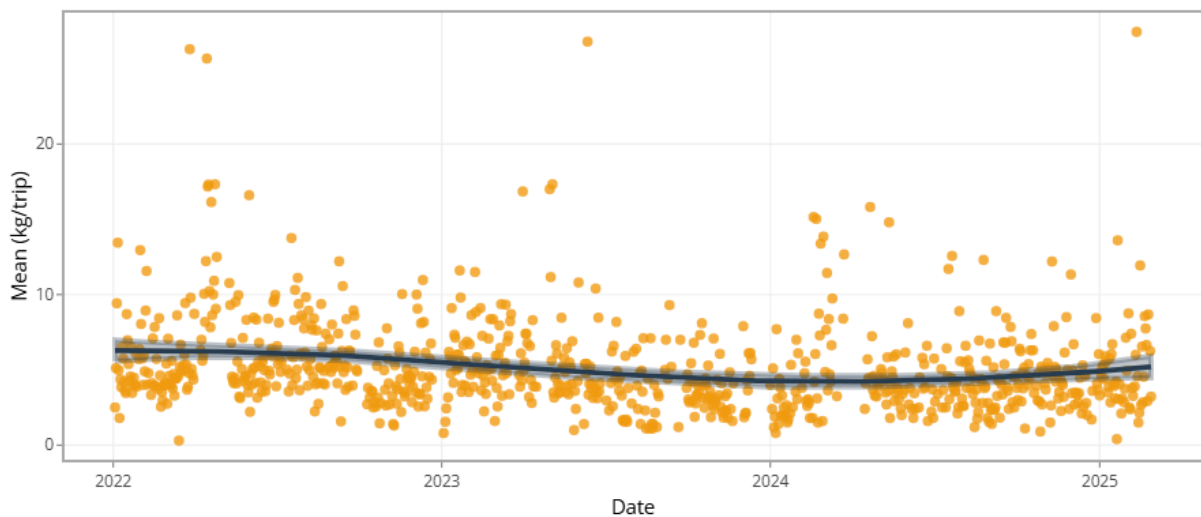


Figure 8 Mean catch per unit of effort (CPUE) of octopus in Torosiaje from January 2022 to February 2025

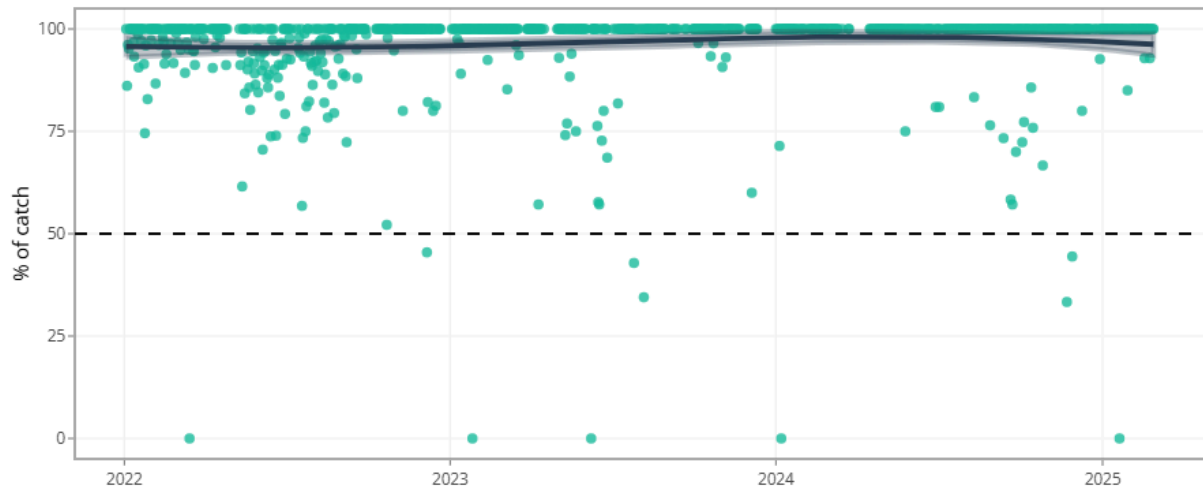


Figure 9 Mean percentage of mature octopus caught in Torosiaje from January 2022 to February 2025. The horizontal dashed line at 50% is a Limit Reference Point (LRP) for the percentage of the mature catch.

Octopus Fisheries in Tojo Una-Una

The octopus fisheries data collected in Tojo Una-Una is ranging from 01 January 2022 to 28 February 2025. Data is collected from Kadoda Village. The fisher's total landings recorded is 14,584kg and the fisher's total income recorded is IDR601,912,502 with the average percent mature octopus caught is 86%. Fisher's average CPUE is 3kg/trip and the average IPUE is IDR93,583/trip.

The total landing trend of octopus fisheries in Kadoda reached a sudden spike in January 2023, then decreased in the next month. Starting from March 2023, the total landings showed a decreasing trend until August 2024 then increasing gradually until February 2025 (Figure 10).

