Coastal Fisheries Creel Report Card

2023

NANUMEA

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 state 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, Lm). 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 **abundance** of the fishery as well as the **efficiency** of the fishing method.

Results

Overall status of Nanumea's coastal resources is poor, with an average of 38% of the fishes caught being undersized between 2016 and 2023. This is below to the national average of 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%

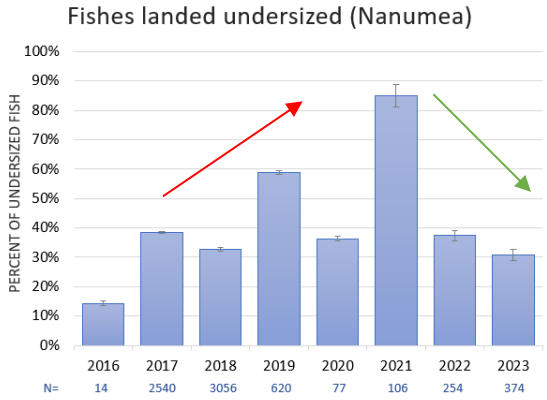

***Figure 1**: Percentage of fishes being landed undersized by year +/-SE. The sample size (n) is reported in blue.*

Green arrow = good trend
red arrow = bad trend

Between 2017 and 2018, Indicator 1 decreased slightly, showing a small improvement in the fishery. The trend reversed and the percentage of fish that were landed undersized doubled over the course of 2020 to 2021. However, in 2022 and 2023, the fish landed undersized drastically decreased indicating a healthy fishery.

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

Indicator 2a, the total weight of fish being landed per fisher per hour spent fishing appears has different trends across the fishing methods. Net fishing returns per fisher per hour decreased in 2018, then abruptly increased in 2019. The trend in spearfishing and Net fishing returns also decreased in 2018 and 2019. Handlining and Rod fishing

For trolling and handlining, there was an increase in returns in 2018, and then a decrease in 2019. There was not much in returns across the years for scoop net fishing and rod fishing (Figure 2).

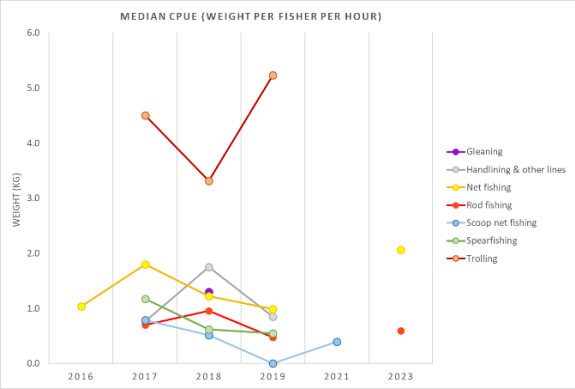

Figure 2: Indicator 2a. Weight (in kg) of fishes landed per fisher per hour spent fishing across Tuvalu 2015-2021. There was no method data available for 2020.

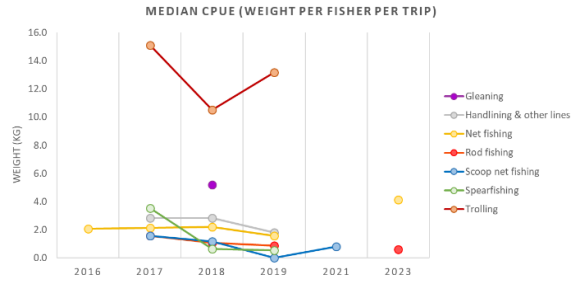

Figure 3: Indicator 2b. Weight (in kg) of fishes landed per fisher per fishing trip across Tuvalu 2015-2021.

The weight of fishes landed per fisher per entire fishing trip as Indicator 2b (i.e., not per hour) has generally shown the same trend as weight per fisher per trip, but with smaller changes (Figure 3). The exception is trolling, which showed an opposite trend – a slight decrease in returns per trip in 2018. There were more fishing trips taken in 2018, and were on average 5 hours shorter than trips taken in 2017. 2019 had similar numbers of trolling fishing trips recorded as 2018, but they were slightly shorter than 2018, and returns per trip were not as good.

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

Note: The catch reported do not include offshore fish species such as Atu (skipjack tuna). These pelagic species accounted for 26% of the total catch numbers recorded in the creel surveys (2016-2023).

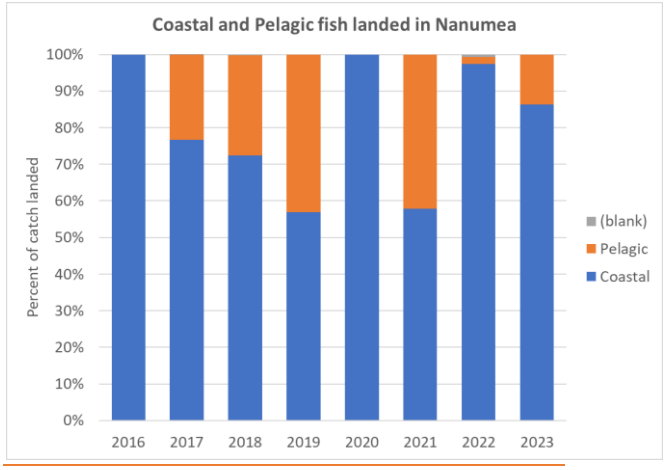

***Figure 4:** Table contrasting Coastal and Pelagic fish landed per Year in Nanumea*

Conclusions

Overall, there has been little improvement to the health of coastal fisheries since surveys begun. The percentage of fish landed undersize continued to increase in 2021, and could reflect an increased reliance on coastal fisheries resources due to lack of affordable protein alternatives in the as a result of COVID-19 pandemic restrictions.

