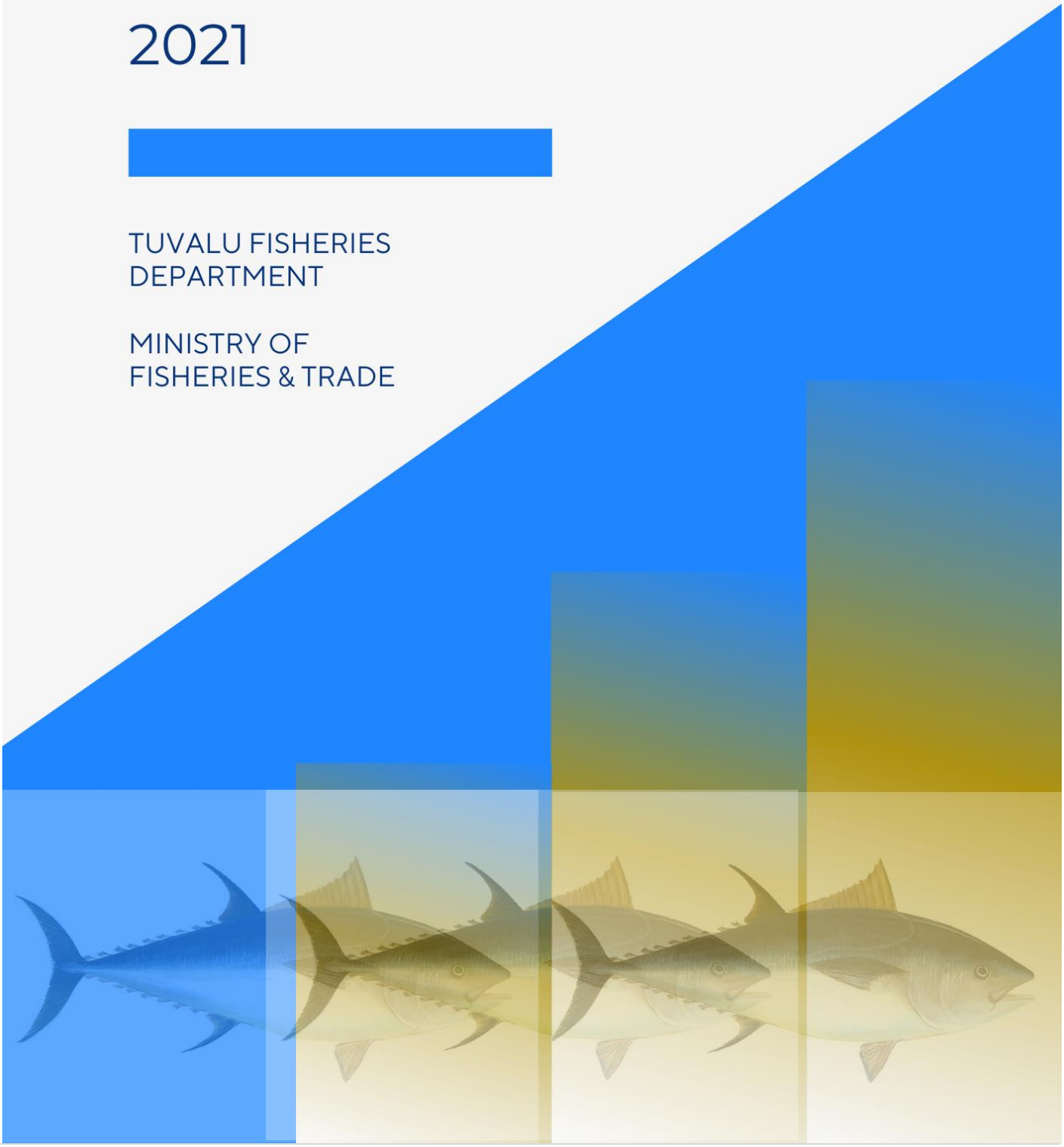
ANNUAL REPORT

2021

TUVALU FISHERIES DEPARTMENT

MINISTRY OF FISHERIES & TRADE



Tuvalu Fisheries Department
Ministry of Fisheries and Trade
Government of Tuvalu

Annual Report 2021

Prepared by:

The staff of Tuvalu Fisheries Department

Funafuti, Tuvalu

June 2022

Acronyms and Terms

AUD, AU$	Australian Dollar
AWP	Annual Work Plan
BDM	Bech de Mer or Sea Cucumber
BSc.	Batchelor of Science Degree
CFC	Community Fisheries Centre
COVID, COVID19	Corona Virus of December 2019
EEZ	Exclusive Economic Zone
FAD	Fish Aggregating Device
FAME	Fisheries Aquaculture and Marine Ecosystems Division (of SPC)
FAO	Food and Agricultural Organisation of the United Nations
FC	Fish carrier
FCA	Funafuti Conservation Area
FFA	(Pacific Islands) Forum Fisheries Agency
FFC	Forum Fisheries Committee
FIMS	Fisheries Information Management System (of PNA members)
FOFA	Fishermen on Funafuti Association
FRFSP	Funafuti Reef Fisheries Stewardship Plan
FSHIL	Fiji Shipbuilding and Heavy Industries Ltd.
FSMA	Federated States of Micronesia Arrangement
GAO	General Administrative Orders (of the Tuvalu Government)
GPS	Global Positioning System (receiver)
HMTS	Her Majesty's Tuvaluan Ship
HOF	Heads of Fisheries (SPC meeting)
HSBI	High Seas Boarding and Inspection
HSP	High Seas Pocket
IATTC	Inter-American Tropical Tuna Commission
IT	Information Technology
IUU	Illegal, Unreported and Unregistered (fishing)
JICA	Japan International Cooperation Agency
JV	Joint Venture
KOFCC	Korea Overseas Fisheries Cooperation Centre
LL	Longline
LMMA	Locally Managed Marine Area
MCS	Monitoring Control and Surveillance
MFAT	Ministry of Foreign Affairs and Trade (of New Zealand)
MFT	Ministry of Fisheries and Trade
MOA/MOU	Memorandum of Agreement/Understanding
MOC	Management Options Consulation (of FFA)
MPA	Marine Protected Area
MSC	Marine Stewardship Council (certified)
MT	Metric Tonne
NAFICOT	National Fishing Corporation of Tuvalu
O & D	Operation and Development Section (of the Fisheries Dept.)
OFCF	Overseas Fisheries Cooperation Foundation (of Japan)

OIDC	Outer Island Data Collector
PAE	Party Allowable Effort (under the PNA Veesel Day Scheme)
PICT	Pacific Island Country or Territory
PNAO	Parties to the Nauru Agreement Office
POA	PNA Observer Agency
PROP	Pacific Regional Oceanscape Programme (World Bank)
PS	Purse seine
R2R	Ridge to Reef Project
RGA	Revenue Generating Activity
RIMF	Regional Information Management Facility (of FFA)
ROCW	Regional Observer Coordinators' Workshop
RV	Research Vessel
SAR	Search and Rescue
SC	Scientific Committee (of WCPFC)
SDA	Seventh Day Adventist Church
SFO	Senior Fisheries Officer
SMC	Senior Management Committee (of the Fisheries Department)
SOE	State of Emergency
SPC	(Secretariat for the) Pacific Community
SRP	Sub-regional pooling (of certain PNA members for vessel days)
TA	Technical Assistance
TAE	Total Allowable Effort (under the PNA Veesel Day Scheme)
TCC	Technical and Compliance Committee (of WCPFC)
TEC	Tuvalu Electricity Corporation
TFD	Tuvalu Fisheries Department
TFSP	Tuvalu Fisheries Support Programme (NZ funded)
TMTI	Tuvalu Maritime Training Institute
TOR	Terms of Reference
TTFH	Tuvalu Tuna Fong Haur (Joint venture with Ching Fu)
TUSA	Tuvalu Sajo Joint Venture
USD, US$	United States Dollar
UST	US Treaty (on Fisheries)
VDS	Vessel Day Scheme (of the PNA + Tokelau)
VHF	Very High Frequency (radio)
WCPFC	Western and Central Pacific Fisheries Commission

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Background

The Tuvalu Fisheries Sector

Tuvalu is situated in the South Pacific Ocean between latitudes 2 and 13 degrees South and longitudes 172 degrees East and 177 degrees West, encompassing an Exclusive Economic Zone (EEZ) of 750,000 square kilometres and a land area of 26 square kilometres. The islands of Tuvalu, all low-lying atolls, are homes to around 11,000 persons with over half 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 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, transhipment 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 2021.

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 2021. The year has again been greatly affected by the COVID 19 pandemic. Although Tuvalu has remained COVID-free, the border closures impacted on many aspects of the Department's work. However, inspite of this, there were a number of important achievements.

2021 represents the second year of the Department's Corporate Plan (2020-2022) and the first year of the new 10-year national sustainable development strategy 'Te Kete", which sets some high-level goals that are similar to those of the Corporate plan. Where possible, activities are reported against the thematic areas identified in the 2021 AWP, based on the Corporate Plan.

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 physical 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 co-operation.

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.

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.

Organisation

The TFD organisational structure, shown in **Error! Reference source not found.**, reflects the establishment approved for 2020, although some positions were only filled in early 2021 due to a recruitment freeze in 2020. No new posts were approved for 2021. The Department 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 initiavies in which the Tuvalu Government has an interest;

- 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;
- 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 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.

Fisheries Department Resources

Staffing

The organisational structure of the TFD Public Service establishment at January 2021 was as shown in **Error! Reference source not found.**. 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.

In addition to the public service establishment, several externally-funded activities continued to operate in 2021 and employed staff who work as part of the organisation. These included:

- A Project Coordinator, Project Accountant and Project Officer for the World Bank-funded Pacific Regional Oceanscape Programme (PROP);
- Data collectors in each of the outer islands to gather information on fish catches, mainly funded under the PROP 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. An Inshore Fisheries Adviser (part time) funded from the same source was recruited 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.

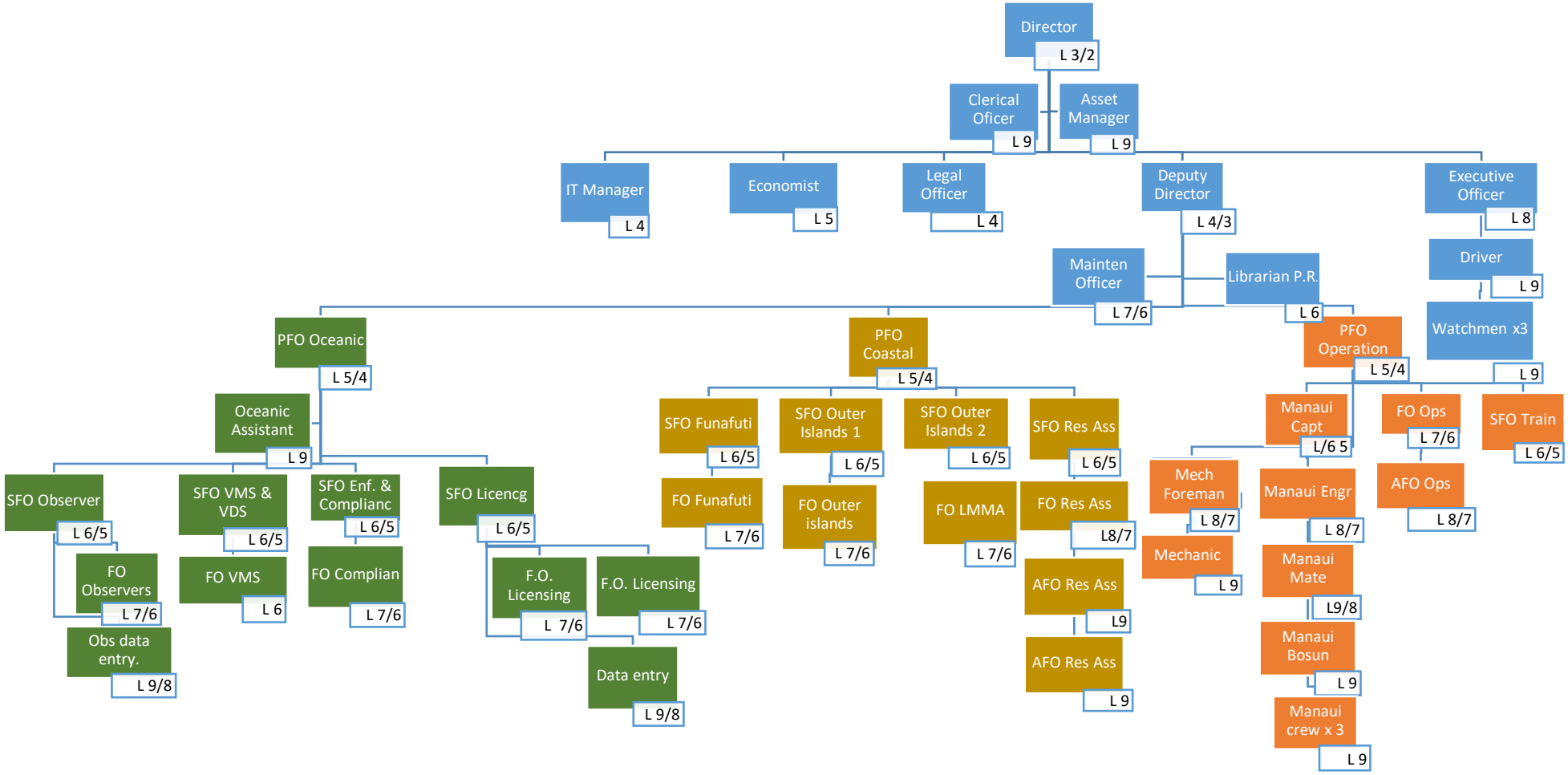


Figure 1: Tuvalu Fisheries Department Organisational Structure in 2020

In 2021 the Department continued to manage a pool of around 80 trained and qualified fishery observers. With no observer placements during the year, TFD organised a number of in-serivce training programmes and also engaged observers on short contracts for various shore-based tasks.

Two Principal Fisheries Officers (Coastal and Operation & Development) continued long term training overseas throughout the year; and the Deputy Director post again remained vacant through 2021. Four senior staff successfully completed long term training overseas and returned to duty in 2021.

Assets and facilities

Work started during 2021 on a major programme 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. In a new initiative, work started on a new sea-wall on the lagoon side of the Office building which will provide additional working and recreational space, as well as protecting the building from storm surges during the Westerly season.

RV *Manaui*, the 17-metre fibreglass vessel provided in 1982 by the Japanese Overseas Fishery Cooperation Foundation (OFCF), was operational for most of 2021 after a new alternator was provided by OFCF. This greatly assisted TFD workplans for the outer islands as well as supporting other Government Departments through charter arrangements.

The *RV Tala Moana* was transferred to the Marine Department early in the year and will no longer be the responsibility of TFD. Although a useful asset, trying to operate the vessel without any recurrent budget and ever-increasing maintenance problems had proved very challenging.

The *Manaui II,* a new 19- metre multi-purpose Fisheries vessel donated by JICA, was delivered to Tuvalu in mid-2021. Again, the COVID situation complicated this hand-over. It had been intended to deliver *Manaui II* directly from Japan via Kyowa Lines (which service Kiribati and Fiji) but the Captain was unwilling to come into the lagoon without a pilot on board, so the boat was transferred to another cargo vessel in Fiji. Engineers who would have come to check the vessel and provide training were also unable to travel to Funafuti. However, TFD staff did their best to get everything operational and the official commissioning ceremony was held in July, led by the Prime Minister. The project also included delivery of materials to upgrade the Fisheries slipway, and work started on this late in the year, engaging unemployed Fisheries Observers to do much of the work.

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 KOFCC during the year and handed over.

Asset Management

Management of these various assets is the responsibility of the Fisheries Storeman, 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 new procurement rules.

Office Maintenance

A new Maintenance Officer was recruited to replace the incumbent who resigned. He has developed a comprehensive plan of building maintenance and, after procurement of materials, started work on repairs for the Office Building, again providing employment for fisheries observers.

Budget

Fisheries licensing, access fees and investments continued to generate a significant proportion of Tuvalu Government revenues: income for 2021 was $32 million – somewhat less than the previous year due to reduced transhipment revenue and less favourable exchange rates. The Government also appropriated the final payment from the sale of Taumoana by NAFICOT. This is reported in more detail later in this report. 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 2020 there was again no increase, and due to errors in the budget submitted to Parliament 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 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, so 2021 represented the last full year of the project. A concept note for the second phase – PROPER – was developed during the year.
- The JICA funded 'construction of the multi-purpose vessel for outer islands development' was implemented with delivery of the *Manaui II* mentioned above. This project has a budget of over AU$5 million.
- The new New Zealand-funded Tuvalu Fishery Support Programme phase 2 (TFSP2) started in January 2021 and will provide NZ$3.5 million over 5 years plus further technical assistance (the Fisheries Adviser and Inshore Fisheries Adviser).
- Two small projects funded by FAO were implemented in 2021, 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.
- The Korean Overseas Fisheries Cooperation Centre, KOFCC, supplied a range of equipment and services aimed at improving fish processing and marketing, delivered in early 2021. Again this was valued at approximately US$400,000.
- 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). 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.

Internal management, monitoring and reporting

The TFD work programme in 2021 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 Information Officer, PROP Coordinator, and the NZ-funded Technical Advisor. The SMC aims 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. 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.

Administration Section Activities

General

Many of the activities of the Administration Section during 2021 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.

COVID response

The COVID pandemic caused a number of issues in the Fisheries sector, and Administration staff worked hard to maintain services and fisheries revenue inspite of the pandemic. Important activities included providing training and income earning opportunities for fisheries Observers who could not be deployed; development of operating procedures to allow transhipment back into the lagoon while not allowing any contact with vessels; and dealing with the delivery and commissioning of the *Manaui II* in the absence of the team from the shipyard who should have accompanied the boat.

Fishery Access Negotiations

Due to COVID travel restrictions, no face to face fishery access negotiations were possible in 2021 and negotiations were therefore led by the Director using videoconferencing and email. Outcomes were generally positive, with the price of purse seine vessel days maintained; and all days for 2022 were sold before the start of the year. The US and PNA pool members were unable to agree on the price of days for 2022 under this arrangement, and so for the first time in decades Tuvalu provided no days under the US Treaty. However, the new arrangement between Tuvalu,

Tokelau and the American Tuna boat Association again provided fishing opportunities for US vessels. The growing domestic fleet (see below) also committed to the purchase of a large number of days and are now our most important buyer.

Joint ventures and domestic vessels

The sale of the *Taumoana,* renamed '*Queen Ellice'* by the new owners, was completed in 2021 when the vessel came back into operation under the Tuvalu flag. TFD facilitated the registration, and various formalities required of the flag state, allowing the release of the final 25% of the purchase price to NAFICOT. This was then appropriated into the Government budget.

The second JV, TUSA, with the Korean fishing company Sajo continued operations of the Tuvalu-flagged purse seiner *Taina*, through 2021. Conditions remained challenging, with low tuna prices but a dividend was paid to NAFICOT.

The new Government decided in 2020 not to pursue further joint venture arrangements in the purse seine fishery, but instead directed TFD to come up with a domestic vessel arrangement that would provide for the sale of days, increased revenue and crew employment. During 2021, two more vessels, plus the Taumoana coming back into service, brought the total number of purse seiners under this arrangement to five. This significantly increased the demand for vessel days, as well as providing additional revenue in the form of an annual management fee.

Figure 2: Taumoana renamed Queen Ellice after re-fit in Taiwan

The winding up of Tuvalu's longline JV – Friendly Tuna – was not implemented in 2021 as planned, due to the absence of the Legal Officer on study leave, but will be completed in 2022.

NAFICOT

NAFICOT was active during the year, with the two management officers in post and an administrative assistant also on the team. Board vacancies were also filled. The main new activity initiated during 2021 was a trial of purchasing fish from local fishermen for processing and resale. A large volume of fish was purchased and sold mainly as smoked and dried products.

Other activities during the year included:

- Completing the programme of renovation to the NAFICOT office and fish market;
- Continuing the sale of ice to the public, including the repair of the machine;
- Appointment of the Administrative Officer;
- Claiming of US$100,000 dividend from the TUSA joint venture 2020 accounts;
- Finalising all necessary policies and developing a new Business plan.

Regional meetings

All regional meetings during the year were conducted through video-conference, with zero duty travel by Fisheries staff. These included: PNA official and ministerial meetings: FFC officials and ministerial meetings: WCPFC Annual Sessions, Technical Compliance Committee (TTC) and Scientific Committee (SC) meetings; the annual FFA Management Options Consultation (MOC); and other technical meetings on MCS, and issues arising from the COVID pandemic. In coastal fisheries, Tuvalu again participated in the Heads of Fisheries meeting and the Regional Technical Meeting on Coastal Fisheries of SPC.