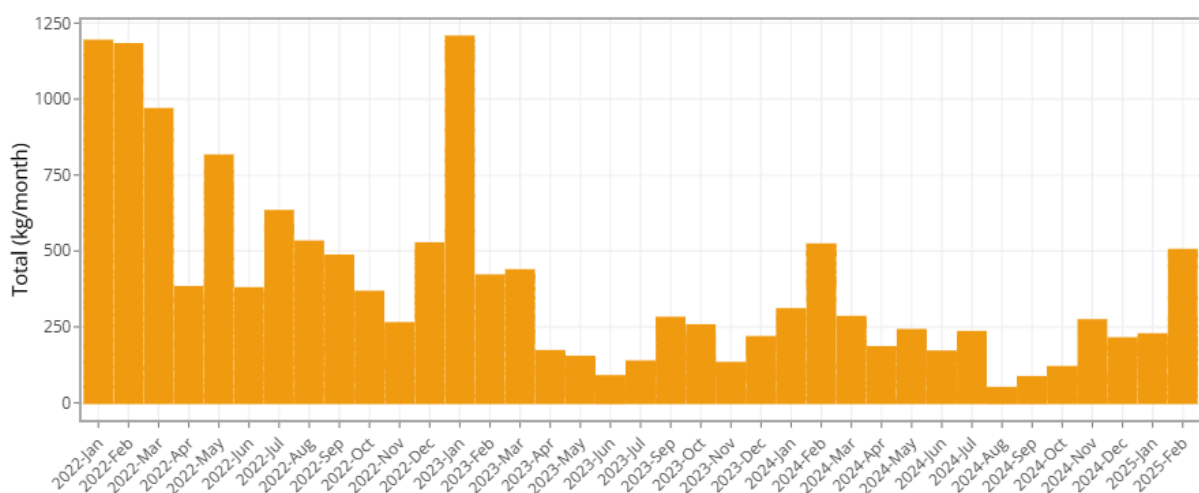


Figure 10 Total landings of octopus in Kadoda from January 2022 to February 2025

The CPUE in Kadoda was in decline during mid-year 2023, then it showed a slight increase at early 2024 then stabilised until February 2025 (Figure 11). On the other hand, the percentage of mature octopus caught is showing a consistent stable trend from January 2022 to February 2025 (Figure 12). From these two indicators, the octopus fisheries in Kadoda are showing a stable condition.

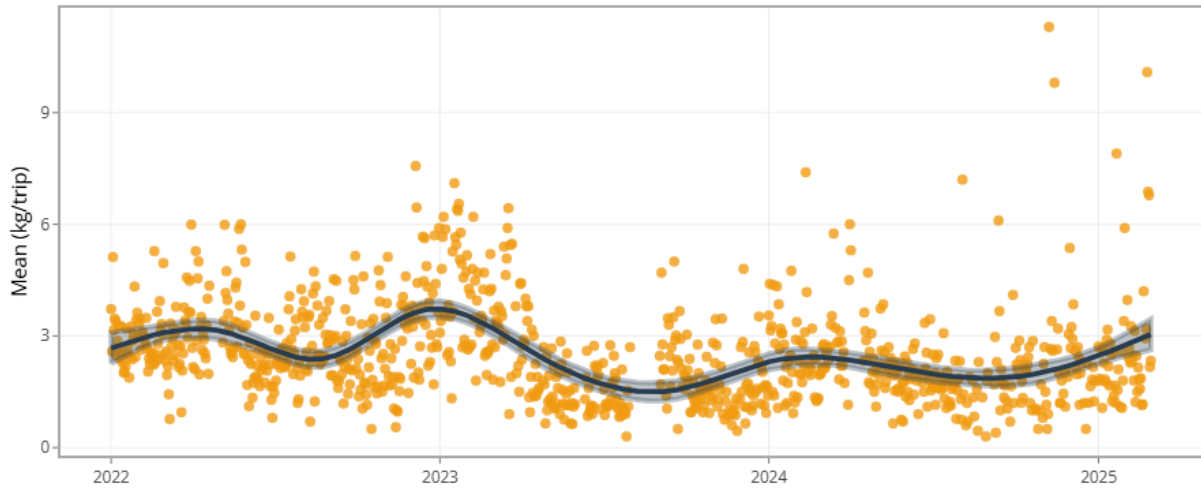


Figure 11 Mean catch per unit of effort (CPUE) of octopus in Kadoda from January 2022 to February 2025

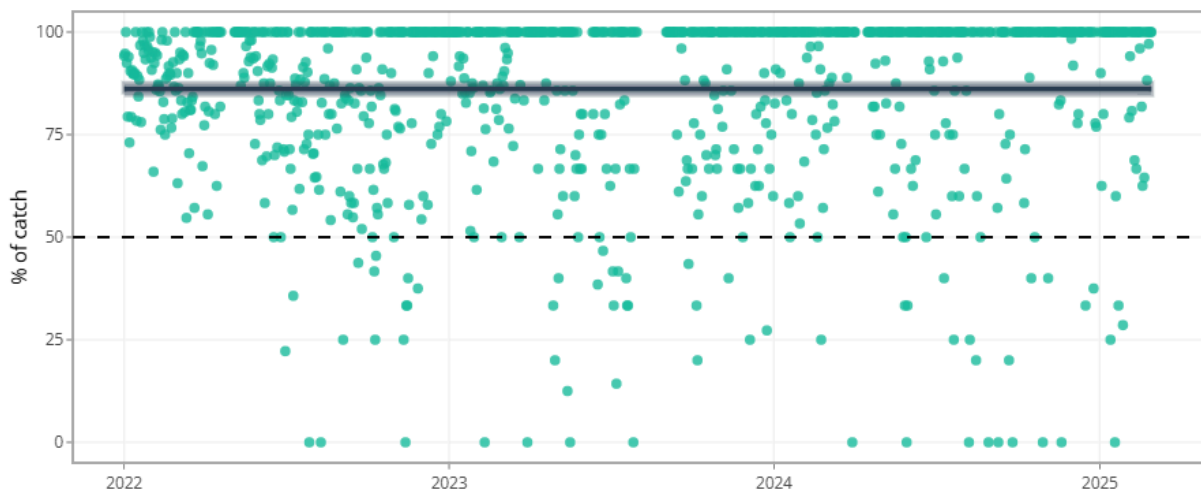


Figure 12 Mean percentage of mature octopus caught in Kadoda from January 2022 to February 2025. The horizontal dashed line at 50% is a Limit Reference Point (LRP) for the percentage of the mature catch.

Octopus Fisheries in Banggai

The octopus fisheries data collected in Banggai is ranging from 01 January 2022 to 26 February 2025. Data is collected from Uwedikan Village. The fisher's total landings recorded is 8,128kg and the fisher's total income recorded is IDR373,134,441 with an

average per cent mature octopus caught is 99%. Fisher's average CPUE is 3kg/trip and the average IPUE is IDR135,181/trip.

The total landing trend of octopus fisheries in Uwedikan declined in November 2022 and remained stable until a sudden increase in March 2024. Then, from April 2024 to January 2025, the total landings showed a consistent declining trend with a slight increase of total landings in February 2025 (Figure 13).

