



Coastal Fisheries Creel Report Card

2023

FUNAFUTI

Introduction

This Coastal Fisheries Creel Report Card summarises the results of monitoring key indicators during creel surveys being carried out by Tuvalu Fisheries Department.

The key indicators we use to show the health of the resources and status of overfishing are:

Indicator 1: Percentage of fishes that are landed which are smaller than the size at which at least 50% of the fish can breed (called length at maturity, L_m). This value should decline and approach zero as management actions improve, followed by improvements in the fisheries resources.

This is an indicator of **overfishing**.

Indicator 2: Catch of fishes per unit of effort (CPUE). We use the weight (kg) of fishes being landed: (a) per fisher per hour spent fishing and (b) per fishing trip. The values for Indicator 2 should increase as things improve. That is, fishers should be able to catch more fish in less time.

This is an indicator of the **abundance** of the fishery as well as the **efficiency** of the fishing method.

Results

Overall status of Funafuti's coastal resources is poor. On average, 40% of the fishes landed

caught undersized between 2015 and 2023. This is quite similar to the national average, 41%.

The ideal % of fishes being landed that are undersized is 0, so any actions that will reduce this to lower levels is a step in the right direction and is expected to lead to improvements in the resources.

IDEAL: % UNDERSIZED should DECLINE over time and approach 0%

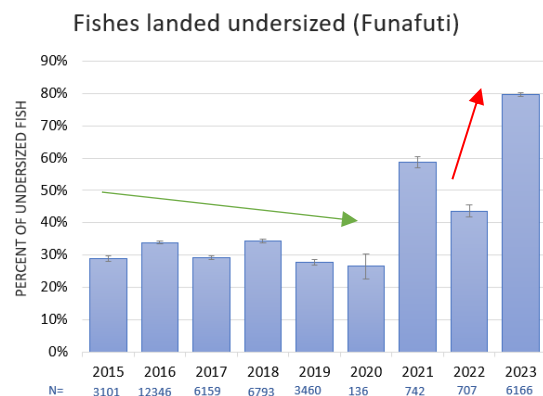


Figure 1: Percentage of fishes being landed undersized by year +/-SE. The sample size (n) is reported in blue.

Green arrow = good trend
Red arrow = bad trend

There was a slight decreasing trend in Indicator 1 between 2015 and 2020, with an average of 32% of the fish landed caught undersized. In 2021, this doubled to 59% undersized (Figure 1). Indicator 1 shows that a greater portion of the catch was landed in 2021 and 2023 before it had a chance to reproduce, indicating overfishing may be taking place.

The ideal percentage (%) of fish being landed that are undersized is 0, so any actions that reduce this to lower levels are a step in the right direction and are expected to improve the resources.

Every fish should have the chance to breed at least once to ensure the resources can be replenished.

For Indicator 2a, the total weight of fish being landed per fisher per hour spent fishing appears to have decreased over the survey years for all fishing methods (Figure 2). Until 2023 all fishing methods increased, especially Spearfishing and Net-fishing. However, Scoop-net fishing has been a constant trend since 2017.

Spearfishing and Net fishing increased, however, this was based on two and four surveys respectively (less than 18%) of the total 2023 surveys. Most surveys (over 86%) did not have data on either fishing methods or fishing hours.

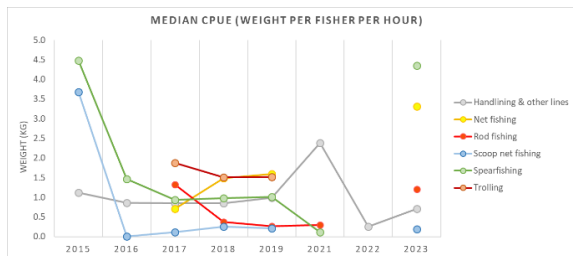


Figure 2: Indicator 2a. Weight (in kg) of fishes landed per fisher per hour spent fishing in Funafuti 2015-2023. There was no method data available for 2020.

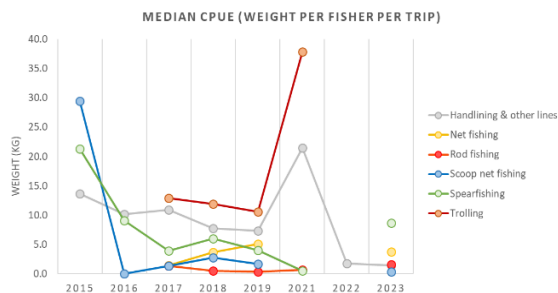


Figure 3: Indicator 2b. Weight (in kg) of fishes landed per fisher per fishing trip in Funafuti for 2015-2023.

The weight of fish landed per fisher per entire fishing trip - Indicator 2b (i.e., not per hour) - generally showed a decline between 2015 and

2021 (Figure 3). The exception was trolling & handling and other lines, where weight per fisher per fishing trip increased between 2019 and 2021 and decreased again in 2023 but between 2021 and 2023, there is an improvement in spearfishing trend. However, there is not enough data to provide more accurate and meaningful results.

This shows that the returns per fishing trip have declined over the years.

