

# TUVALU FISHERIES ANNUAL REPORT 2022

## Ministry of Fisheries & Trade





*Tuvalu Fisheries Department*  
*Ministry of Fisheries and Trade*  
*Government of Tuvalu*

**Annual Report 2022**

*Prepared by:*

**The Staff of Tuvalu Fisheries Department**

*Funafuti, Tuvalu*

*July 2023*

## *Acronyms and Terms*

|         |   |
|---------|---|
| ACR     | Brand name for grab bag kits such as GPS, medical kit, etc.     |
| AIS     | Automatic Identification System                                 |
| ALB     | Albacore  |
| ATV     | Brand name of 4 wheels drive motorcycle                         |
| AUD     | Australian Dollar   |
| AWP     | Annual Work Plan  |
| BDM     | Beche-de-mer  |
| BET     | Big eye tuna  |
| CBFM    | Community Base Fisheries Management                             |
| CFC     | Community Fishing Centres                                       |
| CFMP    | Coastal Fisheries Management Plans                              |
| CFO     | Community fisheries officer                                     |
| CFP     | Ciguatera fish poisoning  |
| CMM     | Conservation management measure                                 |
| CPUE    | Catch per unit effort   |
| EEZ     | Exclusive Economic Zone   |
| ENSO    | El Niño-Southern Oscillation                                    |
| FAD     | Fish Aggregating Device   |
| FAO     | Food Agriculture Organisation                                   |
| FC      | Fish Carrier  |
| FFA     | Forum Fisheries Agency  |
| FIMS    | Fisheries Information Management System                         |
| FMPs    | Fisheries Management Plans                                      |
| FOFA    | Fishermen on Funafuti Association                               |
| FSMA    | FSM Arrangement   |
| GTX     | Gambierdiscus toxicus   |
| IFA     | Inshore Fisheries Adviser                                       |
| IFIMS   | Industry Fisheries Information Management System                |
| IUU     | Illegal, unregulated and unreported fishing                     |
| JICA    | Japan International Cooperation Agency                          |
| JV      | Joint Venture   |
| KOFCC   | Korean Overseas Fisheries Cooperation Center                    |
| LL      | Longline  |
| LLVDS   | LL Vessel Day Scheme  |
| MCS     | Monitoring Control and Surveillance                             |
| MET     | Meteorological agency   |
| MFT     | Ministry of Fisheries and Trade                                 |
| MIS     | Management Information System                                   |
| MOA     | Memorandum of Agreement   |
| MOU     | Memorandum of Understanding                                     |
| MPA     | Marine Protected Area   |
| MPI     | Ministry of Primary Industry                                    |
| MSC     | Marine Stewardship Council                                      |
| MTU     | Mobile Transmitting Unit  |
| NAFICOT | National Fishing Corporation of Tuvalu                          |
| NFD     | Non-Fishing Days  |
| NTSA    | Niue Treaty Subsidiary Agreement                                |
| OFCF    | Overseas Fishery Cooperation Foundation                         |
| PAE     | Party Allowable Effort  |
| PIRFO   | Pacific Island Regional Fisheries Observer                      |
| PNA     | Parties to the Nauru Agreement                                  |
| PNAO    | Parties to the Nauru Agreement Office                           |
| PROP    | Pacific Regional Oceanscape Programme                           |
| PROPER  | PROP Economic Resilience  |
| RSP     | Regional surveillance picture                                   |
| RTMCFA5 | Regional Technical Meeting on Coastal Fisheries and Agriculture |
| SKJ     | Skipjack tuna   |
| SMC     | Senior Management Committee                                     |
| SPA     | Special Protected Area  |
| SPC     | Secretariat of the Pacific Community                            |

|       |  |
|-------|--|
| STCW  | Standards of Training, Certification, and Watch keeping Training |
| TA    | Technical Advisor  |
| TFD   | Tuvalu Fisheries Department                                      |
| TFSP  | Tuvalu Fisheries Support Programme                               |
| TFSP2 | Tuvalu Fishery Support Programme phase 2                         |
| TMTI  | Tuvalu Maritime Training Institute                               |
| TVNOP | Tuvalu National Observer Program                                 |
| VDS   | Vessel Day Scheme  |
| VHF   | Very High Frequency  |
| VMS   | Vessel monitoring system   |
| WB    | World Bank   |
| WCPFC | Western Central Pacific Fisheries Commission                     |
| YFT   | Yellowfin Tuna   |

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# 1 Background

## 1.1 *The Tuvalu Fisheries Sector*

Tuvalu is composed of four reef islands and five atolls. They are spread out between the latitude of 5° and 10° south and between the longitude of 176° and 180° , encompassing an Exclusive Economic Zone **Error! Bookmark not defined.**(EEZ) of 750, 000 square kilometers (900,000 sq. nm) and a land area of 26 square kilometers. The islands of Tuvalu, are homes to around 11,000 persons with ~60% living on the capital Funafuti.

Subsistence activities dominate Tuvalu’s fisheries sector. A wide variety of techniques are used throughout the group to collect fish, crabs and shellfish which are consumed, shared or informally bartered. In the past Fisheries Centres were established on most outer islands with the intention of providing fishers with income earning opportunities. Although not fully used, all of these are now operational to some extent. On the main island, Funafuti, artisanal fishing is limited to a small fleet of 4-7-meter outboard powered skiffs which mostly fish by trolling for tuna and by line fishing for reef fish.

More than half of the fish landed in Tuvalu (59% by weight) are ocean species, predominantly two species –skipjack and yellowfin. The remainder is made of reef and lagoon species, with smaller amounts of bottom fish from deep slope areas. The most recent household income and expenditure survey (2015/16) shows that 55% of households participate in fishing for subsistence and cash, although this rises to 75% in the outer islands. This is a reduction from previous surveys, and suggests a growing dependence on wages and salaries. Just under 10% of households regularly fish to sell their catches for cash. Fish consumption was estimated by this same survey at 72 kgs/person/year (90 kgs in the outer islands and 55 kgs for Funafuti). Although this is still one of the highest consumption rates in the world, it also shows a decline over the past decade.

Tuvalu waters are important for the two key industrial tuna fisheries of purse seine and longline. Fishing is generally undertaken by foreign vessels operating under access agreements and skipjack tuna make up the bulk of the catch. Fisheries licensing is now the major source of Government revenue based on the combination of license fees, selling of vessel days, transshipment fees, observer fees and joint venture dividends. The industry normally provides employment opportunities for observers, port monitors and stevedores, and it had also been planned to start placing crew in 2020. The COVID pandemic and border closures continued to prevent taking advantage of these opportunities in 2022.

## 1.2 *Purpose of this report*

This report describes the objectives, activities and results of the Tuvalu Fisheries Department (TFD) within the Ministry of Fisheries and Trade (MFT) during 2022. The border closures impacted on many aspects of the Department’s work. However, there were number of important achievements.

The year 2022 represents the last year of the Department’s Corporate Plan (2020 – 2022). Although this was developed first, most of the objectives and goals in this Plan are aligned with the ‘Te Kete’, the new national sustainable development strategy plan. Where possible, activities are reported against the thematic areas identified in the 2022 Annual Work Plan (AWP) based on the Corporate Plan.

### **1.3 Vision**

The guiding vision of the Department can be stated as:

- ❖ Bountiful inshore fisheries supporting livelihoods and providing healthy local food
- ❖ Sustainable oceanic fisheries providing sustainable and consistent revenue, jobs and other economic opportunities.

The social and economic health of the Tuvalu population depends upon the health of its inshore and oceanic fisheries, which can be managed by Tuvalu. The health of oceanic fisheries cannot be managed by Tuvalu alone but requires regional and sub-regional cooperation.

### **1.4 Mission**

The Department's mission is:

- ❖ To maximise social and economic returns to the people of Tuvalu through the sustainable management and wise use of Tuvalu's living marine resources.

On behalf of the people of Tuvalu, the Government, through its Fisheries Department, will act as a responsible custodian of oceanic or designated inshore fishery resources and fisheries rights so that they generate national revenues and sustainable employment opportunities. The Department will also support Kaupule / Falekaupule to manage inshore fisheries to support livelihoods and provide local food security.

### **1.5 Objectives**

The primary objectives of the Department are as follows:

- i. Sustainable management of oceanic fisheries resources through regional cooperation and compliance with regional commitments; a strong and innovative Monitoring Control and Surveillance (MCS) programme; and effective systems for collection and analysis of data.
- ii. Maintaining and where possible increasing economic benefits from the tuna fishery by maximising a sustainable and consistent flow of access fee revenue, while developing other economic opportunities including employment.
- iii. Improved management of coastal fisheries, for sustainable inshore resources, through comprehensive data collection and analysis, and working closely with island communities to improve management of the resources and the broader ecosystem.
- iv. Supporting sustainable development of small-scale fisheries for livelihoods, food security and healthier diets through training, FAD deployment, safety at sea initiatives and building a larger class of vessel for offshore fishing.
- v. Improvement and maintenance of TFD infrastructure and facilities through improved asset management and maintenance; further building on the fisheries site; and upgrading facilities.
- vi. Development of staff capacity and systems to ensure that training and staff management meet the requirements for the work; efficient implementation of development projects; and exploring the transition to a Fisheries Authority.

- vii. Promoting public awareness and education on fisheries issues including materials for schools and recording traditional knowledge.

Some of these objectives are supported by ongoing activities of the Department; others require new initiatives.

## **1.6 Organisation**

The TFD organizational structure, shown in Figure 1, comprises:

- ❖ An Administration Section, comprising the Director and Deputy Director, several professionals with cross-cutting responsibilities (Legal Officer, Economist and Librarian/Public Relations Officer, Fisheries IT Officer) and the Executive staff. The Administration group is responsible, among other things, for recommending fishery policy initiatives, negotiating fishery access arrangements, securing assistance through development projects and establishment of new commercial initiatives in which the Tuvalu Government has an interest;
- ❖ A Coastal Fisheries Section, responsible for inshore fishery resource assessment, monitoring, and providing support to kaupule, fishers associations and other stakeholders in the management of coastal fishery resources and the marine environment, both in Funafuti and the outer islands;
- ❖ An Oceanic Fisheries Section, responsible for industrial fishery vessel licensing, managing the sale of fishery access rights, compliance with Tuvalu's obligations under international fishery treaties and conventions, and monitoring, control and surveillance of fishing activities within the exclusive economic zone;
- ❖ An Operation & Development Section, responsible for the running of the TFD vessels, construction and deployment of fish aggregation devices, vocational training of fishers and fishing vessel crew, and other development-oriented activities. The Corporate Plan calls for this Section to expand its activities to promote food security.

## 2 Fisheries Department Resources

### 2.1 Staffing

The Organisational structure of the TFD Public Service establishment at January 2022 was as shown in Figure 1. There are a number of anomalies in the grading of positions, with qualified and experienced staff still stuck at the bottom of the pay scale. Correcting these issues is a priority of the Department.

A number of staffs that work for the Fisheries Department are employed on contract with the Government and do not form part of the establishment. These include:

- More than 70 Fisheries Observers who are only engaged when required to work on foreign fishing vessels;
- 7 Crew of the Manau II;
- 8 Data collectors – one on each of the islands of Tuvalu except Niulakita – who carry out creel surveys of catches.

In addition to the public service establishment, several externally-funded activities continued to operate in 2022 and employed staff who work as part of the organization. These included:

- ❖ A Project Coordinator, Project Accountant and Project Officer for the World Bank-funded Pacific Regional Oceanscape Programme (PROP);
- ❖ A Project Manager for the New Zealand funded TFSP2 project;
- ❖ Seven Community Fisheries Officers – one posted to each of the outer islands – funded by the TFSP2 project;
- ❖ Several temporary positions in the Department, to provide relief for staff undertaking training overseas.

A Fisheries Adviser funded by the New Zealand Aid Programme, worked throughout the year in Tuvalu apart from a period of home leave. An Inshore Fisheries Adviser (part time) funded from the same source was on contract during the year but was unable to travel to Tuvalu. The Adviser from OFCF was also not able to travel to Tuvalu during the year to take up his post. A Project Assistant funded by FAO was in place for most of the year to deal with requirements for FAO national and regional projects.

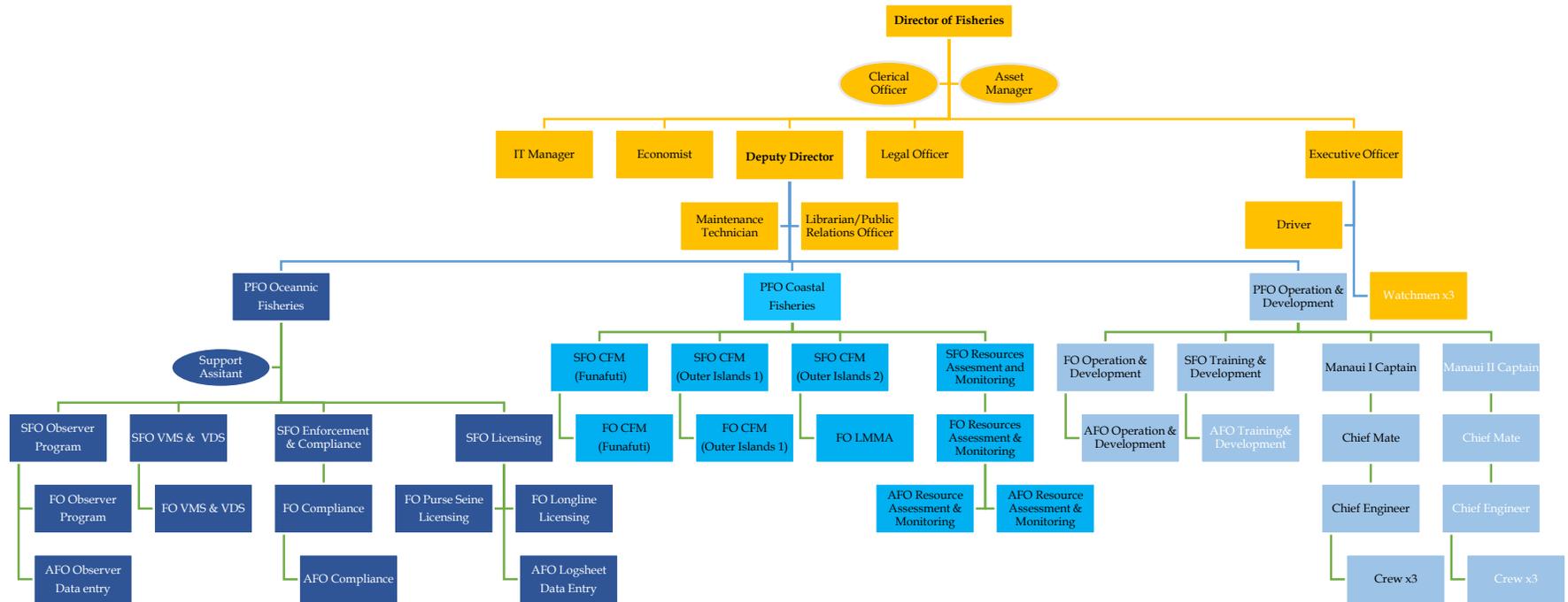


Figure 1: Tuvalu Fisheries Department Organisational Structure in 2022 (contract/temp officers in white font)

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## **2.2 Assets and facilities**

Work continued in 2022 of maintenance for the TFD Office building. The new photovoltaic solar power system, which meets the electricity needs of the office from renewable energy, continued to experience problems. This has been ongoing since the COVID pandemic prevented the company from sending an engineer to hand over the system and provide training in its management. Work was completed on a new sea-wall, including shelter and seating, on the lagoon side of the Office building. This will provide additional working and recreational space, as well as protecting the building from storm surges during the Westerly season.

RV Manauī, the 17-metre fibreglass vessel provided in 1982 by the Japanese Overseas Fishery Cooperation Foundation (OFCF), was broken down in 2022 with generator problems. Given the age of the vessel, there was a need to replace most of its functional equipment. This greatly affected the TFD workplans for the outer islands as well as supporting other Government Departments demands.

The Manauī II, a new 19- metre multi-purpose Fisheries vessel donated by Japan International Cooperation Agency (JICA), was delivered to Tuvalu in mid-2021. Soon after delivery there were a few problems that were found. The Fisheries Department received some support from engineers sent by the builders in mid 2022 and operations resumed after this.

TFD continued to operate a range of other equipment and assets, with valuable support for maintenance and replacement provided by OFCF. Important assets for the NAFICOT market were provided by the Korean Overseas Fisheries Cooperation Center (KOFCC) during the year and handed over. Ice-boxes for use by fishers in all islands were also distributed.

## **2.3 Asset Management**

Management of these various assets is the responsibility of the Fisheries Asset Manager, who has been maintaining the Department's asset register. Achievements during the year included;

- Implementation and enforcing the asset policy;
- Clearing and checking a range of project equipment and materials delivered for various projects and;
- Procurement of materials and supplies funded by the recurrent budget in line with the Government's procurement rules.

## **2.4 Office Maintenance**

In early 2022 the team continue to carry out its maintenance work, particularly maintenance of the office main building and the workshop building. Other equipment such as air conditions, fire alarms were all serviced throughout the year and properly maintained. Several installations took place throughout the year which consisted of the installation of cameras in the dive bay, the radar for the VMS/VDS system and the cantilever shelter and outdoor benches on the seawall. With no proper storage room, most of the tools and new equipment are stored in the dive bay and in the main office space.

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## 2.5 Budget

Fisheries licensing, access fees and investments continued to generate a significant proportion of Tuvalu Government revenues: income for 2022 was \$36 million – this resulted from the increased number of fishing days sold under the VDS, but transshipment revenue was very low due to COVID restrictions. The Fisheries Department plays an active and critical role in maximising these returns through its ongoing participation in regional and bilateral fisheries negotiation, and the development of strategies intended to promote Tuvalu’s economic interests.

Although the TFD’s recurrent budget allocations are far less than the true cost of running the organisation, there have been some increases in recent years. However, these increases stopped in 2019. For 2022 there was again no increase, and as usual at the start of the year there was a delay of several weeks before TFD could access various important expenditure votes.

The Department has continued to benefit from additional funding support to the fisheries sector from several major development partners:

- The World Bank (WB) Pacific Regional Oceanscape Programme (PROP), was designed to provide a total of US \$7,910,000 over a 6-year period that commenced in September 2014. A 23 month no-cost extension of this project was agreed in 2020, and project activities continued up to August 2022. The proposal for a second phase of the project – PROPER – was finally submitted to the WB for funding under the IDA20 in mid 2022, and should be operational by 2024. This project has a budget of US\$13 million, mainly financed from WB regional funds.
- The New Zealand-funded Tuvalu Fishery Support Programme phase 2 (TFSP2) started in January 2021 and provides NZ\$3.5 million over 5 years plus further technical assistance (the Fisheries Adviser and Inshore Fisheries Adviser). The project supported a range of activities in 2022 to support implementation of TFD’s Corporate Plan.
- Two small projects funded by FAO were completed in 2022, aimed at repairing damage to the Fisheries sector caused by Tropical Cyclone Tino and the COVID pandemic. These projects had a budget of around US\$400,000.
- A new proposal was developed with the Korean Overseas Fisheries Cooperation Centre, KOFCC, for fisheries infrastructure. This US\$5 million project was agreed in late 2022, and will fund the construction of a fisheries training centre, boatshed and store, a fisheries jetty and solar power systems for NAFICOT and FOFA fish markets. Construction will be over three years 2024-2026.
- The Overseas Fisheries Cooperation Foundation continued to provide equipment and supplies in support of TFD programmes and to maintain assets, although technical assistance was not possible due to COVID restrictions.

Together these programmes support a wide range of activities by the Fisheries Department working in close collaboration with other partner agencies, including NAFICOT, the Maritime Wing of the Tuvalu Police Department, the Tuvalu Maritime Training Institute (TMTI), the Kaupule on each of Tuvalu’s islands and the Fishermen on Funafuti Association (FOFA).

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Activities to be supported by programmes are fully integrated into the Department's Work Programme, under which most activities are funded by a combination of donor and recurrent budget allocations.

Additional support continued to be available through the main fisheries sector regional organisations (Forum Fisheries Agency (FFA), Secretariat of the Pacific Community (SPC), Parties to the Nauru Agreement Office (PNAO) and Western Central Pacific Fisheries Commission (WCPFC)), although again workshops, training and support visits were impacted by COVID.

## ***2.6 Internal management, monitoring and reporting***

The TFD Work Programme in 2022 was led through coordination of TFD senior management and key projects. This was done primarily through the Senior Management Committee (SMC), which comprises the TFD Director and Deputy Director, the three Principal Fisheries Officers, the Fisheries Legal Officer, Fisheries Economist, Fisheries Librarian/Public Relations Officer, Asset Officer, Projects Coordinators and the NZ-funded Technical Adviser. The SMC aim to meet monthly throughout the year to discuss and review activities and any issues arising.

The effectiveness of the SMC was further improved through regular meetings of all TFD staff, which were held to discuss the implemented activities, as well as professional and social issues within the department.

Reports were prepared on the PROP, TFSP2 and FAO projects as required by the donors, including the Implementation Completion Report for PROP. A mid-year report on progress with the work plan was prepared, as well as a number of briefs for periodic meetings with the Minister.

## **3 Administration Fisheries Activities**

### ***3.1 General***

Many of the activities of the Administration Section during 2022 were ongoing from previous years. These included recruitments of personnel, staff appraisals, and reporting on activities. Many of the Administration staff were involved in regional meetings throughout the year, although by video-conference. One of the Fisheries obligations is for the fisheries information to be shared with the public. The fisheries library and the TFD website were updated and improved during the year.

### ***3.2 Transition to a Fisheries Authority***

An important activity supported by the PROP project was a study to consider options for improving the efficiency and effectiveness of the Fisheries Department. After a number of delays, the results of the study were considered by Cabinet who decided to approve in principle the transition of TFD to a statutory authority. Detailed work on the implementation of this decision and the necessary legislation is planned for 2023.