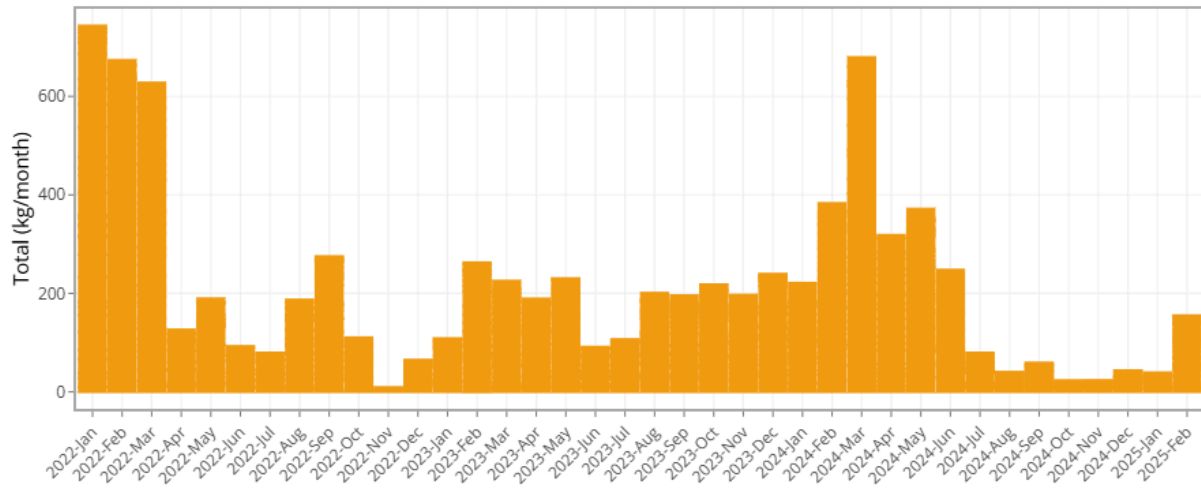


Figure 13 Total landings of octopus in Uwedikan from January 2022 to February 2025

The CPUE in Uwedikan showed no change in trend between January 2022 to June 2024 and then decreased until February 2025 (Figure 14). However, the average percentage of mature octopus caught is showing a stable trend from January 2022 to February 2025 (Figure 15). From these two indicators, the octopus fisheries in Kadoda are showing a stable condition.

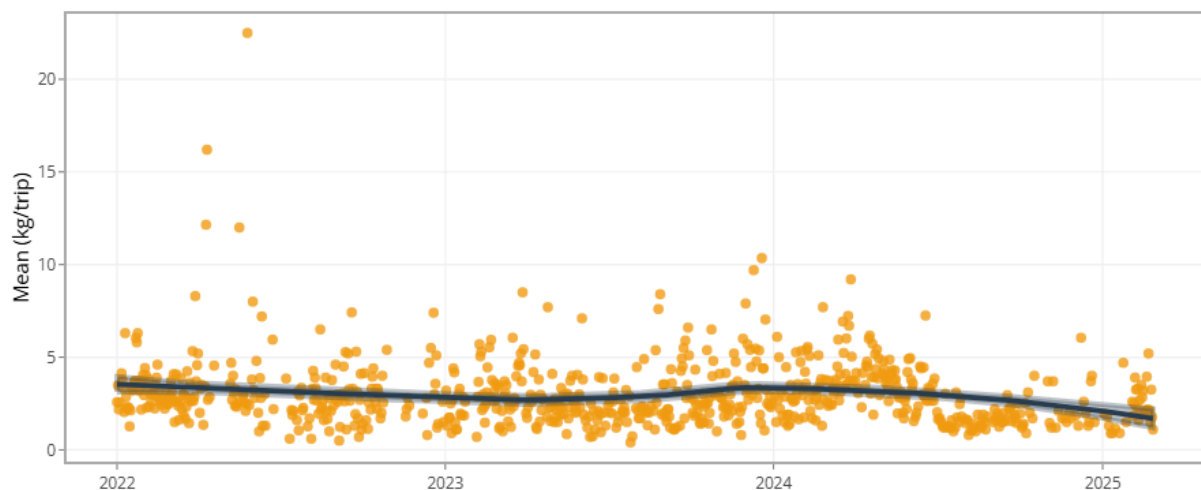


Figure 14 Mean catch per unit of effort (CPUE) of octopus in Uwedikan from January 2022 to February 2025

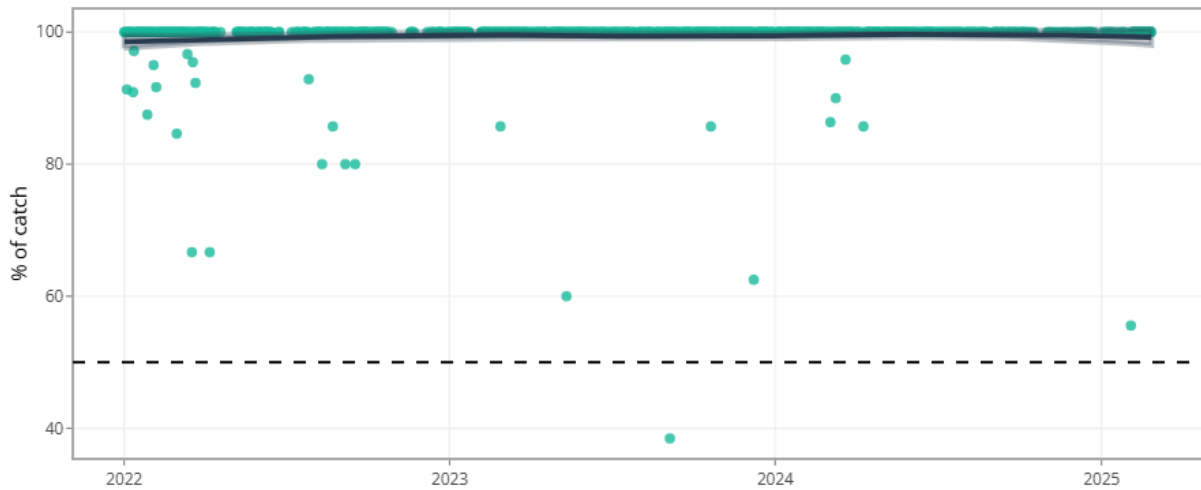


Figure 15 Mean percentage of mature octopus caught in Uwedikan from January 2022 to February 2025. The horizontal dashed line at 50% is a Limit Reference Point (LRP) for the percentage of the mature catch.