With the WCPFC Tropical Tuna Measure due to expire at the end of 2021, there were a series of workshops held to try to develop a new measure. These were preceded by preparatory meetings of PNA and FFA members. Despite a number of interesting and innovative proposals being considered, WCPFC members were unable to agree on significant changes to the current measure, which was largely rolled over for another 2 years.

While participating in virtual meetings presented some challenges for Tuvalu, particularly with poor internet connections, most of the core business of these meetings was completed. In particular, the continuation of management measures for Tropical Tuna agreed in WCPFC can be seen as an important achievement for the sustainability of our main natural resource.

Staff training and workshops

As with the meetings noted above, various training workshops were either cancelled or moved into a vitual format. Training sessions on the PNA Fisheries Information Management System (FIMS) were organised, and staff who had signed up for the Fisheries Leadership Programme also participated on line.

The return to duty of mid-level staff who had been attending long-term training overseas gave a big boost to the Department's staffing. Three completed their BSc, programmes at the University of the South Pacific, while a fourth gained a Master's degree from James Cook University in Australia. Only one senior officer took up a scholarship in 2021 – the Fisheries Legal Officer started a Masters programme (remotely) with the University of Wollongong.

Legal Services

As noted above the Legal Officer was on study leave during the year. The Fisheries Adviser provided assistance with drafting of amendments to Access Agreements and other documents, with the support of officers of the Attorney-General's Office where necessary.

Information Technology

The Department's IT manager continued to maintain and upgrade IT systems for the Department. A new Kacific dish was installed to provide internet access as the landline to Telecom could not be repaired. A new server and firewall were also installed to improve IT services. The IT manager is also the main point of contact for the photovoltaic system and worked through various issues during the year.

Fisheries Economist

The Fisheries Economist is another active member of the Senior Management Team and took the lead on sorting out issues with the Department's budget. Other important duties included representing PNA members on the Board of Pacifical and successfully winding up the joint venture; and conducting a study of costs and earnings of local Funafuti tuna fishermen. This latter, supported by FAO and providing employment for observers, was supported by FAO.

Fisheries Adviser

The Fisheries Adviser continued to provide advice and briefing to the Minister, Permanent Secretary and Director, as well as advising other staff on request. During 2021 he was particularly engaged in implementing the new TFSP2 project, as well as assisting with PROP activities and the FAO projects.

Public Information and Awareness Program

There are five collections within the library which include: periodicals, reference, main collection, audio/visual and the Tuvalu Fisheries (country) collection.

There are only few radio awareness programs conducted this year as most of the awareness activities were shared on the Fisheries face book page, website and as well as outreach programs to communities and outer islands. Apart from Radio awareness, there are also other awareness activities including the ongoing updating of the TFD website and Fisheries FaceBook page with fisheries latest news, fisheries related short educational videos on sustainable fishing practices, vacancies advertised, fisheries progress reports, uploading recent fisheries related document to the website and also printing of fisheries reports.

Collecting and documenting of local fishing skills and knowledge from local fishers from each remote island was being was part of the work plan and the corporate plan for this year and therefore the documenting of each video is in progress and ultimately to complete editing before end of the year 2022.

Table 1: Shows TFD Radio awareness through the year 2021

DATE	RESPONSIBLE SECTION	TOPIC	SUMMARY
4/ Feb/2021	Admin	Fisheries new vessel Manaui II	A brief update on the: Manaui II, Fisheries new vessel – construction has completed.
25/Feb/2021	Coastal	FRFSP	An update on the progress of the FRFSP- Things that are being achieved and partly achieved.
11/Mar/2021	Coastal	FCA	An update on the status of the FCA and activities.
18/Apr/2021	Admin	Fisheries vessel - Talamoana	Update on the officially turn over of the RV Talamoana to the Ministry of Transport, Energy & Tourism.
29/Apr/2021	Admin	World Tuna events	Share to the general public about activities of the World Tuna day event and elaborate on the importance of tuna to Tuvalu as a whole
17/Jun/2021	Coastal	Metronome trip to the Central islands	Brief update on the purpose of the trip and activities that will be done on each remote islands.

8/Jul/2021	O&D	Paddling canoes funded under FAO	update the general public on the progress of the constructions of paddling canoes.
12/Aug/2021	Admin	TFSP	An update on the New Zealand funded TFSP II first Governance committee meeting
26/Aug/2021	O&D	Fishing Trip	Update the general public on the purpose of the fishing trips and responsibilities on each island.
16/Sept/2021	Admin	New Community Fisheries officers & 10 new train the trainer officers.	Brief update on the newly recruited community Fisheries officers for each 7 remote islands and the 10 officers awarded sea safety train the trainer.

World Tuna Day

Tuvalu celebrated World Tuna Day for only the third time in 2021, with a programme of events leading up to the day itself on 2nd May. Uncertainty over COVID restrictions left little time for preparation, but after a ban on public gatherings was lifted, the TFD team put together a bigger and better programme of activities than in 2020.

Events that had proved popular were repeated: a Futsal tournament for young men; a tuna dish competition; a fishing contest; essay writing competition on the subject of tuna; and a volley ball tournament for young women.

These awareness activities were coordinated by the TFD in order for the public to engage and to recognize the importance of Tuna to our lives individually, to our families, our communities, our islands and our country as a whole. Young people of all ages participated actively with support and assistance of secondary schools, and the USP Centre.

The programme highlight was on World Tuna Day itself: Saturday 2nd of May. The many winners in the different activities were awarded their prizes at a closing lunch at the Vaiaku Hall hosted by the Minister of Fisheries and with participation of the Prime Minister, Ministers, Diplomats and other dignitaries. At a time when Tuvalu was coming to terms with the impacts of the COVID pandemic, it provided a welcome event and happy celebration of our most important fish.

Coastal Section

General

The Coastal Fisheries Section had a successful year in 2021, with 95% of the work plan successfully implemented. This was despite the ongoing challenges posed by COVID-19 restrictions which delayed a few activities, as well as staff turnover. Two major tasks under the Funafuti Reef Fisheries Stewardship Plan (FRFSP) - Size Limit Study and Funafuti

Conservation Area Hut - were rolled over to 2022 due to the delay with the consultants' arrangements.

A major milestone for the Department was the return of two permanent officers from study leave. Senior Fisheries Officer (SFO) Maani Petaia and SFO Lotokufaki Kaitu recently completed tertiary studies at the University of the South Pacific, Fiji, and James Cook University, Australia, respectively. Maani Petaia took up the SFO role for Research and Assessment, while both Lotokufaki Kaitu and Matapua Falani hold positions as SFO Outer Islands Management. Sione Falesene was confirmed to the position of Fisheries Officer for Outer Islands Management. Lale Petaia oversaw the Coastal Section in the first half of the year, and Lotokufaki P Kaitu took over this role in June 2021. Dr. Aimée Komugabe-Dixson started as Inshore Fisheries Advisor (IFA) at the end of August 2021, to provide specialist technical assistance and support the implementation of activities being undertaken by the TFD.

Support Program for Outer Islands

Metronome Trips

In 2021, the Support Programme for the Outer Islands was successfully delivered through four trips (Table 1). The Coastal Section jointly carried out these trips with the Administration, Operation & Development and Oceanic Sections. The Coastal Section worked collaboratively with outer islands Kaupule and communities to enhance the sustainable management of their marine resources. During each trip, the team consulted with Kaupule, Falekaupule, fishers and the community on fisheries management and development issues, conducted awareness programmes, and continued research and monitoring activities as reported in the following sections. The metronome trips were made possible through funding from Pacific Regional Oceanscape Programme (PROP), Tuvalu Fisheries Support Programme Phase 2 (TFSP2), EIF Project, and Tuvalu Government.

Table 1: Metronome Trips to Outer Islands in 2021.

Table 2: Metronome trips to outer islands in 2021

Metronome (vessel)	Islands	Start date	Finish date
Metro 18 Central (Manaui I)	Nukufetau & Nui	13/3/21	27/3/21
Metro 19 South (Manaui I)	Niulakita & Nukulaelae	07/5/21	24/5/21
Metro 20 Central (Manaui I)	Vaitupu	28/6/21	06/7/21
Metro 21 North (Manaui II & I)	Niutao, Nanumaga & Nanumea	08/9/21	09/10/21

Details of results of work and activities, issues and recommendations during these metronome trips can be downloaded from: http://www.tuvalfisheries.tv/library.

Priority Activities - Community Management and Monitoring Plans

In 2018, Community Integrated Management and Monitoring Plans were developed for outer islands by the Ridge to Reef (R2R) Project, with support from the Coastal Section. These plans cover both terrestrial and marine issues. The priorities in Table 2 were selected by communities from the 2020 fisheries-related issues extracted from R2R management plans during metronome trips in 2021. The Coastal Section has continued to implement the fisheries-related activities in these plans through TFSP2, which provided AU$10,000 per island to fund priority projects. All island priorities are expected to be delivered to the outer islands in 2022.

Table 3: Fisheries-related island priorities for each outer island

Island Names	Management and Monitoring Plan Priorities
Nanumea	Inshore Fish Aggregating Devices (FAD) deployment
Nanumaga	3 Key Safety Equipment for fisher – Epirb, GPS and VHF Radio
Niutao	Inshore FAD deployment
Nui	Inshore FAD deployment
Vaitupu	Refurbishment of Milkfish Pond at Elisefou
Nukufetau	Light Beacon to indicate reefs at low tides during night fishing
Nukulaelae	Train fishers on boat motors maintenance and procure boat motor spare parts
Niulakita	Inshore FAD deployment

The Coastal Section will develop fisheries-specific management plans for each community, in consultation with the Kaupule and community members in 2022. This will help to clarify the goals and objectives of managing coastal resources, and enable the implementation of feasible and relevant fisheries activities to achieve these goals. Overall, this contributes to the implementation of the Island Strategies and the Te Kete National Strategy for Sustainable Development (2021-2030).

Locally-Managed Marine Areas

Management of marine resources in the island communities has used a Locally-Managed Marine Area (LMMA) approach for several decades. These areas are governed by customary laws. Funafuti is the only island with a Marine Protected Area (MPA). The Funafuti Falekaupule have restrictions over fishing gears. For instance, fishers are not allowed to use fishing nets with mesh sizes of two inches and less.

Table 4: Conservation & Locally managed management areas of Tuvalu

Island Name	Type of Conservation Area	Type of Environment	Location
Nanumea	LMMA	Marine & Terrestrial	Lagoon
Nanumaga	2 LMMAs	Marine & Pond	Main settlement & Hapai pond
Niutao	LMMA	Marine	Main settlement
Nui	LMMA	Marine & Terrestrial	Terikiai islet
Vaitupu	2 LMMAs	Marine & Pond	Main settlement & lagoon
Nukufetau	LMMA	Marine	Lagoon
Funafuti	MPA	Marine & Terrestrial	Tepukasavilivili, Fualopa, Fuafatu, Vasafua, Fuakea and Tefala islets
Nukulaelae	LMMA	Marine & Terrestrial	Main settlement
Niulakita	2 LMMAs	Marine & Pond	Main settlement & Niulakita pond

In 2021, the TFD coastal team visited each LMMA on each island during metro-trips. Although no baseline surveys had previously been conducted in these areas, TFD officers were able to clearly define and collate information on these LMMAs through physical observations and key informant interviews. In general, communities have observed an increase in the fisheries resources both

within and near the vicinity of the LMMAs compared to previous years. Awareness programs have been conducted in the island communities and schools on the advantages and benefits of such management tools. The locations for all conservation and management areas listed in Table 3 have been plotted using the QGIS software.

The Coastal Team will monitor the effectiveness of both the LMMAs and the awareness programmes in order to improve efforts to conserve and manage coastal resources through:

i. Socio-economic household surveys
ii. Baseline LMMA surveys

The Coastal team will continue to mark the LMMA boundaries to avoid poachers. Conserving and managing marine resources through LMMAs and MPAs has a lot of community support. However, for these initiatives to be successfully implemented, more financial support is required from the government.

Creel Data Collection Program

Creel surveys are the primary method of collecting coastal fisheries data in Tuvalu. They are low-cost, easy to implement and provide a rapid assessment of coastal fisheries resources. Tuvalu now has one of the longest-running creel data collection programmes in the Pacific; more than 80,000 fish have been measured in the 3,500+ surveys carried out across the 9 islands since 2015. Data collectors play an important role in continuing this programme, by collecting and monitoring fishers' catch at the landing sites.

During 2021, data was collected from all 9 islands. The 2021 data presented in this report is from 141 creel surveys (121 from Funafuti, 8 from Nanumea, 7 from Nukufetau, 2 from Nukulaelae, and for 3, no island was recorded). However, the actual number of creel surveys carried out in 2021 is much higher, as not all the surveys have been submitted to the Fisheries Department. Data collection during 2021 was better than 2020, although still lower than previous years (Figure 1). There was a back-log of creel surveys that needed to be entered into the database, which has now been cleared, with some 2021 surveys still outstanding.

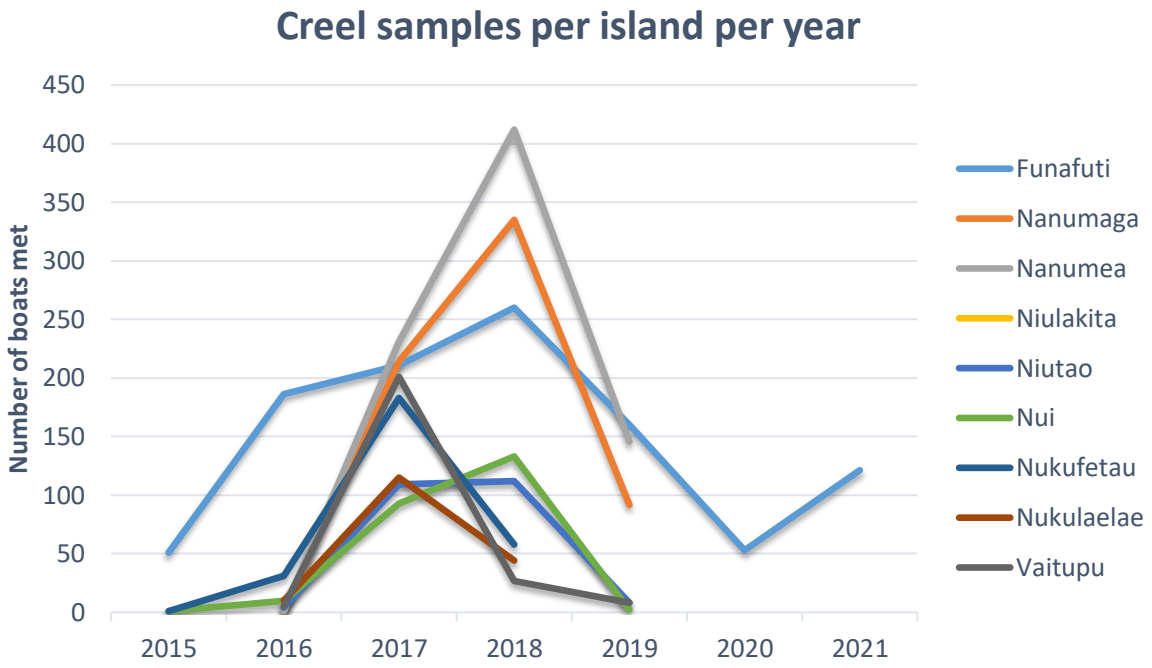


Figure 3: Number of Creel surveys collected by data collectors and CFS staff by island and year

Creel data provide important insights on harvests, effort, and fisher perceptions, which ultimately inform management decisions. Creel surveys can provide information on fishing pressure through the use of fish length data. The percentage of fish landed that are undersized, i.e., smaller than expected length at maturity, is expected to decrease towards zero with good management. The length at maturity estimates were obtained from available published data for the region, with a preference for latitudes closest to Tuvalu. These maturity estimates will be updated as more maturity data is collected for Funafuti, for more accurate analyses.

Overall, 52% of fishes were landed that were undersized in 2021 (Table 4). Of the top fifteen species landed, four species comprised entirely mature catch (0% undersized): *Aphareus furca* (Palusega, Kotua, Taelepe, Takuoga), *Naso hexacanthus* (Pokapoka, Ume tinae sega), *Caranx ignobilis* (Tino ulua, Lupo, Aseu, Mea tal), and *Sargocentron spiniferum* (Tamalau).

Three of the top species caught were consistently landed undersized: *Naso lituratus* (Manini lakau, Umalei), *Naso brevirostris* (Pokapoka, Ume pokapoka), and *Acanthurus triostegus* (Manini, Koinava). This means that none of the catch had reached the size where they are able to breed at least once. These three species have been included in the list of priority species for Funafuti, for which maturity data is being collected, with the aim of developing sustainable minimum size limits.

Table 5: Summary % of fish landed that were undersized for each island in 2021. only top 15 coastal species listed. N represents the number of fish samples

Species	All	*N*	Funafuti	*N*	Nanumaga	*N*	Nukufetau	*N*
Caranx lugubris	17%	145			17%	144	100%	1

Naso lituratus	100%	82	100%	77				
Acanthurus lineatus	86%	70	86%	70				
Aphareus furca	0%	58			0%	58		
Naso unicornis	72%	47	72%	47				
Naso brevirostris	100%	22	100%	22				
Acanthurus triostegus	100%	20					100%	20
Siganus argenteus	90%	20	90%	20				
Naso hexacanthus	0%	19	0%	19				
Lutjanus gibbus	71%	17	75%	16			0%	1
Lutjanus bohar	31%	16			33%	15	0%	1
Caranx ignobilis	0%	15	0%	15				
Siganus punctatus	60%	15	60%	15				
Lethrinus microdon	36%	11	40%	10			0%	1
Sargocentron spiniferum	0%	9	0%	9				
Overall	**52%**	**1095**	**61%**	**804**	**19%**	**257**	**90%**	**29**

Mariculture Assistance

The plans for mariculture hatchery to be built opposite the TFD office at the Teone site have slowly progressed. The designs have been completed and all building materials are on site. However, construction has been postponed due to other projects taking priority. TFD will look again at work on the hatchery in 2022.

Most communities have expressed little interest in mariculture activities, although it has enormous potential to support food security and better livelihoods. Some islands, though, have requested for assistance in mariculture/aquaculture. For example, the Nanumaga community have expressed interest in culturing prawns and more diverse fish species in marine ponds, and Niutao requested for support with their newly set-up aqua-farm. TFD senior management also visited to Vaitupu to consult with the community on their milkfish farm.

Quarterly Visits

In addition to the metronome trips, quarterly visits to each island are scheduled mainly to support data collectors and strengthen communication with the Kaupule. During these trips, TFD staff follow up with data collectors on their work progress and address any issues encountered. TFD staff also conduct refresher training, and collect original creel datasheets. In 2021, only one trip was made, which was to the Southern Islands (Niulakita and Nukulaelae). The staff were not able to visit other islands due to staff shortages and delays in implementing some Funafuti-based activities.

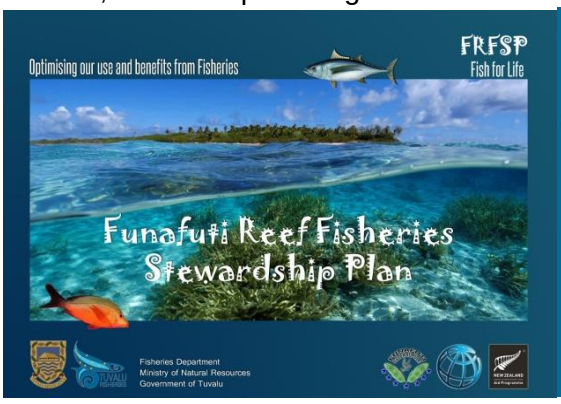
FAO Data Collection Workshop

The Data Collection Workshop held in November 2021 was aimed at strengthening the collaboration and cooperation of fishers and other relevant stakeholders with the creel survey programme, as well as other coastal related data collection surveys. Fishers were the targeted group for this workshop and the half day workshop was facilitated by Coastal Section and fully funded by FAO (Figure 2).

Figure 4: Group photo taken during the end of the workshop

Funafuti Reef Fisheries Stewardship Plan (FRFSP)

More than 60% of Tuvalu's population resides on Funafuti, and this puts very high pressure on the fishery resources. It is critical to manage these resources, hence the development of the Funafuti Reef Fisheries Stewardship Plan (FRFSP) in 2017. The Coastal Section continued to work in collaboration with the Funafuti community, Kaupule, and fishers to implement the FRFSP, with TFD providing technical assistance to the Funafuti community on a regular basis.