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### **3.3 COVID Response**

Tuvalu maintained border closures through the first half of 2022, with only very limited travel allowed and long periods of quarantine for arriving passengers. Quarantine requirements were gradually relaxed in the second half of the year, but still greatly reduced travel and the number of flights. This affected many areas of TFD's work, including support by consultants, travel for meetings and overseas training. This, together with shipping delays, supply chain issues, and very limited air freight impacted on projects and activities. Travel to outer islands was also difficult at times as restrictions were imposed to prevent COVID spreading from Funafuti, where there were cases in quarantine and, later in the year, community transmission.

For most of the year there was no employment for observers. Efforts were made to provide income for the observers and their families in the absence of placements, including refresher training and casual jobs at Fisheries to carry out a range of work in maintenance, boatbuilding and other areas.

Transshipment and licensing of carrier vessels was also greatly affected by COVID restrictions. Despite submissions from TFD to allow 'no-contact' transshipment in the lagoon, this was not approved until near the end of 2022 and then with many restrictions in place. Use of the offshore transshipment area, which had been popular at the start of the pandemic, had also declined to almost nothing as other ports in neighboring countries were already open. As a result there was very little activity or revenue from transshipment.

### **3.4 Fishery Access Negotiations**

Access negotiations were completed successfully with bilateral partners for fishing in 2023, with 95% of fishing days sold before the end of the year. Face-to-face negotiations were held with Korean and Taiwanese associations in September when travel restrictions started to be relaxed. Arrangements with other partners were concluded through email and video-conference.

A sticking point in negotiations with several partners was the issue of FAD tracking which had been planned for implementation in 2023 as a PNA requirement, but was eventually deferred to 2024 as most PNA members were not ready. This decision allowed agreements to be signed in the margins of the WCPFC meeting in December.

### **3.5 Joint ventures and domestic vessels**

Tuvalu's fleet of six purse seiners operated throughout 2022, with TFD responsible as the flag state. A number of activities support their properly regulated and legal operation each year in addition to the normal access agreements and licences for Tuvalu, including: maintaining their WCPFC registration; issuing high seas and foreign waters permits; supporting their application for FSMA regional licences; arranging the order allowing exemption from the FAD closure each year and monitoring its use; monitoring catches and transshipment for reporting to WCPFC; etc.

Market access for their catches is also vital for these vessels to continue operations. In 2022, TFD completed the requirements for reporting to the US on marine mammal interactions to comply with the MMPA; and a new seafood export regulation which empowers TFD to act as the

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competent authority for exports to the EU was signed into effect. Achieving EU approval is expected to be a long process, however, further delayed by COVID restrictions.

### ***3.6 Regional meetings***

In the first half of the year all regional meetings were conducted virtually, with poor internet connectivity often making this difficult for Tuvalu. It is unfortunate that Tuvalu's year as chair of the PNA occurred in a year when the organisation's annual meetings were held virtually.

A team from the Administration section travelled to Lisbon, Portugal as part of the Tuvalu delegation to the U.N. Oceans Conference in June. Travel slowly became easier in the second half of the year, and face-to-face meetings included the FFA Ministerial meeting, and the WCPFC annual session. The latter had some significant achievements, including the approval of a harvest strategy for Skipjack in which Tuvalu, as chair of PNA, played a role in negotiating.

### ***3.7 Staff training and workshops***

In terms of long term training, two Principal Fisheries Officers completed degree programmes at USP during the year and returned to duty with the Department. The Legal Officer was enrolled in a Master's programme at the University of Wollongong, but due to travel restrictions undertook this through distance learning in 2022. He will complete the course in Wollongong in the first half of 2023. The Fisheries Economist completed a short attachment in Washington under a scholarship awarded by the US.

COVID restrictions also prevented much of the planned short term training, with staff unable to travel and trainers not able to get to Tuvalu. However a number of staff completed online courses, and by the end of the year it became possible for some officers to join training workshops overseas. These are detailed in the reports of different sections below. As noted above, training for observers was delivered in-country, and by the end of the year trainee observer trainers were able to participate in short workshops overseas.

### ***3.8 World Tuna Day***

As in previous years, TFD organised a full programme to celebrate World Tuna Day on 2<sup>nd</sup> May. New events in 2022 included canoe racing in Funafuti showcasing canoes built by fisheries projects, and extension of the popular fishing competition to all islands of Tuvalu, with the help of Community Fisheries Officers in the outer islands. The guest of honour for the celebration was the Executive Director of WCPFC, Feleti Teo.

### ***3.9 Legal Services***

The Legal Adviser continue to provide advice and support across sections from drafting MOUs for the Operation and Development Section to revising Fisheries related policies and laws that are due for reviews. A proposal was submitted to amend rates of diving allowances in the GAO, but was not approved. This is a disappointment for fisheries divers, but work will be continuing until such amendments is made. Assistance was also provided to local legal consultant with legal

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matters pertaining to fisheries laws and management plans. There are a few incomplete works that are in the plan for next year, such as completing the work on the Niue Treaty Subsidiary Agreement (NTSA) for the MCS Section, and on the Marine Mammal Protection Act.

### ***3.10 Information Technology***

The IT Manager continue to support the department by improving and providing IT services. Technical assistance by TA's has played a very important role in making sure the department achieve its goals and objectives throughout the year. This TA is funded by TFSP and PROP hence continue to work closely with the IT manager. Poor Internet connectivity continued to be a long-standing issue to the TFD, even with the successful switch from the only Local ISP (TTC) to Kacific Satellite Service Provider. Border closure due to Covide19 pandemic has been uplifted this year, but still overseas face to face activities were not achieved. However, it will carry forward to the year 2023.

### ***3.11 Fisheries Economics***

The Fisheries Economist completed a report on a survey of the economics of small-scale tuna fishing in Funafuti, examining in particular whether fish is over-priced. He was also Chair of the Pacific Association and engaged with the winding up of the Pacific Joint Venture.

### ***3.12 Public Information and Awareness Program***

The Tuvalu Fisheries (country) collection is one of the library's five collections, along with periodicals, reference, the main collection, audio/visual, and the main collection. This year, 31 TFD new publications were produced. While hard copies were kept in the TFD physical library, pdf versions were posted to the TFD website library. A selection of new posters, such as the Oceanic FAD posters, the Coastal posters, and pamphlets on grouper release knowledge were translated from the English version to the Tuvalu version.

Furthermore, a few other educational videos, including a grouper release video and short animation videos on sustainable fishing practices, have been translated into Tuvaluan. This year, there were just a few radio awareness campaigns because the majority of the awareness-raising initiatives were disseminated on the Fisheries website and Facebook page, as well as through outreach initiatives in nearby communities and on remote islands. The TFD website and the Fisheries Facebook page are continuously updated with the latest fisheries news, short educational videos on sustainable fishing techniques, job listings, and fisheries progress reports. Additionally, recent fisheries-related documents are uploaded to the website, and fisheries reports are printed.

The corporate plan 2020–2022 included collecting fishing expertise from local fishermen on each isolated island. The editing and completion of each video was eventually accomplished.

*Table 1: TFD Radio awareness through the year 2022*

| <b>DATE</b>      | <b>TOPIC</b>                       | <b>SUMMARY</b>   |
|------------------|------------------------------------|--|
| <b>20 Jan 22</b> | <i>Sea cucumber – Beche-de-mer</i> | <i>Awareness on the importance of sea cucumber, shared through Radio &amp; TV</i>  |
| <b>10 Feb 22</b> | <i>Parrot Fish</i>                 | <i>Awareness on the importance of parrot fish in terms of sustainable fishing practices, shared through Radio &amp; TV</i>   |
| <b>24 Feb 22</b> | <i>A Fisher’s Dream</i>            | <i>Radio &amp; TV awareness on the importance of night spear fishing and overfishing which related to sustainable fishing practices</i>  |
| <b>17 Mar 22</b> | <i>A smart mesh</i>                | <i>Awareness on the importance of fishing using correct mesh size to catch fish, this also related to sustainable fishing practices</i>  |
| <b>31 Mar 22</b> | <i>Protecting Homes</i>            | <i>Awareness on the importance of preserving corals shared through Radio &amp; TV</i>  |
| <b>21 Apr 22</b> | <i>A little privacy</i>            | <i>Awareness on the importance of fish spawning seasons</i>  |
| <b>2 May 22</b>  | <i>World Tuna Day</i>              | <i>A brief explanation on the importance of tuna to Tuvalu as a whole and as well as elaborating on activities and the program of the event on celebrating of the World Tuna day</i> |
| <b>5 May 22</b>  | <i>Word Tuna Day</i>               | <i>Sharing results of competitions and competitors who took part to compete in Word Tuna Day activities</i>  |
| <b>16 Jun 22</b> | <i>Size limits: A Golden rule</i>  | <i>Awareness on the importance of minimum fish size limits when fishing.</i>   |
| <b>30 Jun 22</b> | <i>Sea Safety</i>                  | <i>Awareness on the importance of sparing 5 minutes to check out a list of important things before going out to the open ocean</i>   |
| <b>14 Jul 22</b> | <i>Protecting Homes</i>            | <i>Awareness on the importance of preserving corals shared through Radio &amp; TV</i>  |
| <b>25 Aug 22</b> | <i>A Fisher’s Dream</i>            | <i>Radio &amp; TV awareness on the importance of night spear fishing and overfishing which related to sustainable fishing practices</i>  |
| <b>8 Sep 22</b>  | <i>Sea cucumber – Beche-de-mer</i> | <i>Awareness on the importance of sea cucumber, shared through Radio &amp; TV</i>  |
| <b>29 Sep 22</b> | <i>A little privacy</i>            | <i>Awareness on the importance of fish spawning seasons</i>  |
| <b>27 Oct 22</b> | <i>Parrot Fish</i>                 | <i>Awareness on the importance of parrot fish in terms of sustainable fishing practices, shared through Radio &amp; TV</i>   |
| <b>10 Nov 22</b> | <i>A smart mesh</i>                | <i>Awareness on the importance of fishing using correct mesh sizes to catch fish, this also related to sustainable fishing practices</i>   |
| <b>24 Nov 22</b> | <i>Size limits: A Golden rule</i>  | <i>Awareness on the importance of minimum fish size limits when fishing.</i>   |
| <b>8 Dec 22</b>  | <i>Sea Safety</i>                  | <i>Awareness on the importance of sparing 5 minutes to check out a list of important thigs before going out to the open ocean</i>  |

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## **4 Coastal Fisheries Activities**

### **4.1 General**

Inshore fisheries of Tuvalu primarily support food security, nutrition, livelihoods and dietary health of people on all islands of Tuvalu. To ensure the sustainability of these resources, the Coastal Fisheries Section has been working closely with relevant key stakeholders such as Kaupules and other government departments to achieve its goal.

The majority of the activities carried out in 2022 were on-going activities that are carried out every year. These includes Metronome trips to the outer islands, creel survey monitoring, ciguatera fish poisoning survey, canoe and boat survey, ciguatera quarterly monitoring and activities to support the implementation of the Funafuti Reef Fisheries Stewardship Plan.

A decrease in staffing, as one of the staffs for outer islands resigned, forced some reshuffling to staffing to minimize the effect of staff turnover. Additionally, the Management Information System (MIS) database server was down for most of the second half of 2022 which greatly affects the quantity of data entered into the server. Despite some of these challenges, a remarkably successful accomplishment was reached in 2022, with an estimated of over 80% of activities under the Annual Workplan 2022 were successfully achieved.

### **4.2 Data Collection**

#### **4.2.1 Boat and Canoe Survey**

The Boat and Canoe survey is an annual assessment that usually carried out during metronome trip on the outer islands. This survey is carried out by recording the total count of each type of small vessels on each island. The survey mainly concentrated around canoes and boats that are currently useable and still sea worthy for fishing. The key purpose for this assessment is to understand the types of marine vessels and the total number of each type available on each island.

In 2022, the Resource Assessment and Monitoring team have expanded this survey to include Funafuti which is a difficult task that usually requires lots of resources and time to execute. In total, Funafuti rounded off as the highest as it has a big count of types of sea transportation, both canoes and boats, well above the rest of the islands.

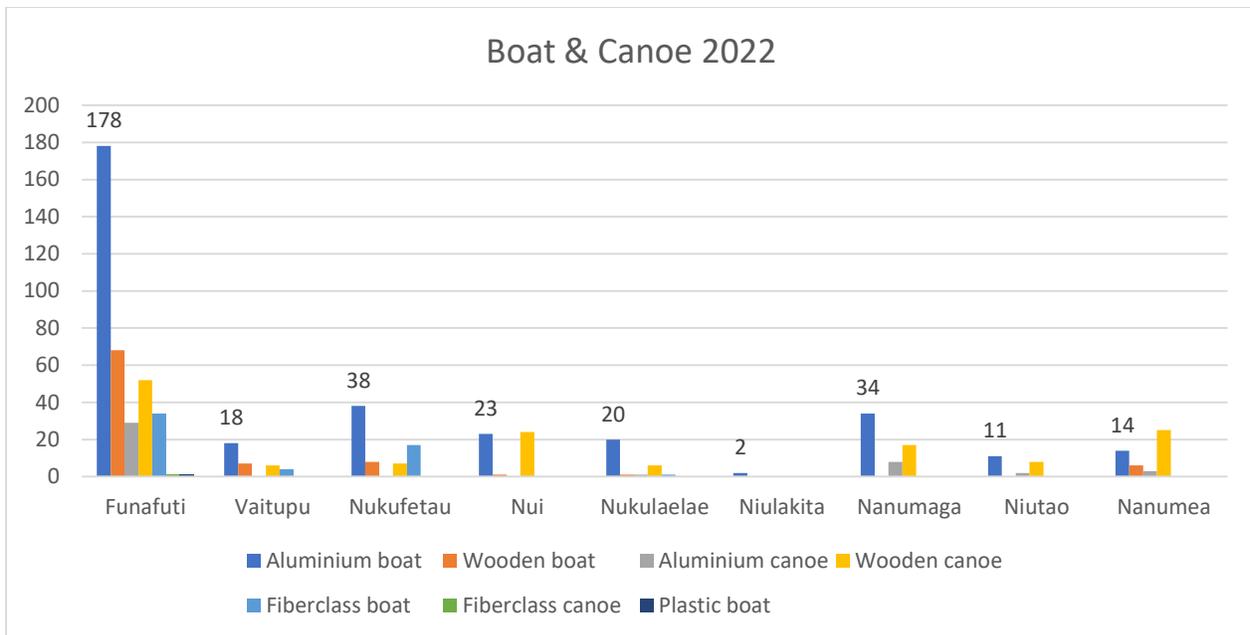


Figure 2: Total count of different types of marine vessels on each island

Aluminum was found to be the most popular type of boat materials that fishers preferred. Perhaps one perception causing this was that aluminum materials require minimum maintenance and suit the harsh environmental conditions of Tuvalu. Some islands, such as Nanumea, Nanumaga and Nui, continue to rely heavily on canoe fishing. Such information will be vital for understanding the estimated level of fishing effort that applies on each islands and the types of maintenance assistance that will be targeted by the Department in future.

#### 4.2.2 *Ciguatera* sampling

The abundance of *Gambierdiscus toxicus* (GTX) and other potentially toxic dinoflagellates in the last quarter (Figure 3) is the highest compared to all quarter in 2022. The high risk of incidents of Ciguatera Fish poisoning (CFP) could increase in sites that have been assessed if the average density has exceeded  $\geq 100,000$  per 100g and medium risk for sites which has an average density  $\geq 10,000$  per 100g. (Kaly, 2000). Reasons for the sudden increase in the density of the dinoflagellates is unknown (Figure 3). However, there are links between an increase in *G. toxicus* and other potentially toxic dinoflagellates related to damage caused by hurricanes and storms (Darius et al. 2007). This increase in density of *G. toxicus* could be directly related to the transition to El Niño-Southern Oscillation (ENSO). Others have suggested a link between outbreaks of ciguatera and nutrient enrichment (Lehane and Lewis 2000). Several recent studies have identified significant problems with nutrient pollution from wastewater in Funafuti lagoon (Sharma, 2010; Fujita et al 2013; Newland 2018).

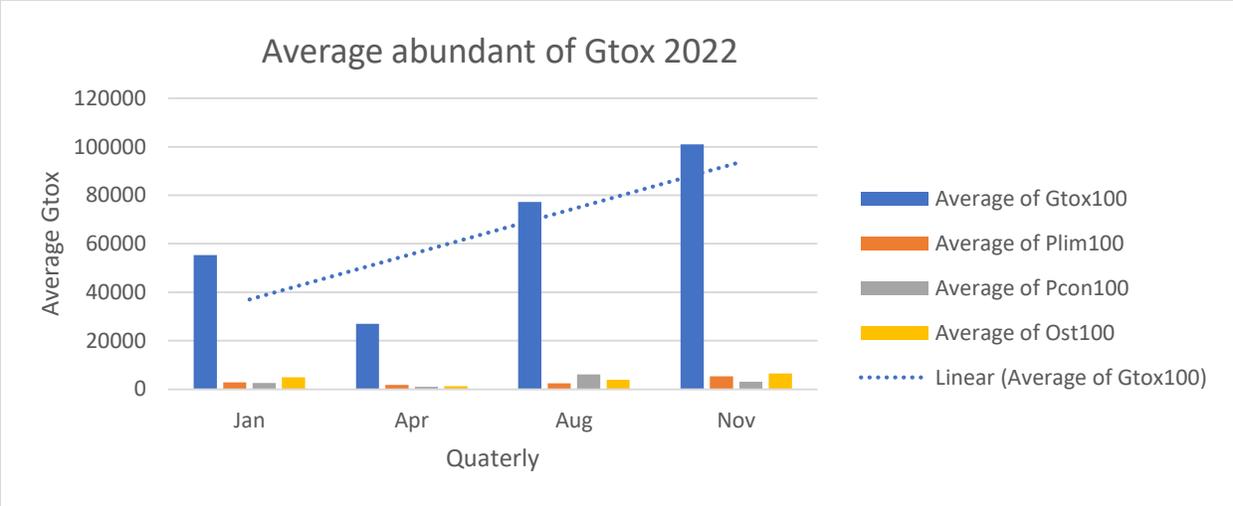


Figure 3: Average abundance of *Gambierdiscus toxicus* (Gtox) and any other dinoflagellates

For 2022, we have increased the number of monitoring sites from 20 to 23. This is because we wanted to have a fair representation and better understanding of different types of areas inside the lagoon. The summary of results across all four reports for 2022 showed that GTX levels at the southern end of Fongafale by the main settlement were fairly high (more than 5,000 dinoflagellates cells per samples) compared with other more distant sites such as Akau Pusa or Akau Fasua. All four reports can be access through the online Fisheries website. These results suggest that high level of nutrients in runoff into the lagoon may be feeding ciguatera outbreaks. This is likely due to runoff from pig waste, household liquid waste and other coastal development.

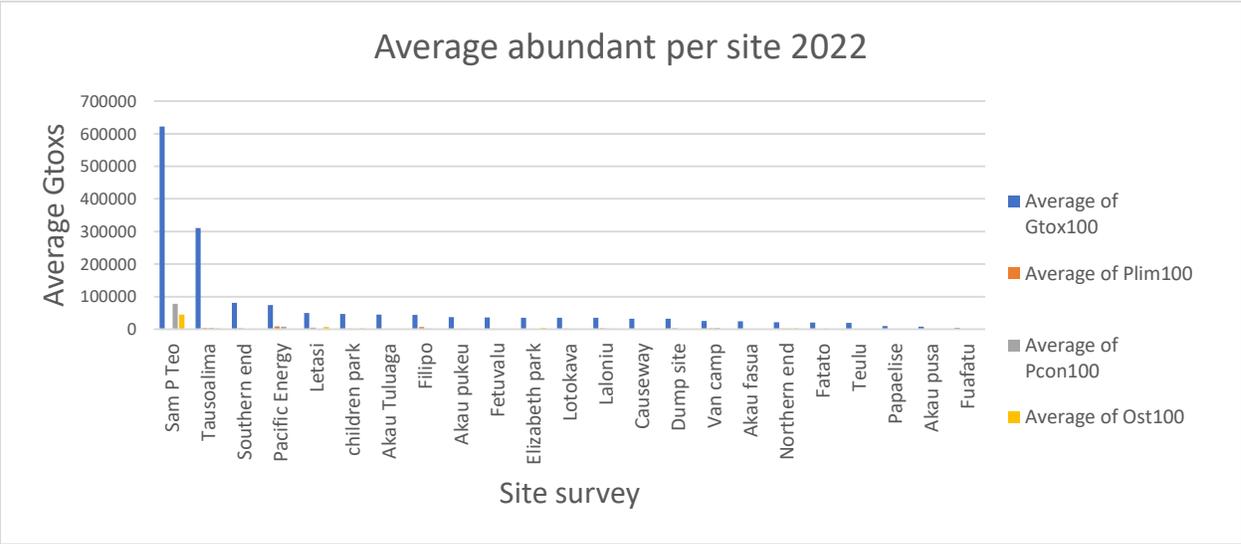


Figure 4: Highest abundant of Gtox per site 2022

### 4.2.3 Ciguatera cases

In addition to the above GTX Monitoring, there has also been work done on collecting information on number of Ciguatera Fish Poisoning (CFP) cases on all islands. Regular CFP assessments were implemented on all islands throughout the year during each Metronome trip, where information was collected on number of cases of poisoning in humans. These cases were normally obtained from hospitals on each island by using a data sheet, which was brought back to Funafuti and transferred into the MIS database in the office. For 2022, there were no signs of serious outbreak of CFP in all islands as there were no recorded cases in all quarters.

### 4.2.4 Creel Survey

The creel survey has been sustained through the continuous collection of information on fishing activities and catches for the whole of Tuvalu by means of the outer islands data collectors. The 2022 data presented in this report is from 350 surveys from Funafuti, Nanumaga, Nanumea, Nui, Nukufetau, and Nukulaelae. There was a real need to improve the quantity and quality of field data collected from all islands. The following Figure 5 and Figure 6 shows the results of creel surveys done on each of the Tuvalu islands per year.