Octopus Fisheries in Banggai Kepulauan

The octopus fisheries data collected in Banggai Kepulauan is ranging from 01 January 2022 to 28 February 2025. Data is collected from two communities, namely Kalumbatan and Lobuton. The fisher's total landings recorded is 45,716kg and the fisher's total income recorded is IDR1,905,161,208 with the average percent mature octopus caught is 95%. Fisher's average CPUE is 4kg/trip and the average IPUE is IDR147,785/trip.

Total landings of octopus fisheries in Kalumbatan and Lobuton showed a fairly stable trend over the months. From January 2022 to February 2025, there are occasional spikes of monthly total landings, in May 2022, November 2023, May 2024, and November 2024 (Figure 16).

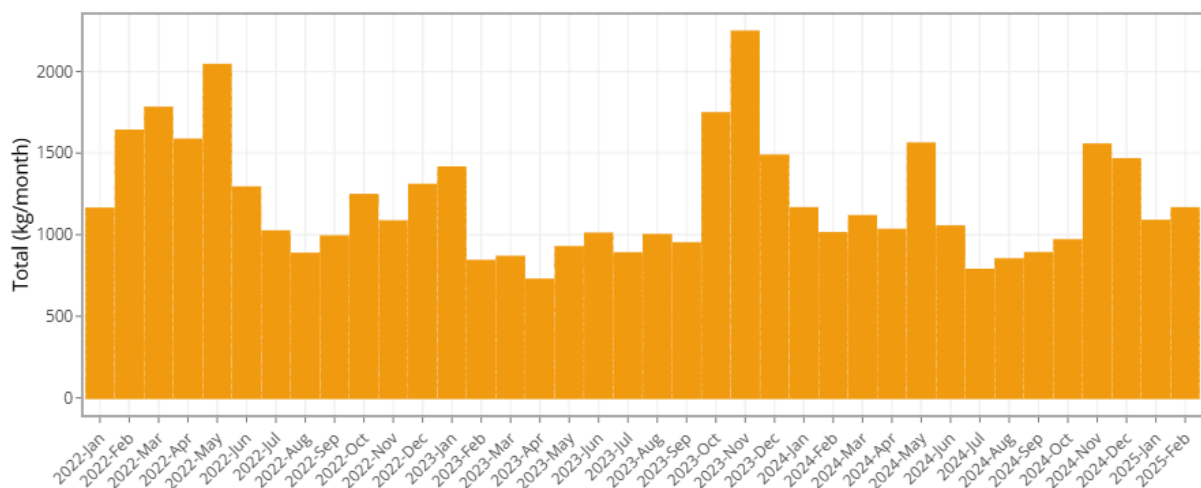


Figure 16 Total landings of octopus in Kalumbatan and Lobuton from January 2022 to February 2025

The CPUE in Kalumbatan and Lobuton showed an increasing trend from January 2022 to February 2025 (Figure 17) with a more observable increasing trend of average percentage of mature catch (Figure 18). Based on CPUE and mature catch trends as indicators, the octopus fisheries in Kalumbatan and Lobuton are showing an improvement with a notable increase of octopus size caught as shown by the percent mature trend.

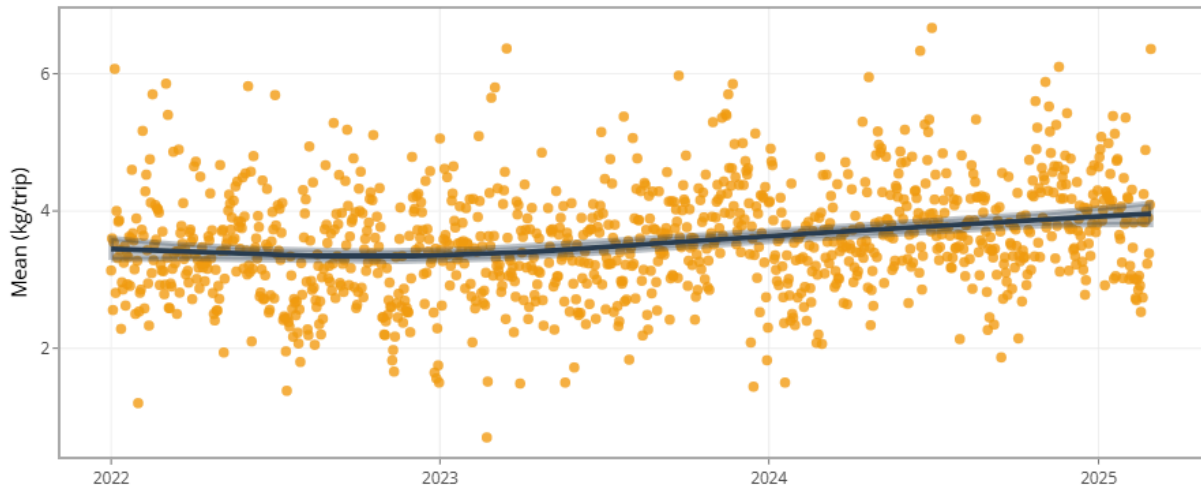


Figure 17 Mean catch per unit of effort (CPUE) of octopus in Kalumbatan and Lobuton from January 2022 to February 2025



Figure 18 Mean percentage of mature octopus caught in Kalumbatan and Lobuton from January 2022 to February 2025. The horizontal dashed line at 50% is a Limit Reference Point (LRP) for the percentage of the mature catch.

Octopus Fisheries in Banggai Laut

The octopus fisheries data collected in Banggai Laut is ranging from 01 January 2022 to 28 February 2025. Data is collected from Popisi Village. The fisher's total landings recorded is 15,965kg and the fisher's total income recorded is IDR671,430,350 with an

average percentage of mature octopus caught is 92%. Fisher's average CPUE is 3kg/trip and the average IPUE is IDR119,820/trip.