Management plans need to be developed and implemented more efficiently to improve the health of Tuvalu's coastal fisheries.

'Te Kaniva' – the Nanumea Coastal Fisheries Management Plan (CFMP) needs to be effectively implemented in order to improve Nanumea coastal resources.

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. We have more accurate information on size of maturity from studies that have recently been published
3. We have now included size of maturity data for 30 extra species
4. We have displayed CPUE by fishing method

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 (2016-2023)

No.	Species	Local Name	Sum of Weight (kg)	2016	2017	2018	2019	2020	2021	2022	2023	Grand Total
1	Acanthurus triostegus	Manini, Koinava	21.5%	14%	26%	19%	37%	39%	35%	37%	38%	25%
2	Caranx sexfasciatus	Teu	12.2%		99%	97%	95%		75%	75%	100%	96%
3	Hipposcarus longiceps	Ulafi	11.1%		8%	22%	15%			0%	2%	14%
4	Kyphosus cinerascens	Nanue	9.5%		22%	8%	30%				0%	20%
5	Crenimugil crenilabis	Kanase	7.5%		72%	26%	7%				67%	57%
6	Caranx melampygus	Aseu	6.9%		56%	18%	27%				33%	27%
7	Liza vaigiensis	Kafakafa	4.3%		69%	67%	70%				0%	67%
8	Kyphosus vaigiensis	Nanue (Ff, Nm)	4.3%		79%	71%	33%			100%	50%	75%
9	Lutjanus fulvus	Tagau,Takape	3.0%		14%	12%	80%	0%			0%	15%
10	Epinephelus fuscoguttatus	Munua	3.0%		0%	67%						57%
11	Lutjanus monostigma	Taiva	2.1%		66%	43%	87%				33%	52%
12	Caranx lugubris	Tafauli, Tino tafauli (large), Aheu tafauli, Uluat	1.7%			100%			100%			100%
13	Acanthurus lineatus	Ponelolo, Alogo, Pone hamoa	1.1%		41%	63%					0%	51%
14	Monotaxis grandoculis	Muu, Mufala	1.0%		27%	0%	67%	0%			0%	18%
15	Parupeneus multifasciatus	Afulu	0.8%		0%							0%
16	Carangoides plagiotaenia	Aseu uluuli	0.8%		36%	80%						40%
17	Aphareus furca	Palusega, Kotua, Taelepe, Takuoga	0.8%						100%			100%
18	Caranx ignobilis	Tino ulua (lge), Lupo (small), Aseu (med); Mea tal	0.7%			100%					100%	100%

19	Naso unicornis	Ume, Pokapoka	0.5%		0%						0%
20	Elagatis bipinnulata	Kami, Kamai	0.5%	33%							33%
21	Lethrinus olivaceus		0.5%		0%						0%
22	Lethrinus xanthochilus	Tanutanu	0.5%	78%	0%						58%
23	Lethrinus obsoletus	Tanutanu	0.3%	0%	0%	0%					0%
24	Naso lituratus	Maninilakau	0.3%	25%	25%					0%	9%
25	Lutjanus gibbus	Taea	0.3%	40%	0%					0%	29%
26	Myripristis violacea	Malau	0.3%	0%	50%						3%
27	Parupeneus cyclostomus	Kaivete piniki	0.3%		25%						25%
28	Lutjanus kasmira	Savane	0.3%	88%	53%						60%
29	Epinephelus merra	Gatalaliki	0.2%	0%	0%					0%	0%
30	Aprion virescens	Utu	0.2%	0%							0%
31	Chlorurus (Scarus) microrhino	Laea	0.2%	43%							43%
32	Cephalopholis argus	Loi	0.2%	67%	60%	100%					65%
33	Lutjanus argentimaculatus	Tagau	0.2%	100%	100%						100%
34	Epinephelus macrospilos	Gatala (Ff), fÄ puku (Nm)	0.2%	100%	33%						40%
35	Sargocentron spiniferum	Tamalau	0.2%	100%	65%						73%
36	Caesio caerulaurea	Ulia, Ulihega	0.1%	0%	0%					0%	0%
37	Myripristis pralinia?	Malau puku	0.1%		6%	33%					11%
38	Epinephelus maculatus	Fapuku	0.1%		80%						80%
39	Mulloidichthys vanicolensis	Kalo	0.1%	0%							0%
40	Cheilinus fasciatus	Gole	0.1%	0%	0%	0%					0%
41	Epinephelus miliaris	Gatala	0.1%		0%						0%
42	Ctenochaetus binotatus	Pone uli	0.1%	0%						0%	0%
43	Lutjanus bohar	Fakamea, Fagamea	0.1%		100%	100%					100%
44	Epinephelus polyphekadion	Gatala (one dot)	0.1%	0%	100%						50%
45	Lethrinus erythracanthus	Saputu	0.1%		0%						0%
46	Lethrinus variegatus	Noto, Tanutanu	0.0%	50%							50%
47	Decapterus macarellus	Atule	0.0%		83%						83%
48	Sargocentron caudimaculatum	Malau	0.0%	0%	0%						0%
49	Myripristis kuntee	Malau	0.0%		0%						0%
50	Parupeneus barberinus	Malili, Kaivete	0.0%	0%	0%						0%
	Grand Total			14%	38%	33%	59%	36%	85%	37%	30%	38%