Catch per unit of effort (CPUE) should INCREASE over time in a well-managed fishery.

Note: The catch reported in Figure 1-3 does not include offshore fish species such as Atu (skipjack tuna). These pelagic species accounted for 20% of the total catch numbers recorded in the creel surveys (2016-2023). Figure 4 compares the percentage of pelagic and coastal species in the survey years.

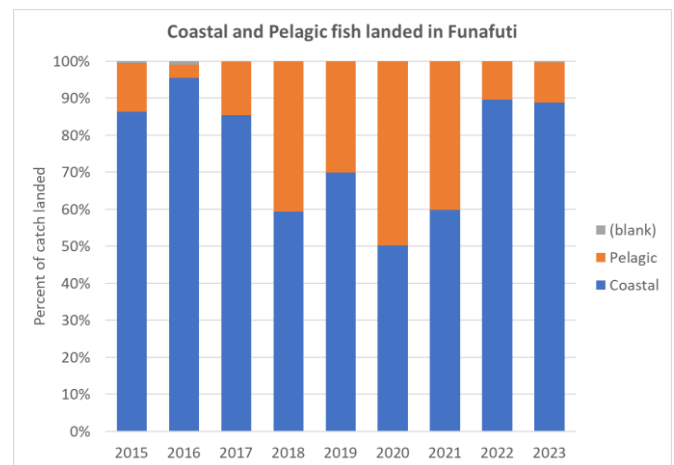


Figure 4: Graph contrasting Coastal and Pelagic fish landed per Year in Funafuti.

Conclusions

Overall, there has been little improvement to the health of coastal fisheries in Funafuti over the past 7 years since surveys begun. Small improvements in sizes of fishes being landed took place between 2016 and 2020 but these were reversed by 2021.

The percentage of fish landed undersize doubled in 2021 and 2023, this could reflect an increased reliance on coastal fisheries resources

due to lack of affordable protein alternatives as a result of COVID-19 pandemic restrictions.

The Funafuti Reef Fisheries Stewardship Plan (FRFSP) is under review to improve management measures for the next five-year cycle.

Why are some figures different from the previous report card?

This is due to a number of reasons:

1. We have received more data from the years 2015-2019
2. Recent studies have provided us more accurate information on size of maturity
3. We have now included size of maturity data for 30 extra species
4. CPUE has now been displayed by fishing method
5. We have added a new indicator, spawning potential ratio (SPR)

Appendix I: Size of maturity (L_m) for top 50 species

Table 1 is part of indicator 1. It shows the breakdown of species that have 50% or more fishes landed that are undersized. A value of 100 means that all fishes landed are undersized. The ideal value for a well-managed fishery is 0. Blank cells indicate that no catch has been recorded for that species in that year. This table shows that many of the species being monitored are being caught undersized, and this varies by year.

The species are listed in order of their abundance in the catch landed (% of total catch).

Table 1: List of species for which size at maturity (L_m) is known, showing percentages landed which are undersized (2015 – 2023).

No.	Row Labels	Local Name	Sum of Weight (km)	2015	2016	2017	2018	2019	2020	2021	2022	2023	Grand Total
1	Lutjanus gibbus	Taea	18.7%	20%	23%	20%	25%	6%	0%	49%	39%	37%	22%
2	Naso unicornis	Ume, Pokapoka	4.8%	60%	49%	29%	71%	75%		33%	18%	0%	47%
3	Acanthurus triostegus	Manini, Koinava	3.9%	0%	9%	61%	29%	32%	43%		82%	4%	29%
4	Naso lituratus	Maninilakau	3.4%	49%	27%	15%	6%	4%	0%	1%	25%		16%
5	Epinephelus polyphedion	Gatala (one dot)	3.3%	54%	41%	26%	24%	44%		82%	28%	0%	35%
1	Acanthurus lineatus	Ponelolo, Alogo, Pone hamoa	3.3%	7%	47%	20%	19%	8%	100%	17%	13%	100%	29%
2	Caesio caerulea	Ulia, Ulihega	2.8%	0%	9%		0%			0%			8%
3	Lethrinus obsoletus	Tanutanu	2.7%	10%	42%	9%	13%	3%		0%	25%	79%	27%
4	Caranx sexfasciatus	Teu	2.5%	33%	78%	46%	49%	62%				100%	56%
5	Decapterus macarellus	Atule	2.4%	31%	29%	12%	62%	38%					48%
6	Fistularia petimba	Taotaoama (NB, Tvd)	2.2%	100%	100%	100%							100%
7	Lutjanus kasmira	Savane	2.2%	59%	56%	61%	37%	42%	100%	85%	38%	67%	53%
8	Lethrinus amboinensis	Noto, Gutulo, Sapotu	2.1%	0%	7%	10%	11%	0%		36%	3%	98%	30%
9	Selar crumenophthalmus	Salala, Atule	2.1%	4%	8%					100%		99%	91%
10	Chlorurus (Scarus) microrhino	Laea	2.0%	0%	46%	47%	0%						45%
11	Caranx lugubris	Taufauli, Tino tafauli (large), Aheu tafauli, Uluat	2.0%		87%	93%	100%					100%	94%
12	Naso vlamingii	Pokapoka lanulanu	1.9%	0%	33%	18%	15%	0%		40%	0%		24%