Total landings of octopus fisheries in Popisi showed a decreasing trend over the months. There is a sudden increase in April 2024 and then it continues to decrease in the following months. The total landings increased from September 2024 to January 2025, and then dropped again in February 2025 (Figure 19).

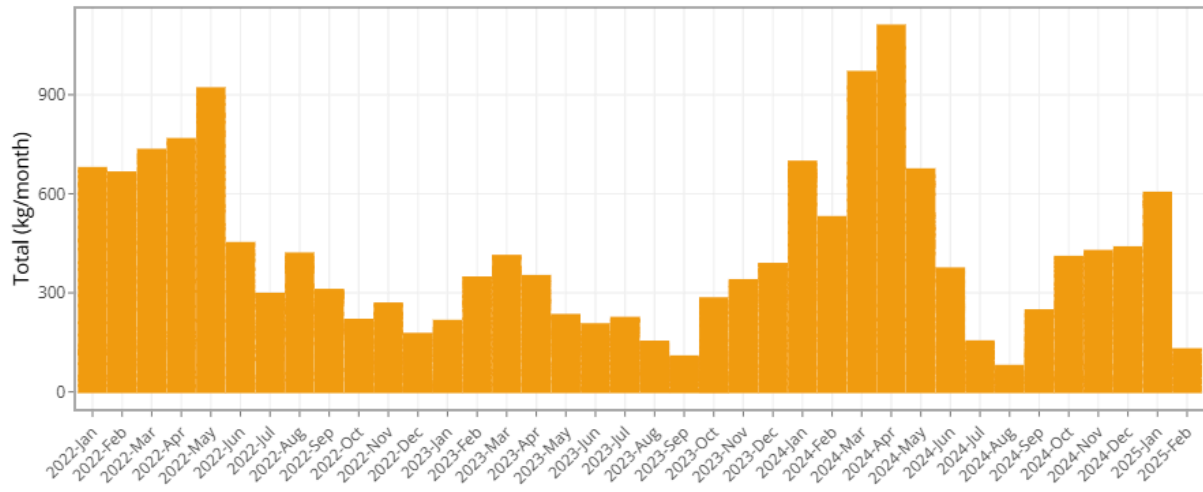


Figure 19 Total landings of octopus in Popisi from January 2022 to February 2025

Contrary to the fluctuation shown by the total landings trend, the CPUE in Popisi showed a stable trend between January 2022 to February 2025 (Figure 20) as well as the trend of the mean percentage of mature octopus (Figure 21). Using CPUE and mean percent mature catch as an indicator, the octopus fisheries conditions in Popisi are relatively stable.

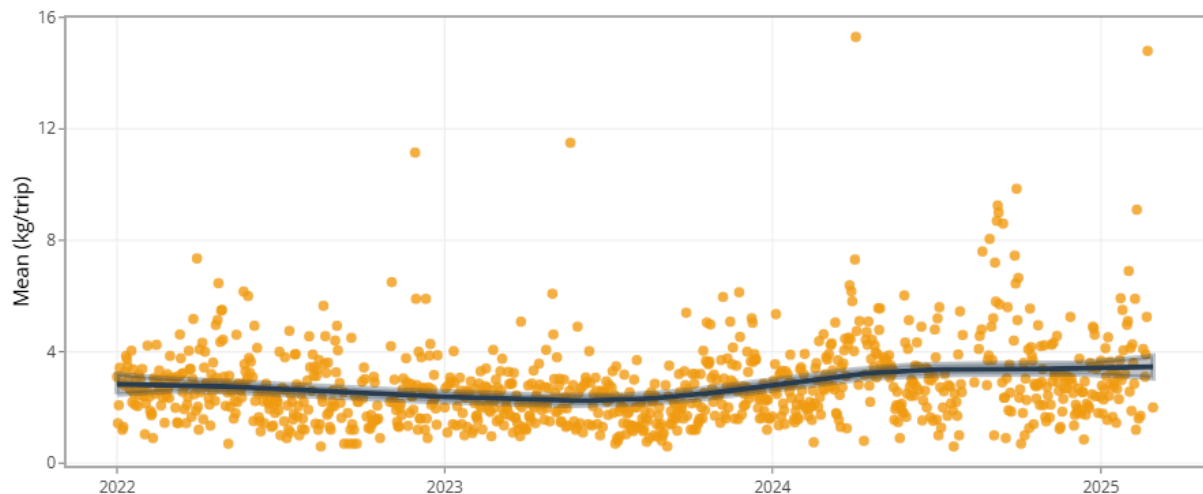


Figure 20 Mean catch per unit of effort (CPUE) of octopus in Popisi from January 2022 to February 2025

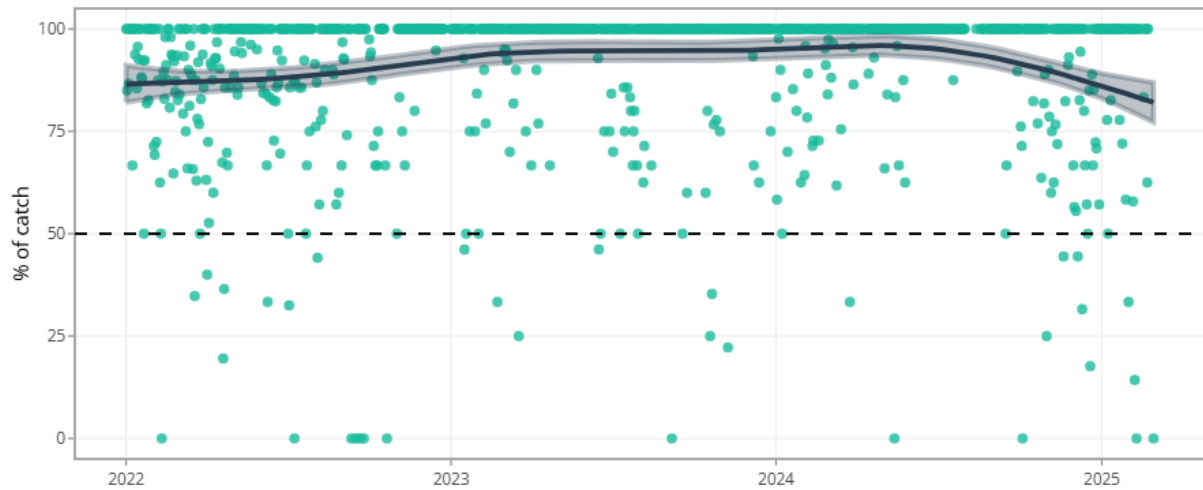


Figure 21 Mean percentage of mature octopus caught in Popisi from January 2022 to February 2025. The horizontal dashed line at 50% is a Limit Reference Point (LRP) for the percentage of the mature catch.