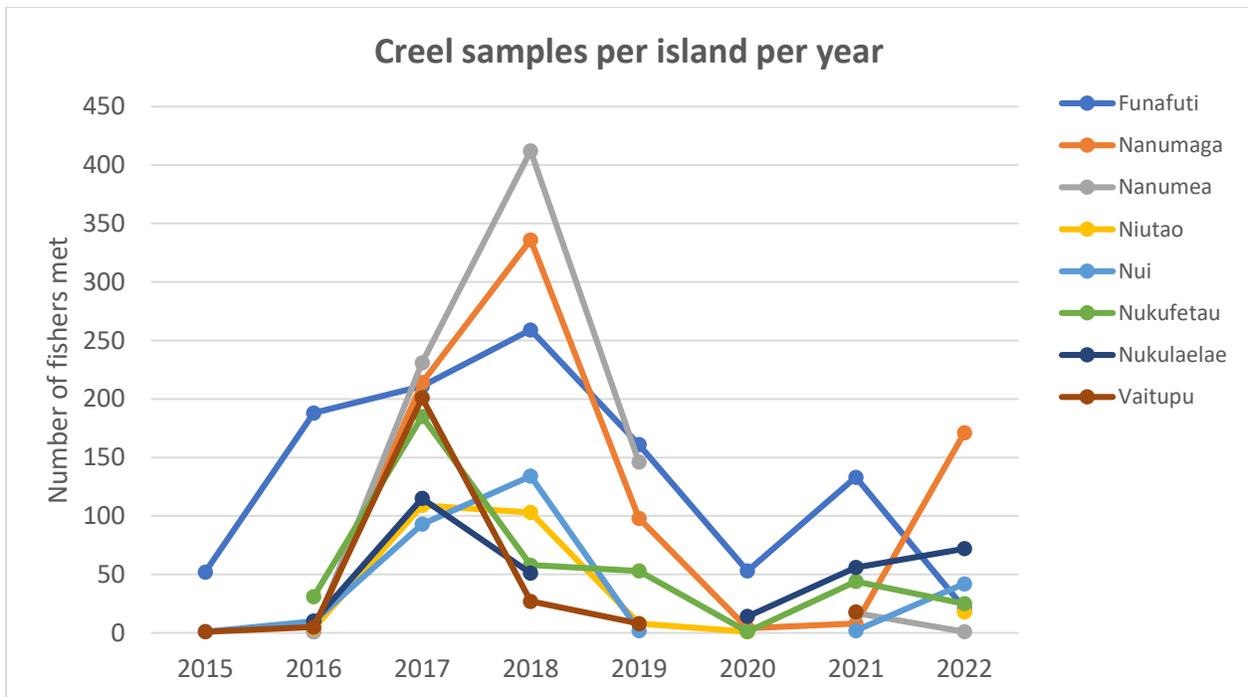


Figure 5: Number of creel surveys collected by data collectors and CFOs by island and year

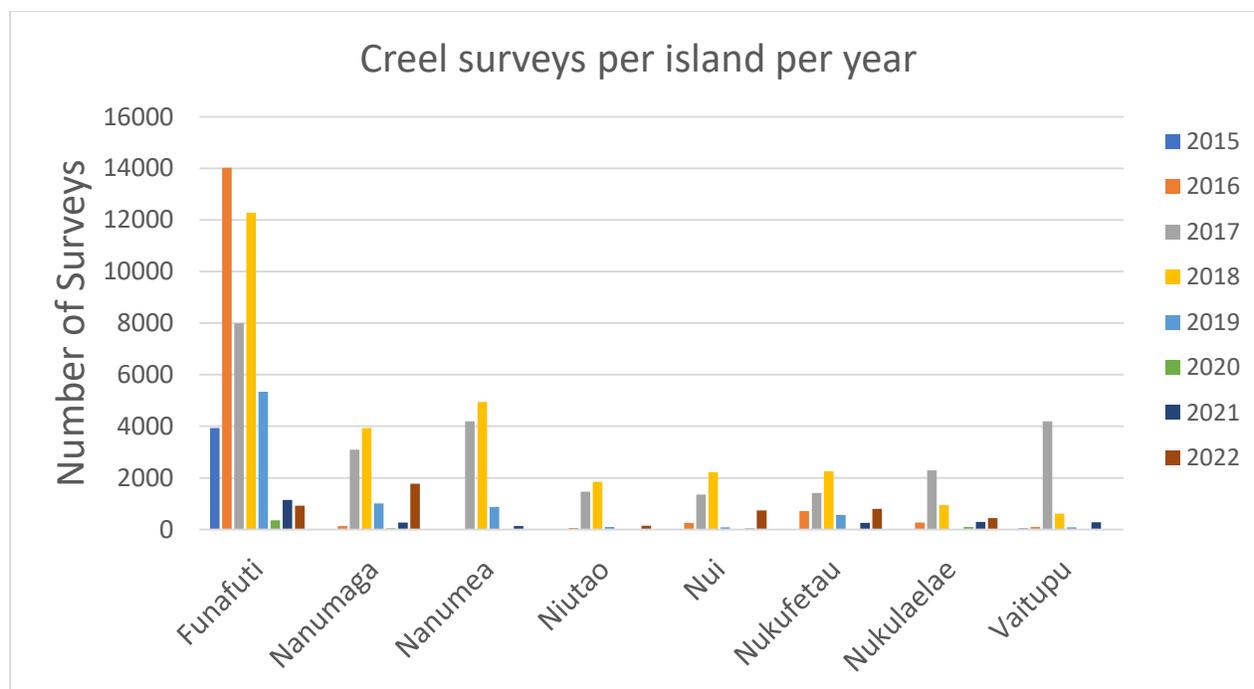


Figure 6: Samples by islands from 2015 to 2022

Figure 6 shows the landings per year on each island upon submissions from each island data collectors. There have been issues with the flow of data from Outer Islands to the main capital island Funafuti this year, a prompt need of management actions to verify the decrease of samples collected each year due to unforeseen issues from office management let alone the data collector’s work themselves. Therefore, attention to data collector’s performance analysis would be the 2023 goal for management purposes to improve the Creel survey program.

Table 2: Percent of top species that were landed undersized in all islands

|    | Species                        | % Landed Undersize | Total Weight (kg) | Sample size (N) | Tuvaluan Names                     |
|----|--------------------------------|--------------------|-------------------|-----------------|------------------------------------|
| 1  | <i>Lutjanus gibbus</i>         | 26%                | 1768              | 703             | Taea                               |
| 2  | <i>Acanthurus triostegus</i>   | 45%                | 154               | 366             | Manini, Koinava                    |
| 3  | <i>Lethrinus microdon</i>      | 50%                | 121               | 143             |                                    |
| 4  | <i>Acanthurus lineatus</i>     | 20%                | 33                | 128             | Ponelolo, Alogo, Pone hamao        |
| 5  | <i>Caranx lugubris</i>         | 91%                | 182               | 108             | Taufauli, Tino, Aheu tafauli, Ulua |
| 6  | <i>Epinephelus merra</i>       | 1%                 | 376               | 98              | Gatalaliki                         |
| 7  | <i>Caranx melampygyus</i>      | 80%                | 178               | 89              | Aseu, Ulua, Fuaika                 |
| 8  | <i>Aphareus furca</i>          | 100%               | 15                | 77              | Palusega, Kotua, Taelepe, Takuoga  |
| 9  | <i>Naso lituratus</i>          | 40%                | 17                | 65              | Maninilakau                        |
| 10 | <i>Lethrinus obsoletus</i>     | 17%                | 14                | 36              | Tanutanu                           |
| 11 | <i>Lutjanus monostigma</i>     | 23%                | 8                 | 26              | Taiva                              |
| 12 | <i>Naso unicornis</i>          | 33%                | 35                | 24              | Ume, Pokapoka                      |
| 13 | <i>Sargocentron spiniferum</i> | 35%                | 10                | 23              | Tamalau                            |
| 14 | <i>Crenimugil crenilabis</i>   | 95%                | 12                | 22              | Kanase                             |
| 15 | <i>Epinephelus maculatus</i>   | 76%                | 17                | 21              |                                    |

|    |                                  |      |    |    |                    |
|----|----------------------------------|------|----|----|--------------------|
| 16 | <i>Epinephelus polyphekadion</i> | 58%  | 23 | 19 | Gatala (one dot)   |
| 17 | <i>Naso brevirostris</i>         | 17%  | 12 | 18 | Pokapoka, Kosotu   |
| 18 | <i>Hipposcarus longiceps</i>     | 41%  | 9  | 17 | Ulafi              |
| 19 | <i>Monotaxis grandoculis</i>     | 50%  | 4  | 14 | Muu, Mufala        |
| 20 | <i>Liza vaigiensis</i>           | 100% | 4  | 14 | Kafakafa           |
| 21 | <i>Elagatis bipinnulata</i>      | 69%  | 43 | 13 | Kami, Kamai; Kamaa |
| 22 | <i>Lutjanus kasmira</i>          | 62%  | 2  | 13 | Savane             |
| 23 | <i>Caranx ignobilis</i>          | 100% | 4  | 13 |                    |

Table 2 shows on average the amount of fish landed undersize. For instance *Caranx lugubris* and *Caranx melampygus* are in danger because almost all of them were landed undersized and as for *Aphareus furca*, all of them were landed undersized. Despite the fact that some species show signs of overfishing, *Lutjanus gibbus* illustrate otherwise. Known in Tuvaluan as Taea, these were the most commonly fished species but only 26% of them were landed undersized. Creel surveys show *Epinephelus merra* were in great condition now as there were only 1% of what were sampled were landed undersized.

#### 4.2.4.1 Catch per unit effort (CPUE)

Table 3 shows catch per unit effort (CPUE) as measured by weight (kg) per fisher per hour, and weight (kg) per fisher per trip. Across Tuvalu for all fishing methods, the median CPUE for 2022 is 4.2 kg/fisher/hr and 14.4kg/fisher/trip. Fishers on Funafuti bring in the lowest catch per hour compared to other islands (Nanumea should be excluded as there was only one trip recorded). The trips taken by Funafuti fishers are almost three times longer than average across Tuvalu. As a result, the CPUE per trip for Funafuti is higher than the average Tuvalu CPUE. Nanumaga has the most data collected compared to other islands.

Table 3: CPUE for 2022

| Island              | Median CPUE<br>kg/fisher/hr | Median CPUE<br>kg/fisher/trip | No. of<br>trips | Average trip<br>duration (hrs) |
|---------------------|-----------------------------|-------------------------------|-----------------|--------------------------------|
| Funafuti            | 1.7                         | 16.9                          | 19              | 9.6                            |
| Nanumaga            | 4.8                         | 12.8                          | 147             | 2.5                            |
| Nanumea             | 1.1                         | 2.2                           | 1               | 2.0                            |
| Nui                 | 4.8                         | 18.1                          | 28              | 3.3                            |
| Nukufetau           | 3.7                         | 18.7                          | 16              | 4.8                            |
| Nukulaelae          | 3.2                         | 6.4                           | 7               | 2.3                            |
| <b>Tuvalu Total</b> | <b>4.2</b>                  | <b>14.4</b>                   | <b>218</b>      | <b>3.4</b>                     |

\*No data available for Niutao and Vaitupu

The median CPUE (all islands combined) for 2015-2022 was 1.5 kg/fisher/hour and 6.0 kg/fisher/trip. Although the median CPUE for 2022 is higher than the period 2015 to 2022, the average trip duration for 2022 is less. This could reflect differences in fishing methods or different species targeted e.g. pelagic species.

Table 4: CPUE for the years 2015 to 2022

| Island               | Median CPUE<br>kg/fisher/hr | Median CPUE<br>kg/fisher/trip | No. of trips | Average trip<br>duration (hrs) |
|----------------------|-----------------------------|-------------------------------|--------------|--------------------------------|
| Funafuti             | 0.7                         | 6.3                           | 871          | 8.7                            |
| Nanumaga             | 2.9                         | 8.5                           | 591          | 3.0                            |
| Nanumea              | 1.4                         | 2.5                           | 690          | 2.2                            |
| Niutao               | 5.6                         | 21.0                          | 114          | 3.2                            |
| Nui                  | 1.0                         | 2.7                           | 216          | 3.2                            |
| Nukufetau            | 3.0                         | 13.9                          | 344          | 5.2                            |
| Nukulaelae           | 3.2                         | 8.8                           | 143          | 3.2                            |
| Vaitupu              | 2.0                         | 5.2                           | 206          | 2.8                            |
| <b>Tuvalu Total*</b> | <b>1.5</b>                  | <b>6.0</b>                    | <b>3177</b>  | <b>4.6</b>                     |

\*Total includes surveys with no island specified

#### 4.2.5 Locally managed marine areas

In 2022, the locally managed marine area (LMMA) awareness work focused mainly on developing and administering a household survey in all the islands. This survey followed up on the programs that raised awareness on the different ways of conserving fish, which were conducted by TFD during Metronome trips in past years. The purpose of this socio-economic survey was to monitor the effectiveness of TFD's education and awareness programme, and identify areas for improvement. The result of the survey will guide TFD coastal staff on ways to deliver LMMA-related information more effectively.

The survey covered all islands except Funafuti with the target participation of 30 people on each island. However, some of the islands have not reached the number of participants targeted due to the unavailability of people due other commitments. Niulakita only had 15 people take part in the survey because there were only few people on the island, approximately 30 in total.

Table 5: LMMA Household survey done in all the Outer Islands of Tuvalu, 2022

| Island     | Gender |        | Household members |
|------------|--------|--------|-------------------|
|            | Male   | Female | Average           |
| Nanumea    | 20     | 10     | 5                 |
| Nanumaga   | 15     | 14     | 8                 |
| Niutao     | 21     | 4      | 5                 |
| Nui        | 16     | 9      | 5                 |
| Vaitupu    | 18     | 9      | 7                 |
| Nukufetau  | 25     | 1      | 6                 |
| Nukulaelae | 15     | 14     | 5                 |
| Niulakita  | 7      | 8      | 4                 |

Most of the participants from each island were fishers (Table 5). Both male and female are included in this survey. Participants were randomly picked to collect different views and understanding from different genders and also from different age groups.

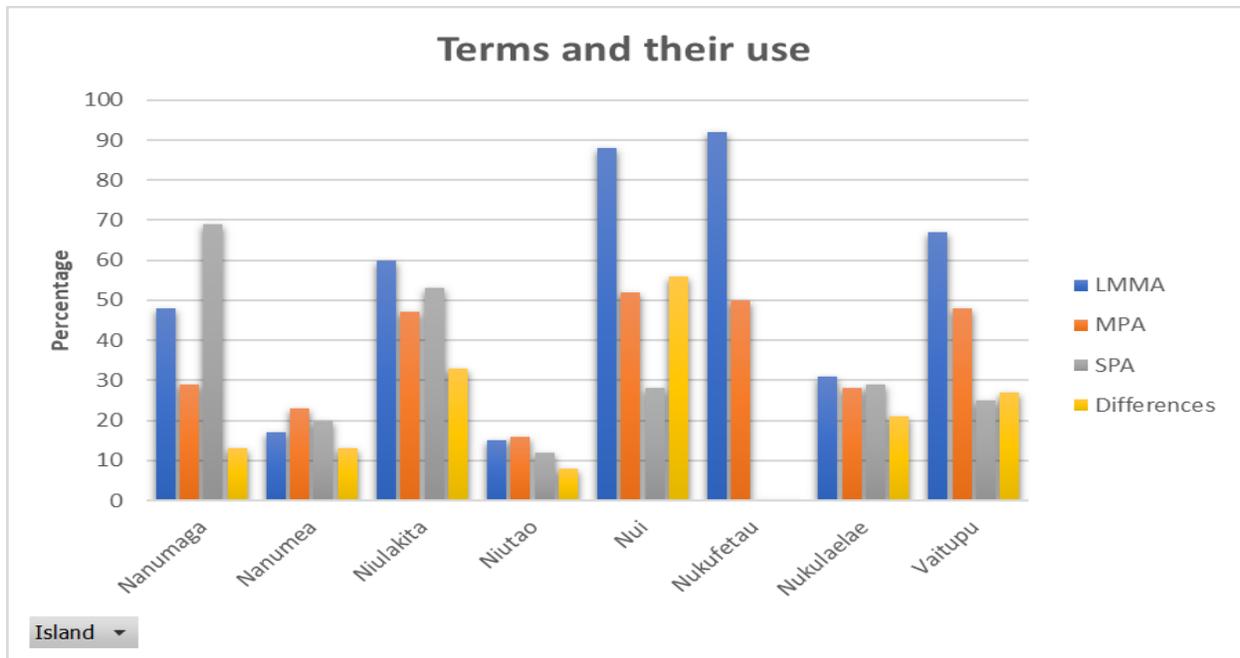


Figure 7: shows the understanding of the participants in the use of terms, LMMA, MPA, SPA

The results of the survey show that more than half of the participants from Nui, Nukufetau and Vaitupu have a strong understanding of Locally Managed Marine Area (LMMA), Special Protected Area (SPA), Marine Protected Area (MPA) and the difference between the three concepts. Furthermore, more than half of these participants have good knowledge of the boundaries of their SPA and the penalties provided by their Falekaupule for poachers. Less than 20% of those surveyed in Nanumea, Niulakita, Niutao and Nukulaelae demonstrated a clear understanding of LMMAs and SPAs, and could differentiate between the concepts. The term “LMMA” has previously been mistakenly used to specifically refer to “no-take zones”. This survey highlights the importance of providing further clarification, emphasizing that the no-take zones are in fact Special Protected Areas (SPAs) that are integral part of the LMMA. The LMMA represents the marine area under the authority of the Falekaupule.

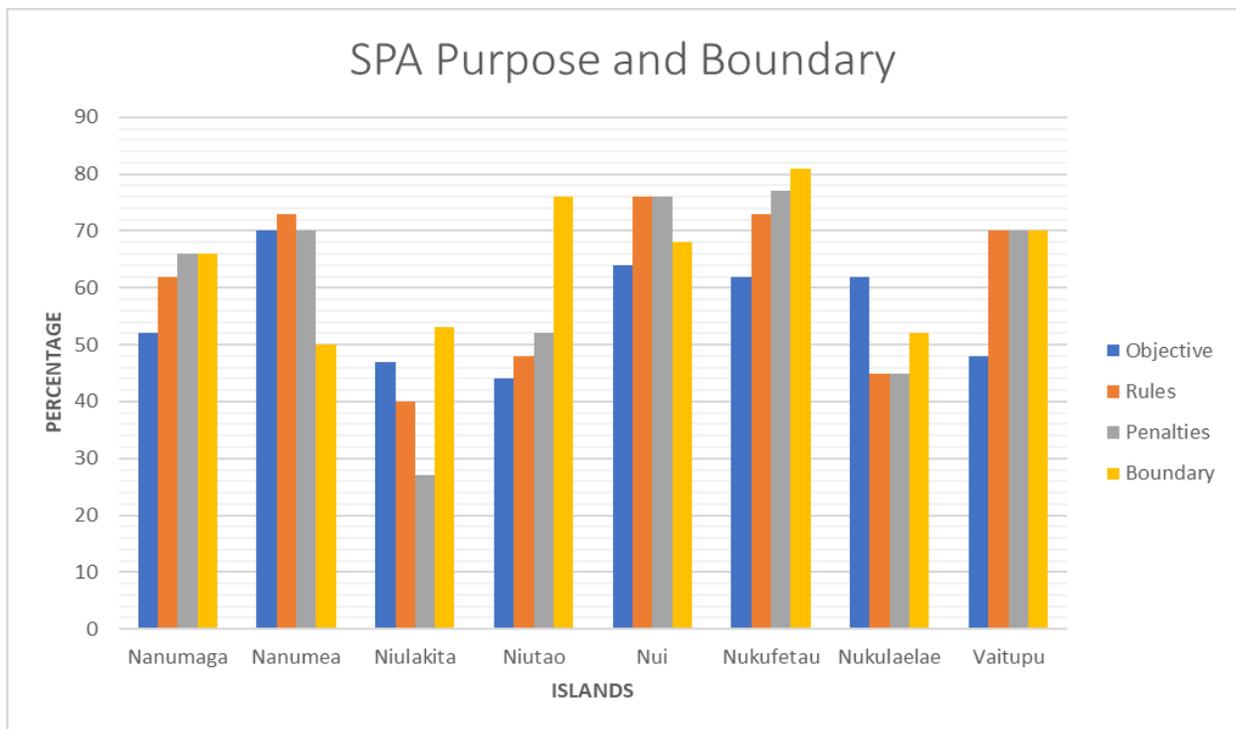


Figure 8: LMMA Purposes and boundary

Most of the participants from Nanumea, Nanumaga, Nui, Vaitupu and Nukufetau are aware and demonstrated a clear understanding on the Objectives, Rules, Penalties and the boundaries of SPAs. These SPAs were established for sustainability purposes and also to cater the needs of the island community, in terms of a reserve in times of bad weather and to provide for occasions host by the island.

### 4.3 Outer Islands Support Programme

#### 4.3.1 Metronome trips

The Support Programme for the outer islands continued in 2022 through four (Table 6) metronome trips to the outer islands. The trips made in 2022, mainly focused on the development of Coastal Fisheries Management Plans (CFMP) for each of the 9 islands; Nanumea to Niulakita. The Coastal section with Operation and Development section worked collaboratively through the Kaupule during these trips to better target mandated activities aligned with Sustainable management of Marine resources and Food security. Therefore, required consultations with the Kaupule and Falekaupule is compulsory and an ongoing activity (Table 7). The metronome trips were funded through the Tuvalu Fisheries Support Programme Phase 2 (TFSP2) and Tuvalu Government.

