Coastal Fisheries Creel Report Card

2023

NANUMAGA

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 Nanumaga's coastal resources is poor, with an average of 49% of the fishes caught being undersized between 2016 and 2023. This is well above 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%

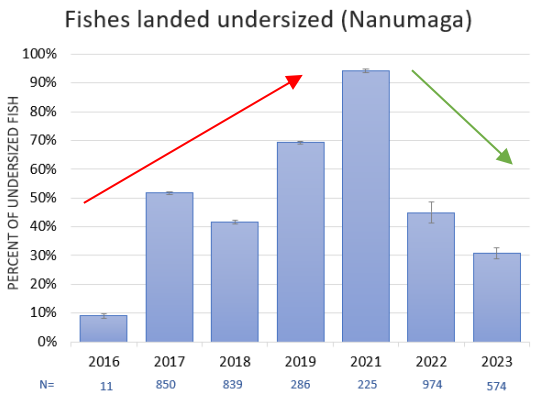

***Figure 1**: Percentage of fishes being landed undersized by year +/-SE. The sample size (n) is reported in blue.*

Green arrow = good trend
red arrow = bad trend

Between 2018 and 2021, Indicator 1 slowly increased, which shows no improvement in the fishery. However, this trend reversed and the percent of fishes that were landed undersized radically decreased throughout 2021 to 2023. There is no coastal fisheries data available for 2020.

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 between 2017 and 2018 for handlining and trolling. Between 2018 and 2019, the returns from trolling per fisher per hour seemed to have increased back to the levels in 2017. There is not much change in returns per fisher per hour for the other fishing methods (Figure 2).

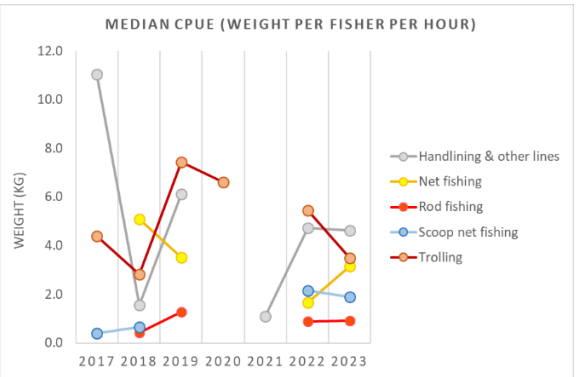

Figure 2: Indicator 2a. Weight (in kg) of fishes landed per fisher per hour spent fishing across Tuvalu 2015-2021. There was no data on fishing method or hours available for 2021.

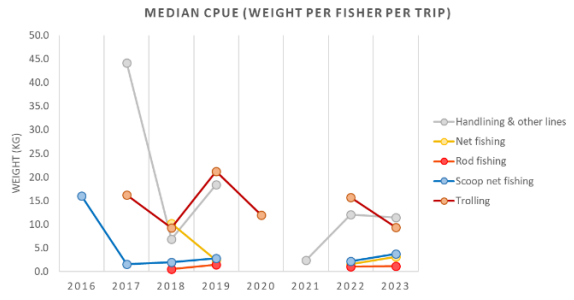

Figure 3: Indicator 2b. Weight (in kg) of fishes landed per fisher per fishing trip across Tuvalu 2015-2021. There was no data on available for 2021.

The weight of fishes landed per fisher per entire fishing trip as Indicator 2b (i.e., not per hour) showed a decline between 2016 and 2017 for scoop net fishing, and then stabilised (Figure 3). For handlining and trolling, there was a decline between 2017 and 2018 and this improved in 2019. This is in contrast to net fishing where the returns decreased between 2018 and 2019.

More data is needed to interpret these differences.

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 65% of the species landed that were recorded in the creel surveys (2016-2021).

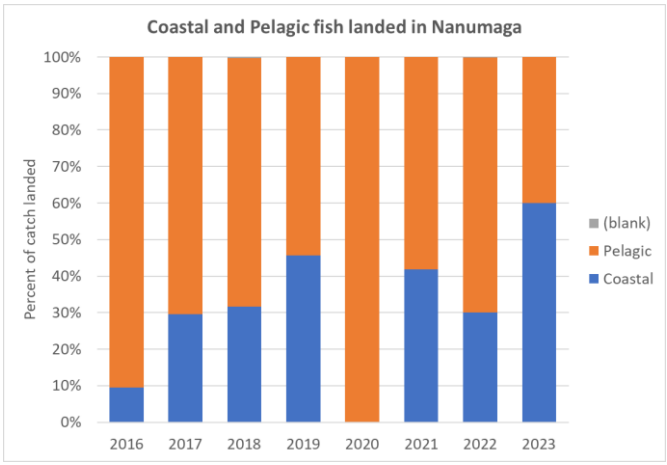

***Figure 4:** Table contrasting Coastal and Pelagic fish landed per Year in Nanumaga.*

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.