Octopus Fisheries in Kepulauan Selayar

The octopus fisheries data collected in Kepulauan Selayar is ranging from 01 January 2022 to 28 February 2025. Data is collected from two communities, Mekar Indah and Kahu-Kahu. The fisher's total landings recorded is 111,582kg and the fisher's total income recorded is IDR4,504,491,474 with the average percent mature octopus caught is 87%. Fisher's average CPUE is 3kg/trip and the average IPUE is IDR113,067/trip.

Total landings of octopus fisheries in Mekar Indah and Kahu-Kahu showed a stable trend from 2022 to September 2023 with a sudden increase in March 2023. From October 2023 to August 2024 the trend underwent a slight decline with a sudden increase in February 2024. From March to June 2024, the total landings decreased and then fluctuated in a stable trend until February 2025 (Figure 22).

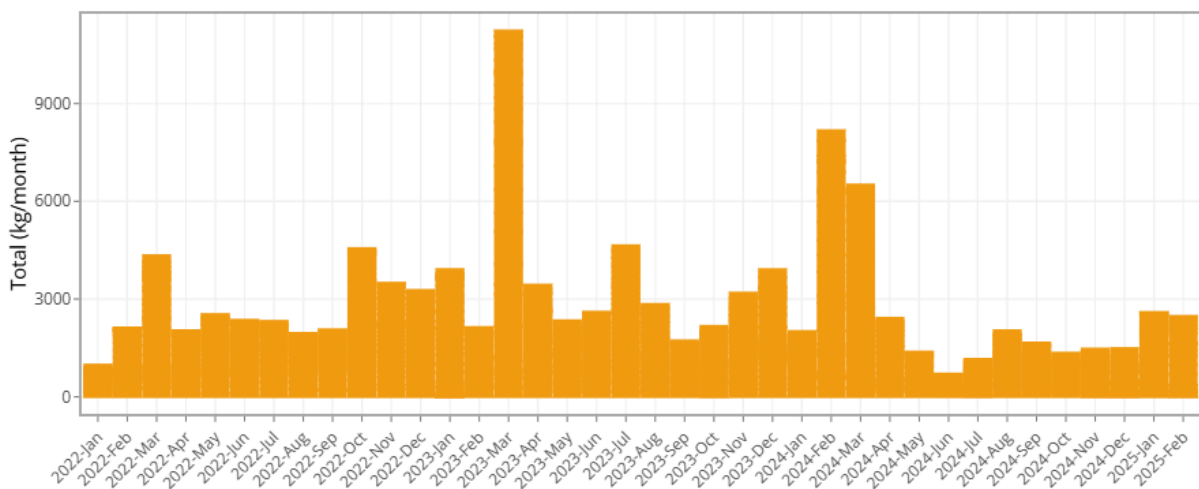


Figure 22 Total landings of octopus in Mekar Indah and Kahu-Kahu from January 2022 to February 2025

Similar to the total landings trend, the CPUE in Mekar Indah and Kahu-Kahu also showed a stable trend between January 2022 to February 2025 (Figure 23). However, the percent maturity is showing a decreasing trend between January 2022 and February 2025 with a notable pattern of low points every start of the year (Figure 24). Using both trends as indicators, the octopus fisheries conditions in Mekar Indah and Kahu-Kahu are fairly stable.

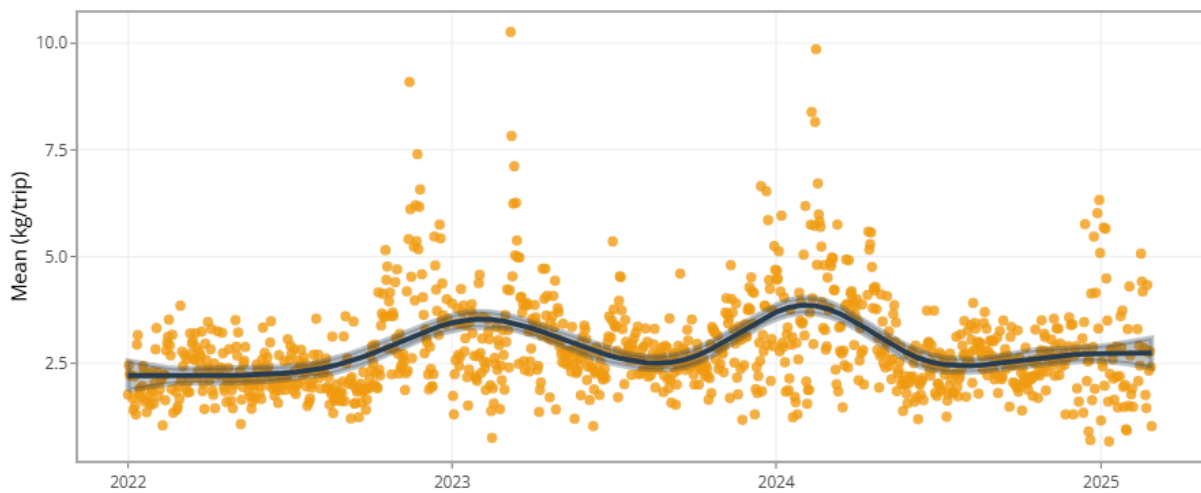


Figure 23 Mean catch per unit of effort (CPUE) of octopus in Mekar Indah and Kahu-Kahu from January 2022 to February 2025