*Table 6: Metronome regular trips to Outer Islands in 2022*

| <b>Metro ID</b>             | <b>Dates Occurred</b> | <b>Islands visited</b>     | <b>Issues &amp; Recommendations</b>  |
|-----------------------------|-----------------------|----------------------------|--|
| <b>Metronome 22</b>         | 16/03 – 10/04         | Nui, Nukufetau and Vaitupu | Refer to <a href="https://tuvalufisheries.tv/library/">https://tuvalufisheries.tv/library/</a> |
| <b>Metronome 23 (Leg 1)</b> | 10/05 – 07/06         | Nanumaga and Niutao        | Refer to <a href="https://tuvalufisheries.tv/library/">https://tuvalufisheries.tv/library/</a> |
| <b>Metronome 23 (Leg 2)</b> | 9/07 – 26/07          | Nanumea                    | Refer to <a href="https://tuvalufisheries.tv/library/">https://tuvalufisheries.tv/library/</a> |
| <b>Metronome 24</b>         | 19/08 – 09/09         | Niulakita and Nukulaelae   | Refer to <a href="https://tuvalufisheries.tv/library/">https://tuvalufisheries.tv/library/</a> |

Implemented activities comprised of boat and canoe surveys, CFP cases update and interviews, data collector refresher training, Fisheries Management Plans (FMPs) community consultation (development process), school awareness, FAD maintenance and deployment, post-harvest training, Beche-de-mer (BDM) survey, LMMA household survey, Grab bag inspection and evaluation of equipment condition. Detailed information regarding a certain activity is available online for reference at <https://tuvalufisheries.tv/library/> - Tuvalu Fisheries website online library. Such visits and long-term relationships with outer island communities need to be maintained and improved for better management of our coastal fisheries in Tuvalu.

*Table 7: Activities implemented during 2022 metronome trips*

| <b>Ongoing activities – Coastal</b>         | <b>Other activities</b>                  |
|---|--|
| Boat & canoe survey                         | Development Coastal Fisheries Management |
| Ciguatera Fish Poisoning                    | LMMA household survey                    |
| Awareness program (Schools and Communities) | Post-Harvest trainings (CFC staff)       |
| Data collector’s refresher trainings        |  |
| FAD maintenance                             |  |

#### **4.3.2 Coastal Fisheries Management and Development Plans**

FMPs are key tools created with the intention to sustainably manage and improve outer islands’ coastal fisheries. Coastal Section staff of Tuvalu Fisheries Department have been trained by SPC and MPI NZ (Te Pātuitanga ahu moana a Kiwa) on the development process of fisheries management plans early in 2022. Consultations with stakeholders have been achieved during regular metronome trips with a great turn out of participants from key targeted groups including Falekaupule elders/leaders, Kaupule and men, women, youth and fishers. All Fisheries Management Plan drafts for 8 outer islands were completed and checked by SPC and MPI with the assistance of our Inshore Fisheries Advisor in furnishing the drafts. Validation of collected information from communities and reviewing of fisheries management plan drafts with communities was done only with Vaitupu due to covid-19 pandemic out-spread.

However, 2023 has in store the outline of re-consulting with outer island communities to be occurred during regular metronome trips and redrafting fisheries management plans for formal endorsement by the minister.

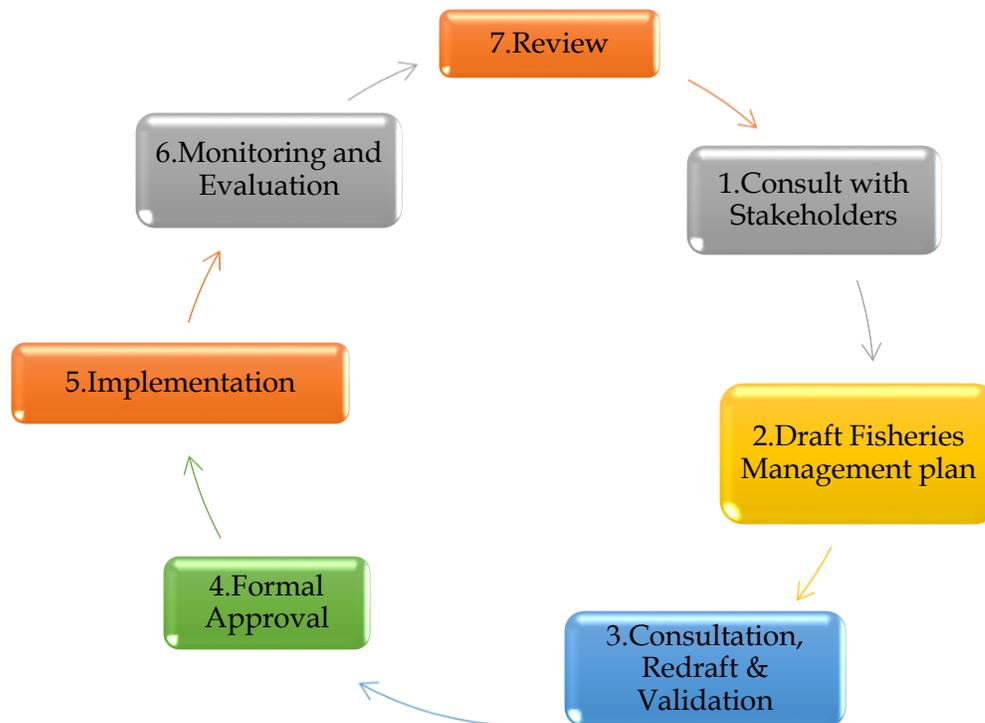


Figure 9: Process of Developing Fisheries Management Plans

#### 4.4 Other Activities

##### 4.4.1 Community Based Fisheries Management scaling up

TFD started working with SPC to develop the Tuvalu LMMA Strategy as part of the Framework for Action on scaling-up community-based fisheries management (CBFM). This process has involved several stages of consultation and information gathering, including: 1) the establishment of a project team, 2) a comprehensive review of the policy context in Tuvalu, and 3) conducting a situation analysis to shape the Strategy. This includes examining the geographical and logistical challenges associated with implementing CBFM across communities, coordinating with other stakeholders, and documenting traditional ecological knowledge and management systems. In 2023, there will be consultations with all stakeholders, and drafting of the Strategy. This document is planned to be completed in 2023.

##### 4.4.2 Development of LMMA MAPS

The Coastal Fisheries Section has been working on regularly updating LMMA maps. This involves making necessary amendments and providing updates to each Kaupule. These changes

are gathered through consultation with the community during metronome trips to the island. Towards the end of 2022, we managed to create new, more updated maps from each island Kaupule office. The plan is to publish these maps in 2023, making them widely available for reference and use.

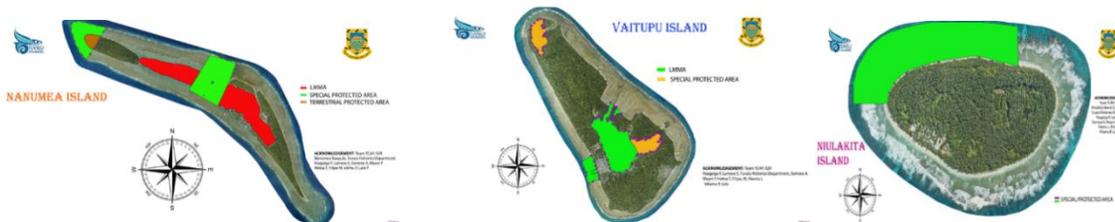


Figure 10: LMMAs of Nanumea, Vaitupu and Niulakita

Despite the fact that more than half of the participants from Nui, Nukufetau and Vaitupu have great knowledge on what TFD has provided in previous years, there is a real need for further scale up on the wide spread of understanding among people on types of LMMA concept and other necessary information required. Boundaries of each SPA should be clearly marked with buoys and beacons so that everyone including visitors will be informed of the SPA boundary. Updated maps should be published in the community and distributed to each island Kaupule.

#### 4.5 Online training & meetings

Coastal Section attended a couple of online meetings and trainings in the year 2022. Financial hands aiding in the preparation and funding of the above were the facilitators with Tuvalu Government.

Table 8: Online trainings and meetings delivered and attended in 2022

| Name of Training  | Time                    | Facilitator            |
|---|-------------------------|------------------------|
| Fisheries Management Online Course                                    | January – February 2022 | NZ MPI                 |
| Fisheries Management Plan Development Training                        | 2022                    | SPC & NZ MPI           |
| Data Analysis Training  | 2022                    | IFA                    |
| Size Limit Sampling, Fish Dissection & Data Analysis Training         | January 2022            | Consultant David Welch |
| Monthly Online In-house Trainings                                     | January – December 2022 | IFA                    |
| Writing Workshop  | Late October 2022       | NZ MPI                 |
| Compliance Training   | 19-22 September 2022    | SPC & NZ MPI           |
| HOF 14 Heads of Fisheries Meeting                                     | 14-17 June 2022         | SPC                    |
| RTMCFA5 Regional Technical Meeting on Coastal Fisheries & Aquaculture | 11-14 October 2022      | SPC                    |

## 5 Oceanic Fisheries Activities

### 5.1 General

The year started on a low note for the Oceanic team with all major undertakings including observer placement, in-port transshipment, fisheries surveillance patrols and aerial surveillance continuing to be put on hold due to the ongoing border closure.

Oceanic staff also participated in fisheries meetings which were only done virtually. Upgrading to the VMS rooms was a major achievement. The opening of border in the second half of the year enabled most operations and services to resume though gradually.

Funding became an issue after the conclusion of the WB bank project (PROP) in August and many activities were left unfunded including TA salaries for the observer program. With no option left, arrangement was made so that all costs associated with the employment of the TA (onwards from August) to be covered under the observer fund until the end of 2022.

The department collected a total of more than \$30,607,722.33 US in fisheries revenues – down by \$1.7m US compared to last year. The VDS is responsible for 90.4% of the collected revenue, licensing 9.4% and transshipment 0.2%. A decline is observed across all the three main revenue streams, although the drop-in transshipment revenue and carrier licensing is the most striking.

### 5.2 Licensing

#### 5.2.1 Fishing Licenses Issued and trend

Licensing continues to be one of the core businesses of the department. This year, a total of 133 fishing licenses were issued, the lowest so far in recent years (Table 9 below). The number of licenses had decreased across all fleets except the bunker fleet. The implementation of the LL VDS, unfavorable fishing conditions (due to La Nina), and COVID19 pandemic have all played a role in the reduction. Some discrepancies in reported fishing licenses, due to an error with the licensing system, were uncovered during analysis this year and are shown in brackets.

Table 9: Annual fishing licenses recorded since 2015.

| Years | Purse Seine | Longline | Pole & Line | Fish Carrier | Bunker | Total     |
|-------|-------------|----------|-------------|--------------|--------|-----------|
| 2015  | 73          | 26       | 1           | 34           | 7      | 141       |
| 2016  | 88          | 66       | 3           | 41           | 1      | 199       |
| 2017  | 82          | 68       | 0           | 40           | 0      | 190       |
| 2018  | 93 (98)     | 77 (78)  | 0           | 45           | 0      | 215 (221) |
| 2019  | 104 (108)   | 70       | 14          | 51           | 0      | 239 (243) |
| 2020  | 98 (101)    | 31       | 16          | 55           | 4      | 204 (207) |
| 2021  | 108         | 27       | 12          | 26           | 10     | 183       |
| 2022  | 93          | 23       | 1           | 6            | 10     | 133       |

#### 5.2.2 Fishing Vessels Categories

Fishing vessels, irrespective of vessel type, are grouped into three broad categories namely Domestic, Bilateral and Multilateral. The Domestic category includes only Tuvaluan flag vessels,

Bilateral category are vessels registered under bilateral arrangement whereas multilateral vessels represent those licensed under multilateral arrangements.

The bilateral, the dominant category, consisted largely of Korean, Taiwanese and Chinese Purse Seiners. The FSM Arrangement (FSMA) vessels continue to make a strong presence dominating the multilateral category with the US treaty having only 7 PS vessels. The FFA and PNAO, the administrators for US treaty and FSMA arrangements respectively, are responsible for the granting of regional licenses for US treaty fleets and FSMA.

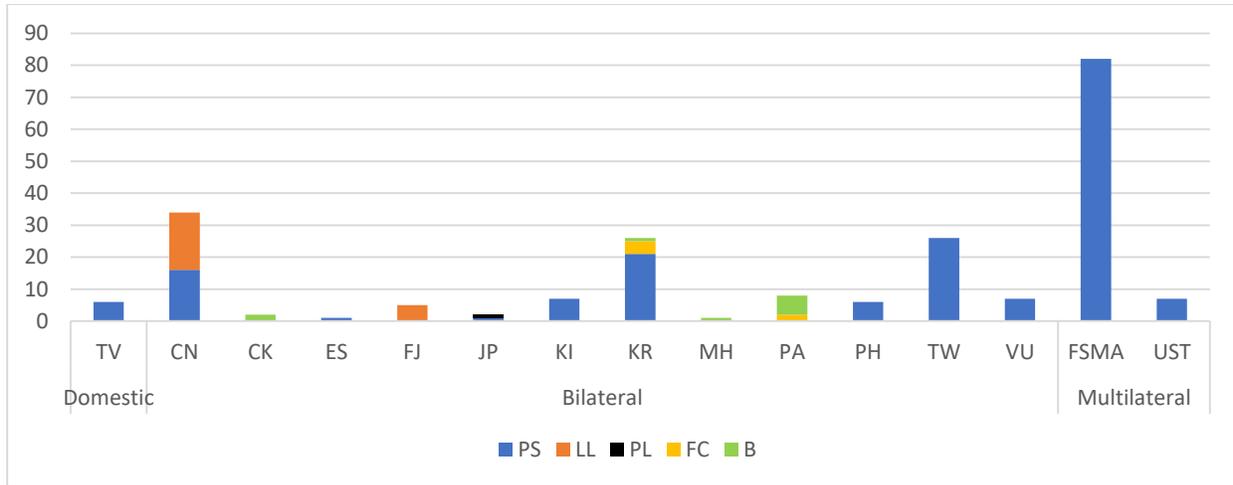


Figure 11: Fishing permits by agreement and flag for 2022.

### 5.2.3 Licensing Revenues

Licensing revenue constitutes mainly of license fees and the Tuvalu flag ship management fees. The licence fee varies between vessel types and ranged between US\$10K and US\$20K. This year the licensing unit collected a total of US\$2,873,441. The flag ship management fee accounted for 52% of the total licensing fee.

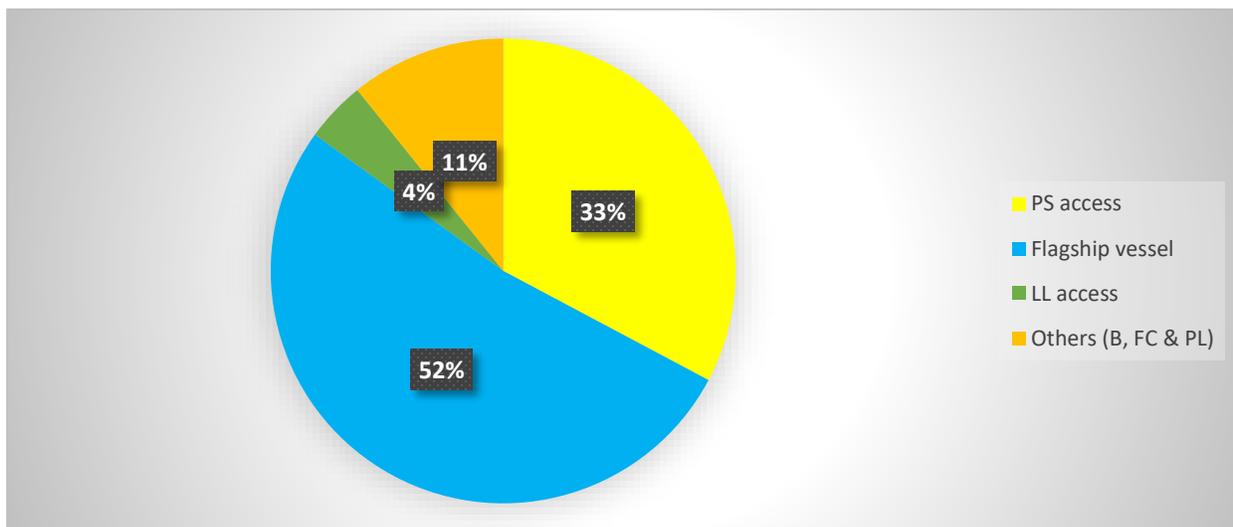


Figure 12: Licensing revenues for 2022

## 5.2.4 Catches

### 5.2.4.1 Domestic Purse seine

Tuvalu had six purse seine active in 2022 and their annual combined catch was 36,842mt this year (Table 10). All the six vessels remained active throughout the year resulting in a relatively good catch. The catch was mostly skipjack comprising 87% of the total catch, yellowfin 12% and bigeye 1%.

Table 10: Annual Purse seine catch by Tuvalu flagged vessels for the last five years.

| Years | BET | SKJ   | YFT  | Total |
|-------|-----|-------|------|-------|
| 2018  | 746 | 8721  | 1619 | 11086 |
| 2019  | 107 | 6364  | 304  | 6775  |
| 2020  | 547 | 8160  | 1095 | 9802  |
| 2021  | 626 | 24124 | 4889 | 29639 |
| 2022  | 358 | 35609 | 5150 | 41117 |

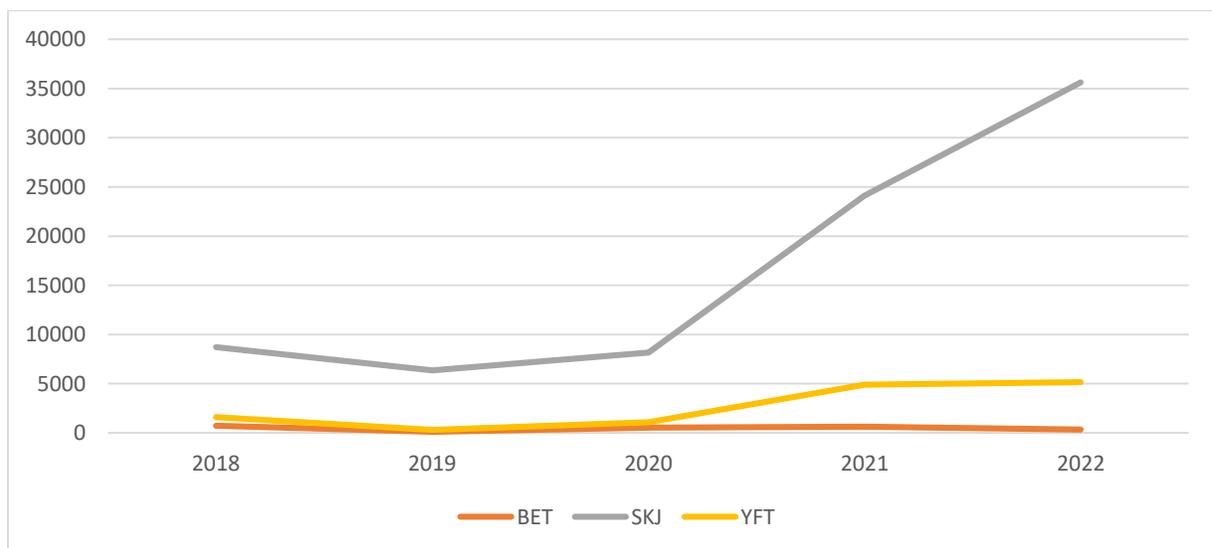
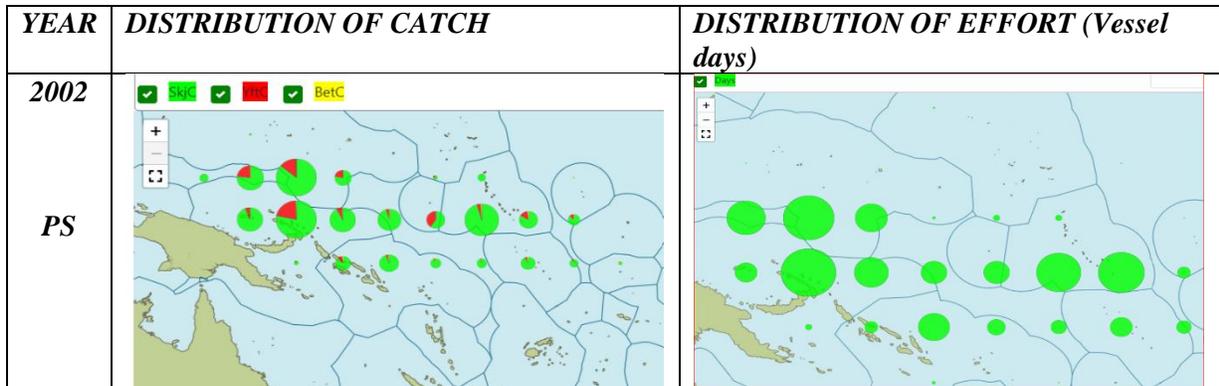


Figure 13: Catch by species composition. Tufman 2 Dorado report

### 5.2.4.2 Purse Seine Catch and Effort Distribution

Our vessels fished extensively over large area. Popular fishing spots tended to be in the EEZs of PNG, FSM and Kiribati as demonstrated below. Some fishing also undertaken in our EEZ but far less compared to the effort in those three EEZs.