'Kogatai o Nanumaga' – the Nanumaga Coastal Fisheries Management Plan (CFMP) needs to be effectively implemented in order to improve their 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 2015-2022
2. We have more accurate information on the size of maturity from recently published studies and recent studies conducted by the Fisheries Department.
3. We have now included size of maturity data for 30 extra species
4. CPUE has now been displayed 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 (2017-2023)

No.	Species Names	Local Names	% Sum of weight	2016	2017	2018	2019	2021	2022	2023	Grand Total
1	Acanthurus lineatus	Ponelolo, Alogo, Pone hamoa	0.0%		100%						100%
2	Acanthurus triostegus	Manini, Koinava	7.6%		20%	23%	40%		23%	24%	24%
3	Acanthurus xanthopterus	Kapalagi, Maa	0.1%		0%						0%
4	Anyperodon leucogrammicus	Gatala lautalo, Gatala lautala	0.1%		100%						100%
5	Aphareus furca	Palusega, Kotua, Taelepe, Takuoga	2.5%			100%		100%	100%		100%
6	Aprion virescens	Utu	0.7%		0%			0%			0%
7	Caranx ignobilis	Tino ulua (lge), Lupo (small), Aseu (med); Mea tal	0.4%		100%				100%	100%	100%
8	Caranx lugubris	Tafauli, Tino tafauli (large), Aheu tafauli, Uluat	10.0%		100%	100%		100%	100%	100%	100%
9	Caranx melampygus	Aseu	14.0%		0%	63%	92%	0%	62%	15%	47%
10	Caranx sexfasciatus	Teu	2.0%		50%	87%		0%	0%		70%
11	Cephalopholis argus	Loi	0.2%			0%					0%
12	Cephalopholis sexmaculata	Mataele	0.2%						100%		100%
13	Cephalopholis urodeta	Mataele	0.0%		100%			0%	100%		75%
14	Crenimugil crenilabis	Kanase	0.4%	0%	0%	50%					7%
15	Decapterus macarellus	Atule	0.1%		46%						46%
16	Elagatis bipinnulata	Kami, Kamai	31.0%		83%	83%	100%		50%		83%
17	Epinephelus macrospilos	Gatala (Ff), fÄpuku (Nm)	1.5%			90%	92%			90%	90%
18	Epinephelus merra	Gatalaliki	2.2%		3%	83%			0%	0%	9%
19	Epinephelus polyphekadion	Gatala (one dot)	0.8%						90%		90%

20	Hipposcarus longiceps	Ulafi	0.1%							0%	0%
21	Kyphosus cinerascens	Nanue	1.2%			0%	100%		9%		70%
22	Kyphosus vaigiensis	Nanue (Ff, Nm)	7.5%		62%	40%	99%		61%	50%	75%
23	Lethrinus erythracanthus	Saputu	0.4%			93%					93%
24	Lethrinus microdon	Filoa, Kapatiko	0.1%			100%			0%		86%
25	Lethrinus obsoletus	Tanutanu	0.0%			67%					67%
26	Liza vaigiensis	Kafakafa	0.3%	25%	0%						8%
27	Lutjanus argentimaculatus	Tagau	0.1%			100%					100%
28	Lutjanus bohar	Fakamea, Fagamea	1.0%			0%		60%	100%		61%
29	Lutjanus fulvus	Tagau,Takape	8.6%		68%	33%			0%		65%
30	Lutjanus kasmira	Savane	0.0%			0%					0%
31	Lutjanus monostigma	Taiva	0.7%		100%	28%	0%		67%		32%
32	Monotaxis grandoculis	Muu, Mufala	0.4%		100%	50%			100%	0%	50%
33	Mugil cephalus	Kanase	0.1%						67%		67%
34	Myripristis berndti	Malau	0.0%			100%					100%
35	Myripristis pralinia?	Malau puku	1.3%			7%					7%
36	Naso lituratus	Maninilakau	0.0%						33%		33%
37	Naso vlamingii	Pokapoka lanulanu	0.1%		0%						0%
38	Parupeneus barberinus	Malili, Kaivete	0.2%		100%						100%
39	Parupeneus cyclostomus	Kaivete piniki	0.1%			33%					33%
40	Parupeneus multifasciatus	Afulu	0.0%		0%			0%			0%
41	Plectropomus areolatus	Tonu gatala	0.0%					100%			100%
42	Sargocentron spiniferum	Tamalau	0.3%			40%	50%				42%
43	Sargocentron tiere	Malau gutu loa, Malua mata loa	3.3%			55%	8%				49%
44	Selar crumenophthalmus	Salala, Atule	0.2%						75%		75%
	Grand Total			9%	52%	45%	71%	94%	45%	31%	49%