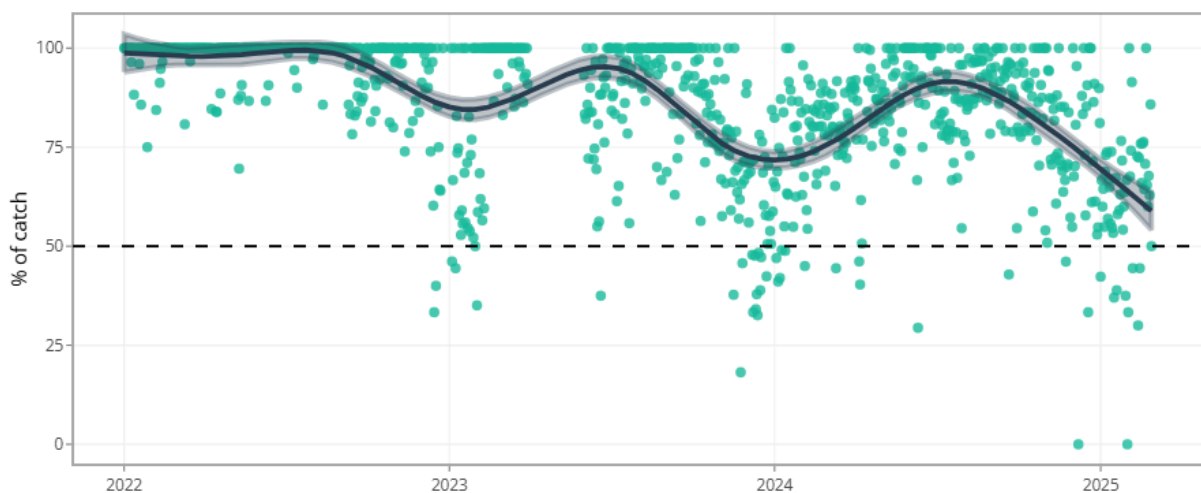


Figure 24 Mean percentage of mature octopus caught in Mekar Indah and Kahu-Kahu from January 2022 to February 2025. The horizontal dashed line at 50% is a Limit Reference Point (LRP) for the percentage of the mature catch.

Octopus Fisheries in Wakatobi

The octopus fisheries data collected in Wakatobi is ranging from 01 January 2022 to 28 February 2025. Data is collected from nine communities in Wakatobi. The fisher's total

landings recorded is 27,776kg and the fisher's total income recorded is IDR970,172,652 with the average percent of mature octopus caught is 89%. Fisher's average CPUE is 4kg/trip and the average IPUE is IDR136,305/trip.

Total landings of octopus fisheries in Wakatobi showed a decreasing trend from January–October 2022. There was a sudden increase in December 2023, then it fluctuated along the months of early 2024. From May 2024 onwards January 2025, the total landings increased and then dropped in February 2025 (Figure 25).

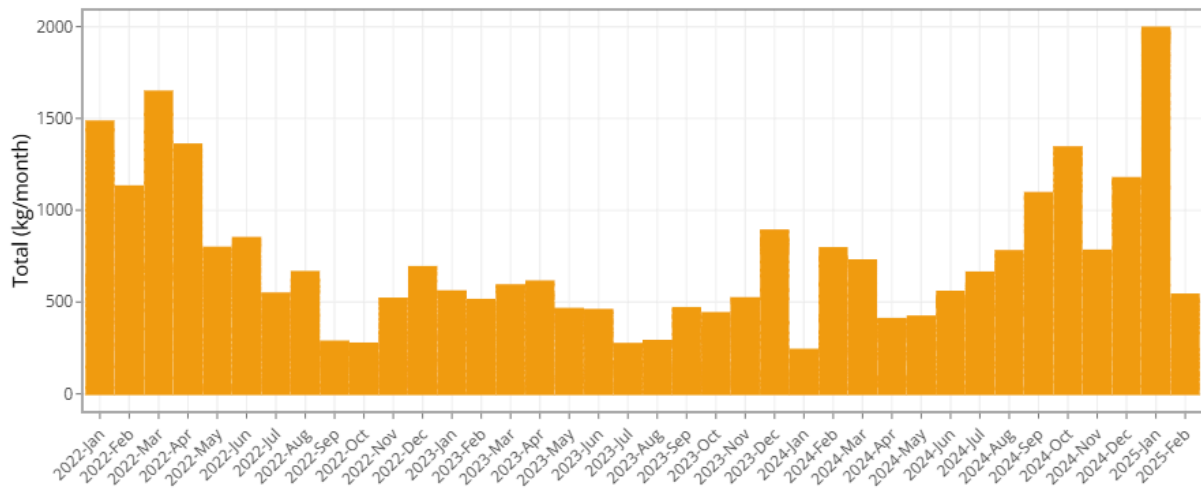


Figure 25 Total landings of octopus across 9 communities in Wakatobi from January 2022 to February 2025

The CPUE in Wakatobi showed an increasing trend between January 2022 to September 2024 then stabilised along the months until February 2025 (Figure 26). Compared to the CPUE trend, the percent mature trend showed a more observable increase between January 2022 and February 2025 (Figure 27). Using both trends as indicators, the octopus fisheries conditions in nine communities in Wakatobi are showing an improvement, as shown by the stable CPUE and increasing octopus size based on its maturity percentage.