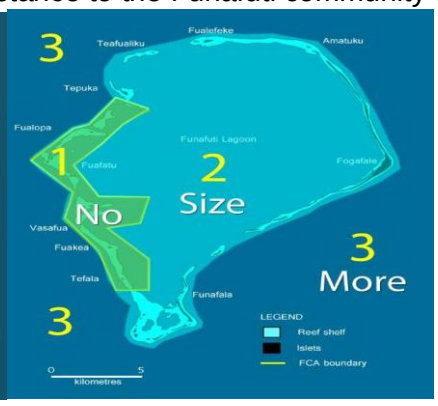


Figure 5:illustrations of the FRFSP and its strategies

Support to the Funafuti Conservation Area

A critical strategy under the FRFSP was to ensure that the Funafuti Conservation Area (FCA) works as a real MPA and not just a paper park. Table 5 details TFD support to Funafuti community in 2021.

Table 6: Summary of activities achieved under the Support to Funafuti Conservation Area

Activity	Description	Budget (Funder)
School awareness	This activity is to provide basic information on the purpose and functions of the Funafuti conservation area and LMMA's to different schools on Funafuti Island.	**$2055.00 (Government)**
Public awareness	This activity is focused on informing the communities on the Coastal Fisheries' activities that are committed towards Funafuti Island. The targeted communities included: • Amatuku • Lofeagai • Fakaifoou • Vaiaku & Kavatoetoe • Papaelise • Funafala	**$5815.00 (Government)**
FCA School excursion	The school excursion is focused on presenting the students the actual site of the Funafuti Conservation area.	**$670.50 (Government)**
FCA meetings	Monthly meetings with the Kaupule of Funafuti.	**-**
Donation including Boat, 60hp twin outboard engines, axle aluminium trailer and freight	The boat was handed over to the Kaupule to support FCA patrols and other important activities	**(60,000.00 (PROP)**

Most activities under the support to the FCA have been achieved except the FCA Hut and FCA stock assessment that were overdue and are major activities which require more time, planning and resources for effective implementation.

3.2 Size Limit Study

The second strategy under the FRFSP is to set up fish size limits to enable the recovery of the depleted fish stocks. Main aims of this study are to determine the sizes of maturity and spawning seasons for key reef species. David Welch (C20 Consulting) was contracted to lead this work, which started in October 2021. A list of 28 species was identified and prioritised based on catch history, endemicity and life history traits (Table 6). Mr Welch then conducted training online on the sampling process, length and weight measurements, fish dissection for gonad weight and sex identification, and data analysis. The consultant developed valuable

resources for the team, including a training video, training manual, size at maturity analysis tool and spawning seasonality analysis tool. There will be ongoing data collection on maturity and spawning seasonality over the next year, and it may take up to three years to obtain robust estimates. As the data is collected, it will be used to develop a system of minimum size limits to be enforced in Funafuti through legislation.

Table 7: Key priority reef species for Funafuti Size limit study

Common name	Species name	Tuvalu Name	Rank
Camouflage grouper	*Epinephelus polyphekadion*	Gatala pulepule	**1**
Fringelip mullet	*Crenimugil crenilabis*	Fuakanase	**2**
Ambon emperor	*Lethrinus amboinensis*	Noto	**3**
Highfin grouper	*Epinephelus maculatus*	Gatala moeo	**4**
Humpback red snapper	*Lutjanus gibbus*	Taea	**5**
Orange-striped emperor	*Lethrinus obsoletus*	Tanutanu	**6**
Common bluestripe snapper	*Lutjanus kasmira*	Savane	**7**
Bluespine unicornfish	*Naso unicornis*	Ume, Tupotupo	**8**
Sabre squirrelfish	*Sargocentron spiniferum*	Tamalau	**9**
Yellowlip emperor	*Lethrinus xanthocheilus*	Gutula	**10**
Lined surgeonfish	*Acanthurus lineatus*	Pone lolo, Pone matagi	**11**
Squaretail mullet	*Liza vaigiensis*	Kafakafa, Baibue	**12**
Convict surgeonfish	*Acanthurus triostegus*	Manini, Koinava	**13**
Orangespine unicornfish	*Naso lituratus*	Manini lakau, Umalei	**14**
Bigscale soldierfish	*Myripristis berndti*	Malau puku, Te mon	**15**
Blue lined squirrelfish	*Sargocentron tiere*	Malau loa, Malau gutu loa	**16**
Longface emperor	*Lethrinus olivaceous*	Filoa, Rou, Kapatiko	**17**
Blacktail snapper	*Lutjanus fulvus*	Tagau, Takape	**18**
Streamlined spinefoot	*Siganus argenteus*	Maiava	**19**
Honeycomb grouper	*Epinephelus merra*	Gatala liki	**20**
Humpnose big-eye bream	*Monotaxis grandoculis*	Muu fatu	**21**
Bignose unicornfish	*Naso vlamingii*	Taitifi, Tativi	**22**
Spotted unicornfish	*Naso brevirostris*	Pokapoka, Ume pokapoka	**23**
Gray unicornfish	*Naso caesius*	Pokapoka, Ume	**24**
Pacific longnose parrotfish	*Hipposcarus longiceps*	Ulafi	**25**
Scarlet soldierfish	*Myripristis pralinia?*	Malau puku	**26**
Snubnose grouper	*Epinephelus macrospilos*	Gatala	**27**
Shoulderbar soldierfish	*Myripristis kuntee*	Malau, Malau po	**28**

The species in Table 6 were ranked based on criteria such as total catch, percentage caught undersized, and productivity.

In mid-December, coastal section conducted a half day consultation with the Funafuti community, fishers and other relevant stakeholders raising the awareness on the importance of the size limit project. The entire workshop was made possible through financial assistance from the Tuvalu government.

FRFSP Review

A one-day annual review was done on 25th November, 2021 to assess what had and had not been achieved. The community raised a lot of concerns on the size limit study and the *Sargassum* species algal bloom issue in the Funafuti coastal areas. This is a critical idea that should be included in the next plan to ensure it is addressed.

Figure 6: grp photo taken during the 2021 FRFSP review & handing over of FCA boat by TFD

Research and Monitoring Activities

Ciguatera Fish Poisoning Cases

1. The coastal section continued working together with Ministry of Health staff to collect data on Ciguatera Fish Poisoning (CFP) cases for the 9 islands of Tuvalu. In 2021 there were 10 cases: 4 CFP cases on Nukufetau and 6 on Funafuti. Both islands had an increase in the number of CFP cases compared to the previous year (Table 7). This highlights the need to be proactive with GTX sampling on a quarterly basis in order to identify the ciguatoxin-hotspots and prohibit the fishers and public from catching or consuming fish from high-risk areas (Table 8).

Table 8: Ciguatera Fish Poisoning cases for the 9 islands of Tuvalu

Ciguatera Fish Poisoning Cases for all islands from 2017 - 2021					
Island	**2017**	**2018**	**2019**	**2020**	**2021**
Nanumea	3				
Nanumaga					
Niutao					
Nui					
Vaitupu		2			
Nukufetau	2	3			4
Funafuti	13	7		4	6
Nukulaelae					
Niulakita					
TOTAL	**18**	**12**	**-**	**4**	**10**

Ciguatera sampling (GTX monitoring)

Ciguatera sampling is undertaken each quarter. It involves collecting samples of seaweeds that might contain the ciguatoxic-causing organisms, and identifying counts under a light microscope. This is a very important survey that serves to warn the public of the likelihood of outbreaks. The main species that produce the toxins are *Gambierdiscus toxicus* (GTX), *Prorocentrum lima* and *Ostreopsis* sp.

In the fourth quarter of 2021, over a third of the sites surveyed had a high risk of Ciguatera Fish Poisoning (CFP), with GTX average densities exceeding 100,000 per 100g (Table 8). More than half the sites surveyed had a medium risk (average density ≥1000 per 100g) and only 3 sites were categorised as low risk (Table 8).

Table 9: Number of counts for ciguatoxin- causing organisms in various locations assessed in the fourth quarter of 2021

Location	AverageofGtx100	AverageofPlim100	AverageofPcon100	AverageofOst100
Sam P Teo	3197313	48597		83695.78231
Pacific Energy	563086	10075.10204	3358.367347	
Southern End	542080		1382.857143	13828.57143
Southern park	197663	6396.890185	1279.378037	15352.53644
Tausoalima	160510	3951.020408		2963.265306
Filipo Resident	143314	7542.857143	3771.428571	5657.142857
Lotokava	109344		16297.95918	32003.26531
Reclaim Land	100010	2963.265306	5926.530612	2222.44898
Akau Pusa	73112	4910.553936		3273.702624
Laloniu	64796	2370.612245		1580.408163
Fetuvalu	50911	2483.498542		4966.997085
Teulu	47823	3457.142857		1728.571429
Van Camp	36847	1133.771074		4535.084295
AkauTuluaga	31344	1279.378037		1279.378037
Northern End	28628		1218.231293	3045.578231
Causeway	25523	1343.346939		5373.387755
Akau Pukeu	18372			2963.265306
Akau Fasua	17006	6235.740905	8503.283052	6235.740905
Fatato	13433	2442.44898		1221.22449
Letasi	13137	4148.571429		

Dump site	9910	1415.782313	1415.782313	1415.782313
Papaelise	4689	2679.822538	1339.911269	
Fuafatu	2155	1436.734694		
KEY	**High Risk**	**Medium Risk**	**Low Risk**	

Boat and Canoe Survey

2. The boat and canoe survey are an ongoing survey carried out by coastal section annually for all islands. Funafuti's survey has been postponed to 2022 due to limited staff and busy schedule. Outer islands' results gathered during metronome trips are shown in Figure 4 below. The survey is focussed on the counts of boats and canoes by type, storage location coordinates and condition of boat or canoe.

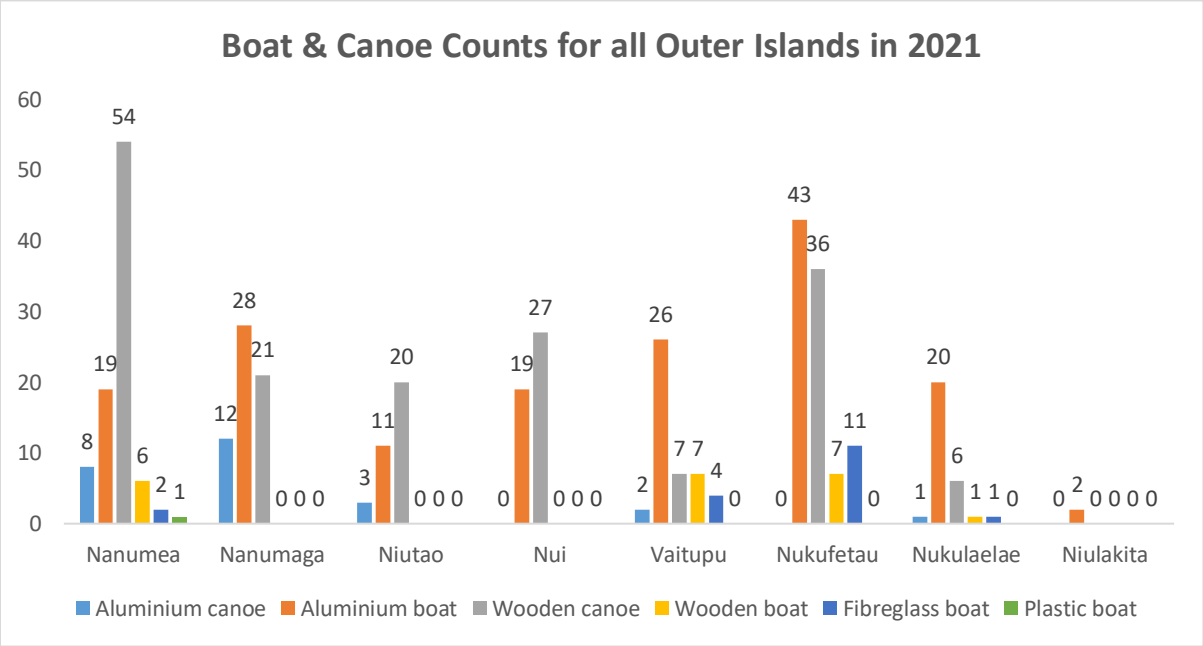


Figure 7: Boat & canoe survey information for outer islands in 2021

Different islands have different preference of the types of boats and canoes to be used for fishing activities. According to information in Figure 4, Nanumea had the highest number of wooden canoes followed by Nukufetau, Nanumaga and Nui. However, Nukufetau has got the highest number of aluminium boats as well as for fibreglass boats. It is witnessed that people nowadays preferred to utilise wooden canoes, aluminium boats and fibreglass boats.

Nanumaga's Seamount Trip

The main aims of this particular trip were to explore the seamount and identify different types of species been caught and determine the health of the seamount resources. Such exploration

studies can provide the people of Nanumaga with more information on the status, importance and potential benefits of their seamount resources in order to utilise their marine resources for better food security and livelihoods. Further creel studies of these seamounts are needed to properly evaluate species with low landing counts during this survey.

Species coloured in green below have >50% of the individuals landed larger than the size at maturity (Lm) and are considered of good status. Species in orange have 50+% of landed individuals with a length of <= the size at maturity. The species without colour coding could not be assessed at this time because no value for Lm is known.

Table 10: Assessment of the species landed identifying those with total catches from the second day of the fishing trip

Tuvalu Name	Scientific Name	Lm	ND	OK	Undersized	%OK	%Undersized	Total
Afulu	*Parupeneus multifasciatus*	15		2		100	0	2
Aseu	*Caranx melampygus*	35			1	0	100	1
Atualo	*Sarda orientalis*		1					1
Fagamea	*Lutjanus bohar*	42.9		5	10	33	67	15
Filu	*Carangoides orthgrammus*		1					1
Gole	*Cheilinus trilobatus*		1					1
Kaivete	*Mulloidichtys vanicolensis*	17		3		100	0	3
Mataele	*Cephalopholis urodeta*	18		1		100	0	1
Palusega	*Aphareus furca*		58					58
Pula	*Cephalopholis miniata*		24					24
Sumu	*Melichthys niger*		2					2
Sumu niu	*Balistapus undulatus*		2					2
Sumumoana	*Xanthichthys caeruleolineatus*		3					3
Tafauli	*Caranx lugubris*	35		20	122	14	86	142
Tapou	*Synodus variegatus*	14		1	0	100	0	1
Tonu	*Plectropomus areolatus*	40			1	0	100	1
Utu	*Aprion virescens*	40		1	0	100	0	1
Total			**92**	**33**	**134**	**61**	**39**	**259**

Training and Regional Meetings

In 2021, the Coastal Section staff participated in a workshop on the use of data-poor methods in fisheries, and two SPC regional meetings, which were all held online due to ongoing travel restrictions.

FAO Workshop on the Sustainable Development Goals (SDG), Indicator 14.4.1

Three Coastal Section officers attended the FAO workshop for the SDG Indicator 14.4.1: *Proportion of fish stocks within biologically sustainable levels* on October 25-27, 2021. This was focussed on methods of assessing data-poor fisheries in the Pacific, particularly using length-based indicators. The workshop provided and demonstrated various online tools

available to member countries. These tools are extremely useful for the Coastal team, and will be used to improve analysis and reporting of creel data.

SPC Heads of Fisheries Meeting 2021

The 13th Heads of Fisheries Meeting was held online from 1-4 June 2021 utilising the Zoom Conferencing platform. This was the second consecutive HoF meeting to be held virtually. HoF is a regional meeting of the heads of SPC member country and territory fishery agencies, and covers the entire range of interests for which they have responsibility and on which the SPC Division of Fisheries, Aquaculture and Marine Ecosystems (FAME) provides advice and assistance.

The priority work areas that Heads of Fisheries raised at the meeting included:

- Electronic approaches to monitoring and reporting, for both oceanic and coastal fisheries.
- Coastal fisheries and aquaculture science and traditional knowledge in support of evidence-based management
- Coastal fisheries and aquaculture policy and legislation development and implementation.
- Customary and traditional governance of inshore fisheries.
- Diversity of livelihood options for fishing communities, including low-technology and small-scale aquaculture.
- Innovative aquaculture development opportunities, including farming of native and low-value as well as high-value species both for food security and export.
- Explore initiatives to increase the value of seafood/aquaculture products.
- Cross-sectoral climate change impacts, implications and adaptations.
- Gender and social inclusion in FAME's work.
- Bring diverse expertise across different sectors and disciplines to support more integrated policy and management options to address the complex problems faced.

SPC Regional Technical Meeting on Coastal Fisheries and Aquaculture

The 4th SPC Regional Technical Meeting on Coastal Fisheries and Aquaculture (RTMCFA4), was a virtual meeting, held on 12 -15 October 2021. The RTMCFA4 brought together coastal fisheries, aquaculture scientists, and technical experts in the Pacific to discuss important technical and scientific gaps, needs, challenges and opportunities. The overarching theme of RTMCFA4 was to discuss and address some of the main technical issues affecting coastal fisheries and aquaculture in support of better science-based resource management and the equitable access to resources.

The agenda was developed based on consultations with SPC Members. Each member was surveyed beforehand on the national coastal fisheries and aquaculture issues, in order to capture lessons learned from the 'response phase' of the COVID-19 pandemic, and identify approaches and priorities as the region transitions to the 'recovery phase' in 2021-2022 and beyond. Tuvalu raised (and subsequently followed up with SPC on) the following priority issues during the discussions and breakout groups:

- Support for the new coastal data collection apps, and agreed to work with SPC to explore effective ways to incorporate TFD historical data into the e-data system.

- Request to continue capacity building in fisheries management, policy, compliance and legislation.
- Request to provide tailored technical guidance and training to meet specific needs in setting up integrated aquaculture operations, seed production systems, as well as relevant enabling environment (e.g., policies, plans, knowledge sharing and awareness mechanisms).
- Proposed that SPC look at strengthening collaboration to transfer of knowledge and information from different experiences in aquaculture, within PICTs and regionally.
- Guidance and support on the selection of most relevant national Coastal Fisheries Report Card indicators for management and decision-making purposes.

The first meeting of the Community-based Fisheries Dialogue (CBFD) was held concurrently with RTMCFA4. The purpose of the CBFD was to prove a platform for Civil Society Organisations and non-state actors to provide information and advice on key needs. The CBFD enabled the sharing of experiences and lessons from community-based initiatives, to strengthen efforts to maintain productive and healthy ecosystems and their associated fisheries resources that are critical to the wellbeing of coastal communities.

Issues and Recommendations

Issues	Recommendations
1. Staff shortages	Recruit new staff – Lab Technician, Coastal Data Manager and Funafuti Assistant Fisheries Officer into the workforce
2. Limited government budget	Increase government financial support in future budgets to strengthen the management and development of coastal fisheries in all islands of Tuvalu
3. MIS database	MIS database should be reviewed and inaccuracies in the data addressed

Operation and Development

General

In the TFD Corporate Plan the fisheries resource is essential for food security and a sizable diet, and small-scale fishing supports the livelihoods of many Tuvaluans. The Operation and Development section continued its technological and funding support to coastal fisheries, to supply a food source, income, and business opportunities. Deployment of FADs, safety at sea and other initiatives have been undertaken with the island communities concerned. Despite the impact of COVID 19, for the Operational and Development section the majority of the natural processes of the work plan for 2021 were achieved; except the work involving the Technical Advisor (TA) was not reached because of border restrictions. There was also a delay in reviewing the MOU for FADs.

Outreach programs for the public and local communities on peripheral islands were also implemented in 2021. In some cases, this involved radio broadcasts and refresher courses on marine safety - mostly on shore-based equipment and VHF.

FADs (Fishing Aggregating Devices)

Artisanal FADs are the types of FADS to attract pelagic fish and to improve the catch rate of people who catch fish for food consumption or sell them at local markets. They are anchored within range of small motor boats and canoes and they are an important instrument for food protection and domestic fisheries development (Figure 1). The Pacific Community (SPC) provides expert assistance to Tuvalu in order to train the fisheries officers how to construct FADs. The main advantage of FAD is improved access for canoes and outboards to reduce fuel consumption and improve marine safety through defined fishing areas around FAD.