Figure 14: Distribution of catch and effort along PNG, FSM and Kiribati EEZs



### 5.2.4.3 Domestic Long Line

Tuvalu has one Long line (Pakasoa) under a Joint Venture with one fishing company based in Fiji. The vessel is old and is yielding no real profit to the Tuvalu. For this reason, the Joint Ventures (JV) was closed off and the vessel was due to be deregistered in 2022. Only one fishing trip was carried out in January 2022, before the vessel broke down and ceased operations

Table 11: Longline catch by Tuvalu flagged vessels. Source: Tufman 2 dorado report ref 2.2.3.

| YEAR  | ALB  | SKY  | YFT  | BET  | TOTAL |
|-------|------|------|------|------|-------|
| 2018  | 118  | 14   | 103  | 65   | 300   |
| 2019  | 64   | 16   | 76   | 52   | 208   |
| 2020  | 123  | 5    | 20   | 10   | 158   |
| 2021  | 57   | 2    | 9    | 19   | 87    |
| *2022 | 0.15 | 0.09 | 0.02 | 0.48 | 2     |

### 5.2.5 Total Annual catch taken by all fleets in Tuvalu EEZ

#### 5.2.5.1 The Purse seine Fleets

The Purse seine catch in the Tuvalu EEZ was 58,922mt (Figure 15) in 2022. As always, skipjack tuna constitutes the biggest catch: SKJ-54,093mt (92%), YFT-4,309mt (7%) and BET-520mt (1%).

As usual, the Korean fleet took the largest share of the catch.

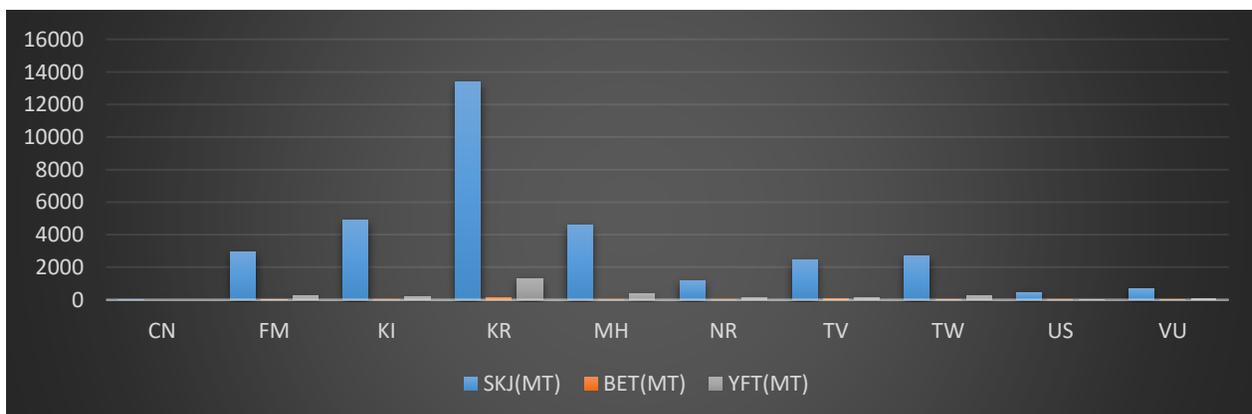


Figure 15: Purse seine catch taken by all fleets in Tuvalu waters

### 5.2.5.2 The Long Line Fleet

Only two fleets (Fiji and China) were present in Tuvalu’s EEZ in 2022 who landed a total catch of 1041mt of tuna. This comprised of albacore tuna, the highest by weight claiming 452mt (44%), YFT-368mt (35%), BET-147mt (14%) and there were also other species 74mt (7%)

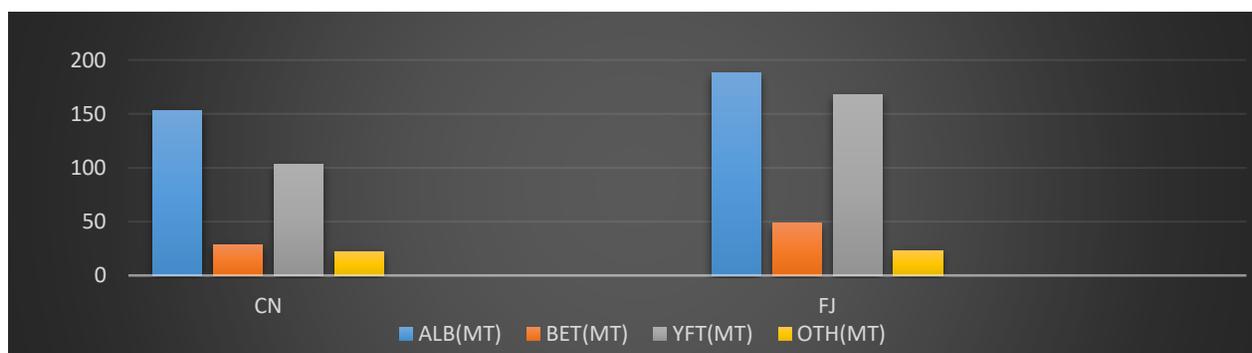


Figure 16: Longline catch in Tuvalu waters

## 5.3 VDS/VMS Operations

### 5.3.1 VDS

#### 5.3.1.1 Party Allowable Effort (PAE) Allocation \_ Purse Seine

Tuvalu PAE continued to grow steadily over the years and it grew to 2306 fishing days this year from 2223 in 2021. While the increase is considered a good thing since a large PAE would result in a large revenue, however, this all depends on our ability to sell it all. Selling of fishing days on the other hand is not that simple. For two years (2021 & 2022) in a row, the department struggled to sell fully its allocated share (PAE) and only just managed to sell the last days near the end of the year. Unfavourable fishing conditions were influenced by strong La Nina, the COVID19 Pandemic has disrupted fishing activities, and Fishing Companies have begun to understand the system (VDS) better. As a result, they no longer rush to buy days like before, and strong competition for buyers among PNA membership are all real obstacles to the selling of days.

Fishing days are closely monitored through the PNA FIMS platform and through it we can keep track of both used and unused fishing days. The paid amount for the unused days is not refundable. For FSMA vessels, this money is kept by the PNA office for later distribution. The number of unused days in 2022 is quite significant and equivalent to about 5% of days allocated for use in the Tuvalu EEZ. Of course, this does not include days transferred out to the FSMA or to other EEZs.

Table 12: Tuvalu's Purse seine Vessel Days usage for 2022

| <i>Foreign Company</i>   | <i>Days allocated</i> | <i>Days - EEZ</i>   | <i>Days Used</i>    | <i>% used</i> | <i>Days remaining</i> | <i>% remaining</i> |
|--|-----------------------|---------------------|---------------------|---------------|-----------------------|--------------------|
| <i>Albacora SA</i>   | 0                     | 0.8                 | 0.8                 | 0             | 0                     | 0                  |
| <i>China Overseas Fisheries Association Distant Water Fisheries Center for Promotion &amp; Demonstration</i> | 195                   | 192.9               | 191.4               | 98.13         | 3.65                  | 1.87               |
| <i>Fair Well Fishery Co. LTD</i>   | 5                     | 6.3                 | 4.7                 | 94            | 0.3                   | 6                  |
| <i>Japan Far Seas Purse Seine Fishing Association</i>  | 3                     | 0                   | 0                   | 0             | 3                     | 100                |
| <i>Kiribati and Sajo Fisheries Co. Ltd</i>   | 105                   | 105.2               | 105.2               | 100.18        | -0.19                 | -0.18              |
| <i>KIRIKORE</i>  | 30                    | 29.5                | 29.5                | 98.23         | 0.53                  | 1.77               |
| <i>Korean Overseas Fishing Association</i>   | 473.6                 | 478.2               | 468.8               | 98.98         | 4.81                  | 1.02               |
| <i>Sajo - Vanuatu</i>  | 101.5                 | 102.4               | 101.3               | 99.84         | 0.16                  | 0.16               |
| <i>Taiwan Deep Sea Tuna Purse Seine Boat-owners And Exporters Association</i>                                | 111                   | 91.8                | 89.4                | 80.52         | 21.62                 | 19.48              |
| <b><i>Totals</i></b>   | <b><u>1024.1</u></b>  | <b><u>1008</u></b>  | <b><u>991.9</u></b> |               | <b><u>33.9</u></b>    |                    |
| <i>Domestic Company</i>  | <i>Days allocated</i> | <i>Days - EEZ</i>   | <i>Days Used</i>    | <i>% used</i> | <i>Days remaining</i> | <i>% remaining</i> |
| <i>Queen Tuvalu Inc.</i>   | 15                    | 10.6                | 9.9                 | 66.2          | 5.07                  | 33.8               |
| <i>TUDO</i>  | 210                   | 183                 | 180.4               | 85.9          | 29.6                  | 14.1               |
| <i>TUSA Fishing Company Ltd</i>  | 72.9                  | 73.6                | 72.9                | 100.04        | -0.03                 | -0.04              |
| <b><i>Totals</i></b>   | <b><u>297.9</u></b>   | <b><u>267.2</u></b> | <b><u>263.3</u></b> |               | <b><u>34.6</u></b>    |                    |

### 5.3.1.2 PAE Allocation \_ Longline Vessel Day Scheme (LL VDS)

The LL VDS is still new and operates in a similar fashion as the PS VDS. However, the number of allocated fishing days appears to be excessive relative to the demand by fishing companies. For instance, in 2022, Tuvalu was allocated a PAE of 6,751 fishing days but the actual number of days used was only 1,804.6 at the end of the year.

### 5.3.1.3 PS VDS Usage

According to the current usage chart, the usage rate tends to be similar to the past five years of the same reporting period. This shows that there is consistency in the admin tools for the user to monitor her VDS and, most importantly, VDS regulations.



Figure 17: Shows the VDs usage rate for the past five years.

#### 5.3.1.4 VDS Revenue

A significant portion of the fisheries revenue is derived from the PS VDS accounting for 90.4% of the total fisheries revenue in 2022. The PS VDS revenue has various components, as the below pie chart depicts. The bulk of the VDS revenue comes from the selling of vessel days (VDs) to bilateral partners and this year accounted for 71% of the total VDS revenue.

Levies imposed on any VD sold and allocated to any Purse seine vessel as a form of access to Tuvalu waters. The VD price varies depending on the agreement signed and agreed upon by both parties. Party-to-party and internal trade of VD within companies are always supported, as this has contributed over a million in the reporting period. The pie chart recapitulates the total amount earned through various arrangements under the VD scheme.

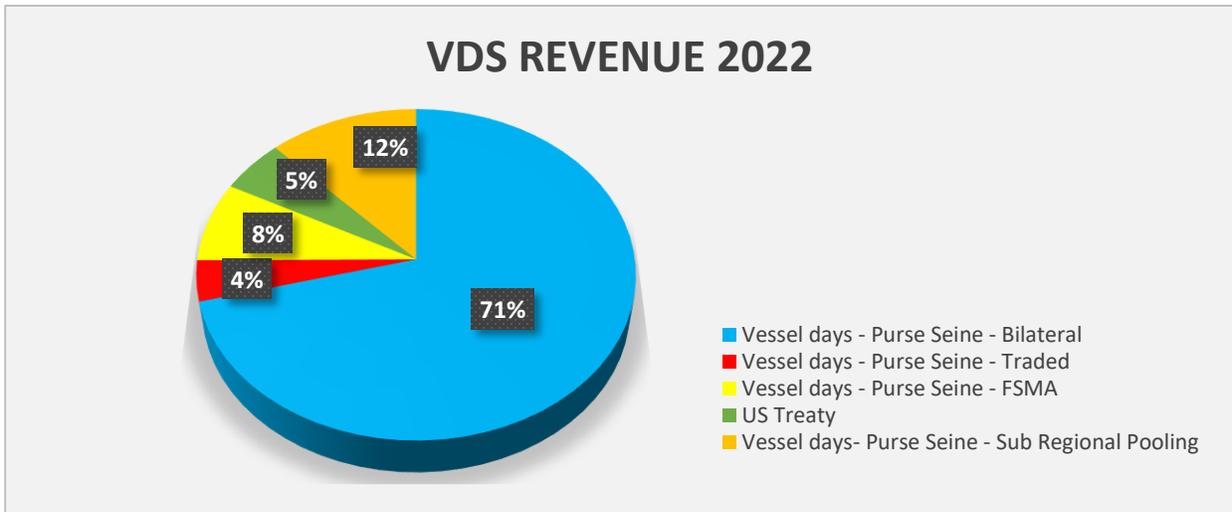


Figure 18: A summary of 2022 VDS revenue by category

#### 5.3.1.5 Non-Fishing Days (NFD)

Counting of VDS days used begins soon as the vessel enters Tuvalu EEZ and stops when it had exited Tuvalu’s waters, even when the vessel is only transiting or stopping due to engine breakdown etc. In this kind of situation the vessel can lodge a non-fishing day claim (via the FIMS platform) with the Fisheries Department for consideration. Shown below is a summary of all NFD claims received and approved in 2022.

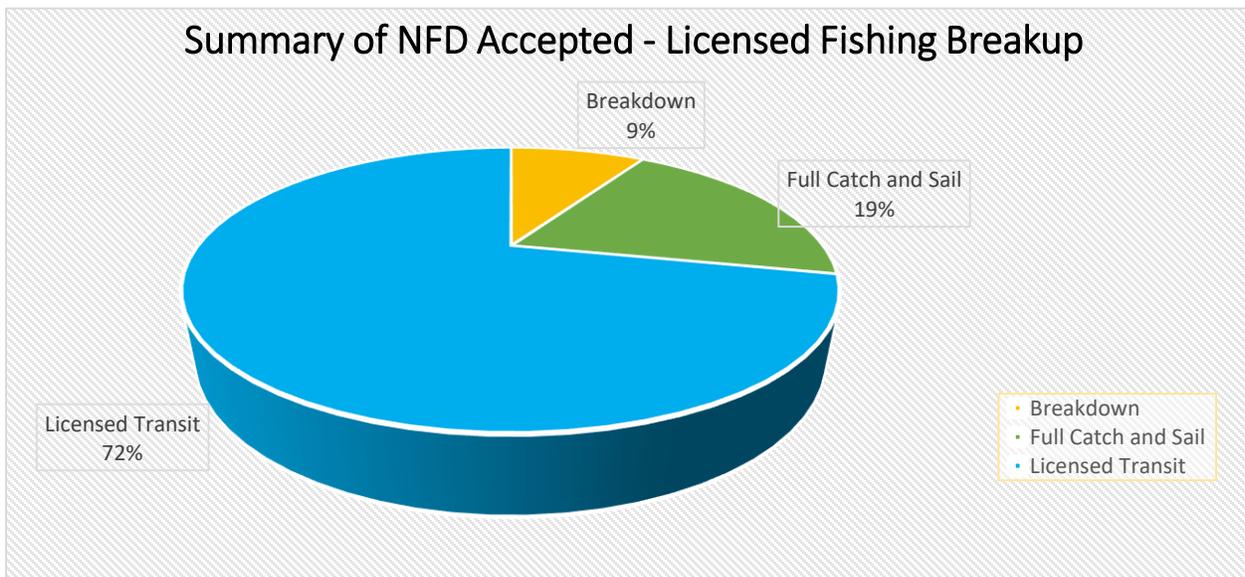


Figure 19 Summary of accepted NFD claims by specific reasons provided.

NFD claims are processed on a weekly basis to avoid the unnecessary accumulation of claims. In summary, 72% of the approved NFDs were vessels transiting to or returning from fishing grounds, 19% were vessels coming into Funafuti port for transshipment, and 9% due mechanical failure. Some claims were submitted twice and duplication were rejected.

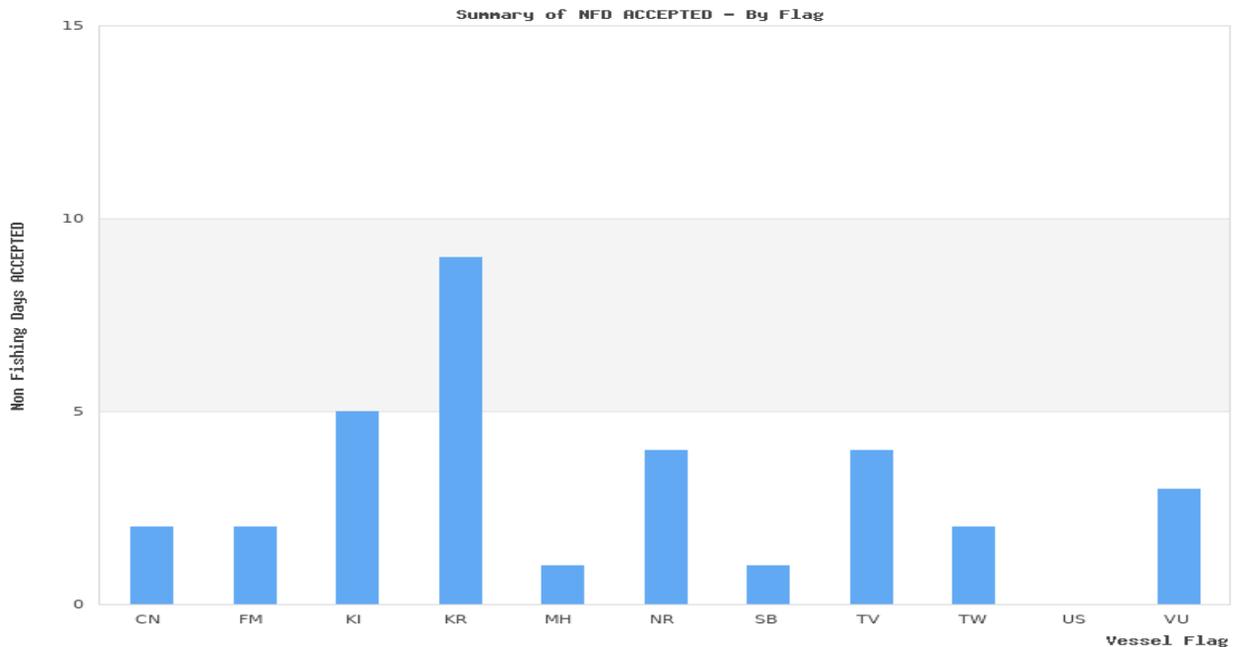


Figure 20: Summary of NFD accepted by flag

### 5.3.2 Vessel Monitoring System

Fishing vessels can be tracked near real time through what is known as the vessel monitoring system (VMS) and every licensed fishing vessel, by law, must be fitted with a Mobile Transmitting Unit (MTU), capable of transmitting vessel position, speed and course at an hourly intervals all throughout its fishing operation. Since the FFA is the administrator, the system is normally referred to as the FFA VMS.

In addition to the FFA VMS, another computer software platform known as the regional surveillance picture (RSP) was created to complement the VMS platform. The RSP is capable of displaying live movements of the fishing vessel over a week's period as well as vessel compliance status. Interestingly vessel compliance status is done through the assignment of colors (red, amber, green) to every single fishing vessel. A red means a violation has been committed, amber represent a potential violation, and green means fully compliant. Monitoring is focused on the vessels with amber and red colour to ensure that they are not engaging in fishing activities whilst in Tuvalu waters in line with its compliance index status.

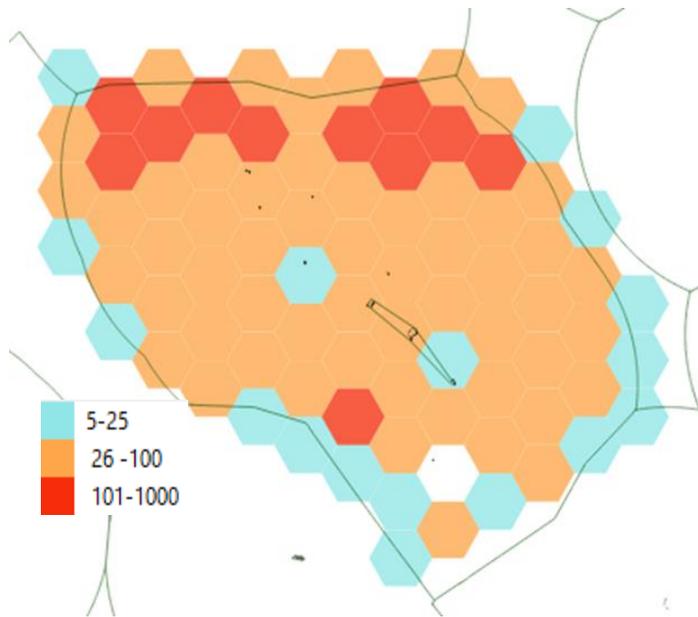


Figure 21: 2022 density map based on VMS data

Throughout the reporting year, three types of fishing vessels were licensed to operate in our waters: Purseine, Longline and pole and line vessels, all targeting tuna species. The movements and fishing spots of these vessels vary throughout the year. As part of the analysis, a density map was developed based on the VMS data for the reporting year depicting the area of concentration for fishing activities in various gear types. As expected, the North part of the EEZ is where most of the fishing activities took place. The area is also a popular transit corridor for vessels operating on the high seas. Since Tuvalu EEZ is adjacent to the high sea pocket in

the west and the high seas to the east, most of the transit vessels are WCPFC vessels authorised to fish in the high seas but not in the EEZ. Activities to the southwest were predominantly licensed longline vessels operating out of Suva.

### 5.3.3 Other Activities

#### 5.3.3.1 VMS and Operation room

VMS is a crucial tool in providing intelligence for planning and executing air and surface (sea) surveillance operations. The area of operation is identified through a combination of VMS datasets for asset deployment in a more coordinated and timely manner. This ensures effective and efficient deployment, noting the vast EEZ that has to be covered with minimal assets.

The VMS operation room was upgraded to support surveillance operations with eight 42" monitors installed. The monitors provide the capability for the staff to feed and display multiple MCS tools, which are critical information for the execution of the operation.

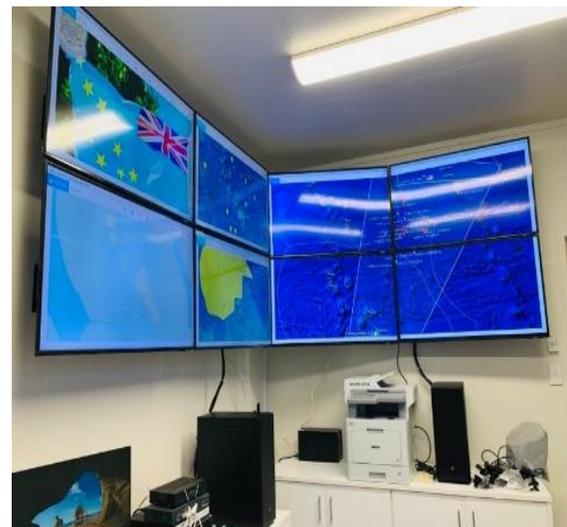


Figure 22: Operation Room

Having multiple displays enables staff to make informed decisions by linking the asset movements with the intelligence at hand.