13	<i>Monotaxis grandoculis</i>	Muu, Mufala	1.8%	74%	71%	41%	59%	27%		82%	45%	100%	51%
14	<i>Naso brevirostris</i>	Pokapoka, Kosotu	1.8%	6%	27%	3%	2%	9%	0%	13%	17%	100%	14%
15	<i>Sargocentron spiniferum</i>	Tamalau	1.8%	66%	62%	46%	42%			35%	88%	98%	58%
16	<i>Lutjanus bohar</i>	Fakamea, Fagamea	1.6%	58%	78%	64%	76%	30%			100%	100%	70%
17	<i>Aprion virescens</i>	Utu	1.5%	50%	71%	51%	34%			0%		100%	60%
18	<i>Lethrinus erythracanthus</i>	Saputu	1.5%	61%	52%	35%	47%			40%		75%	48%
19	<i>Naso caesius</i>	Ume (Ff?), pokapoka (Nm?)	1.4%		9%	23%	57%	40%		38%			26%
20	<i>Siganus argenteus</i>	Maiava	1.3%	0%	30%	37%	39%	0%		5%			18%
21	<i>Lutjanus monostigma</i>	Taiva	1.2%	3%	8%	9%	23%	50%	0%	0%	100%	55%	15%
22	<i>Epinephelus maculatus</i>	Fapuku	1.2%	65%	63%	47%	100%	67%		25%	53%	100%	58%
23	<i>Epinephelus macrospilos</i>	Gatala (Ff), fÁ@puku (Nm)	1.2%	13%	5%	71%	35%	43%	8%	50%	100%		37%
24	<i>Epinephelus fuscoguttatus</i>	Munua	1.1%	47%	40%	22%	43%	67%			50%	50%	44%
25	<i>Lethrinus xanthochilus</i>	Tanutanu	1.1%		73%	84%					47%	100%	74%
26	<i>Sphyræna forsteri</i>	Taotao	1.1%	19%	6%	4%	19%	13%				80%	15%
27	<i>Naso hexacanthus</i>	Pokapoka, Ume tinae sega	1.0%		66%	64%	55%	100%	100%	100%			72%
28	<i>Hipposcarus longiceps</i>	Ulafi	1.0%	24%	21%	14%	11%	50%				100%	19%
29	<i>Macolor macularis</i>	Tonu	1.0%	78%	50%	0%	30%						38%
30	<i>Macolor niger</i>	Makala	0.9%	89%	87%	73%	86%						82%
31	<i>Lethrinus miniatus</i>	Noto	0.9%	91%	75%	88%	84%	0%	0%	88%			83%
32	<i>Lethrinus microdon</i>	Filoa, Kapatiko	0.9%					20%	0%	50%	60%	88%	57%
33	<i>Myripristis pralinia?</i>	Malau puku	0.9%	0%	4%	1%	2%	0%	0%	0%	100%	0%	3%
34	<i>Myripristis berndti</i>	Malau	0.8%	29%	26%	13%	42%			0%	33%		23%
35	<i>Anyperodon leucogrammicus</i>	Gatala lautalo, Gatala lautala	0.8%	8%	5%	21%	0%				0%	80%	9%
36	<i>Crenimugil crenilabis</i>	Kanase	0.7%			20%	50%	66%			0%	100%	64%
37	<i>Aphareus furca</i>	Palusega, Kotua, Taelepe, Takuoga	0.7%	78%	96%	89%	100%	100%		100%		83%	93%
38	<i>Liza vaigiensis</i>	Kafakafa	0.7%			73%	100%	66%			33%	100%	52%
39	<i>Lutjanus fulvus</i>	Tagau, Takape	0.7%	0%	6%	0%	8%	10%		0%	3%	80%	9%

40	Lethrinus variegatus	Noto, Tanutanu	0.6%		0%	2%		0%								2%
41	Myripristis kuntee	Malau	0.6%	6%	6%	50%									56%	7%
42	Elagatis bipinnulata	Kami, Kamai	0.6%	100%	100%	76%	73%									88%
43	Priacanthus hamrur	Matapa	0.5%	33%	14%	2%	4%									11%
44	Sargocentron tere	Malau gutu loa, Malua mata loa	0.5%	50%	48%	77%	32%	38%	0%	100%	63%					46%
45	Selar boops	Salala, Atule	0.4%					1%		100%					99%	92%
46	Caranx melampygus	Aseu	0.4%	0%	0%	47%	0%	0%							83%	38%
47	Lethrinus olivaceus		0.4%					0%		100%	73%					69%
48	Epinephelus merra	Gatalaliki	0.3%	4%	0%	0%	0%	0%	0%	0%	7%	0%				1%
49	Ctenochaetus binotatus	Pone uli	0.3%	0%	2%	0%	50%									2%
50	Kyphosus vaigiensis	Nanue (Ff, Nm)	0.3%		77%	100%	58%	100%							100%	68%
	Grand Total			29%	34%	29%	34%	28%	25%	56%	40%	80%				40%