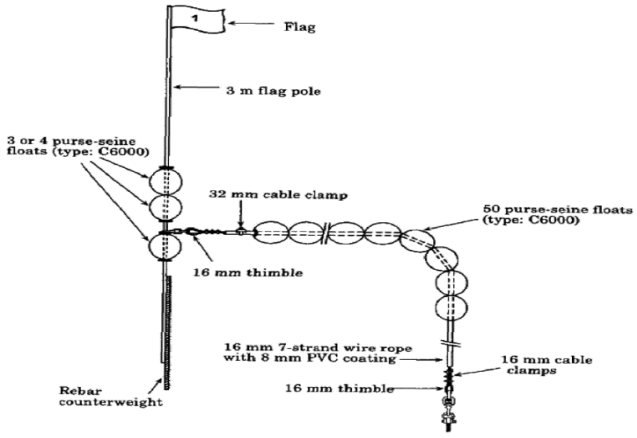


Figure 8: Physical type of FADs

"Lizard FAD" is a type of FAD which has been introduced for fishermen in Tuvalu. This combines a subsurface with a surface type, so that the FAD is not lost if the surface part is cut. These are located at depths of approximately 1200 metres and 800 metres (offshore DCP), while others are placed in approximately 400 to 500 metres (shoreline). A FAD of 400 m depth requires a complete length of rope of 520 metres (nylon rope 370 metres x polypropylene rope, 150 metres). All the fishers along the outer islands have the mental ability of building this new FAD design with the aid from the Operation & Development Officers.

The usual problem with the deployment of FADs is their short lifespan. Some break free for reasons obscure, sometimes before the benefits are understood; and others are destroyed by passing ships or vandalized by people who do not realize the benefit of the FADs.

FADs Maintenance

FADs maintenance is a continuous activity that is critical to the longevity of the device. Maintenance was performed on the Vaitupu and Nukulaelae FADs (Fig 2). The OD Beach Officer evaluates the FAD and replaces the aggregator with coconut leaves. He will also dive down about 40 meters to check the primary line and fittings are still in good shape. The major maintenance considerations are as follows.

- Inspect surface floats for cracks (replace where necessary)) and remove any fouled material from the floats and ropes.
- Remove fishing line tangled around the ropes.
- Inspect ropes for twists, folds or cuts and replace ropes as needed.
- Inspect surface hardware for corrosion and replace every bit needed.
- Replace aggregators.

FADS STATUS IN THE OUTER ISLANDS

The total FADs deployed on the outer islands since 2013 was 23 in total (Figure 3 and Table 1). There were three primary types of FADs: coastal surface FADs, offshore surface FADs, and lizard FADs. One was deployed on most of the islands, although Nui and Vaitupu have two - an offshore and coastal FAD. Funafuti now has an additional inshore FAD connected to a wave buoy. Of those 23 FADs, 17 (74%) were lost without a record. Islands without a FAD and no trace of what happened to them are Niutao, Nui and Nukufetau.

FADs which are recognized to have been lost or damaged for which we have records (identified as passive) are but three – in Nanumea, Vaitupu and Funafuti. Only Nanumaga, Funafuti and Nukulaelae have active FADs which were still in use in 2021.

Table 11: FAD status - Active, Inactive & No record

Islands	FADS No	Type of FAD	Deployed depth	Location		Date deployed	Active/Inactive	Remarks
Nanumea	1	In-shore surface FAD	500	05''40.051'S	176''05.193'E	18/10/2013	No record	
	1	Off-shore surface FAD	1000	05''41.120'S	176''06.456'E		Inactive	tangled by yacht propeller 20/03/20
	1	Lizard FAD	400	05''41.599'S	176''07.192;E	21/07/2019	No record	
Nanumaga	1	In-shore surface FAD	500	06''17.491'S	176''18.298'E	18/10/2013	No record	lost after TC Pam
	1	Off-shore surface FAD	1000	06''17.6025'S	176''17.80'E		No record	
	1	Lizard FAD	400	06''16.649'S	176''18.679'E	22/07/2019	Active	Only this FADs was maintenance on the 25/09/21
Niutao	1	In-shore surface FAD	500	06''06.932'S	177''17.664'E	19/10/2013	No record	
	1	Off-shore surface FAD	1000	06''07.894'S	177''21.241'E		No record	The fad still exist but it gone under water and cannot be inspected
	1	Lizard FAD	400	06''05.809'S	177''20.655'E	23/07/2019	No record	
Nui	1	In-shore surface FAD	500	07''14.307;S	177''08.155'E	6/11/2013	No record	
	1	Off-shore surface FAD	1000	07''12.896'S	177''07.747'E		No record	

Vaitupu	1	In- shore Surface FAD	500	07''29.053'S	178''39.847'E	10/06/2013	Inactive	Tangled by vessel propeller
	1	Off-Shore Surface FAD	1000	07''28.774'S	178''39.087'E		No record	
Nukufetau	1	In-shore surface FAD	500	08''00.526'S	178''18.568'E	6/12/2013	No record	
	1	Off-shore surface FAD	1000	08''01.592'S	178''17.209'E		No record	
	1	Lizard FAD		08''58.719'S	178''19.719'E		No record	lost after TC Tino
Funafuti	1	In- shore Surface FAD	500	08''36.138'S	179''03.127'E	2/12/2013	Inactive	cut by fisherman
	1	Off-Shore Surface FAD	1000	08''28.728'S	179''02.813'E		No record	lost during TC Tino
	1	Lagoon FAD	40	08''26.9360'S	179''05.9966'E	2016	No record	
	1	Nearshore FAD / West	450	08''27.83688'S	179''40.6902'E	21/12/2021	Active	New fad constructed and deployed wave buoy attached.
Nukulaelae	1	In-shore surface FAD	500	09''22.051's	179''47.783'E	9/07/2013	No record	
	1	Off-shore surface FAD	1000	09''24.813'S	179''49.319'E		Active	
	1	Lizard FAD	360	09'21.767''S	179'47.947''E	18/02/21	No record	

Table: Status of FADs in the outer islands in 2021

Fishing FADs

The OD section is not registering the number of fishermen fishing on FADs in the outer islands in 2021; only the data collectors who are operating under the Coastal Fisheries are collecting such information and data. However, the data have been very limited and inconsistent when compared to the number of fishermen in each island. Community fishery officers from all islands were recruited in 2021 under the TFSP2 project, and may be tasked with collecting data on FAD usage going forward.

Inshore FADs with wave Buoy

The wave buoy was deployed by MET officers, fishery officers, and with the help of the crew of the Manaui II (Figure 4). The wave buoy is attached to a FAD for reporting of the real time data on wave height and full stop. It also describes the precise location of the FAD. The wave buoy was deployed along the West side of Funafuti to measure the impact of Westerly storms.

Figure 9: constructing of inshore FAD & attached wave buoy in Funafuti

Sea safety

A grab bag is an essential, accessible and transportable bag of ocean safety equipment to aid natural selection of a fisherman when they encounter problems at sea. Items in the bag may vary from one vendor to another, but should include items critical to search and rescue operations. At Tuvalu, there is a high usage of skiffs with only one outboard, operating out of sight of land and out of mobile signal range. TFD's plan is that all fishermen must carry this grab bag for their refuge. More than 50% of fishermen in Tuvalu already have their safety bags. By the end of 2021, the next order for grab bags was already in Funafuti, funded by PROP. These grab bags will be given out to all fishers. Before they could be supplied, the Tuvalu Fisheries Department had to arrange an MOU between the fishermen's association and the Kaupule on all the islands to ensure they have the same understanding in utilizing these bags and to avoid confusion. That process was completed by 2021.

The total items in the grab bags selected by Fisheries and PROP are 16 and include: 2 life jackets, 1 flashlight, 1 mirror, 1 Personal Locator Beacon, 1 VHF radio, 1 Laser light, etc. as indicated in Figure 5.

Figure 10: Fishermen's grab bag contents

Grab bag inspection and refresher training

The OD staff has been directing training and inspection of all, grab bags with the fishermen in the outer islands (Figure 6). This includes training on how to use items in bags in an emergency to make sure the equipment is being used properly.

Figure 11: OD staff inspect grab bags

Result of grab bags Inspection

Figure 7 below shows the results of the inspection of the bags of all the fishermen in the outer islands, with the exception of Funafuti, where we have no record of the bags of the fishermen's association. Based on the findings presented, the total number of items lost, damaged, and without batteries was 134. There were 71 items in the grab bags were lost, 27 items were damaged, worn out items were 12 and 24 items have no batteries. In the figure shows below,

batteries were the highest number of items that were lost by 40, VHF radios accounted for 25 items, strobe light 16 items, followed by 13 GPS. Lifejackets were the only items never missing from a bag during those inspections.

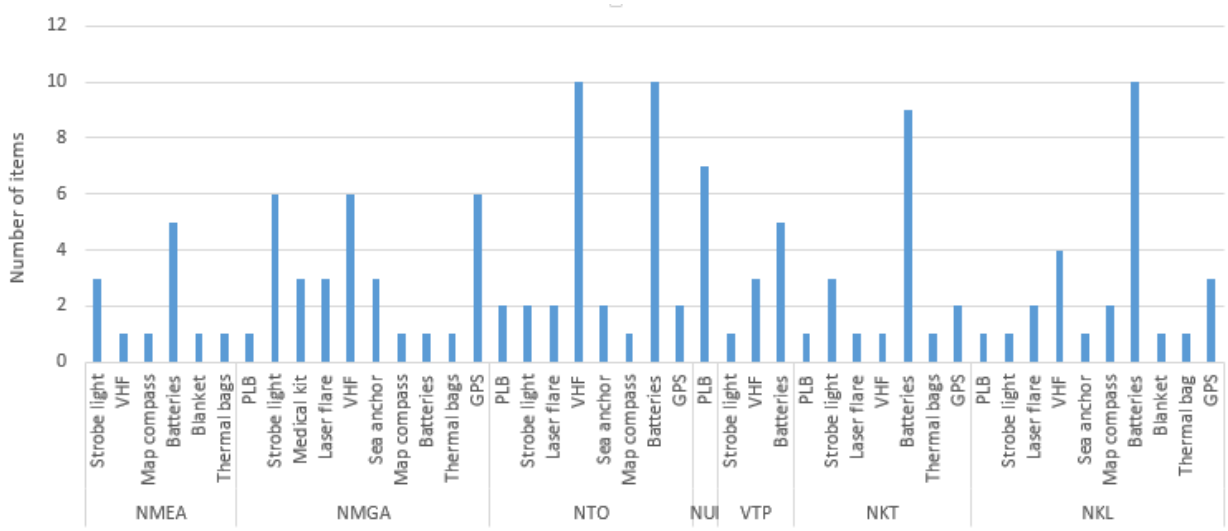


Figure 12: Result of grab bag inspection

Post-Harvest

The OD section continued to support the people of Tuvalu in Post-harvest Training. A baseline survey was undertaken after harvest to assess the economic viability of Tuvalu. The main objective outlined in the Fisheries Corporate Plan is to support the sustainable development of small-scale fisheries for livelihoods, food security and healthier diets. The training in post-harvest handling mainly aims at sustaining the product in good condition for a long time, as easily as taking in something fresh and dissimilar. The Operations and Development Section provides training in handling, storing, processing and packaging to all island communities. In 2021, the training was delivered to 6 islands.

Smokebox construction and formation

Figure 8 below shows training on the construction and operation of a smoke can. The training took place at Nukulaelae and Niulakita.

Figure 13: Smoke box construction in Nukulaelae & Niulakita

Bottling, Smoked fish training and packinging

The total number of people participating in the bottling, packaging and smoked fish training was 228 (Figure 9a.9b). These training sessions took place at Vaitupu, Nui, Nukufetau, Nukulaelae and Niulakita. That course also involved tudent of Motufoua TVSD in Vaitupu. Apparently in the figure presented below the highest number of participants by gender are 140 (61%) male and 88 (39%) female. For each island, the largest number of participants came from the island of Nukufetau, where 47 people attended.

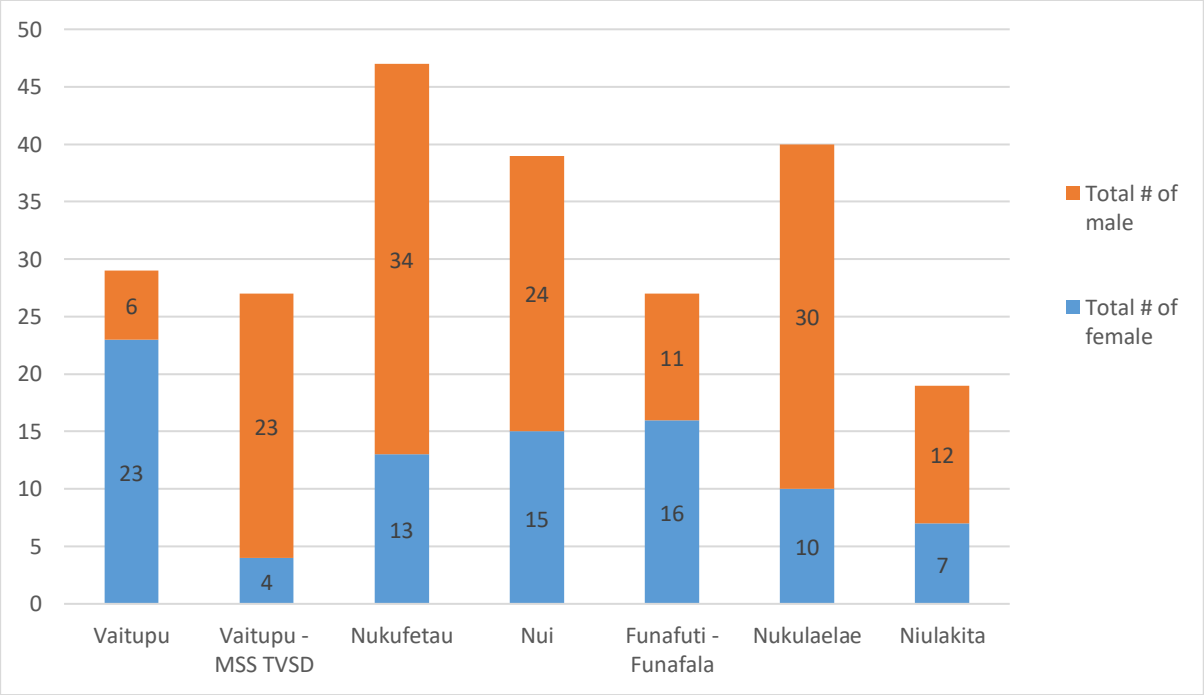


Figure 14: Participation of different communities (both male& female) to the bottling, packaging & smoke fish training in the outer islands in 2021

Figure 15: Participants from Nukufetau is during bottling and smoked fish

Fishing Technique training

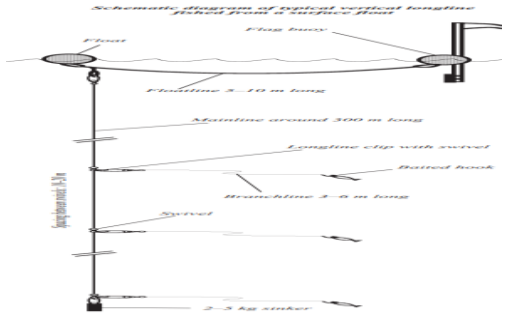
The training was conducted by the OD Chief Fishery Officer and focused primarily on fishing associations on the outer islands. The primary intent of the training was to introduce them to new skills and fishing methods that can help them catch fish easily. The activity was supported by the OFCF of Japan by supplying fishing gear for training, and also the FAO which supplied gear and other expenses.

Types of Fishing

The following illustrations show different types of fishing that were presented to the fishermen through the associations (Figure 10). Participants learned two new fishing techniques: i) vertical longline and ii) electric reels. Vertical longline fishing is simple and relatively inexpensive for deep-sea tuna and other pelagic fisheries. It is especially suited for fishing around FADs but can be practiced anywhere. Participants rigged a line, followed by a long vertical set. Electric reels are commonly used for deep water fishing and need a power supply to power the engine for fishing. With no power supply, the hand-held reels can be used and they are also used to attach and pull the vertical longline. In some islands training was also offered in mid-water trolling and deep-sea squid fishing, although the latter has not been very successful to date and was abandoned.

In figures 11a-c show the fishermen being taught by fisheries officers how to set up vertical longline and electric reels.

1. Vertical



2. Mid water trolling

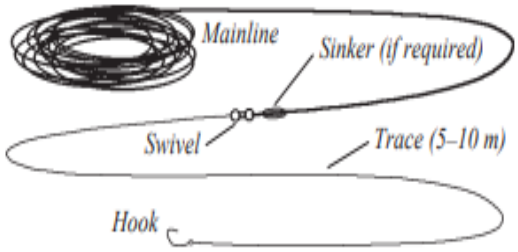
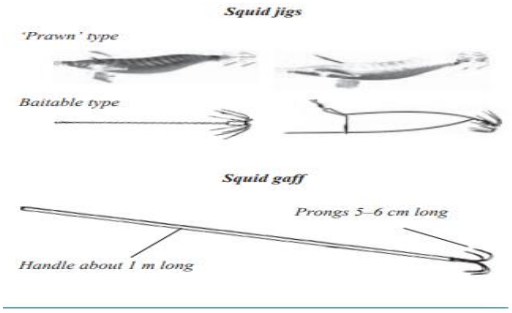
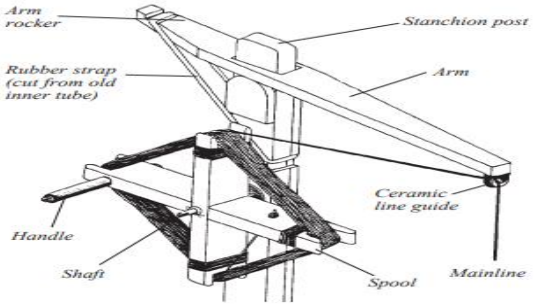


Figure 16: 4 types fishing

3. Squid fishing



4. Electrical Reel/hand reel



Fishing training practical Result

The TFD conducted training with four main fishing techniques along the outer islands in 2021 for the 1st time. The five islands involved in this formation consisted of Nanumea, Nanumaga, Niutao, Nui and Nukufetau (Figure 12). OD staff aimed to provide a five-day training program, but this program was cut short in some inactive areas due to time constraints. The fishing training results show that the highest numbers of fish captured were from Mid water trolling with 65 fish (53% of the total catch); Electric reels caught 52 fish (42%) and Vertical Longline fishing 6 fish (5%). No fish have been caught at Nanumea by squid fishing, whereas Nanumaga or Niutao have no fish caught by squid fishing or vertical longline. For Nui and Nukufetau islands only two fishing methods were utilized because of time constraints; however, Nukufetau did not get any fish from these new fishing techniques due to bad weather and a strong current which caused the main line of the vertical longline to snap.

The commonest fish species captured in this training was wahoo, rainbow runner (kamai), trevally (Ulua), yellowfin tuna (Takua), great barracuda (ono), yellow edged lyretail (Palau) and twin spot snapper (fagamea).

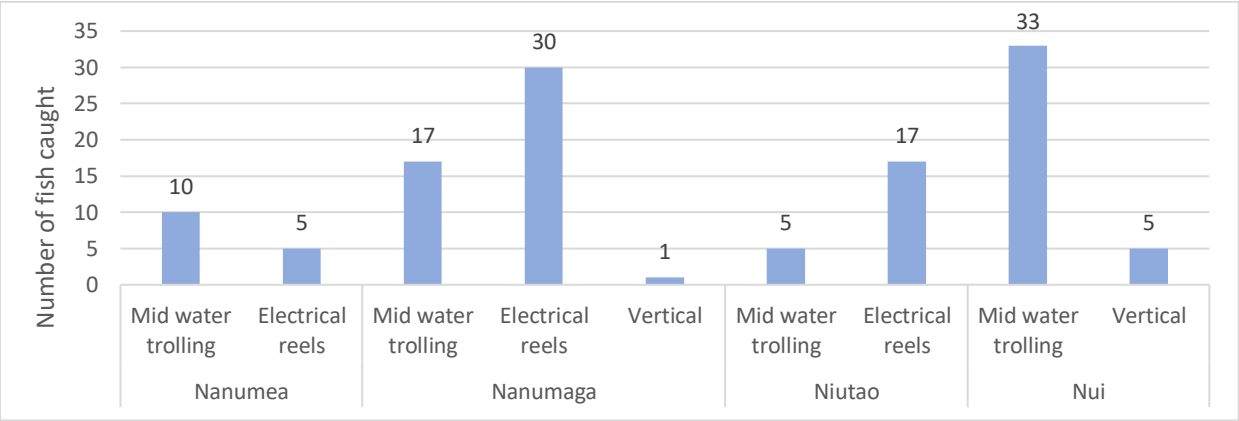


Figure 17: Fishing training practical results using different fishing techniques

Vessels operation

The OD section operated two research vessels (Manaui I and II) to help carry out all activities of the Department of Fisheries' 2021 work plan. The vessels were also involved in private charters and medical evacuations (MEDIVAC).

The Manaui II is a new ship donated by the Government of Japan and arrived in Funafuti on the cargo ship Captain Wallis on May 19, 2021. The Manaui II was unloaded directly into the lagoon by the ship's crew and OD staff committed to this operation. To ensure COVID-19 precautions, they were all wearing protective gear. The Manaui II was launched using two of the vessel's cargo cranes. After the vessel was safely launched, it was towed to docking and quarantined for 5 days in the lagoon.