### 5.3.3.2 Transhipment Monitoring System (M2 radar)



For the first time since the start of the pandemic, in port transhipment had resumed with the Fisheries Department being required to undertake strict monitoring of it to ensure no physical contact is made between arriving fishing boats and the local community. Moreover, a transhipment zone was established within the port area, an attempt to keep the virus from spreading.

A marine (M2) radar system, with capability to detect small wooden craft, was procured under the NZ TFSP fund to monitor transhipment.

Figure 23: M2 radar

The system would pick up any small craft approaching the designated transhipment area. It is also fitted with a camera allowing pictures both video and still images to be taken.

The system has a maximum range of 45Nm if installed correctly. However, at its current position it can only scan up to 12 Nm. With these capabilities, the department is in a good position and should be able to assist in search and rescue operations locally. The Marine Monitor (M2) is a land-based radar system that can detect and records potential vessels as "tracks" that contain both time history and location information. The effective detection range and positioning mainly depend on the type of vessel observed and the local weather conditions. Larger vessels are detected and tracked over longer distances than smaller vessels, and the calmer the sea conditions, the greater the range of the system. The M2 radar system also records the AIS traffic locally, and AIS is often registered beyond the reasonable scope of radar sensors.

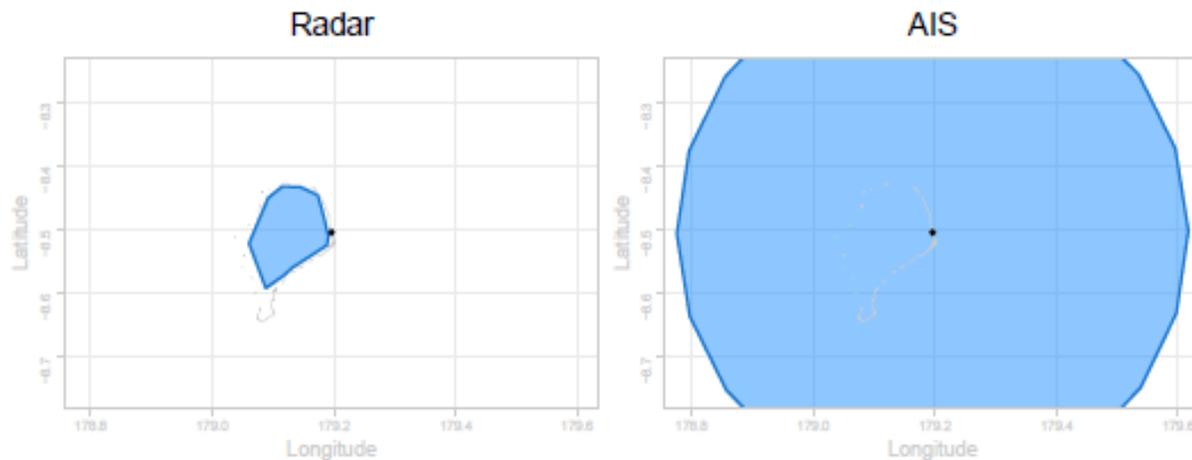


Figure 24 Shows radar and AIS vessel tracks detected during this reporting period.

The system automatically uses marine radar to detect and track targets in the lagoon transhipment area. Below is a summary of the target tracks observed during the reporting period, which may be outside the envelope area designated for record-keeping purposes.

| Total | Tracks | Alarm | Date       | Peak activity | Time       |
|-------|--------|-------|------------|---------------|------------|
| 3,561 |        | 61    | Mon Jun 13 |               | 3pm to 6pm |

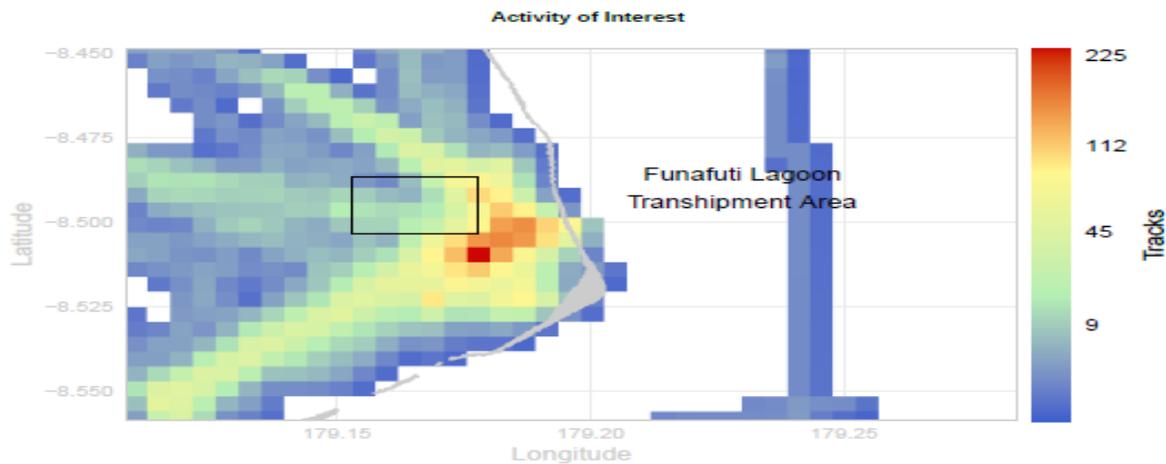


Figure 25: The map shows tracks detected by radar and the Automatic Identification System (AIS) with an average speed of fewer than 6 knots or triggered a preset alarm zone.

In 2022, the system was mainly in standby mode due to a few transhipment activities carried out in port. System Uptime is as follows;

- ✓ The M2 radar system was functional (all 24 hours) on 83 days (23% of all days)
- ✓ The M2 radar system was offline (all 24 hours) on 132 days (36% of all days)
- ✓ AIS was functional (all 24 hours) on 218 days (60% of all days)
- ✓ AIS was offline (all 24 hours) on 99 days (27% of all days)

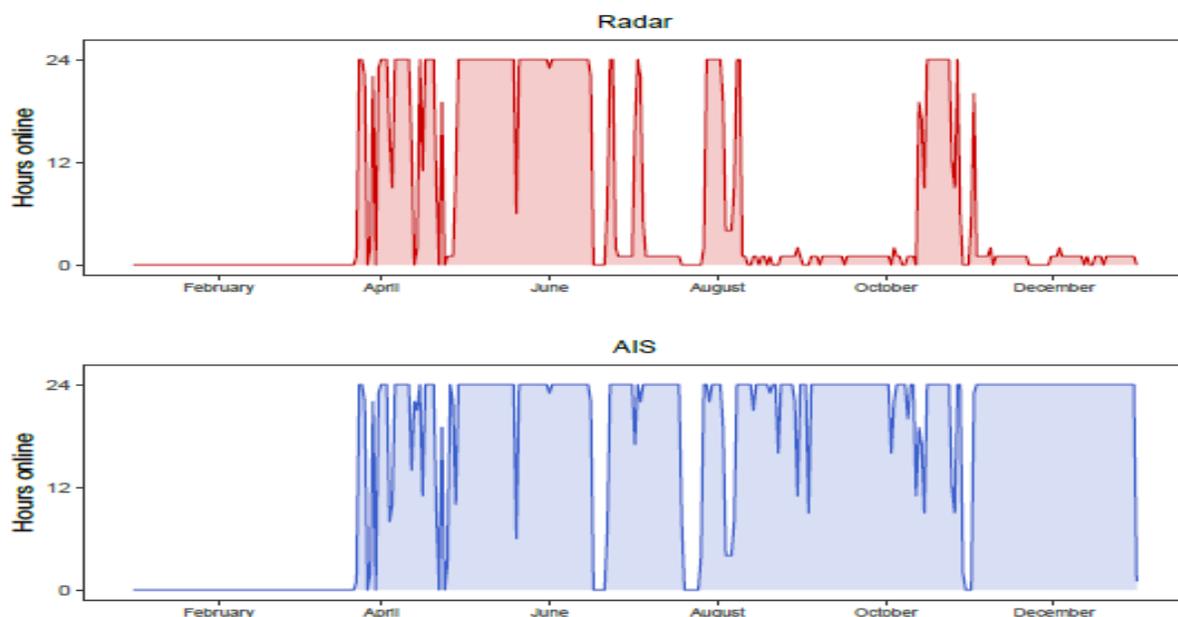


Figure 26: Hours per day that the M2 radar system and AIS were functional.

### 5.3.3.3 Data Overview

Data were collected from January to December 2022. During this time, there were 40,250 total tracks detected. After removing likely 'false' and insignificant tracks, 3,561 tracks remained for analysis. Anchoring and activity are monitored in the Transshipment Area.

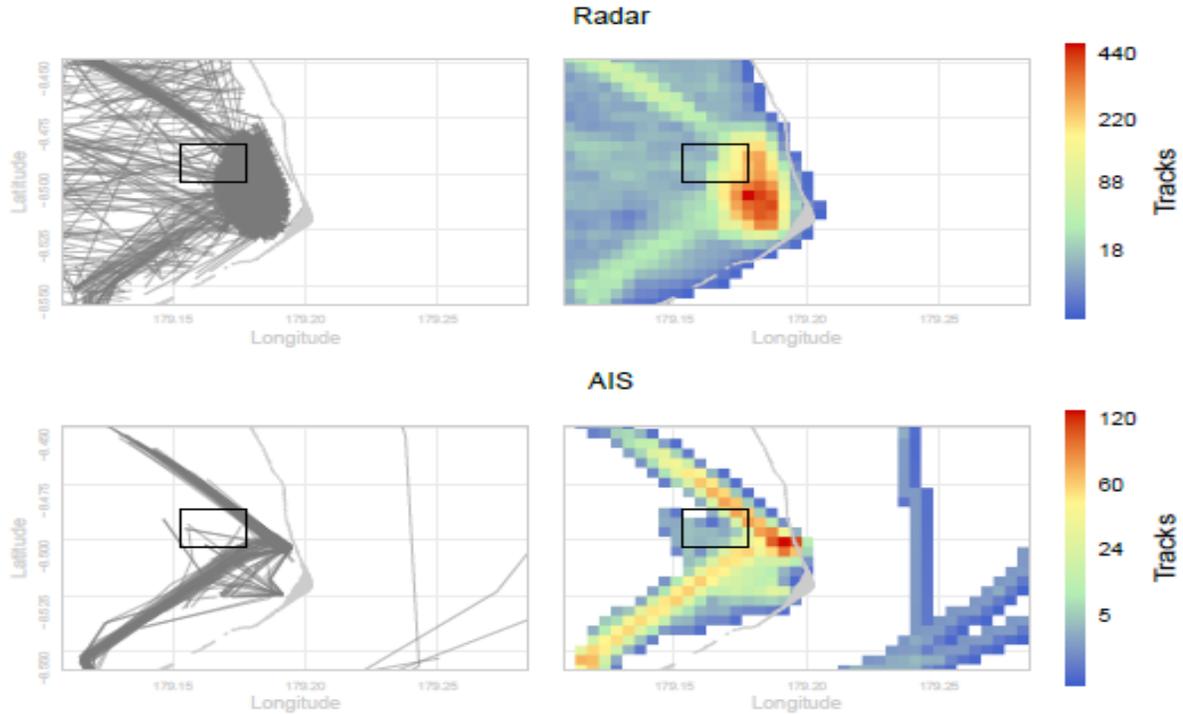


Figure 27: All tracks recorded in the area in 2022

### 5.3.4 Detailed Results

The overall activity was most remarkable on June 13, July 29 and July 30. Most daily tracks began on Thursday in the afternoon between 1500hrs and 1800hrs. Zone alarms occurred most frequently on June 13, June 29, July 30, and Friday had the most tracks that triggered a zone alarm.

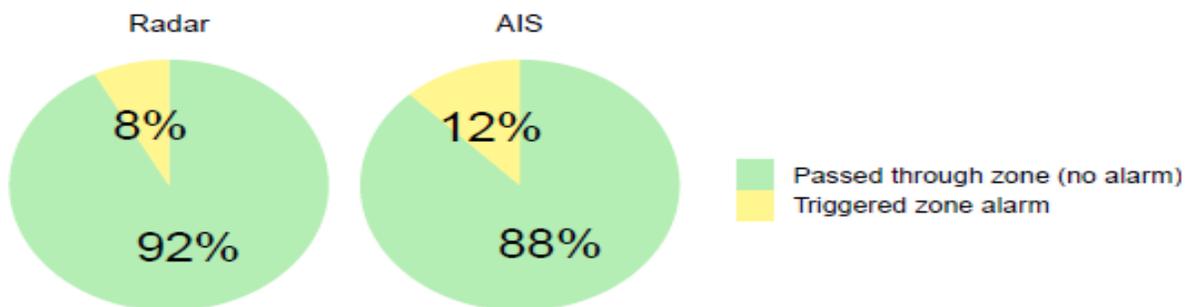


Figure 28: Alarm/non-alarm tracks were passing through designated transshipment vicinity.

## 5.4 Compliance and Surveillance Unit

The tuna fisheries is by far the single most important resources to Tuvalu providing significant revenue to the government and food for the local population. Effective enforcement therefore is critical to safeguard it from any unlawful exploitation which can adversely impact its long-term sustainability. The Compliance and Enforcement Unit is meant for this purpose whose core duties involve ensuring fishing operators comply with both Tuvalu fisheries laws, regional conservation management measure (CMM) of the tuna commission (WCPFC) and others international fisheries treaties to which Tuvalu is a party. Main activities include, transshipment monitoring, boarding and inspection both in port and at sea, fisheries surveillance both aerial and surface, and responding to any compliance issues that may arise from time to time. For aerial and surface surveillance supports, the department continues to rely on the assistance from partners such as the Tuvalu Maritime Police, the FFA and QUAD members.

### 5.4.1 Transshipment

Border closure's continued to have an adverse impact on transshipment revenue. This caused government to call for immediate resumption of the activity in port by January 1<sup>st</sup> 2022. However, confusion still looms among vessel operators over the "no contact rule within 14 days" as a condition of port entry causing them to choose foreign ports other than Funafuti.

Overall, nine transshipment activities were recorded this year. Four of them took place during the earlier part of 2022 when pandemic protocols were strictly enforced thus no inspection on them was conducted. Five more occurred in the final quarter and since the pandemic protocols had relaxed at time of their arrivals, all the five vessels were boarded and inspected.

*Table 13: The number of revenues generates in 2022 from transshipment activities and number of fishing vessels transship in port.*

| <i>Years</i> | <i>Transshipment event</i> | <i>Total catch transhipped</i> | <i>Total Revenue (USD)</i> |
|--------------|----------------------------|--------------------------------|----------------------------|
| 2015         | 181                        | 159377                         | 489,630.75                 |
| 2016         | 132                        | 119628                         | 1,239,223.80               |
| 2017         | 163                        | 148555                         | 1,528,167.50               |
| 2018         | 192                        | 174345                         | 1,784,231.50               |
| 2019         | 131                        | 125335                         | 1,268,935.00               |
| 2020         | 148                        | 127089                         | 1,238,774.00               |
| 2021         | 69                         | 62799                          | 545,430.00                 |
| 2022         | 9                          | -                              | 49,665.00                  |

Catch is obviously different from past records. Past transshipment records showed that catch would normally consists of three main grade including brine, MSC and Sashimi. This year, there was only one grade been reported (brine). Either it was true that no targeting of other grade actually occurred or that fishing for other grade did occur but fishing companies chose not to report knowing of the poor monitoring of the activity at the time due to the pandemic.

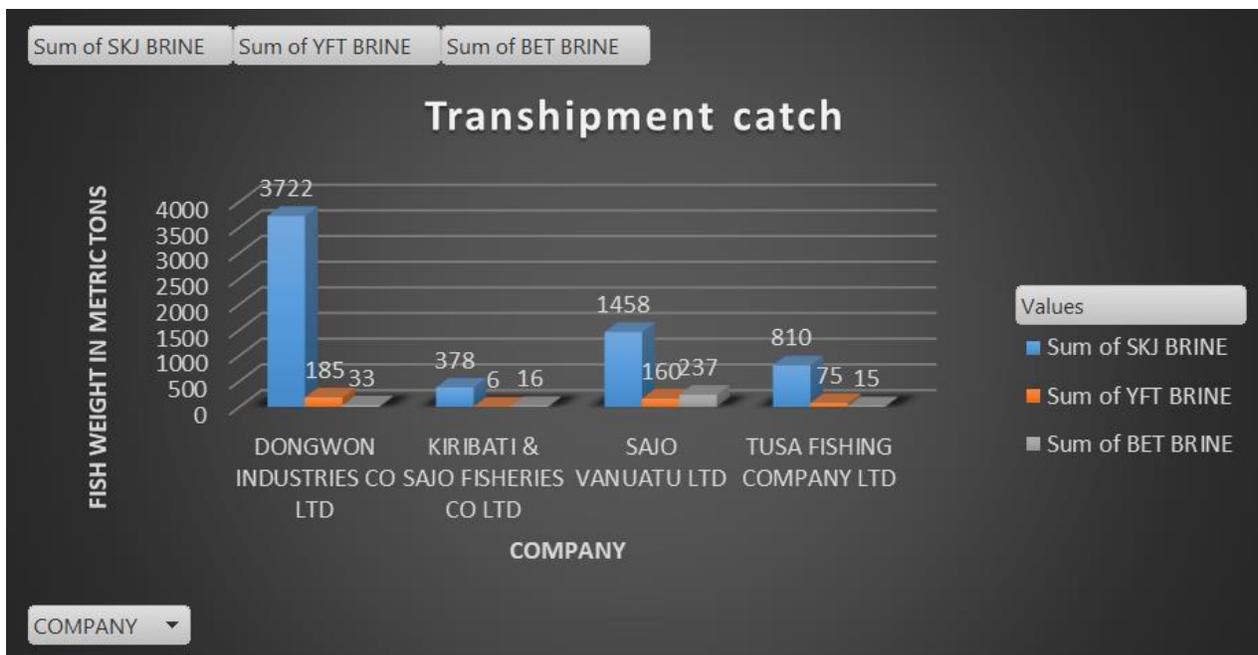


Figure 29: Number of fishes in metric tons transship in Funafuti 2022

#### 5.4.2 Surface patrol operation

Four regionally led operations were undertaken this year just the same as in the previous years. Tuvalu is expected to part take in three of them, however, due to limited surface capability we were able participate in only one operation (as in Table 1).

Table 14: Island chief operation boarding details

| Operation Name | Surface Asset       | Duration of Operation | Number of Vessels Encountered |          |                | Infringement                 |
|----------------|---------------------|-----------------------|-------------------------------|----------|----------------|------------------------------|
|                |                     |                       | Purse Seine                   | Longline | Reefer Carrier |                              |
| Island Chief   | HMTSS Te Mataili II | 9 days                | 1                             | 5        | 1              | No infringements encountered |

As the operation happened during border closure, boarding was strongly discouraged and inspection was carried out remotely via HF radio. A total of seven fishing vessels were intercepted with no serious breaches being detected.

#### 5.4.3 Aerial Surveillance

More surveillance flights were planned for this year but not a single operation actually took place due largely to pandemic and border closure. Fuel shortage also contributed to the lack of aerial surveillance by preventing the FFA plane from coming to Tuvalu during the last quarter.

#### 5.4.4 Vessel sighting and FAD Awareness

The department continues to pay a close attention to IUU fishing activities due to continued reporting of vessel spotted within 12nm zone. Those reports provoked the fisheries department

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to reach out to the public and the fishermen (via physical visit and radio program) to inform them of the role they should play as well as type of information they should be collecting and reporting to the department of fisheries for further analysis. A form was also prepared and distributed to Community fisheries officer (CFO) on each island for them to use in the event of a sighting.

The compliance team visited Vaitupu Island and successfully delivered its aware raising campaign. The visit focused mainly on two things; Vessel sighting and Fish Aggregating Devices (FADs). The team also visited the northern islands on the Manaua but upon arriving at Niutao they were notified that they could not go ashore because of immediate imposition of COVID restrictions. The imposition was so sudden leaving the team with no option but to return immediately without any work being undertaken.

#### *5.4.5 Challenges and way forward*

##### *5.4.5.1 COVID19 restrictions*

The COVID19 pandemic was a real challenge forcing readjustment to be made to the work program. For some activities, postponement was the only option.

##### *5.4.5.2 Oil spills*

Several oil spill reports during transshipment were received by the department and are a cause for concern, especially when it happens inside the lagoon. Detecting or finding the responsible vessel is difficult at this point in time, even with the presence of fisheries observers onboard. Training of fisheries officers to be able to detect the source of discharge is strongly desirable to prevent future discharges. Furthermore, since that oil spill is an area outside the jurisdiction and expertise of the department, expanding the boarding team membership to include port officers and maritime police is something to consider for future operations.

##### *5.4.5.3 Patrol Boat availability*

The availability of this asset is an ongoing issue for many past years. All fisheries surveillance operations depend on the availability of the Maritime Police Asset “HMTSS TE MATAILI II”. The department had signed an MOU with the maritime police with the understanding that it will address the issue. However, this issue remained due to the increase of government commitments and charter tasking to the patrol asset, as well as breakdowns.

#### *5.4.6 In-port boarding*

Incoming transshipment vessels would normally anchor in the lagoon and wait for the boarding party to conduct inspection and clearance. As experienced in the past years, some boarding officers were injured while attempting to board a fishing carrier from a small outboard boat during rough seas. This way of boarding is extremely dangerous and hinders participation by female officers in boarding activities. To avoid potential mishap in future, requiring all incoming vessel to come to the wharf for clearance would be the ideal option.