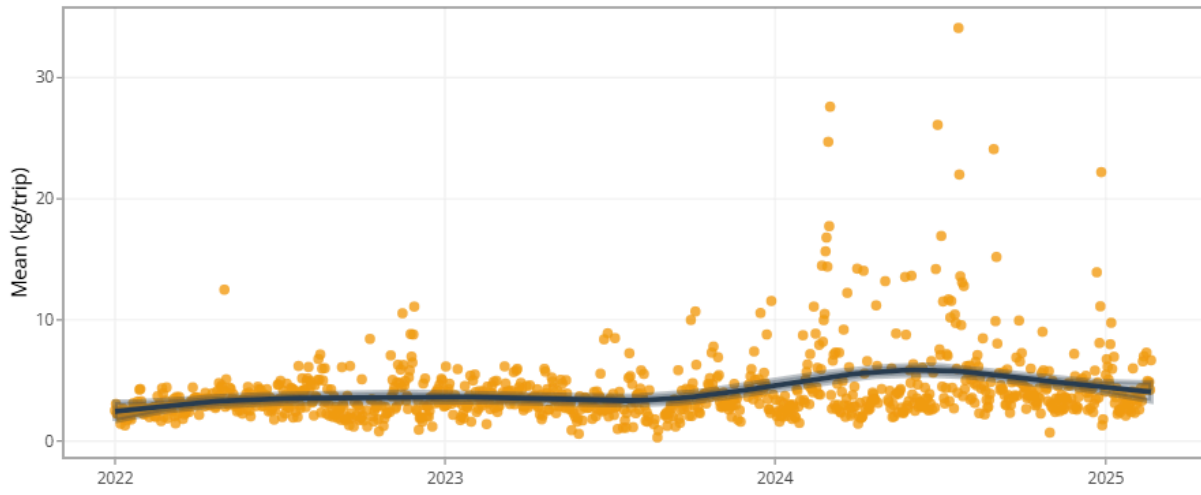


Figure 26 Mean catch per unit of effort (CPUE) of octopus across 9 communities in Wakatobi from January 2022 to February 2025

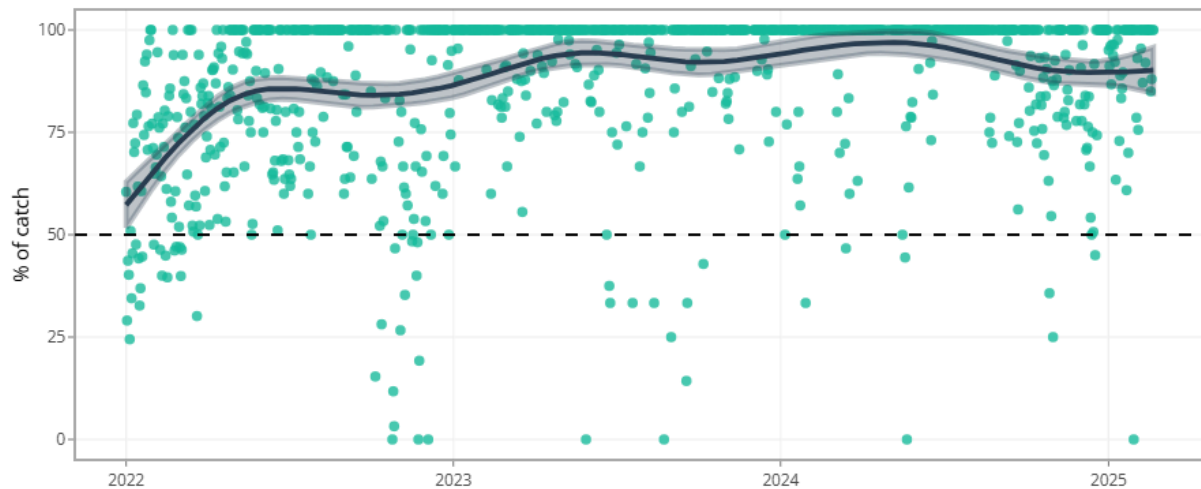


Figure 27 Mean percentage of mature octopus caught across 9 communities in Wakatobi from January 2022 to February 2025. The horizontal dashed line at 50% is a Limit Reference Point (LRP) for the percentage of the mature catch.

The result of the data collection is discussed with the community through regular Data Feedback Sessions (DFS). The DFS is the fundamental activity to decide fisheries management responses and action. One of its management actions is implementing Temporary Closure (TC) in the UoC of the FIP. As the biological and live history status of the day octopus (*Octopus cyanea*) as they are short-life species, temporary closure is considered to be an appropriate management response to recover the local octopus biomass. Additionally, communities also agreed on minimum octopus size catch and the management of fishing gear allowed in their respective management area boundaries.

Appendix



Appendix 1 Staff of FONEB was leading a data feedback session in Kampo-Kampo, Wakatobi

KONDISI KESEHATAN PERIKANAN

Indikator Perikanan	Titik Referensi Limit	Titik Referensi Target	Nilai Indikator	Kondisi Perikanan
Tren Total Tangkapan Nelayan 2024	Menurun	Meningkat atau Stabil	Meningkat	Stabil
Tren Tangkapan Sekali Melaut/CPU 2024	Menurun	Meningkat atau Stabil	Stabil	Stabil
Tren Total Pendapatan Nelayan 2024	Menurun	Meningkat atau Stabil	Meningkat	Stabil
Tren Pendapatan Sekali Melaut/IPUE 2024	Menurun	Meningkat atau Stabil	Stabil	Stabil
Rata-Rata Tangkapan Dewasa 2024	<50%	≥90%	80%	Stabil
Tren Tangkapan Dewasa 2024	Menurun	Meningkat atau Stabil	Meningkat	Stabil
Tren Ukuran Tangkapan 2024	Menurun	Meningkat atau Stabil	Stabil	Stabil

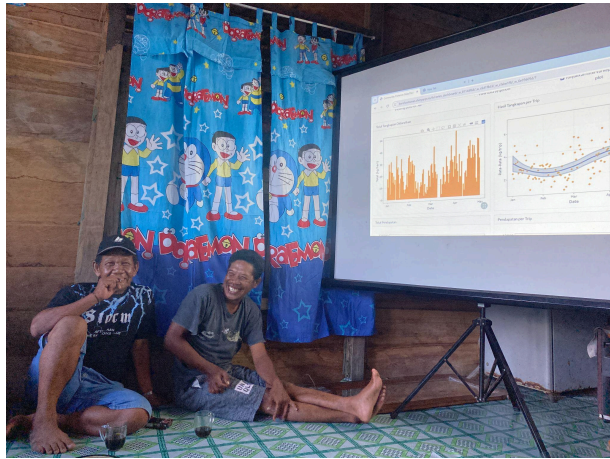
Appendix 2 Discussing fisheries performance indicators and the fisheries condition during data feedback sessions in Kampo-Kampo, Wakatobi



Appendix 3 Data feedback session in Torosiaje, Pohowato



Appendix 4 Data feedback session using dashboard in Kalumbatan, Banggai Kepulauan



Appendix 5 Data feedback session using dashboard in Popisi, Banggai Laut