The Manaui II started its maiden voyage on 02/08/2021, and made 15 journeys before the end of the year. The purpose, date and voyages of the Manaui II for 2021 are presented in Figure 13. The total diesel and premix consumption were 33,792 litres and 1,050 litres, respectively. The total sea allowance for crews was $12,825.01, and the night watch allowance was $4,595.04.

As a new vessel, the Manaui II has had some problems, and a comprehensive defect list is very important. There have been problems with electrical faults, and water getting into the wiring and accommodation and some deck fittings not securely attached. The tables below show defects that have been fixed and maintenance completed (Figure 14), and incomplete tasks that still need work during 2022 (figure 1

Manaui II Voyage status

Table 12: Manaui II voyage report for 2021

Date	Voy	Voy Route	Purpose	Fuel consumption	Premix	SHIFT	SGA	Pax outward	Pax inward
02/08/2021	1	FUN/NMG/FUN	To carry out survey at seamount North of Nanumaga	3100	50 ltrs	$1586.59	$5843.21	4	2
11/08/2021	2	FUN/NKT/FUN	To roll out second dose of covid 19	1150	25 ltrs			5	Nil
14/08/2021	3	FUN/NKL/NKT/NKL/FUN	Drop of MLGA/Pick and drop health Team	1350	25			7	4
18/08/2021	4	FUN/NKF/FUN	Drop off tec spare parts	700	25			nil	nil
21/08/2021	5	FUN/NKL/FUN	Pick up MLGA team	750	25				1
01/09/2021	6	FUN/VTP/FUN	Medivac to Vtp	700	25	$1088.46	$3203.45	4	11
08/09/2021	7	FUN/NMG/NUI/FUN	Drop off metro team to nmga and pick up CFO of Nui	2184	25			9	4
21/09/2021	8	FUN/VTP/FUN	Admin trip to Vtp	1210	25			10	10
05/10/2021	9	FUN/NMA/NTO/FUN	Pick up/drop off metronome team from Nmea to Nto	2406	25	$558.3	$2010.26	nil	4
13/10/2021	10	FUN/NUI/NTO/FUN	Drop climate team/pick up local food from nui	2200	25			4	nil
16/10/2021	11	FUN/NTO/FUN	Pick up metronome team	2160	25			nil	10
21/10/2021	12	FUN/NTO/TVEEZ/FUN/TVEEZ/NTO/FUN	Patrol/drop off CCECC Team from Nto	5578	50	$1660.96		9	9
08/11/2021	13	FUN/NKL/FUN	Drop off OIMI to NKL	600	25		$5002.92	3	1
12/11/2021	14	FUN/NKL/FUN	pick up OIMI Team	700	25			nil	3

22/11/2021	15	FUN/TV EEZ/FUN	Patrol EEZ	6600	50			1	1

Table 13: Manaui II voyage report for 2021

Tabulated defect onboard Manaui II

Table 13: Manaui II defect/completed maintenance list for 2021

Task No	Task Description	Department	Complete/ Incomplete	Remarks
1	Clean Port & Starboard Fresh water tank	Deck	Complete	The tank is completely clean. Carry out maintenance for the sterilizer plant and install filter onboard.
2	Inspect/change/ grease runner	Deck	Complete	Completely grease
3	Grease all necessary part	Deck	Complete	Complete
4	Fabricate a partition at the port toilet	Deck/contractors	Partially complete	Need contractor that familiar with fiberglass to assist the crew
5	Install new flood light at the aft station	Engine	Partially complete	Waiting for the order
6	Troubleshooting steering gear	Engine	Complete	Its working now
7	Change Fuel Filter Gen & Main Engine	Engine	Complete	Regular change with oil once the running hour due
8	Clean and Inspect gearbox lub oil filter	Engine	Complete	Regular change with oil once the running hour du
9	Change oil Generator	Engine	Complete	Depends on running hour

Table 14: Outstanding defect/incomplete maintenance list for 2021

Task No	Task Description	Department	Complete/Incomplete	Remarks
1	Inspect & grease all pipe fitting onboard	Engine	Incomplete	
2	Inspect & replace light in Aft Pax Cabin	Engine	Incomplete	Need to solve the low insulation and then replace the light
3	Rectify &mega test 220v low insulation	Engine	incomplete	Seek advice from TEC
4	Clean & Dry Generator Stator	Engine	Incomplete	
5	Replace Halogen lamp at the aft P&S	Engine	Incomplete	Low insulation problems
6	Service 40HP outboard motor	Engine	Incomplete	Chief engineer available
7	Clean all suction strainer at P&S seachest	Engine	Incomplete	
8	Clean R.O desalination plant suction strainer	Engine	Incomplete	Need chemical
9	Check & Clean Sewage plant	Engine	Incomplete	Need chemical

10	Tappet clearance Gen & Main engine	Engine	Incomplete	chief engineers
11	Test & overhaul fuel injector for Gen & Main Engine	Engine	Incomplete	Chief Engineers

Manaui I voyage Status

Table 15: Manaui I Voyage status

DATES	VOY NUMBER	CHARTER	TO	PURPOSE
10/05/2021	Jan-00	Metronome (Fisheries)	Fun/Niulakita/Fun	Drop Metronome Team trip to Niulakita
21/05/2021	Jan-00	Metronome (Fisheries)	Fun/ Niulakita/ Nukulaelae/ Fun	Pick Metronome Team from Niulakita to Nukulaelae
28/05/2021	Jan-00	Metronome (Fisheries)	Fun/Nukulaelae/Fun	Pick Metronome Team back to Funafuti
08/06/2021	4	Private Charter (Falasese.T)	Fun/ Nukufetau/ Vaitupu/ Fun	Drop their Families to Vaitupu
16/06/2021	5	Private Charter (Fakaluta.A)	Fun/Nukulaelae/Fun	Drop cargo to Nukulaelae
25/06/2021	6	MLGA (Taofia.P)	Fun/ Nui/ Vaitupu/ Fun	
27/06/2021	7	Health Charter	Fun/ Nukufetau/ Fun	Medivac
29/06/2021	8	Metronome (Fisheries)	Fun/Vaitiupu/Fun	Drop Metronome Team to Vaitupu
04/07/2021	9	Health Charter	Fun/Nui/Fun	Medivac
07/07/2021	10	Metronome (Fisheries)	Fun/Vaitiupu/Fun	Pick Metronome Team back to Funafuti
08/07/2021	10	MLGA (Taofia.P)	Vaitupu/ Nukufetau/ Vaitupu	Pick MLGA Team to Vaitupu
12/07/2021	11	Climate Change (Pepetua.L)	Fun/ Nukufetau/ Vaitupu/ Fun	Pick Climate Change Team from Nukufetau to Vaitupu
16/07/2021	12	Fishing Trip (Fisheries)	Fun/ Te Puka/Fun	Fisheries Fishing Trip
01/08/2021	13	Operation Section (Fisheries)	Fun/ Nanumaga/ Nanumea/ Niutao/ Fun	
18/09/2021	14	Fisheries	Fun/ Nukulaelae/ Fun	
22/09/2021	15	Private charter (Pisila.k)	Fun/Vaitiupu/Fun	Drop Cargo to Vaitupu

25/09/2021	16	Metronome (Fisheries)	Fun/ Vaitupu/ Nanumaga/ Nanumea/ Fun	Pick Metronome Team from Nanumaga to Nanumea
03/10/2021	17	Health Charter	Fun/ Vaitupu/ Fun	Medivac
08/10/2021	18	Private Charter (Manraoi.V)	Fun/Vaitiupu/Fun	
15/10/2021	19	MPUI (Simon.A)	Fun/ Nukulaelae/ Fun	Drop PWD Team to Nukulaelae
20/10/2021	20	Climate Change (Pepetua.L)	Fun/ Vaitupu/ Nui/ Fun	Pick up Climate Change from Nui to Funanfuti
26/10/2021	21	MPUI (Simon.A)	Fun/ Vaitupu/ Fun	Drop PWD Team to Vaitupu
28/10/2021	22	Private Charter (Fakapoga.F.)	Fun/Vaitupu/Fun	Drop Deceased family to Vaitupu
30/10/2021	23	Waste Department	Fun/Vaitupu/Fun	Drop Waste Department Team to Vaitupu
01/11/2021	24	Lands Department	Fun/Vaitupu/ Nukufetau/ Nui/ Nukufetau/ Nui/ Fun	Drop Lands Department to Vaitupu and continue with the Waste Department
13/11/2021	25	Waste Department	Fun/ Niutao/ Nui/ Nanumea/ Nanumaga/ Niutao/ Fun	Drop Deceased family to Niutao and Continue with the Waste Department
27/11/2021	26	Health Charter	Fun/Nukufetau/Fun	Medivac
28/11/2021	27	Lands Department	Fun/ Nui/ Vaitupu/ Fun	Workshop
01/12/2021	28	Waste Department	Fun/ Niulakita/ Nukulaelae/ Fun	Workshop
11/12/2021	29	Fisheries and Lands Department	Fun/ Nui/ Nukufetau/ Vaitupu/ Nukufetau/ Fun	Fishing Training and Pick up Lands Department Team from Vaitupu to Funafuti

Fisheries Workshop Mechanical

The Fisheries mechanical workshop was established for maintenance purposes. However, the workshop provides facilities for maintenance all fisheries assets. It is expected that crew from the two vessels will be assisting the mechanics in all maintenance that has to be done. Table 2 shows the planned activities that have been achieved and not achieved by the workshop mechanics

Table 16: Activities achieved & incomplete by the mechanical workshop

Workshop Mechanical				
		Achieved	Not Achieved	Reason
Air-condition	Workshop Aircon			Cleaning indoor and outdoor
	office workshop			Rearranging inside office
	Manaui Office	There is no Office for the Manaui		
	Store room A/C			Handed over to Tekiali
Vehicles	Crane Trucks (Hino)			No maintenance done to it due high cost of maintenance.
	Toyota Hilux (old one)			Repair beyond budget
	Toyota Hilux			Tune up maintenance (changing oil, filters, fuel lines and brake lines etc.....
	Motor cycle			No budget for maintenance
	4-wheel motor cycle			Tune up done (changing oil twice greasing drive shafts and four-wheel oil etc...
	Mazda Pickup (PROP)			Oil change fuel filter tire service and brakes
	Ssang Yong Korando			Body filling, painting, renew crankshaft oil seal, cleaning water passage, filling ac and check for leakage.
Speed Boat	Lancer with trailer /single motor (Evinrude 75 E-Tecc			Cleaning spark plugs, fuel filters, replacing water separator and checking battery status. (While waiting for fuel tank someone cuts a hole on one the tubes, now we are waiting for repair kit.
	Zodiac Pro Grey Red with trailer/double motor 60 HP (four stroke)			Awaiting spare parts from the OFCF.
	Zodiac Pro Grey with Trailer/double motor 60 HP Yamaha four stroke			Changing spark plugs, Oil filter, Fuel filter, water separator, batteries and painting trailer replacing tires.
	Manaui I 30HP Yamaha (spare parts eng)			Done by chief engineer
	Manaui I 30hp Yamaha			Done by chief engineer

	Fiber glass with trailer/90 HP single motor sea Pro 4 stroke			Awaiting spare parts from Talua.
Dock Yard	Winch hut			No maintenance done to it.
	Slipway tracks			Still working on slipway. Continue on to next year
	slipway Ramp			
	slipway cradle			
Ships	Manaui I			
	Manaui II			

Issues and Challenges

- FADs Program
  - Inconsistent data on the number of fishermen fishing and not fishing on FADs in the outer islands

- SEA SAFETY
  - Grab bag inspection
  - Data need to be recorded accurately and precisely

- POST HARVEST
  - No protective gears (such as hair net and disposable gloves) that can be used to marinate and prepare food to prevent the spread of germ, and of course improve the hygiene environment.

- TRAINING
  - Fishing techniques
  - No protective gears (rain coat, boots) for participants during practical session (day and night) training out at sea
  - Very short period of time for the training (due to delay of issuing of DSA & payment for the training)
  - Procure more fishing gear sets enough for the participants

- VESSELS OPERATION
  - Manaui I
  - Management issue (no voyage report including daily activities and no defect list of the vessel)
  - Delay of payment for ration, sea going allowances and fuel
  - Requirement of valid certificates

- Manaui II
- Requirement of valid certificates

- Fisheries Workshop Mechanical
  - Management issue
  - Misuse of the workshop for private purpose

Oceanic Section

General

This was another difficult year for the Oceanic due largely to the impacts of the COVID19 pandemic. Areas within the Oceanic section most affected by the Pandemic were the Observer program, Fisheries surveillance, and transshipment. Observer livelihood remains a top priority for the observer program with the two initiatives started last year being continued. Fisheries surveillance was and has been extremely challenging with no observers on fishing vessels, no boarding, limited aerial surveillance, and limited surface surveillance due to the inactivity of Te Mataili for the whole year. A new surveillance tool was also introduced this year and trial runs being commissioned in the last quarter of this year. Some interesting results have been produced. Offshore transshipment continued with a massive drop in the number of events being observed. The offshore area perhaps has something to do with this fall, at a time when other ports have been opening up for transhipment.

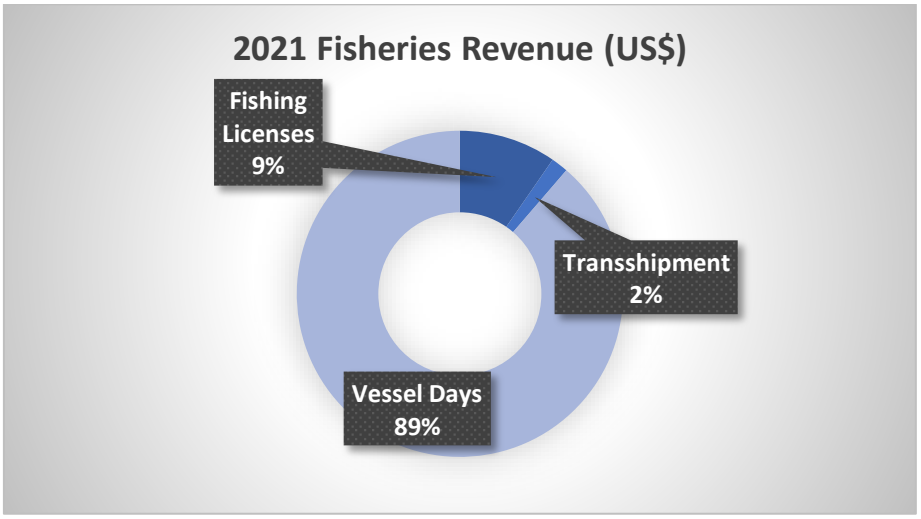


Figure 18: Fisheries revenue (US$)

It was not all bad news, and despite the COVID19 and its impacts, the department managed to collect a combined revenue of US$32,296,851.10. The selling of fishing days was the biggest contributor accounting for 89% of the total revenue, fishing licenses 9% and transshipment the least with 2%.

Financial support for implementation of the Oceanic Activities for 2021 as well as the past several years came from a range of sources including the World Bank (via PROP) and NZ (via TFSP2), the major donors. Next year will be the final year of the PROP initiative and its departure will leave behind a lot of unfunded activities. We are hopeful that other important bilateral partners will be able to step up their financial assistance to the Oceanic activities once PROP is finished.

Licensing Section

The licensing unit, comprising of three staff, is responsible for the issuance of fishing licenses. An important part of their work is to ensure that no vessel with a criminal record get a chance to fish in Tuvalu's EEZ, a role made easy with the advancement in technology and accessibility to information. Since Tuvalu is part of the PNA group, processing of fishing license application

is now possible electronically via the PNA FIMs platform. The only exception to this being the pole and line fleet who can still lodge their applications outside of this platform.

Fishing licenses issued

Despite the COVID19 pandemic, business continued as usual for tuna operators. This year a total of 183 fishing licenses, 24 less than last year and 60 fewer than the peak in 2019, were issued by the department under the bilateral arrangement category. Of this the Purse Seine made up 59%, Lonliners and Reefer Carriers 14% each, and 6% each for the Pole and line and bunkers.

Fishing vessels licensed under the other arrangements namely the FSM and US treaty are treated separately and were not part of the 183 licenses shown below.

Table 17: Number of bilateral fishing licenses by gear type since 2017 issued by Tuvalu for the past few years

Years	Purse seine (PS)	Long line (LL)	Pole and line (PL)	Reefer Carrier (RC)	Bunker (B)	Total
2015	73	26	1	34	7	141
2016	88	66	3	41	1	199
2017	82	68	0	40	0	190
2018	98	78	0	45	0	221
2019	108	70	14	51	0	243
2020	101	31	16	55	4	207
2021	108	27	12	26	10	183

As illustrated above, the PS has been and is the dominant fleet type operating consistently in the Tuvalu EEZ for the past many years. Between 2016 and 2019, there was strong presence of the Korean fleet in our EEZ which accounts for the higher number of LL vessels during that period. A change in licensing policy for LL fleet which came into effect since 2020 provoked the Korean to leave Tuvalu's EEZ. A drop was also obvious in Reefer carriers, and maybe linked to border closure and due to transhipment being done offshore.

In terms of vessel nationality, the PS fleet in 2021 was largely dominated by Taiwan and Korea together consisting more than 50 PS followed by the Phillipines, Panama and China. The LL fleet on the other hand consists of three countries only including China (22), Fiji (4 vessels) and Tuvalu (1 vessel). The Korean LL fleet, once was the dominant, have vanished following the adoption of LLVDS by Tuvalu since 2020. As for the Pole and line, all the 12 licenses this year were from Japan.

Other purse seine vessels operating under other arrangements (US treaty and FSMA) consists an important part of the overall tuna fleet. Vessels once enlisted under these two schemes can fish in the EEZs of any member parties provided they have fishing days (VDs). The figure below shows the total number of licenses for 2021, by flag and by arrangement. An upward trend is seen in the total number of FSMA vessels but the opposite is true for the US treaty with only 17 treaty vessels being registered in 2021.

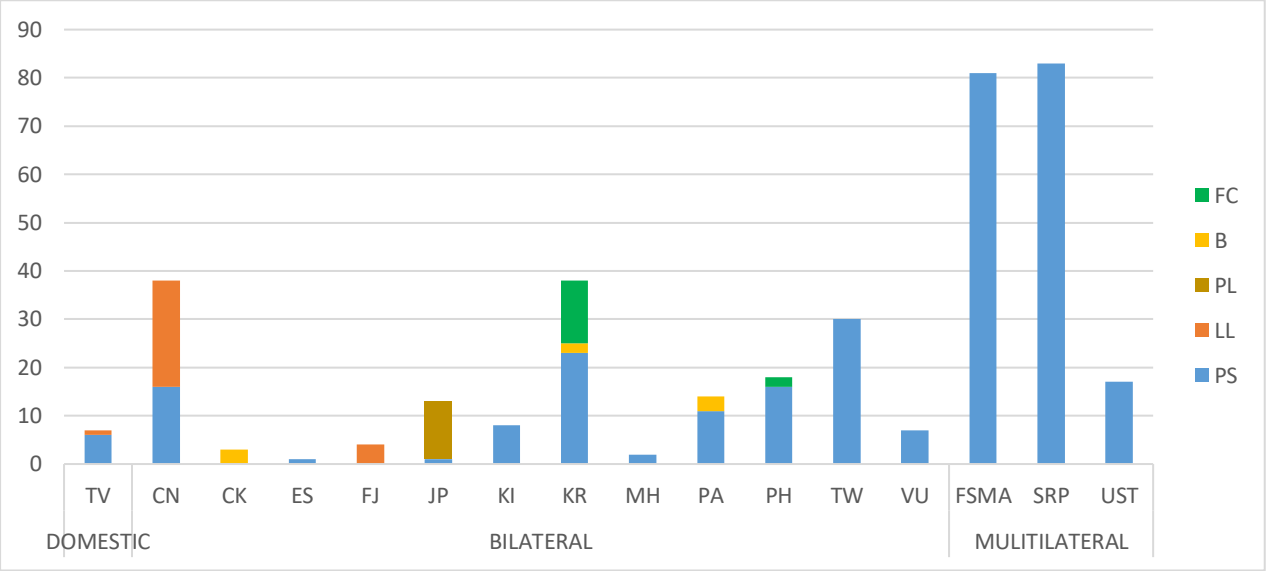


Figure 19: Fishing licenses by flag and by arrangement for 2021. Note: UST & FSMA fishing licenses are issued by administrators of those schemes (FFA & PNAO) & valid fishing in PNA waters

Fishing license revenues

Fishing licenses comprising of four categories recorded a combined total of US$3,111,335 of which US$1.2m (39%) was attributed to the new vessel flagging (flagship) arrangement and the other 61% from fishing licenses.