## 5.5 The Observer Program

The Tuvalu observer program is part of the Pacific (WCPO) wide observer program whose purpose is to collect and collate tuna data on purse seine vessels for compliance and scientific purposes. The Tuvalu observer program employs around 73 observers this year but only around 40 were free and ready to take on observer duties during the resumption of 100% observer coverage in the final quarter of 2022. The remaining 30 observers either have found jobs outside the fisheries or have migrated overseas with their families for various reasons.

Most of our observers are placed on bilateral vessels, especially on Korean purse seine vessels who have a keen interest in employing our observers. Other observer service providers such as the PNA (FSMA vessels) and the FFA (US Treaty vessels) also hire our observers. For the past three years, and due to the pandemic, placement had been stalled up until late this year following the commission's decision to uplift suspension of the 100% observer coverage requirement on purse seine. Around 33 Tuvaluan observers were placed between July and December 31<sup>st</sup>. Most placements took place in the final quarter in line with the easing up of the border closure. The number could have been higher if only more observers were available to take up the high demand for observers.

Training was a big part of the observer work program to ensure that observers, after 3 long years of not doing any observer work, do get a chance to refresh their skills and knowledge.

Observers were also supported financially through short term employment offered by the department. Furthermore during observer trainings observers were offered a sitting allowance (AUD\$25 per day) each. This ensured that observers get some financial support during these difficult times.

### 5.5.1 General Observer Data

Fisheries observers are not just any ordinary/normal person. In fact, observers undergo a lot of training, examinations, screening and must satisfy the minimum observer standard (PIRFO standards) in order to be accorded an observer status. There are different levels of qualification (in bold and in the order from lowest to highest) readily available for observers as shown in the table below. The number on the right indicates the number of observer in the corresponding qualification category.

*Table 15: Number of observers by qualifications*

| <i>Qualifications</i>                     | <i>Number of observers in 2022</i> |
|---|------------------------------------|
| <i>Basic Observers</i>                    | 73                                 |
| <i>Certified Debriefers</i>               | 22                                 |
| <i>Trainee Debriefers</i>                 | 9                                  |
| <i>E-Reporting Observers</i>              | 69                                 |
| <i>MSC Observers</i>                      | 60                                 |
| <i>Cross Endorsement Observers</i>        | 4                                  |
| <i>Debriefers' Assessors</i>              | 5                                  |
| <i>Trainee Trainers (yet to complete)</i> | 3                                  |

The program is yet to have a qualified trainer and this is a priority area under the observer work plan. The three (3) Trainee trainers shown in the table above are still undergoing training and are expected to be certified next year if all goes well.

### 5.5.2 *Observer training.*

In 2022 the program managed to complete 3 observer in-country training courses and participated in 3 sub-regional training. See below training details.

#### 5.5.2.1 *In-Country Trainings*

##### *i. Standards of Training, Certification, and Watch keeping Training (STCW)*

The training was conducted by TMTI on two separate occasions due to the availability issue faced by the observers. In total, 5 observers managed to attend STCW Training this year and thus bringing the total of STCW certified observers to 68.

*Table 16: STCW and e-reporting training*

| <i>Training</i>                       | <i>Date</i>  | <i>Venue</i>        | <i>Funding</i> | <i>Participants</i> |
|---------------------------------------|--|---------------------|----------------|---------------------|
| <b>STCW</b>                           | 18 <sup>th</sup> to 29 July 22                             | TMTI                | FFA            | 3                   |
| <b>E-Reporting Refresher Training</b> | 29 <sup>th</sup> August to 23 <sup>rd</sup> September 2022 | TFD Conference Room | Observer Fund  | 51                  |
| <b>STCW</b>                           | 10 <sup>th</sup> to 21 <sup>st</sup> Oct 22                | TMTI                | FFA            | 2                   |

##### *ii. E-Reporting Refresher Training*

Electronic logs (e-logs) reporting by observers is another priority agenda under the observer work plan with the program aiming to achieve a 100% observer e-log reporting by 2024 if not next year. This requires training of observers. At present most of the Pacific Islands countries and fishing vessel (mainly purse seine vessels) have already started e-log reporting on a voluntarily basis.

An observer e-log refresher training, as requested by some national observers, was conducted by the program using its own trainer (Acting Coordinator). The training was attended by fifty-one observers. Due to the large number of participants wishing to take part, the training was carried out in four batches of about 12 observers.

#### 5.5.2.2 *Sub-Regional Trainings*

##### *i. E-Debriefing Training Attachment in PNG*

E-debriefing is an essential part of the observer the e-log reporting process without which the e-log reporting process would and can never be completed. Therefore, the need to run an e-debriefing training for the program was necessitated and encouraged.

Table 17: Sub-regional training attachments

| Training   | Date  | Venue                          | Funding                      | Tuvalu Participants   |
|--|---|--------------------------------|------------------------------|---|
| <b>E-Debriefing Training Attachment in PNG</b>         | 10 <sup>th</sup> to 28 <sup>th</sup> October 2022 | NFA New Building in PNG        | Tuvalu Fisheries             | 2 trainee trainers, TVNOP TA, and SFO –Observer Coordinator |
| <b>Certificate IV – Debriefing Operations Training</b> | 28 <sup>th</sup> Nov to 2 <sup>nd</sup> Dec 2022  | Nadi - Hexagon Conference Room | FFA/SPC                      | 2 Observers - Mr Talavalu Lipua and Mr Auina Amosa          |
| <b>Trainers Workshop</b>                               | 5 <sup>th</sup> to 9 <sup>th</sup> December 2022  | Nadi - Hexagon Conference Room | FFA/SPC and Tuvalu Fisheries | 3 trainee trainers, TA and the SFO – Observer Coordinator   |

PNG being the only program in the region with a well set up observer e-log reporting system was requested for assistance in delivery of such an important training. A four-member team from Tuvalu including the observer technical adviser travelled to PNG for this training. The objective of the training attachment was to observe how PNG conducts E-Debriefing so that Tuvaluan debriefers can be trained accordingly. The training attachment focused mainly on importation of observer’s electronic data into Industrialised FIMS (IFIMS) and debriefing the observer e-data electronically.

*ii. Certificate IV – Debriefing Operation*

The above training was conducted in Nadi, Fiji and Tuvalu it was attended by Mr Talavalu Lipua and Auina Amosa. These two Debriefers did exceptionally well and were reported to have scored good grades.



Figure 30: Certificate IV debriefer training in Nadi, Fiji

*iii. Trainers Workshop (Nadi –Hexagon Hotel Conference Room)*

A regional trainers’ workshop to discuss and deliberate on training issues and needs took place from 5 to 9<sup>th</sup> December, 2022. The meeting also provided an opportunity to hear an update regarding recent changes and development to the PIRFO Training Framework. Tuvalu was represented by the observer coordinator, three trainee trainers and TA. The participation of the five officers was jointly funded by SPC and the Fisheries department.



*Figure 31: Regional trainers' workshop in Nadi, Fiji*

**5.5.3 Observer placement**

The first deployment, after 3 years of stalling, happened on the 27<sup>th</sup> July 2022. More placements followed thereafter and by December 31<sup>st</sup> thirty-three (13 PNA and 20 national) placements had been made in total. The majority of these placements were on Korean purse seiners.

*Table 18: Total number of observers placed by service provider and by vessel type*

| OBSERVER PROGRAMS |                   |                  |       |
|-------------------|-------------------|------------------|-------|
| TVNOP             |                   | POA              | Total |
| Purse Seine (PS)  | Fish Carrier (FC) | Purse Seine Only |       |
| 16                | 4                 | 13               | 33    |

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#### 5.5.4 *Observer Insurance*

A fisheries observer works in a very risky environment and it is considered a dangerous job. This requires for observers to be properly insured. Currently, fishing companies are responsible for providing insurance coverage for our observers. However, there is limited information available about this cover and we cannot know what is covered and what is not or whether the cover is adequate or inadequate. Moreover, accessing to the funding is challenging due mainly to the lack of information shared by the fishing companies.

For the stated reasons, great emphasis was placed on the need to establish an insurance scheme for our observers for the past two years and again this year. Two approaches were explored by the FD. The first option looked at developing our own insurance scheme using the observer fund to finance it with Fisheries department taking control over its management. Progress on this was stalled due to the inability of the Ministry of Finance to commit to it despite the good effort made by the Fisheries department.

Frustrated by slow progress, the fisheries department approached a US based insurer (VUMI Global Services) this year, requesting assistance on the possibility of providing insurance coverage for Tuvaluan observers for a period of one year. This one-year deal would allow observers to receive insurance coverage while the department continue to progress work on the local insurance scheme. The deal involves Tuvalu paying a premium of more than \$70K US for a full one-year coverage of 76 observers. The deal is expected to come into effect on January 1<sup>st</sup>, 2023 once payment has been made.

#### 5.5.5 *Extension of contract for Observer Technical Advisor (TA)*

As the WB PROP ended in August so did the TA's contract also ended as he was being financed by PROP. By the August, some important observer businesses, which requires the full service of the TA, were still incomplete. This include work on the insurance coverage, e-log reporting and local observer trainers. Moreover, during this time, fisheries observers were starting to get back on board fishing vessels to resume observer duties. To prepare for the resumption of observer placement, it is of great importance that we retain the service of the TA. Consequently, the TA contract was extended using the observer fund. The NZ TFSP was also approached for assistance and will reimburse the observer fund.

## **6 Operation and Development Section**

### **6.1 General**

Almost all homes engage in coastal fishing for subsistence, and many people who do not have formal jobs make a living through small-scale commercial fishing. Artisanal and subsistence fishing have been the main fishing activities domestically. The local fishers including women in the outer islands use a variety of fishing methods to catch finfish, and invertebrates for consumption, trade, share, or sold at the local market or road side.

For the past few years the Operation and Development section has been dedicated to providing technical support to our communities through awareness and training, distribution of fishing and

safety gears, and providing advice to ensure our communities have the ability to efficiently and effectively access our marine resources for livelihoods and healthier diets. On that note, Operation and Development work collaboratively with stakeholders such as Island councils, Fishermen’s associations and communities to ensure the section delivers prompt services to the people of Tuvalu.

Furthermore, the section has the mandate of managing the operation of the two (2) Fisheries vessels namely - Manau I and Manau II. The seaworthiness of the two (2) vessels is a top priority for our sector, to ensure all of the Department’s activities in the outer islands are accommodated on a satisfactory basis.

## 6.2 Fish Aggregating Device (FAD) Program

FAD programmes have become increasingly important to support fisheries management and development aspirations in Tuvalu. FADs have a role in supporting coastal fisheries management activities, enhancing food security and livelihoods, increasing economic return for fishers and improving sea safety.

Much has been learnt from previous deployments, resulting in technological modification and innovations in FAD designs. Several social issues with FADs (e.g. vandalism) have also been highlighted during this period, leading to the introduction of the new design, such as the subsurface FADs to reduce vandalism impacts.

### 6.2.1 Active artisanal FADs in Tuvalu

Table 19 below explains the remaining active FADs in Tuvalu. There are 3 remaining islands with their existence FADs, while a new FAD was deployed in Nui in October. With the rest of the other islands, none of their FADs exist at the moment.

Reason: the weather and sea conditions are some of the main factors for the loss of FADs in Tuvalu, though few FADs that were lost due to vandalism.

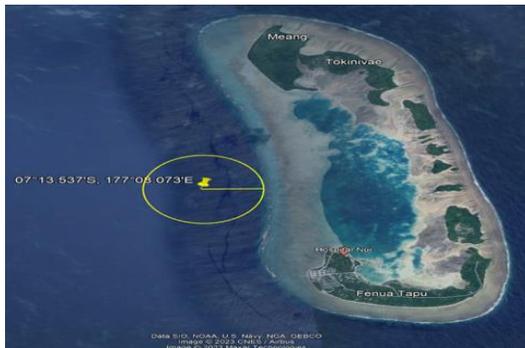
*Table 19: Active FADs*

| Island     | Type             | Date of Deployment | Fad Depth | Coordinates                  | E/buoy | Remarks                               |
|------------|------------------|--------------------|-----------|------------------------------|--------|---------------------------------------|
| Nanumaga   | Lizard FAD       | 22/07/2019         | 400m      | 06°16.649’S,<br>176°18.679’E | No     | Sub-surface floats probably submerged |
| Nui        | Lizard FAD       | 29/10/22           | 404m      | 07°13.537’S,<br>177°08.073’E | No     | Sub-surface FAD/Floats removed by TFD |
| Nukulaelae | Lizard FAD       |                    | 1000m     | 09°24.813’S,<br>179°49.319’E | Yes    | FAD condition good                    |
| Vaitupu    | Indo-Pacific-FAD | 10/06/13           | 500m      | 07°29.053’S,<br>178°39.847’E | Yes    | Flag pole removed for maintenance     |

## 6.2.2 FAD Construction and Deployment

The program commenced on the 25<sup>th</sup> of October in Nui, with an awareness program involving fishermen, as the department recognizes as they are the main target group who are mostly involved in fishing activities. The program mainly focuses on;

- ❖ *Developing fishers understanding of different type of FADs*
- ❖ *Fads significant toward the community's livelihoods.*
- ❖ *Type of FAD suitable for Tuvalu*
- ❖ *FAD rigging/construction process and their involvement*
- ❖ *FAD deployment site selection or discussion.*
- ❖ *FAD deployment operation process*



### Briefing

Figure 32: Coordinates of the new FAD deployed at Nui

On the 29<sup>th</sup> of October, a new FAD was deployed at Nui offshore area, about 400 meters away from the island, deployment depth of 404 meters. The operation was carried out by the Operation and Development team, assisted by local fishermen who joined the fishing activity during the morning session.

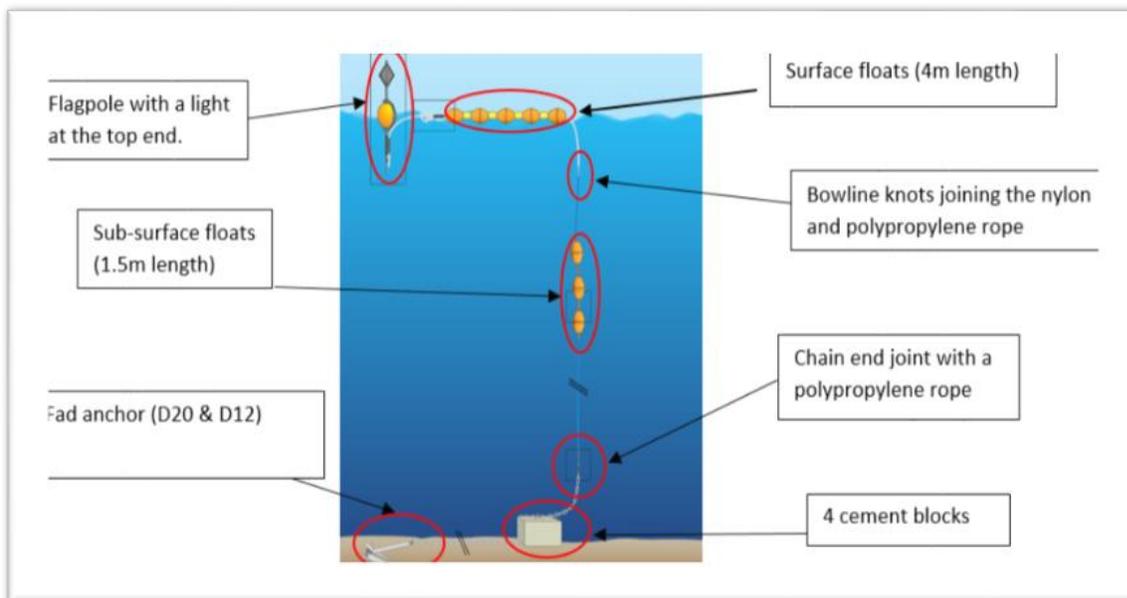


Figure 33: Lizard FAD Structure and design deployed in Nui

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### 6.2.3 FAD Monitoring and Maintenance

Ongoing FAD maintenance and inspection is essential for the longevity of the device and the National FAD programme and development as a whole. There are only 3 islands with their FADs that are currently active, Nanumaga, Vaitupu and Nukulaelae, with Nui's FAD deployed in late October this year.

This program was executed during the Metronome trips to the outer islands. The O&D team assisted by the coastal team carry out these activities. Coconut fronds were normally attached in the beginning below the surface floats to aggregate more fish species, before the divers dive to inspect the top ropes at least to 20m depth.



*Figure 34: Inspection of Nanumaga FAD by the Metro diver team*

Lastly, the FAD deployment activity was postponed throughout this year due mechanical and engine problems that both the Fisheries research vessels faced. Secondly, the unavailability of some materials such as swivels and shackles. Thus, this activity is expected to be implemented by early 2023 without any delays, soon after materials arrive.

### 6.2.4 New FAD Initiatives

Objective of the program are to;

- Reduce fishermen's time consumed in searching for fish/tuna schools.
- Improved monitoring of the FAD active and where-about.
- Promote fishermen's use of fish species associated around and below the FAD.
- Scaling-up FAD program (data availability, and accessibility)

#### 6.2.4.1 Wave buoy Program

A monitoring wave buoy is an instrument that floats on the ocean's surface and records wave heights, directions, and transmits these data via satellite to a shore-base station for analysis (FishNews164\_03, 2021).

The device is small and light (5kg) and does not create any drag on the FAD system. It includes a GPS system with real-time iridium data transmission, which is capable of sending data every hour.

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The wave buoy program was first initiated in December 2021, in collaboration with the fisheries department to execute the program before the end of the year.

Benefits for fisheries.

- Monitor a FAD position in real time
- Understand how the FAD mooring reacts to currents and winds
- Get a more accurate estimate of the anchor position, and
- Track the FAD in case of mooring line failure

Benefits for fishermen.

- Data is crucial information and can be used as a safety parameter for fishers at their favorite FAD site.
- Essential information provided by the MET service, can help ensure the safety of fishermen before they go out fishing.

Benefit for the oceanographic and meteorological agency (MET).

- Access observation real-time ocean data for wave prediction and coastal inundation warning.
- Provide more accurate sea bulletins
- Collect extreme weather event data during tropical cyclones
- Improve global numerical wave models by comparing observed and predicted wave data
- Understand nearshore oceanography current patterns, and
- Follow nearshore sea temperature evolution in real time

Unfortunately the FAD did not last long, its location was too close to the shoreline, as the gradient of the coast from the shoreline to the FAD anchor point is close.

### ***6.3 Echo-sounding buoy Program***

An echo-sounding buoy is a device that has been used by most commercial fishing companies with drifting FADs to improve their vessel catch, and reduce time searching for tunas.

This year, the Fisheries department acknowledged the TFSP 2 for funding of 3 new devices to be trial on 3 nominated FAD in Tuvalu. These buoys were deployed during the TFSP 2 and Development trip on the 7<sup>th</sup> to 13<sup>th</sup> of December, 2022. The islands that were nominated are Nanumaga, Vaitupu and Nukulaelae. These 3 islands' FADs' still remain active apart from the rest of Tuvalu.

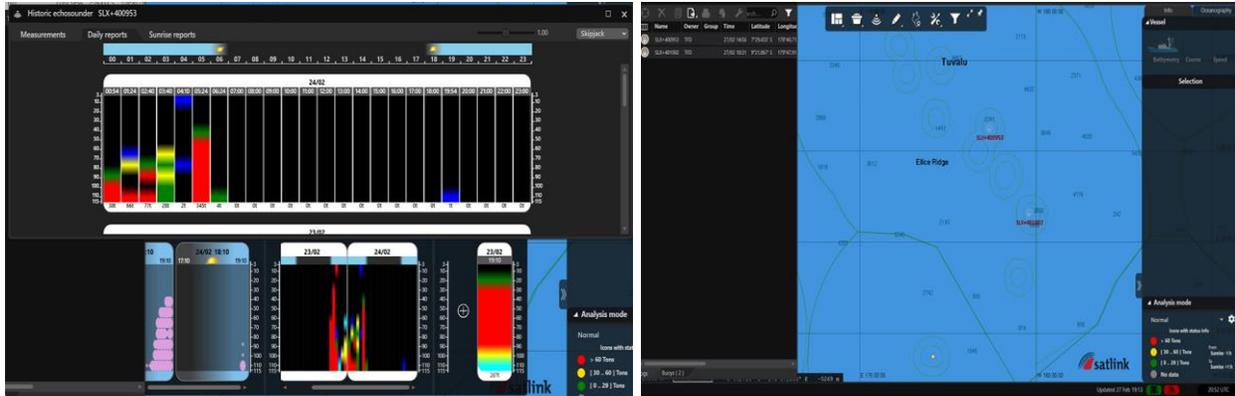


Figure 35: SATLINK images on fish associated with the FAD (Vaitupu)

## 6.4 Safety of Life at Sea Program

### 6.4.1 Sea Safety Training

The O&D staff has delivered refresher training for fishermen on sea safety throughout this year for each island (Metronome trips). The training focuses mostly on the usage of gears and devices in the grab bags, including demonstration. In addition, during the training the fishermen were divided into groups and given the opportunity to present the usage and significance of gears inside the grab bags. These approaches enable training officers to evaluate fishermen's understanding of gears in the bags.

### 6.4.2 Distribution of Sea Safety Equipments

Sea safety is noted as one of the main concerns that the department is prioritizing, to reduce issues faced by fishermen in the past. Regarding the government limited funding, the PROP assisted by funding 99 New Large grab bags (Red bags) and 30 Mini bags in 2022.

It took almost a year to come up with a solution of how the department will distribute the grab bags without compromising or arousing any conflict between fishers, fishermen associations and outer islands Kaupule. The O&D staff took full responsibility initiating these activities in a good manner, a proper survey was carried out amongst all active offshore fishermen, including the Grab bags MOU amendment.