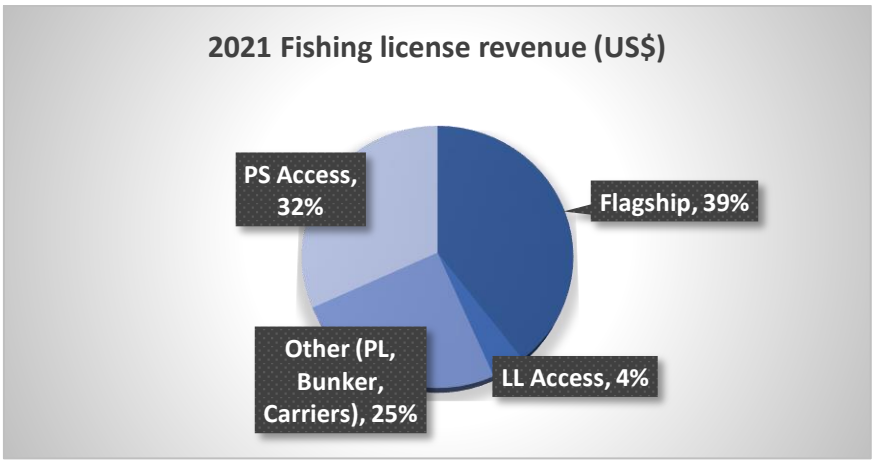


Figure 20: Fishing license revenue (US$)

Domestic Fleet

The Department approved three more additional vessels under the flagship arrangement this year thus increasing the number of our domestic fleet from four in previous years to now seven as shown in the table below. All the seven vessels are based abroad with the closest vessel being the Pakasoa which is based in Suva.

Table 18: Tuvalu flagged vessels. Source: WCPFC RFV

Vessel name	Flag	Registration Number	IRCS	Vessel Type	Auth Period From	Auth Period To
COSMOS KIM	Tuvalu	38498121	T2QA5	Tuna purse seiner	26-Mar-21	26-Mar-22
ELSPETH	Tuvalu	37968220	T2PH5	Tuna purse seiner	10-Nov-20	5-Nov-22
DEOLINDA	Tuvalu	38478221	T2PZ5	Tuna purse seiner	23-Mar-21	23-Mar-22
CARIBE	Tuvalu	37868220	T2PC5	Tuna purse seiner	17-Oct-20	17-Oct-22
TAINA	Tuvalu	34128217	T2BX5	Tuna purse seiner	20-Jul-20	20-Jul-23
QUEEN ELLICE	Tuvalu	37850920	T2FA3	Tuna purse seiner	17-Mar-21	7-Oct-22
PAKASOA	Tuvalu	23011010	T2RB3	Tuna longliner	8-Feb-20	8-Feb-22

Domestic Purse Seine Catch

The domestic PS fleet of six vessels landed a combined total catch of 29, 639mt in 2021 (Table 19 & Figure 22), as shown below. It is evident that the catch increased between 2019 and 2021. The number of vessels increased from 1 to 3 at the end of 2020 and from 1 to 6 by the middle of 2021, which laid the groundwork for this occurrence. Skipjack (SKJ), which made up 24,124mt (81%) of the total catch, was followed by yellow fin tuna (YFT), with 4,889mt (17%), and bigeye tuna, with 626mt (2%) (BET). However, catch data for 2021 is still provisional at the time of the report with more data expected to arrive. None of the catch being landed in Tuvalu.

Table 19: Purse seine catch by Tuvalu flagged vessels. Source SPC TUFMAN2 Dorado Report- Recon. Note that 2021 catch is provisional and expected to change as data become available

Year	SKJ	BET	YFT	TOTAL (MT)
2017	3573	209	1859	5641
2018	8721	746	1619	11086
2019	6364	107	304	6775
2020	8160	547	1095	9802
2021*	24124	626	4889	29639

***Provisional**

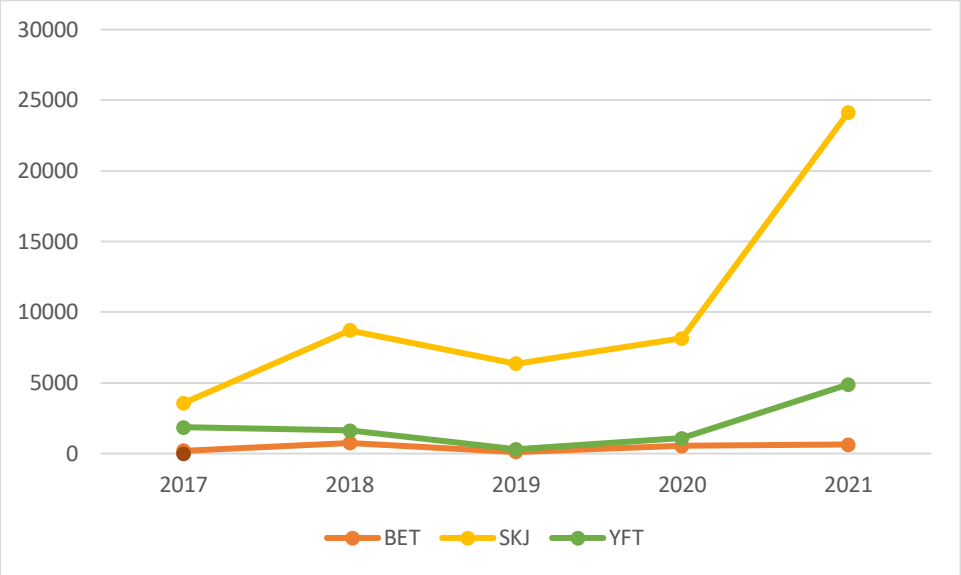


Figure 21Catch by species composition. TUFMAN 2 Dorado report – Recon

Domestic Longline catch

The overall catch for the Tuvalu longline vessel in 2021 was 95 mt (Table 20 & Figure 23). The maintenance of the vessel and certain financial issues brought on by COVID 19 were the causes of the declining catch. The biggest catch was made up mainly of albacore tuna species, which totaled 57 mt (60%), followed by bigeye tuna (BET) 23 mt (24%), yellowfin tuna (YFT), 9 mt (9%) and skipjack tuna species (SKJ), which totaled 6 mt (6%).

Table 20: Longline catch by Tuvaluan flagged vessels. TUFMAN 2 Dorado report-Recon

	ALB	BET	SKJ	YFT	TOTAL (MT)
2017	175	111	7	164	457
2018	121	64	13	106	304
2019	64	53	32	76	225
2020	117	9	5	16	147
2021	57	23	6	9	95

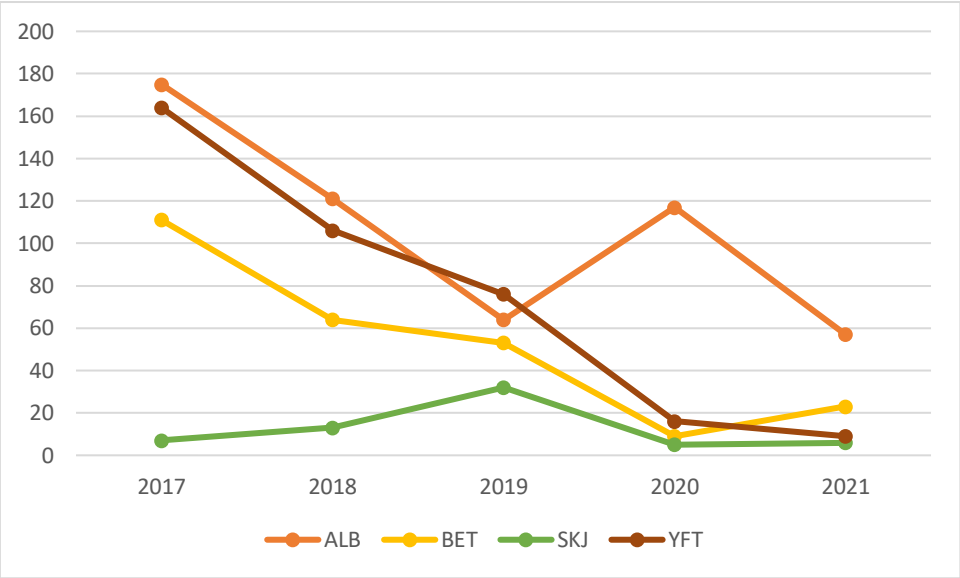
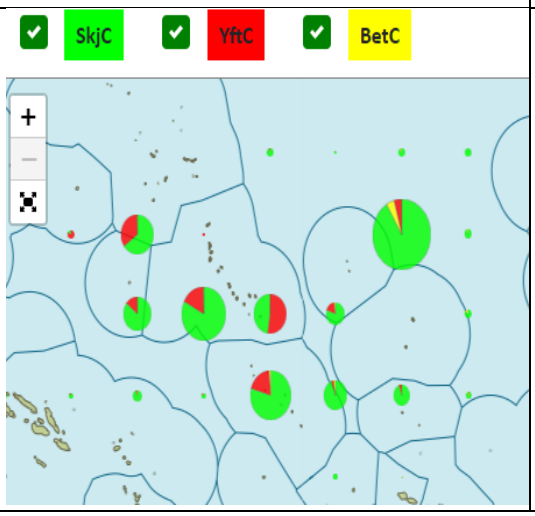
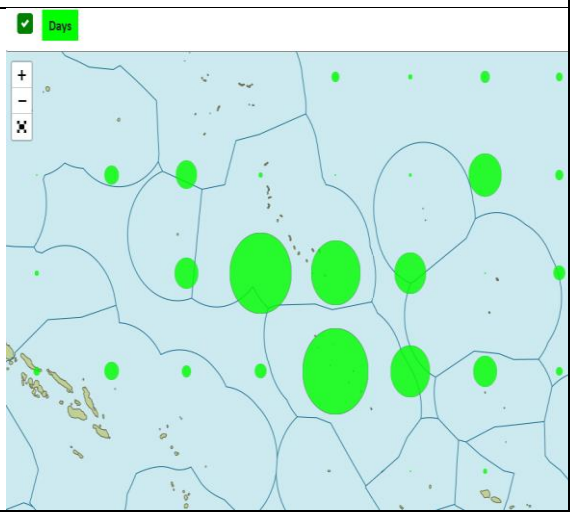


Figure 22: Catch by species composition by Tuvalu Longline flagged vessels from 2017-2021. Source: TUFMAN 2 - Dorado report - Recon

Catch and Effort distribution for Tuvalu flagged vessels (PS & LL)

The domestic PS fleet fished over a wide area, both inside multiple EEZ's and in the High seas targeting mainly skipjack tuna, however, yellowfin and bigeye also constitute a significant portion of the catch. A closer examination of fishing effort (days) tends to indicate a strong tendency for our PS fleet to fish in the two EEZs of Kiribati and Tuvalu (top left of the figure below). However, in terms catch, better catch rate seems to occur in the North eastern beyond the EEZ of Howland Island to the east (top right of picture below). The LL fleet in contrast fished mainly in the Tuvalu EEZ and the open HS southern of New Caledonia (bottom left of below picture). Fishing in the high seas seems to produce better yield for the LL fleet as demonstrated by the size of the green circle (bottom right).

Year	Distribution of catch	Distribution of effort (vessel days)
2021 PS		

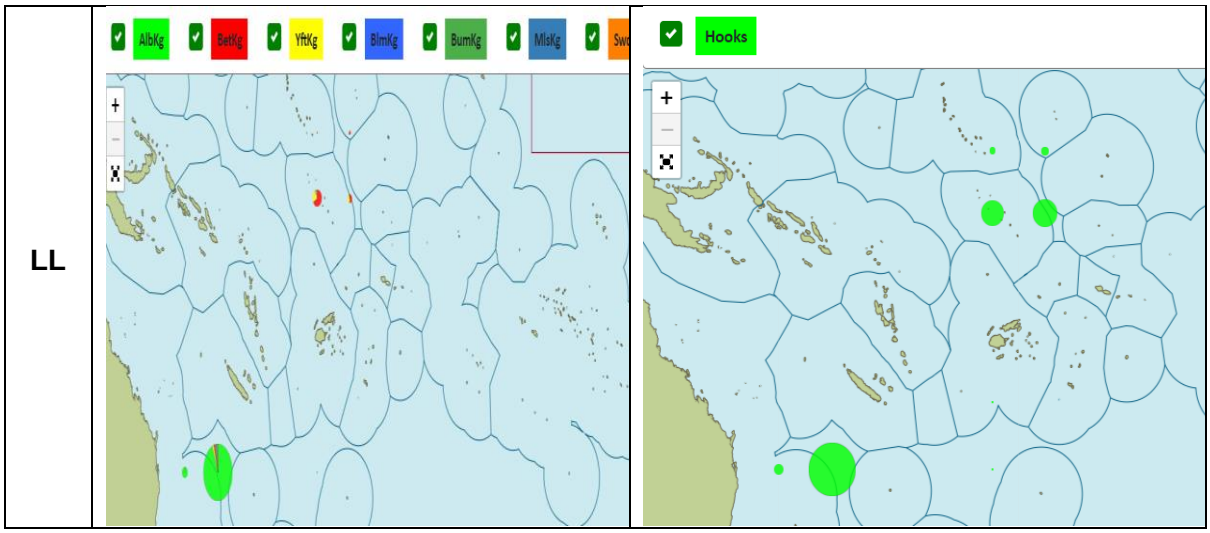


Figure 23: Fishing area of the Tuvalu flagged vessels in 2020. Source: SPC TUFMAN2 Dorado report - Recon

Catch taken by all fleet in Tuvalu EEZ

Annual catch from Purse seine fleets

The total tuna catches taken within our EEZ by the PS fleet in 2021 was 61,246mt (Figure 5). Of this, the Korean fleet contributed 46% (28,041mt), Kiribati fleet 12% (7307mt) and Chinese with 10% (6082mt). As expected, skipjack tuna dominated the catch followed by yellowfin tuna then bigeye tuna.

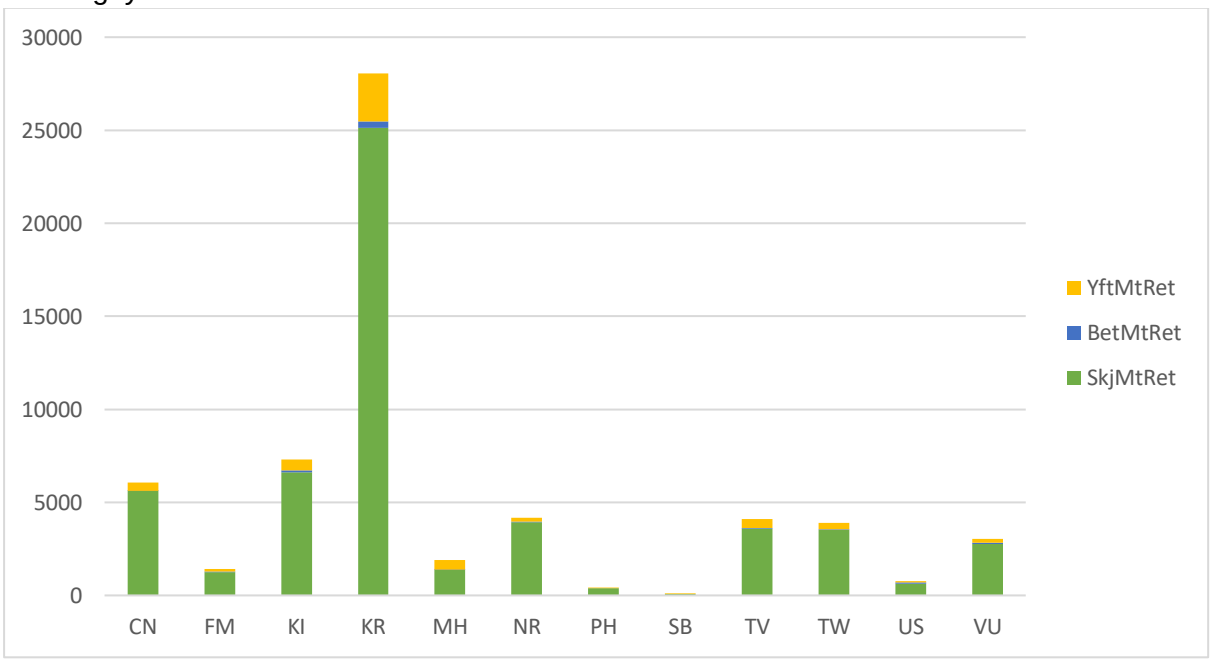


Figure 24: PS catch composition in Tuvalu EEZ by flag. Source: TUFMAN2: Dorado report - Recon

Annual catches from Longline fleets

The LL fleet comprised of only Chinese and Tuvaluan vessels. The total tuna caught in Tuvalu's EEZ by the two fleets was 71.803mt which is less than the catch for 2020. The Chinese fleet contributed 62% (45mt) and Tuvalu 38%. However, data coverage for 2021 is still incomplete at the time of the report hence the catch presented here is only provisional.

The catch consisted mainly of tuna with yellowfin tuna accounting for 43% (31 mt), bigeye 29% (20mt), albacore 15% (11mt). The remainder 12% (9.8mt) consisted of other species including billfish.

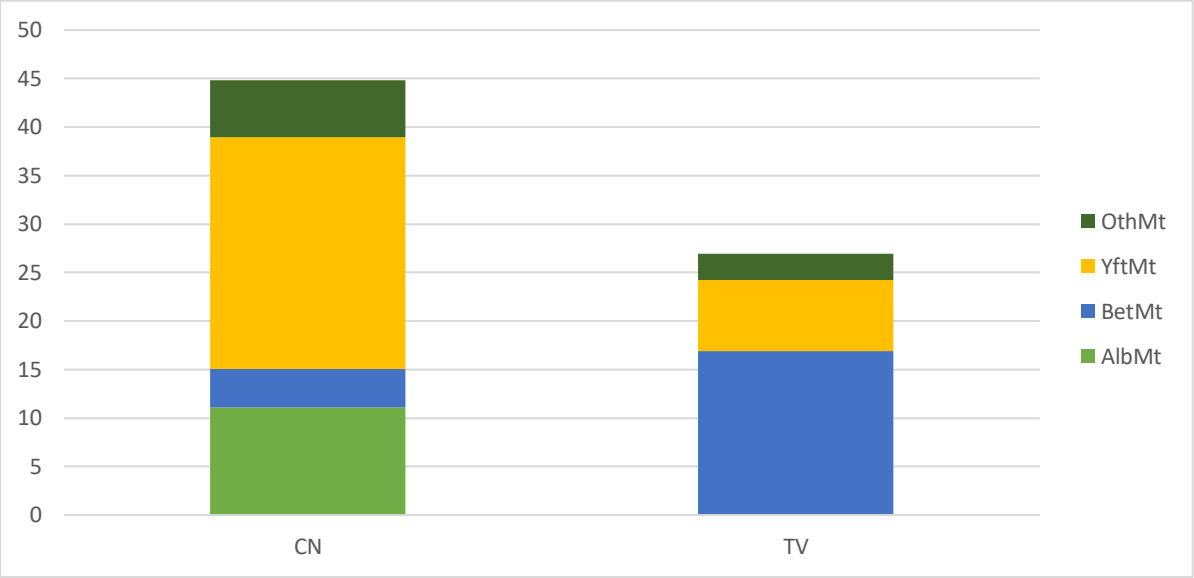


Figure 25: Catch composition from LL fleets in Tuvalu EEZ in 2021. Source: TUFMAN 2 - Dorado report - Recon

Vessel Monitoring System (VMS) and Vessel Day Scheme (VDS) Section

The VDS/VMS, a newly established sub-section since 2020 consisting of two staff, is responsible specifically for the daily management and operation of the two systems: FFA VMS and PNA VDS.

In 2021, the COVID19 pandemic remains a major obstacle and while it has adversely affected other key areas of operations such as observer and transhipment which Tuvalu relies upon for revenues etc., the VDS continued to do well and was able to generate some extra revenues which has helped make up for the shortfall observed in other fisheries revenue streams. VMS on the other hand continued to play a critical role in the monitoring of Tuvalu's vast EEZ.

Substantive progress was made in several areas highlighted as ongoing challenges in past annual reports. It includes the appointment of the senior VDS/VMS officer to oversee and manage the daily operation of the sub-unit. The appointment had enabled confinement of VDS related works/activities to VDS/VMS officers only. In the past, VDS matters are handled by multiple staff which was proven to be problematic when it comes to reconciliation, record keeping and reporting.