In December, due to the limited number of new grab bags available. A total of 25 active offshore fishermen on Funafuti were nominated and received the new grab bags. The activities were accompanied with training delivered by training officers from the Fisheries department. The training was to familiarize fishermen and to educate them on the proper usage of each item in the bag.

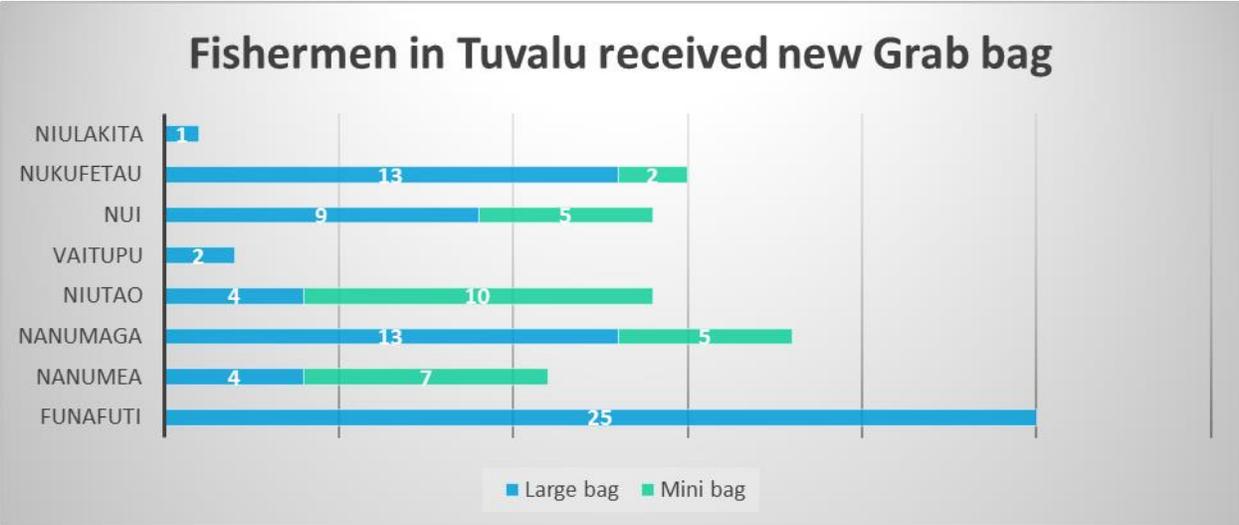


Figure 36: Grab bags distribution 2022

According to Fishermen, the training and assistance provided by the Department will enable them to better utilize this equipment.

6.4.3 Monitoring and Inspection of sea safety equipment

Throughout this year, the O&D staff were able to carry out safety grab bags inspection during the Metronome trips. Table 20 shows a massive number of gears and devices inside the grab bags that either were damaged intentionally or unintentionally, some were stolen or lost, and some already been used and need replacement or serviced such as life-jackets and medical kits. Overall, the number of gear categories under this status, shows the lack of commitment done by the fishers in regarding the MOU/MOA agreement, whereby the fishers took ownership of the gears, with expectation of full responsibility toward the management of the bag.

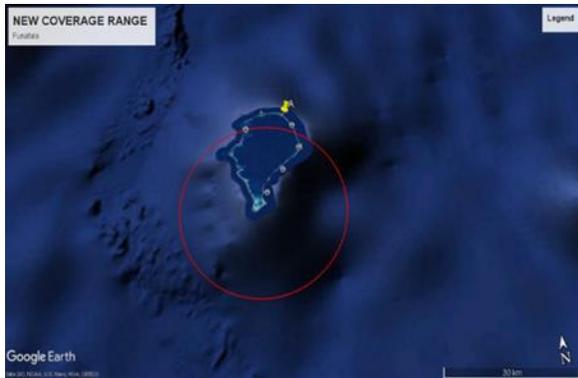
Table 21 shows that the majority of bags have been inspected from each island during the Metro trips 2022, 3 bags were inspected in Funafuti, though none of the bags in Nanumea turned up for inspection. Community Fisheries Officers will follow up on each island to complete this inspection.

Table 20: Result of grab bags inspection during the metronome trips

| Bags  | Nanumea   | Nanumaga  | Niutao    | Nui       | Vaitupu   | Nukufetau | Funafuti  | Nukulaelae |
|---|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|
| No. of bags turn up for inspection          | 0         | 6         | 15        | 5         | 11        | 19        | 3         | 13         |
| No. of bags did not turn up for inspection. | 16        | 10        | 1         | 11        | 5         | 2         | 51        | 10         |
| <b>Total Bags (TFD + Kaupule Bags)</b>      | <b>16</b> | <b>34</b> | <b>16</b> | <b>16</b> | <b>16</b> | <b>21</b> | <b>54</b> | <b>23</b>  |

Table 21: Analysis/Result of Grab bag inspection for Tuvalu Islands except Nanumea.

| Status                        | ACR 46 PLB | ACR Strobe Light | ACR Medical Kit | Signal Mirror & Whistle | Magnum Rescue Laser | Rescue Streamer | Cobra Hand held VHF | Sea anchor/Drogue | Inflatable Life Jacket | Coleman Map Compass | Garmin Handheld GPS73 | Thermal Blanket | Thermal Bag | Grab Bag Large | Grand Total |
|-------------------------------|------------|------------------|-----------------|-------------------------|---------------------|-----------------|---------------------|-------------------|------------------------|---------------------|-----------------------|-----------------|-------------|----------------|-------------|
| Damage                        | 6          | 10               | -               | 1                       | 8                   | 1               | 27                  | -                 | 1                      | -                   | 23                    | 1               | 2           | 2              | 82          |
| Broken                        | 2          | 4                | -               | 3                       | 2                   | -               | 21                  | 1                 | -                      | 3                   | 7                     | 1               | -           | -              | 44          |
| Lost                          | 2          | 6                | 5               | 5                       | 7                   | 4               | 3                   | 3                 | 2                      | 5                   | 3                     | 3               | 4           | 1              | 53          |
| Required service              |            |                  |                 |                         |                     |                 |                     |                   | 2                      |                     |                       |                 |             |                |             |
| <b>Cumulative Gears Total</b> | <b>10</b>  | <b>20</b>        | <b>5</b>        | <b>9</b>                | <b>17</b>           | <b>5</b>        | <b>51</b>           | <b>4</b>          | <b>5</b>               | <b>8</b>            | <b>33</b>             | <b>5</b>        | <b>6</b>    | <b>3</b>       | <b>179</b>  |



#### 6.4.4 VHF repeater installation on Funafala islet

The repeater is a duplex talk through unit that receives on one frequency and re-transmits on another. The unit is solar powered so has its own independent power supply. The VHF repeater was installed on Funafala Island, the site was selected and agreed by the Funafuti Kaupule. This VHF repeater will operate on a band of 156.050MHz to 160.650MHz.

Figure 37: VHF Repeater coverage range of 20 km

All equipment for this project was funded under the PROP. This initiative will improve communication and reporting of any fishing incidents on the south side of Funafuti.

### 6.5 Post Harvest Program

Post harvest was one of the methods that was approached by the O&D to all CFC in the outer islands; this training was delivered with the expectation to improve food security, improve the community livelihoods and enhance resilience to climate change.

#### 6.5.1 Fish Handling Training

The O&D team conducted a 2 session on this field. The classroom session was mostly focused on presentation, while the practical session was conducted the following day of the program. This is where the CFC staff were trained in the field; maintaining a hygienic environment, safe handling of tuna species and how they process it before coming to the final stage, selling of the products to end customers.

#### 6.5.2 Value Added Product Training

Smoked fish, arguably one of the oldest of all fish products, continues to increase in popularity. This year, the department delivered training in the method to the outer islands CFCs by training all CFC staff, including the CFO including the production of a simple smoke box for fish processing.



Figure 38: Nanumea CFC staffs and O&D Officer during the smoke fish process

The smoking process provides fish protection against spoilage when compared to fresh products. These products need to be stored carefully to reduce spoilage and prevent the growth of toxin-producing microorganisms. When fish are smoked properly, they should have shelf lives that range from one to four weeks.

In the training, a refresher was also conducted on the proper usage of the sealing machine and packaging of smoke-fish products.

### 6.5.3 Fishing Technique Training

The mid-water trolling fishing method help to improve fishermen’s daily catch, contribute to food security, and improve fishermen’s and their community’s livelihoods. Moreover, this fishing method was introduced with the idea to promote more fishing activities around FADs.

For this year, Funafuti, Nui and Nukufetau were nominated as the islands where the fishing techniques training was delivered. The CFO and fishermen association for each island

dealt with the selection of participants and the number was limited to 20 fishermen from both islands due to limited funds and available resources for the training, while the participants for fishermen on Funafuti were nominated by the SFO Training Officer (O&D), based on examining fishers that have not joined any training conducted in the past years.



Figure 39: Fishermen engaged in the mid water trolling training

The training (classroom session) was conducted on the 28<sup>th</sup> of October on Nui Island, 2<sup>nd</sup> of November on Nukufetau Island, followed by practical training for Nui and Nukufetau (Figure 1), while Funafuti fishermen did not receive any practical training, except the training on the 29<sup>th</sup> of November. Though, were encouraged to use their gear whenever they spotted a tuna school, it was also highlighted that the fishing method is more effective before dawn breaks out, and also around a FAD.



Figure 40: Mid-water trolling training continues

The majority of the outer islands' CFC staff were happy with the training, with newly employed staff able to learn the contents of the training. From the CFC staff perceptions, the facilitators help them to remind the importance of the fish quality in the market, and for the healthy diet of the communities.

Fishermen in Nui and Nukufetau showed appreciation for the training. The method approached by the O&D included provision of gears for the training, able to help fishermen attain new gears apart from what they have, they were hoping to use them whenever they found floating FADs nearby, and especially during the morning period.

## 6.6 Fisheries Fleet Operation

The Operation and Development section also consist of two multi-purpose vessels namely Manau I and Manau II. The two vessels are mainly used for research and fishing purposes. The Manau I have been with the TFD for more than 30 years whereas the Manau II has only been in service since 2021.

Both vessels underwent thorough maintenance throughout the year. Table 22 provide a summary of the maintenance work for both vessels. For the Manau II, most of the maintenance work was completed in the first half of 2022. Due to the outbreak of covid 19 in Tuvalu, all procurement processes were slow and got delayed.

Table 22: Maintenance work done for both Manau I and Manau II

| Manau I   |  | Manau II                               |                           |
|---|--|--|---------------------------|
| Problem   | Maintenance work   | Problem                                | Maintenance work          |
| <b>Ship Generator</b><br>- Water leaks into oil<br>- Cylinder head made clicking noise<br>- Fuel pump damaged | - Fixed<br>- Replaced with new cylinder head<br>- Order and await whole year | Anchor rollers and handrails<br>- lost | - new ones were installed |
| <b>Ship GPS</b><br>- Malfunctioned  |  | Refrigerant pipe                       |                           |

|   |   |  |  |
|---|---|--|--|
|   | - Need replacement or expert to fix it            | - Rainwater sipping from the penetration   | - Water proof putty replenished                  |
| <b>Ships anchor</b><br>- Kicking strap, anchor breaks and mainframe need repairing        | - Regular repairing and maintenance were done     | Rubber packing at wheelhouse<br>- Water immerse  | - Door packing was changed and adjusted          |
| <b>Out-board motor</b><br>- Breakdown   | - New one was procured                            | Windlass<br>- Leaked from gearbox  | - Oil seal replaced                              |
| <b>Life raft stand</b><br>- Expired   | - Serviced and return                             | DC24v charter<br>- malfunctioned   | - new charter was installed by expert from Nishi |
| <b>Steel post</b><br>- Right steel post rusted  | - Removed, maintained and attached back to vessel | AIS Unit<br>- Malfunctioned  | - Software need updated                          |
| <b>Ship sides</b><br>- Minor damaged observed   | - fixed   | SSB<br>- cannot received transmission  | - still fixing                                   |
| <b>Derrick</b><br>- rusting   | - removed, maintained and attached back           | Low insulation<br>- malfunctioned  | - still fixing                                   |
| <b>Portable generator</b><br>- malfunctioned, no electricity running within the generator | - fixed   | Steering gear<br>- oil leak in lower deck's bulkhead dividing the crew quarters from engine room | - fixed  |
| <b>Mooring buoy</b><br>- damaged  | - new one procured and deployed                   | Amplifier<br>- No sound from loudspeaker   | - New amplifier                                  |

Table 23 shows the voyages for Manauí II within the second half of the year 2022 after all the maintenance work were completed and most of the damage was fixed. A total of \$23, 634.91 revenue was collected from these voyages, however almost double the amount went to expenses of the vessel.

Table 23: Voyages of the Manauai II

| DATE         | VOY# | VOYAGE ROUTE                         | PURPOSE   | REVENUES           | EXPENDITURES       |
|--------------|------|--------------------------------------|---|--------------------|--------------------|
| 22/08/2022   | 1    | FUN/NKT/FUN                          | Drop off metronome team   |                    | \$9,946.00         |
| 01/09/2022   | 2    | FUN/NKT/NKL/NKT                      | Pick up metronome team from Niulakita and drop team off at Nukulaelae   |                    |                    |
| 13/09/2022   | 3    | FUN/NKFT/NUI/NKL/FUN                 | Pick up the Red Cross team from Nukufetau and drop the team off at Nui.<br>Pick up Metronome team from Nukulaelae | \$2,090.16         |                    |
| 17/09/2022   | 4    | FUN/NUI/NMG/NMA/NTO/FUN              | Pick up Red Cross team from Nui and deliver team to Northern islands for workshops                                | \$12,681.65        |                    |
| 20/10/2022   | 5    | FUN/NUI/NTO/NMA/NMG/VTP/FUN          | Drop off O&D team in Nui and pick up CFO's from outer islands   |                    | \$20,198.71        |
| 24/10/2022   | 6    | FUN/NKL/FUN                          | Pick up Nukulaelae's CFO  |                    |                    |
| 27/10/2022   | 7    | FUN/NUI/NKFT/FUN                     | Deploy FAD and conduct fishing training in Nui and Nukufetau  |                    |                    |
| 08/11/2022   | 8    | FUN/VTP/NTO/NMA/NMG/FUN              | Oceanic & Coastal consultation  |                    | \$13,915.00        |
| 18/11/2022   | 9    | FUN/NMG/FUN                          | MEDEVAC (Outstanding payment)   | \$3,381.00         |                    |
| 06/12/2022   | 10   | FUN/NKFT/NUI/NMA/NMG/NTO/VTP/NTO/FUN | Drop off CFO's to their islands<br>MEDEVAC from Niutao (Outstanding payment)                                      | \$2242.00          |                    |
| 14/12/2022   | 11   | FUN/NKT/FUN                          | MEDEVAC (Outstanding)   | \$3240.10          |                    |
| <b>TOTAL</b> |      |                                      |   | <b>\$23,634.91</b> | <b>\$44,059.71</b> |

## **6.7 Mechanical Workshop Operation**

The Mechanical Workshop falls under the management of the Operation & Development section. The Workshop has two staff members, the Mechanical Foreman and the Mechanic who manage the workshop in providing their services.

One of the main roles of the workshop is the maintenance of the Fisheries Department vehicles. Regular maintenance of these vehicles were carefully planned out in order to avoid breakdowns which could hinder the work of different sections within the TFD. From regular oil change to the changing of punctured tires, all of these services were provided by the workshop.

Within the year, only regular maintenance could be done due to the slow process of procurement thus, the overhauling of whole vehicles could not be completed. Apart from all vehicles, only the ATV four-wheel cycle was completely overhauled and repaired.

Apart from vehicles, the Workshop also looks after the regular maintenance of Fisheries speed boats together with outboard motors. The Coastal section boats have been repaired and one of their outboard motors was replaced with a new one from OFCF. The Oceanic section boats are still awaiting patches to be procured. Once the patches have been procured, repairment can be done.

Meanwhile, trailers for all boats have undergone maintenance and hopefully the repair parts for the Oceanic boats will arrive in the following year. The Operation section boats are currently all operational and regular maintenance has been done throughout the year.

### **6.7.1 Fisheries Shipyard**

The slipway was renovated in the early quarter of the year with new rails attached. The winch hut has also undergone maintenance and is currently awaiting a new stronger and improved wire. The new improved wire will greatly help in increasing the safety of dry docking both vessels, especially the Manau II since its weight is higher than the Manau in terms of tonnes.

Experts from OFCF have been traveling in and out of Tuvalu over the years in order to assist the workshop staff and Manau engineer in overhauling of engines, installations of machinery and new equipment. Due to COVID-19, these experts were unable to visit Tuvalu however, it has been planned that these experts will arrive in the early months of the following year in order to overhaul the Manau engine.

### **6.7.2 Mechanical Workshop Building**

Although the workshop plays a lot of roles in the maintenance of the fisheries assets such as vehicles, vessel maintenance and the shipyard operations. The workshop also offers other services to fishermen. Some of these services include welding of boats, training and repairing outboard motors for fishermen, hiring of the crane truck and forklift.

Currently, the workshop building is undergoing maintenance and the task will carry forward to the following year. The workshop building has been through a numerous number of maintenances over the years since it was built. A need for an assessment to be conducted on the safety of the infrastructure is highly recommended.

## **6.8 Sections Staff Meetings and Trainings**

Staff meetings were held once every quarter of the year. During these meetings, updates from the subsections within the O&D section were laid out. These subsections include the workshop, Manauai and Manauai II, Operation, and the Training & Development side. In these meetings, work plans were presented and the progress of the work. These meetings encourage all staff of the O&D section to be aware of each subsection's work and the way forward. Since the whole section is rarely present all in one place within the year due to ongoing training programs in outer islands and charters for the vessels. A system of fortnightly report submission from each subsection was implemented to keep everyone updated.

Ongoing training programs were still implemented in the outer islands and even in the capital. These ongoing training programs included fishing gear training and trials, post harvest training, grab bags and sea safety training. Only the outboard motor and welding of boat training was not completed due to the tight scheduled time frame and the slow procurements of materials for these two training sessions. There was no overseas training for O&D staff due to COVID outbreak and lockdown.

## **6.9 Challenges**

### **6.9.1 FAD Program Challenges**

Some issues encountered during the pre and post fad deployment activities;

- Vessel instability during the operation, as weights and the anchor were placed at the starboard-side of the Manauai 2 standby for deployment.
- Reducing the FAD number of weights to retain the vessel stability during the deployment process - 2 weights or cement blocks were removed from the FAD plan, supposed to be 6 cement blocks or weights attached below the FAD.
- Subsurface floats found after deployment to be floating at the surface as well.

### **6.9.2 Grab Bags Inspection Challenges**

Lack of fishermen's cooperation to turn up with their grab bags for inspection. For instance, few bags were inspected in Funafuti, while none from Nanumea during the Metronome trip.

### **6.9.3 Fishing Technique Training Challenges**

- Participants/fishermen lack presence during the field training/demonstration after they received their new fishing gear.
- Some fishermen lost their gear at sea during the practical session/lesson learnt to improve knots applied by fisher's.

### **6.9.4 VHF Repeater installation**

During the gathering and verifying of the VHF repeater equipment, the team found out that some of the equipment, like N Type connector, connectors were supplied incorrectly etc.

- Repeater doesn't come with a hand mirco-phone.
- The installation was delayed as landowners of Funafala stopped the installation to get confirmation of the Kaupule land boundaries.

### 6.9.5 Management

The lack of policies to guide each and every staff, thus a lot of miscommunication and different understanding on a particular matter.

- Disregarding the chain of command without following the proper order which leads to problems between staff.

### 6.9.6 Procurement

- A very slow procurement process especially for orders overseas. This in turn hinders the progress of work due to a lot of time spent waiting for the order.

## 7 Donor funding and projects

### 7.1 General

Over the past years, Tuvalu has benefitted from the generous support of donor agencies including New Zealand, World Bank, and many other organisations and countries. There are now several major projects under way, as described in the following paragraphs. These projects and programmes are fully integrated into the TFD work programme and support many of the activities already described in earlier sections of this report.

### 7.2 NZ Tuvalu Fisheries Support Programme (TFSP)

The TFSP Phase 2 was operational throughout 2022 (its second year of a 5-year programme).



Figure 41 – New seawall and shelter funded by TFSP2

Achievements supported by the project during the year included: completion of the new seawall and shelter; procurement of the M2 system for monitoring transshipment; supporting the positions of 7 community fisheries officers in the outer islands; and supplying low-priced fishing gear for re-sale in the outer islands. In terms of consultancy inputs, an important study on the feasibility of locally owned longline vessels was completed, and an IT specialist provided advice and support to the Department. Two long-term technical advisers were also funded.

### 7.3 World Bank Pacific Regional Oceanscape Programme (PROP)

2022 was the final year of the PROP project which has provided a huge amount of support to the Fisheries sector. The project ended in August. Important activities during the year included supply of new laptop computers for TFD staff and a forklift for the Department; completion of the study on transition to a Fisheries Authority; a review of transshipment activities and fees; and the design of the new training centre, boatshed and watchman's hut. Although construction of these could not be completed before the end of the project, the training centre and boatshed/store will be built with Korean aid while the watchman's hut for the Funafuti Conservation Area will be completed under the second phase PROPER programme.

#### **7.4 *Other Assistance***

The Department has benefitted from ‘in-kind’ assistance from OFCF with supply of parts and expertise for maintenance of equipment of the two vessels, and support from FAO national and regional projects.

### **8 *Issues and Challenges***

#### **8.1 *Low recurrent budget allocations***

The 2022 recurrent budget allocation was too low for an effective Fisheries Department. The Department cannot rely on its recurrent budget to implement its activities, since around 80% of the allocated budget is for staff salaries and allowances. While the Department has been able to secure donor funding to meet other needs, these projects are all of limited duration.

#### **8.2 *Staff retention and turnover***

The department continues to experience a high level of staff turnover as qualified fisheries personnel leave to take up work with better packages in other Ministries, overseas, or take advantage of long-term training awards.