Due to the sustained prevalence of COVI19 worldwide this year a range of VDS related trainings both regional and international meetings were once again restricted to virtual

setting and done through the zoom platform. In its effort to assist participation by its membership in zoom meetings, the FFA donated one teleconference TV screen along with an internet dish to certain members upon request. Tuvalu was one of the recipients of this generous donation and it is now used for all zoom meetings. Despite the good effort, connectivity continues and remain to be real challenge.

VDS 2021 Party Annual Effort Allocation (PAE):

The vessel day scheme (VDS) is a management tool for managing tuna stocks in PNA countries. As part of the scheme each individual member will receive an annual allocation (fishing days) which the parties can then trade to any interested fishing partner. The PAE is determined by a meeting of the PNA membership which takes place once yearly. The size of PAE changes every year depending on amount of fishing activities occurring in one's zone in the past few years. Hence the more fishing in zone the better the prospect of a higher PAE.

For Tuvalu a steady gradual climb in its PAE allocation (exception of 2019 and 2020) is being observed for the past five years, indicating good fishing in our EEZ. For this year, Tuvalu's PAE was 2,223 days of which 1882 were allocated to bilateral partners, the rest went to other arrangements such as domestic vessels and pooling etc.

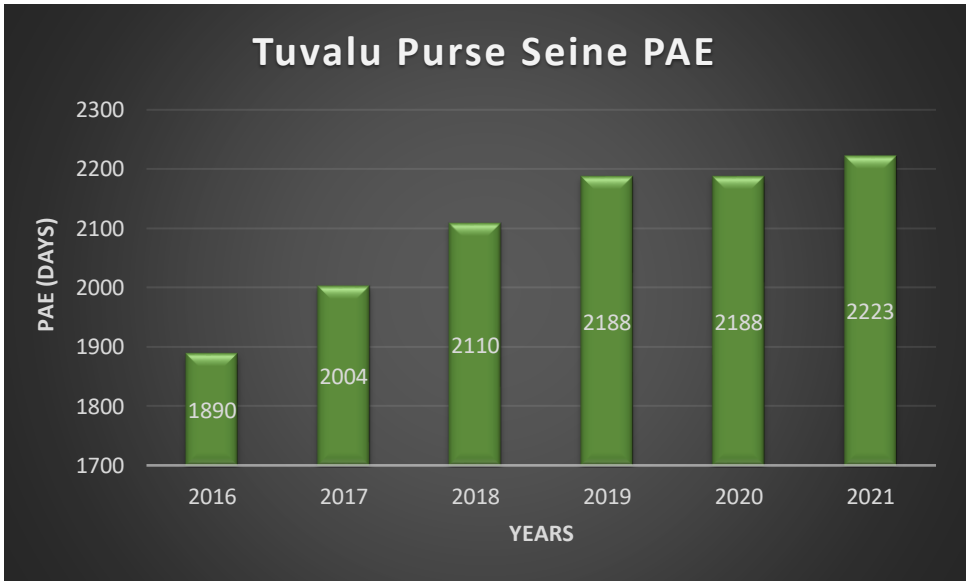


Figure 26: Tuvalu's Purse seine Annual PAE since 2016

Traded days

The transfer and trading of days (traded) between different countries, different fishing companies or within the same company is possible under the scheme and is becoming increasingly popular in recent times with 852 days being traded this year compare to 308 and 619 in 2019 and 2020 respectively. A small administrative charge applies to every single day transferred and the annual revenue from traded days has substantially risen as shown below.

Table 21: Traded days statistics for the 5 past years including 2021

Statistics	2017	2018	2019	2020	2021
Total days traded	275	347	308	619	852

Total revenue (US)	678,000	494,000	170,575	824,000	1,099,000

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 indicates that the usage has been consistent with the management tool to monitor VDS and, most importantly, the VDS regulations.

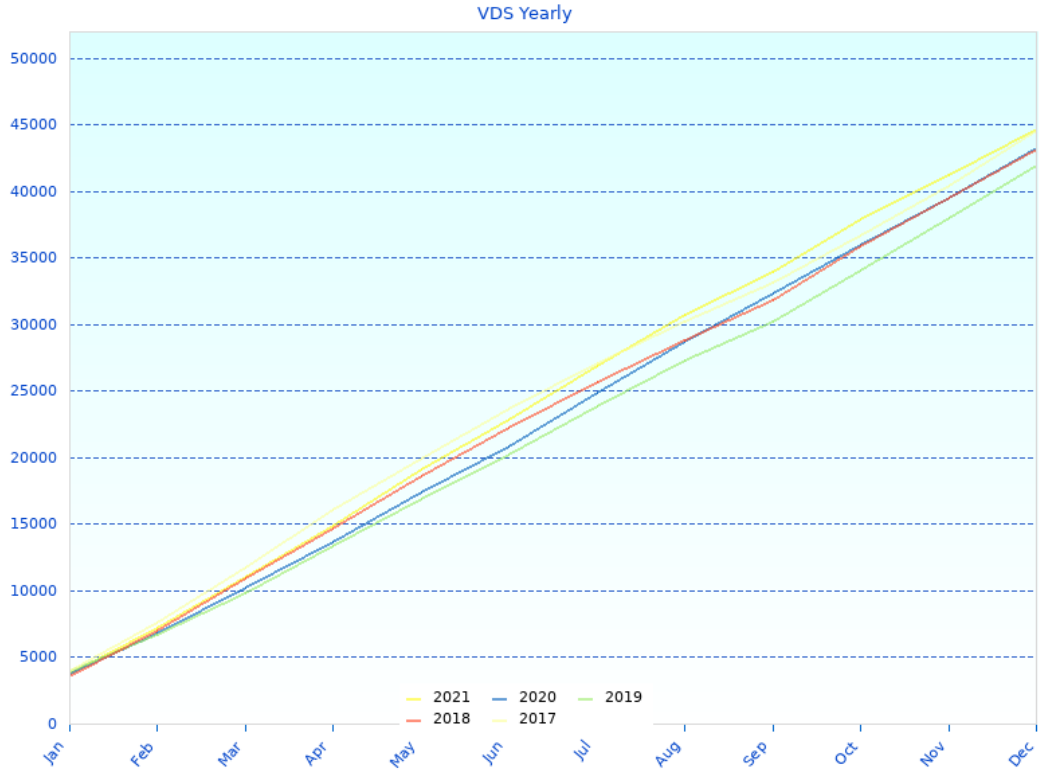


Figure 27: Total usage of days under the PS VDS (all parties) in the last 5 years

VDS usage

The year closed off with total usage of more than 95% of the total allocated fishing days. Nevertheless, when this report was prepared, days for 2021 were yet to be closed until the end of March 2022. Therefore, there might be a possible change in the records by the end of the VDS year.

Table 22: Utilization of Tuvalu's Bilateral usage under the purse seine VDS for 2021

Foreign Company	Days Allocated	Days EEZ	Days Used	% Used	Days Remaining	% Remaining
Albacora SA	15.0	2.7	0.9	6.1	14.1	93.9
China Overseas Fisheries Association Distant Water	254.0	244.4	242.5	95.5	11.5	4.5

Fisheries Center for Promotion & Demonstration						
DONGWON INDUSTRIES CO. LTD.	0.0	0.0	0.0	0.0	0.0	0.0
Fair Well Fishery Co. LTD	20.0	24.8	19.6	97.9	0.4	2.1
Japan Far Seas Purse Seine Fishing Association	7.0	0.5	0.5	6.6	6.5	93.4
Kiribati and KT Fisheries Co. Ltd	30.0	30.0	29.1	97.0	0.9	3.0
Kiribati and Sajo Fisheries Co. Ltd	36.0	37.2	37.2	103.2	-1.2	-3.2
KIRIKORE	50.0	51.2	49.9	99.8	0.1	0.2
Koos	40.0	23.1	23.1	57.8	16.9	42.3
Korean Overseas Fishing Association	845.0	915.2	892.2	105.6	-47.2	-5.6
RD Fishing Group	40.0	24.1	24.1	60.2	15.9	39.8
Sajo - Vanuatu	76.0	76.9	76.2	100.3	-0.2	-0.3
Silla Co. Ltd	0.0	0.0	0.0	0.0	0.0	0.0
Taiwan Deep Sea Tuna Purse Seine Boat-owners And Exporters Association	101.0	97.5	92.9	92.0	8.1	8.0
Trans Pacific Journey	20.0	12.5	12.5	62.4	7.5	37.7
TOTALS	**1534**	**1539.9**	**1500.6**		**33.4**	

VDS Revenue

The total 2021 revenue from the VDS and the US treaty combined was $28,640,086.00 US, 4% more than the previous year, and was second highest since start of the scheme. Our bilateral fishing partners contributed the most accounting for 44% of this year's revenue, sub-regional (pooling, FSMA) at 28%, Domestic (Tuvalu flagged vessels) 19%, US treaty 5% and traded days 4%.

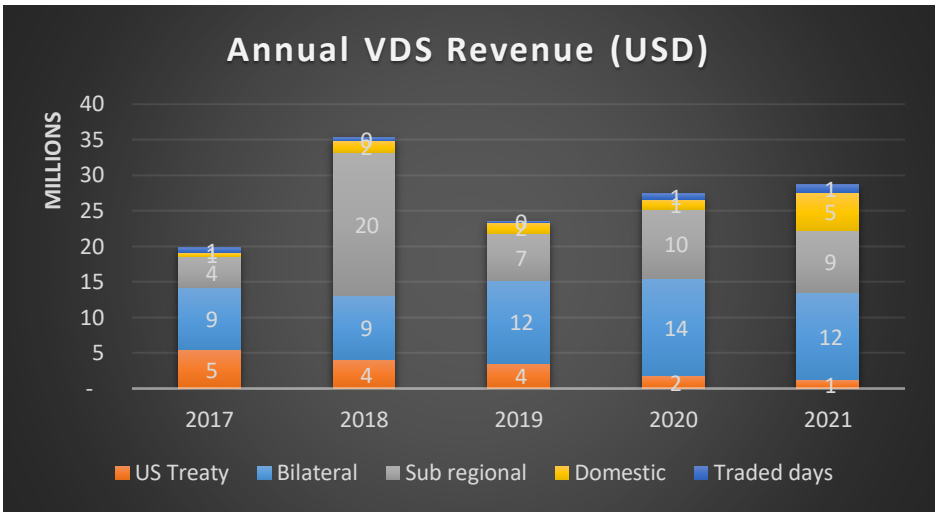


Figure 28: Annual VDS revenue for years 2017- 2021

The US treaty revenue, split in two components (equal share and fishing/vessel days), continues to shrink (5m in 2017 to 1m in 2021). The US did not commit to purchasing of treaty fishing days hence no treaty share for fishing days was received thus contributing to the low treaty income in 2021. This non-payment of fishing days by the US, however, did not impact fishing operations of their vessels due to the existence of bilateral fishing arrangements between them and a few Pacific Islands. A mini pool arrangement between Tuvalu, Tokelau and the US is one of such arrangement which came into being in 2020. Revenues from this poling arrangement falls under the sub-regional category.

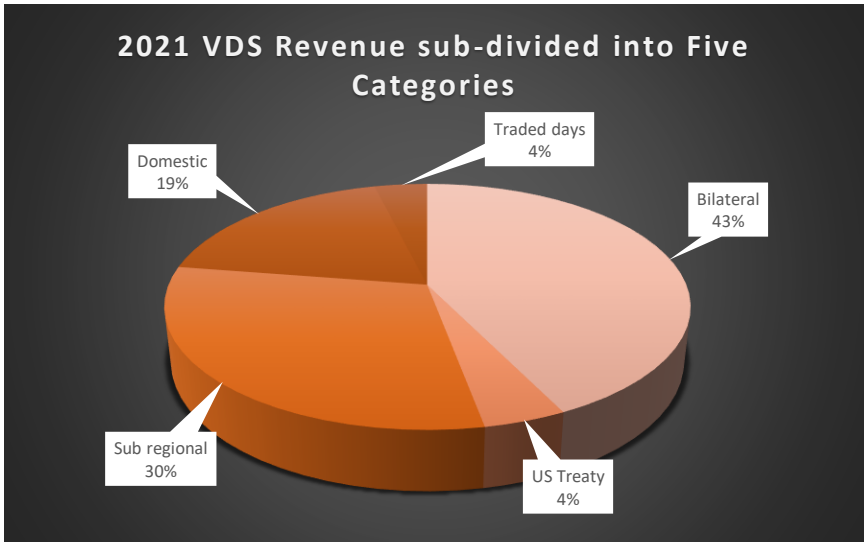


Figure 29: Shows the 2021 total VDS revenue collected by 5 different categories

Non-Fishing Days:

The validation and verification of Non-Fishing Days (NFDs) claims is an important part of the VDS set up and is an ongoing activity. Such an important work takes place via the PNA FIMs Platform. Apparently, and despite the many years of the scheme being in operation, yet there are still certain bilateral companies who appear to be unaware of the correct process pertaining to NFD claims as manifested in duplication of NFDs claims. Any duplication, unfortunately is declined or rejected.

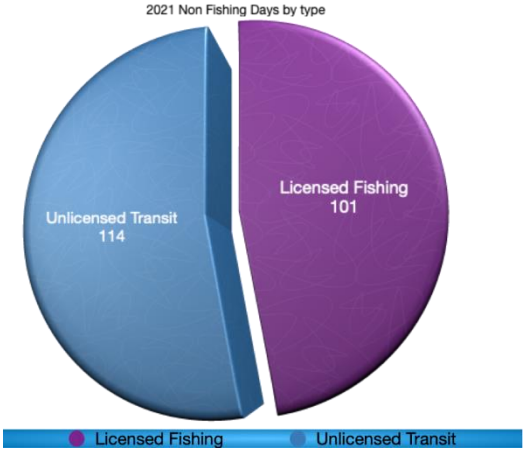


Figure 30: Total number of NFD claims submitted in 2021

There are two broad categories of NFDs under which a vessel can make a claim.

i. Unlicensed transit – applicable only for non-licensed vessel transiting through EEZ.
ii. Licensed Fishing – for licensed vessels only but who must meet certain specific requirements. At the moment eligibility is restricted to the following the reasons which may include bad weather, breakdown, total catch, and sail to discharge in port.

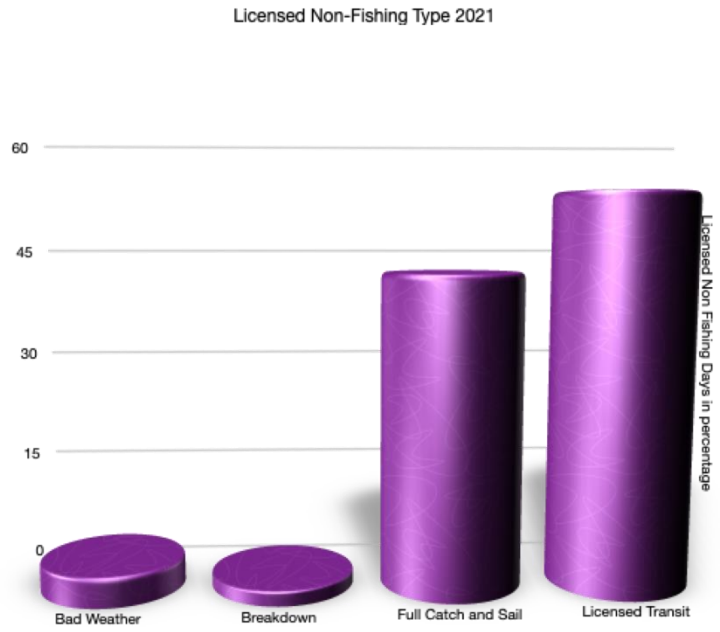


Figure 31: Total PS licensed transit NFDs lodge for approval in 2021

As the figure above shows, 52% NFD approvals relate to licensed transits, 42% full catch and 6% bad weather and breakdown.

Meetings, Workshops, Trainings attended in 2021.

Below is a summary of meetings, workshop and trainings that VDS/VMS officers participated in during the reporting period.

Table 23: List of workshop/ trainings/meetings attended in 2021

Workshop/Training/Meeting	Dates
Global Fisheries Enforcement Training Workshop	13th -14th July, 2021
CDS Virtual Training	22nd July, 2021
E-Reporting Training	26th July, 2021
Tropical Tuna Measure	29th September, 2021
Technical Compliance Committee Meeting	21st - 27th September, 2021
South Pacific Coastguard Workshop	15th -17th November
18th Regular Session of the Commission	29th - 7th December

Challenges and Issues Encountered.

Intercompany VDS transfer

Monitoring of intercompany transfer of days was difficult since no form exists for this kind of transfer. Hence a form was developed and incorporated into our Access Agreements. Companies are therefore encouraged to use this form when requesting a transfer or request would not be processed.

Fisheries revenues information mismatched

The longstanding inconsistency existed between the Treasury and the Fisheries department regarding Fisheries Revenues data was given special attention this year. And despite the excellent effort put in by the fisheries team to reconciling, nothing seems to have happened with discrepancy still obvious in the data that have been already dealt with. A combination of factors maybe at play but from the fisheries perspective the lack of dedication on the part of the Finance to the reconciliation process plays a big part. The problem surely will continue on unless the Ministry of finance takes this issue seriously.

Delayed payment advice from finance department

Financial payment advice, a role played by the finance department, is an integral part of our licensing and VDS processes which has direct bearing on approval and disapproval of a request. While a delay is not unusual, a delay by a month was the longest and worst experience in 2021.

VDS revenue record-keeping

The concern is due to the absence of a database or a central data storage system. Even accessing to an external hard drive for backups storage in the event of a computer failure was difficult. This led the section to work with the PNA Fisheries Information Management System (FIMS) developer and the Parties to the Nauru Agreement Office (PNAO) on the development of a VDS invoicing module for Tuvalu. The new module will contain features that will greatly

assist Managers in their decision-making role. The work will be flagged as an ongoing task for completion in 2022.

Longline VDS

Tuvalu officially started to implement the LL VDS this year. As a new scheme problem are anticipated to arise. One thing seen as an issue from Tuvalu's perspective was the use of a length factor for the calculation of fishing days. The scheme dictates that a length factor of 0.8 be applied to vessels 40m or less whereas those greater than 40m a length factor of 1.3 per 24 hrs would apply. Tuvalu is yet to consider the length factor but for now it still considers the fishing day as the full 24hrs irrespective of vessel length. The issue has been shared with the PNAO with further discussions expected going forward.

Vessel Monitoring System (VMS)

COVID-19 continued to affect the world on an unprecedented scale, and Tuna fishery in the Pacific region is no exception. The department has been working tirelessly realigning its national policies and processes to ensure the continuation of fishing activities in Tuvalu EEZ. And with other MCS options become unavailable due to the COVID19 crisis, the Vessel Monitoring System remains functional and has been the primary platform used for fisheries surveillance purposes. Some brief highlights of the 2021 VMS achievements are provided below;

Vessel activities monitoring

The VMS provides Tuvalu Fisheries Department with the capability to monitor and track fishing vessel movements in our EEZ in real time, hence it is a requirement by law that every licensed vessel is to be fitted with an FFA VMS.

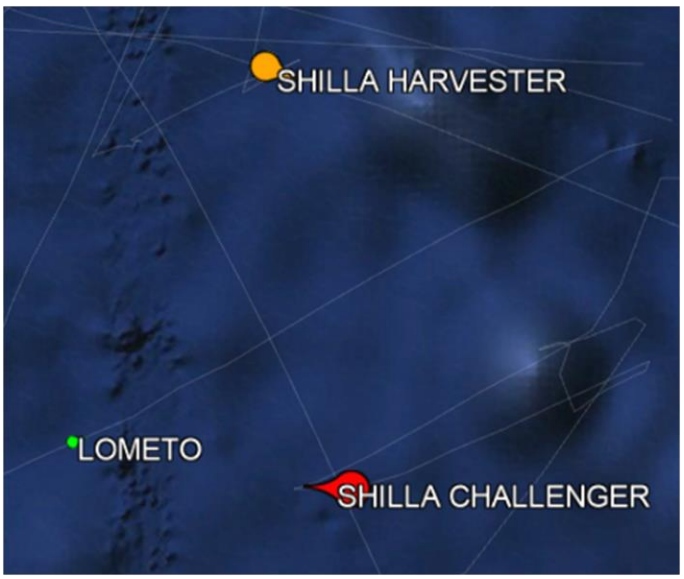


Figure 32: an example of the three-compliance index status where monitoring is focused

The FFA VMS main platform Track-well is overlaid on the regional surveillance picture (a separate computer program), which provides various analysis functions for day-to-day monitoring work. One of the critical purposes of regional surveillance is the ability to differentiate license, unlicensed vessels and vessels that might have a compliance issue in

Tuvalu or other member's waters. Each vessel is assigned a compliance index (colour) depending on its status when entering the EEZ. Red is for vessels with compliance issues, amber is for vessels not licensed in Tuvalu waters, and green is for vessels licensed to fish in Tuvalu waters. Monitoring is focused on the vessels with amber and red colour to ensure that their non – compliance status is lifted.

There were three main gear types of fishing vessels licensed to operate in our waters throughout the reporting year: Purse seine, Longline, and pole and Line vessels targeting tuna species. The movements and fishing spots of these vessels vary throughout the year. An example is given in the position density on the heatmap. The figures in the map represent an average number of positions recorded in a 60x60sq.Km block. The red block has the highest average number of positions due to transhipment activities in the transhipment designated area (DTA). Support vessels, fish carriers and bunker vessels were also licensed to support fishing vessels in transhipment and bunkering activities.

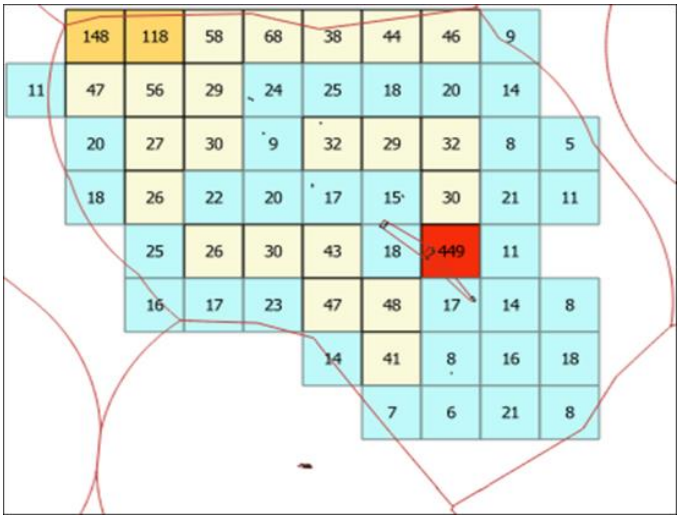


Figure 33: Heatmap showing highest average number of positions received in 2021

As part of the monitoring work, an analysis was made on the number of vessels operated in Tuvalu waters to identify trends in the operation of various gear types for 2021. The results shown in the table below, China has the highest number of combined fleets whilst Korea has the highest number of purse seine fleets operated in the zone. Panama and Korea account for the highest number of carriers and bunker vessels.

The figures in the graph also account for unlicensed vessels transiting through the EEZ and not demonstrating tracks that may indicate fishing activities. Tuvalu's EEZ is adjacent to the High seas pocket 2.

Figure 34: China recorded the highest number of LL & Korea with highest number of PS operating in 2021

Marine radar installation

A marine radar to monitor transshipment in the lagoon will soon be installed in the VMS/MCS room. This is all part of effort to bring transshipment back into the Funafuti lagoon.

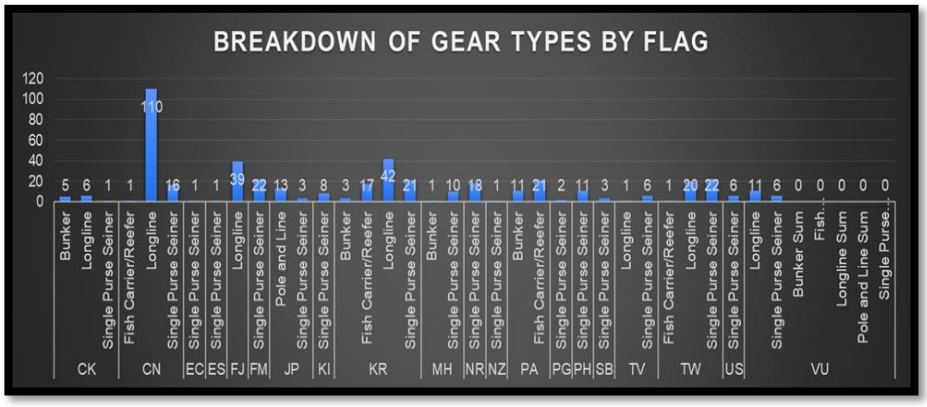
VMS vs Surveillance operation

The FFA VMS has been and is a vital tool in providing useful intelligence for the planning and executing air and surface (sea) surveillance operations. The success of the three surveillance operations this year were due in part to the ongoing support from the VMS.

Other Works

Satellite Surveillance Trial

Due to COVID constraints and the limited surveillance capability, other means (new technology) were explored leading to the commissioning of Satellite Surveillance trials in the third quarter of 2021. The system simply detects Radar Frequency (RF) signals emitted by any vessels. As such, it is a highly useful tool for the detection of unlicensed fishing vessels. The only set backs are that the system is complex and requires highly technical personnel to interpret the gathered data, and also there is a high cost attached. All of which were made possible by the World Bank through its PROP initiative.



A sample picture below is a depiction of a finished product and shows how the data looks like after proper analysis. The red circles denote un-reporting or unidentified vessels and grey circles representing a reporting vessel. The trial will continue next year and will stop when PROP ends in August. By then we should be able to know more about the trial.

Figure 35: satellite scan results correlated to VMS data & AIS. Grey means ok & red means unidentified or unknown and could potentially be an IUU vessel

VSAT maintenance

The FFA VSAT is the backbone of the VMS operation as it provides a steady and reliable internet connection without which real time monitoring of vessel activities in Tuvalu EEZ would be highly impossible. Considering its importance, regular maintenance had become an integral part of the section's work program.

Challenges and Issues encountered

Outdated Job descriptions

A huge overlap in roles and duties of the two staff exists thus leading to confusion and slow progress in some areas. Hence a review therefore is strongly recommended to be a priority next year to quickly resolve the issue.

Use of VDS room for Meetings

The use of VDS/VMS office as a zoom venue on a frequent basis is a cause for concern due to the fact that when it happens staff have to find a place to work for the duration the meeting which can range between just few hours to several days. Long meeting is quite disturbing and disruptive affecting both workflow and staff commitment. Hence highly advisable for future meetings to seek other alternative venue.

Compliance & Enforcement Unit

The Compliance and Enforcement team is responsible for the surveillance and monitoring of fishing activities inside Tuvalu's EEZ ensuring license vessels are in full compliance with Tuvalu laws, and illegal fishing activities are effectively eliminated. It is also responsible for the monitoring of transshipment. This short report outlines the main activities the section was able to achieve in 2021.

Transhipment Operations & monitoring

Ongoing COVID19 restrictions caused transhipment operation to confine yet again to the new designated area offshore. This year, a total of sixty-nine transhipment visits were reported, a 53% drop from the previous year, and lowest for the past seven years. There could be several factors impacting the level of transhipment activities but the new

transhipment area could be an important one since most operators considered it as highly unstable and unsafe.

The continuation of COVID19 restrictions and the absence of observers on board was a big challenge to monitoring of fishing activities. With all other MCS tools being problematic, VMS remain the only functional option hence our heavy dependence on it for surveillance and monitoring purposes.

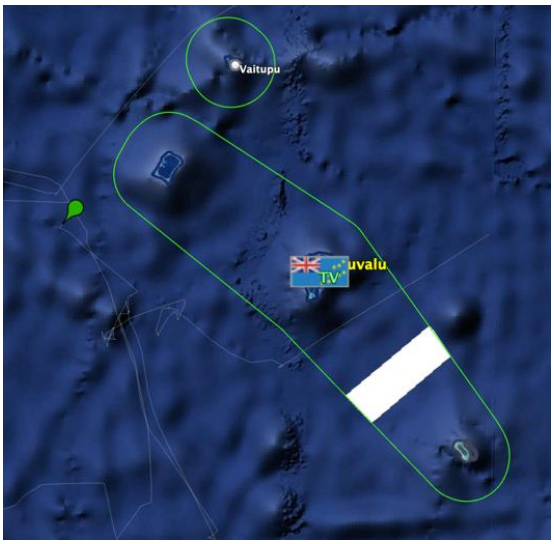


Figure 36: Map showing the new transhipment area in the white box

Transhipment catch and revenue

A dramatic fall in transhipment revenue was experienced in 2021 (56% down compare to 2020) and lowest in recent years. This could be caused by a number of factors and the changed in transhipment area from the lagoon to the open sea could have played a big part.

Table 24: Transhipment statistics for the past 7 years including 2021

Transhipment statistics	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Transhipment events	181	134	163	192	131	148	69
Total Catch transshiped (mt)	159,377	119,628	148,555	174,345	125,335	127,089	62,799.03
Total revenue collected (US$)	489,630.75	1,239,223.80	1,528,167.50	1,784,231.50	1,268,935	1,238,774	545,430

A significant portion (41%) of the 2021 transhipment revenue was still outstanding after December 31st. This was partly a result of the late submission of transhipment invoices by the department due to technical reasons. The department will endeavour to follow up on these outstanding in 2022.

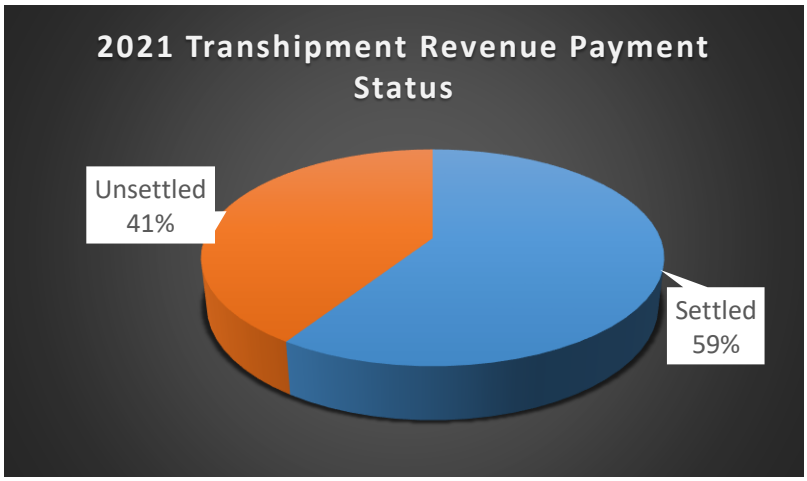


Figure 37: Total transhipment revenue status of payment

Surface Surveillance Patrol Operations

Surface surveillance capability was severely impacted this year due to that the Te Mataili was out of Operation for the whole year. The inactivity of the "Te Mataili" was also the reason for Tuvalu's inability to participate fully in regional surveillance exercises. Since other boats were also unavailable, the Manaui II was the only option. And despite its operational constraints, the vessel managed to complete two surveillance missions.

Table 25: 2021 Surveillance operations

Operation Name	Platform	Vessels intercepted & checked	Duration	Infringement
Whale shark Ops	RV/ Manaui II	9	21-31 Oct, 2021	No serious event encountered
Skip Jack Ops	RV/Manaui II	10	22 Nov- 4 Nov 2021	No serious event encountered

No boarding took place during these two missions due to ongoing COVID19 restrictions and compliance checks were done visually and verbally from a distance using VHF. The interactions with fishing vessels happened mostly during the night making visual observations a bit difficult. However, the limitations did not discourage the team from doing what they did knowing that their presence at sea makes a big impact on the way fishers behave.

Aerial Surveillance

Several aerial supports planned for execution this year by the FFA aircraft did not eventuate due to the ongoing pandemic restrictions imposed by Tuvalu. Limited aerial surveillance coverage however was being facilitated by the French Navy Airplane during the Operation Kurukuru. No illegal activities were reported except three licensed vessels sighted in the transhipment area.

Challenges/Recommendation

Boarding and inspections

The COVID restrictions have adversely impacted the ability of enforcement officers to undertake physical inspection of fishing vessels through boarding and inspection. Conducting assessments from a distance is completely ineffective since the officers cannot physically examine the evidence but rather rely on vessel crew to tell them. Fact is information from vessels crews may not always correct or truthful. Hopefully borders can open up very soon to enable actual boarding to take place.

Limited surface surveillance capability

Tuvalu's surface surveillance capability is extremely limited, hence our continued reliance on partners both here and abroad for assistance. However, the experience to date proved that even partnership cannot work when it comes down to priority. Looking ahead, procurement of a patrol asset for the department would be the key to solving this deficiency.

Staff Shortage

Staff shortage (manpower of 2) is a huge problem given the important role this section plays in the enforcement of Tuvalu laws. Fisheries information and intelligence are widely available from a wide variety of different sources and require someone to carry out proper analysis for them to be of any use. This had not happened simply due to manpower shortage. Delayed implementation of or slowed progress in achieving certain compliance activities is another manifestation of this problem. With additional manpower, all this can be possible.

TUVALU NATIONAL OBSERVER PROGRAMME REPORT 2021

Fisheries Observers, who live and work onboard fishing vessels, are regarded as the eyes and ears of the fisheries managers. Their role as information providers play a key role in the sustainability of the tuna resources. The information collected by fisheries observers are useful for two reasons; science and for compliance.

As a matter of requirement, Purse seine vessels operating in the Western and Central Pacific Fisheries Commission's (WCPFC) must carry a fisheries observer onboard at all times (100% coverage), but for a longline a 5% observer coverage must be attained.

This requirement was suspended by the commission since 2020 due the pandemic for safety reasons which Tuvalu strongly supported. On the downside, the suspension meant a loss of income earning opportunities for our observers. Some part time work was thus created and offered to observers which were part of our effort to address the livelihood concerns associated with the loss of job.

Observer Placement

As stated previously, and due to the ongoing pandemic and regional continued suspension of 100% observer coverage on purse seine in 2021 no observer placement was undertaken. Resumption is likely to occur once the suspension is lifted. When will it occur is highly uncertain.

Observers livelihood

Responding to livelihood concerns, two initiatives were introduced; emphasize

a) A daily sitting allowance ($25AU) – payable only upon attendance to meetings, trainings, or workshops organized by the department.

b) Hiring of observers in return for a reasonable wage. Due to large number of observers looking for a job the length or duration of any contract was limited to a maximum of 2 weeks. This ensures everyone gets an opportunity to earn a salary. At the end of 2021, thirteen observers had worked for the department. This hiring is expected to continue until observer placement resumes.

Financial support to meet the additional costs as a result of these new initiatives were sourced from the NZ Fisheries Support Program (TFSP), FAO and the Observer fund.

Observer compensation or insurance scheme

Fisheries Observer is a risky job with the chance of getting injured or even killed being very high. Therefore, a compensation scheme is critical to ensure observers and their families are financially protected should an unfortunate event occur during the period of active engagement.

Hence the insurance policy was formulated and submitted to cabinet for its consideration. Basically, the scheme provides coverage for medical as well as life insurance, and to be funded by Tuvalu through observer levy (observer fund). The cabinet, however, instead of approving it redirect the Fisheries to collaborate with the Finance department who is also doing some similar work. No further progress was made since then, and hence some follow ups would be required in 2022.

Observer trainings

Observer trainings, since 2020, has been an important part of the observer annual work plan for two main reasons: i) address observer livelihood concerns as highlighted above, and ii) keeping observers engaged with program basically to avoid losing observers.

A total of 14 trainings, meeting and workshops took place this year. The recruitment of ten new observers (1 female) was the highlight of observer's training component.

Figure 38: Newly recruited observers

Table 26: List of trainings conducted in 2021

No	Types of Training	Date	Venue	Funded by
1	PIRFO Observer Basic	Dec 1, 2020 – Jan 22, 2020	FD conference rm	TVNOP
2	STCW Training and Refresher	1st – 12nd February 2021	TPCC Room 2 and TMTI	FFA / TVNOP
3	8th PNA Coordinators Workshop.	8th February 2021	TPCC Room 9	POA
4	ROCW21 Workshop	9th to 12nd February 2021	TPCC Room 8	FFA
5	Critical Incident Assessment Training(CIA)	06th to 9th April 2021	TPCC Room 2	FFA
6	E-Reporting Training	19th to 22nd April 2021	TPCC Room 2	PROP
7	E-Reporting Training	17th to 20th and resume the last day on 25th May 2021	TPCC Room 2	FFA
8	Observer Basic Refresher Training	24th to 28th May 2021	TFD Conference Room	PROP
9	Debriefer Refresher Training	31st to 4 June 2021	TFD Conference Room	PROP
10	Consultation Meeting with Observers	21st to 22nd June 2021	TPCC Room 1	PROP
11	Observer Data Quality Training	5th to 23rd July 2021	TFD Conference Room	PROP
12	Critical Incident Assessment Training	5th to 6th and resume on the 8th to 9th July 2021	TPCC Room 5	FFA
13	Regional Covid-19 Workshop	20th July 2021	TPCC Room 2	FFA
14	Debriefer Data Quality Training	18th to 12nd November 2021	TPCC Room 9 & TUFHA	PROP

Several other trainings could not be executed and deferred due to data limitation and travel restrictions as a result of the COVID19 pandemic. New execution date for each training will very much be dependent upon data availability and travel restrictions situation.

Table 27: List of deferred trainings

#	**Courses**	**Durations**
1	MSC training for those remaining un-certified Observers	1 Week
2	Debriefer Assessor Training	2 Weeks
3	Cross Endorsed Training	1 Week
4	Debriefing Part B Training	8 Weeks
5	Debriefing Part C Training	1 Week
6	E-Debriefing Training	2 Weeks

Observer Trainee Trainers

Although Tuvalu has been an important observer provider for many years, yet no qualified observer trainer is available locally who can conduct observer trainings and train new observers when the need arises. The obvious benefit is that there would not be a need to source a trainer from outside.

Three candidates were identified and a training plan for them had also been developed which also include some travelling abroad for further training. Because they could not attend overseas training due to the pandemic, they have been engaged in locally run trainings including the observer training basic training. Until travel resumes, the three will continue with local training under supervision of the observer TA.

General Observer Statistics

Table 28: Summary of Tuvalu Observer's qualifications and status (active) to dat

Qualifications	2021
Total number of Active Observers	80
Certified Debriefers	22
Trainee Debriefers	9
MSC Certify Observers	70
E-Reporting	21
Certified Cross Endorsement Observers	4
Debriefer Assessors	7
Trainee Trainers (yet to complete)	3 undergoing training

Observer Levy

All vessels registered to fish in Tuvalu must pay an observer levy which is a cost recovery mechanism imposed in support of our national observer program. The collected fund is used to finance the various costs associated with the operation of the National Observer Program. These costs can include observer payments, observer advances, accommodations, airfares, equipment, trainings etc. Another additional observers' expenditure such as observer scheme is also expected to be met from this fund.

A variation on the annual levy is quite obvious from the figure below which was influenced by the fluctuation in the number of registered fishing vessels. This year was the lowest since 2016 and a direct reflection of the number of vessels registered in 2021.

An analysis, of the observer fund, undertaken by the program tend to suggest the existing observer fee level to be inadequate with an increase (options provided) in fee being proposed ensuring the long-term sustainability of the fund.

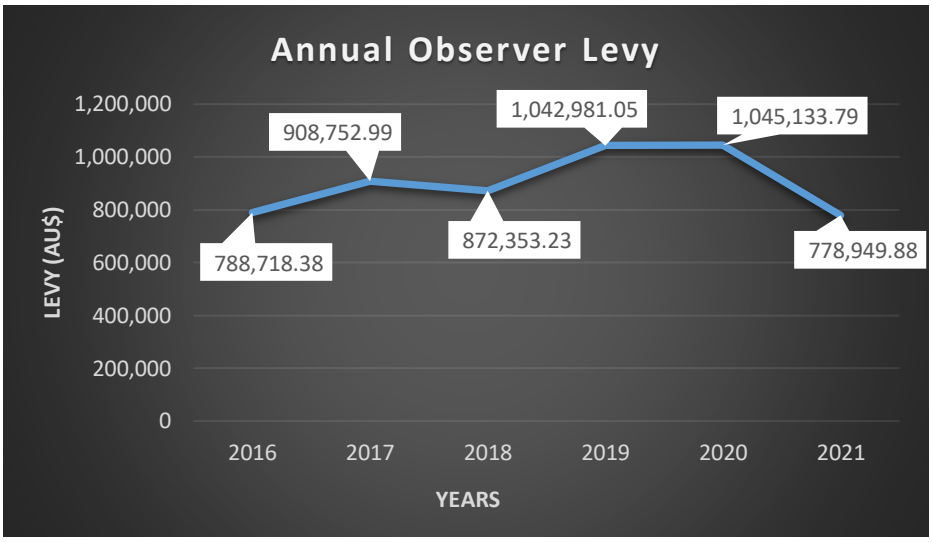


Figure 39: Annual observer levy since 2016

External funded projects

High Seas Boarding and inspection – WCPFC (Japanese grant)

Further progress heavily impacted by COVID19 pandemic and resumption of activities will depend on when things will get back to normal.

Cross-endorsement – WCPFC (Taiwanese grant)

This is a project for 2020 but due to the pandemic, activities were deferred. Again this year no progress was achieved due to continuation of restrictions on overseas travel and activities were put on hold indefinitely.