



Coastal Fisheries Creel Report Card

2022

NUKULAE LAE

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

Results

Overall status of Nukulaelae's coastal resources is poor, with an average of 49% of the fishes caught being undersized. This is well above the national average of 36%.

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%

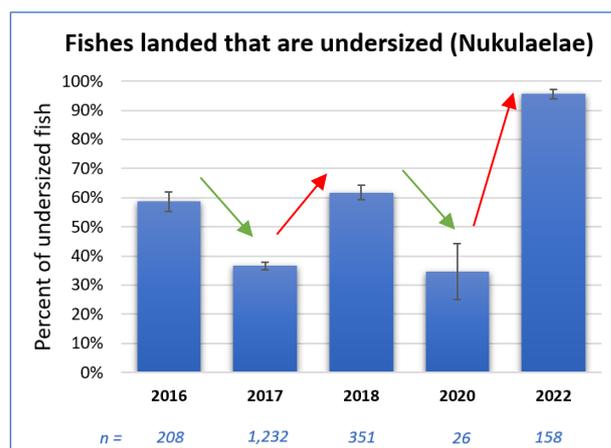


Figure 1: Percentage of fishes being landed undersized by year +/-SE. The sample size (n) is reported in blue.

Green arrow = good trend
red arrow = bad trend

In Nukulaelae, there was a decrease in the percentage of undersized fishes landed in 2017, which is a good sign. Unfortunately, in 2018, it went back up to 2016 levels. In 2020, trend reversed and the number of undersized fishes being landed decreased. However, in 2022, all most all the fish that were landed were undersized (96%), which is concerning. No coastal fisheries L_m data is available for 2019 and 2021.

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, and 2b weight per fisher per trip, have similar trends (see Figure 2). The highest CPUE is observed in 2018 (for weight per fisher per hour) and in 2022 (weight per fisher per trip). The lowest CPUE is observed in 2021.

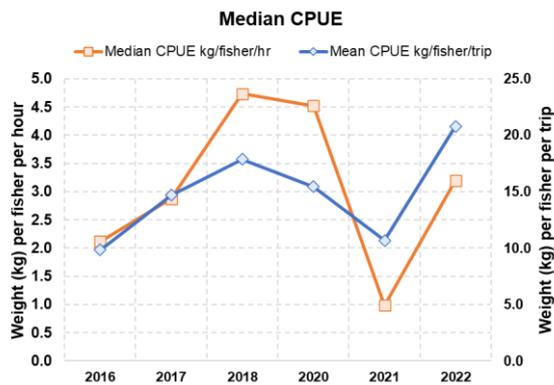


Figure 2: Indicator 2. (a) Weight (in kg) of fishes landed per fisher per hour spent fishing and (b) Weight of fishes landed per fisher per trip in Nukulaelae from 2016-2022.

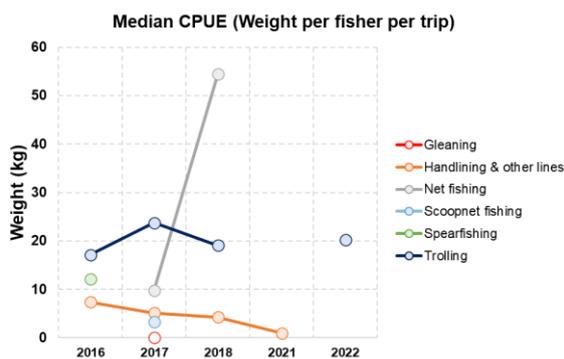


Figure 3: Indicator 2b. Weight (in kg) of fishes landed per fisher per fishing trip in Nukulaelae for 2016-2022.

Indicator 2b, the weight of fishes landed per fisher per entire fishing trip, varies depending on the fishing method (Figure 3). The CPUE for

handlining and other lines appears to have decreased from 2016 to 2021. Net fishing produced the highest CPUE in 2018.

However, more data is needed for this trend to be meaningfully interpreted. For example, the data on gleaning, spearfishing, and net fishing in 2018 are each based on one fishing trip.

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

Conclusions

Overall, there has been minimal improvement to the health of coastal fisheries since surveys began. More consistent data collection is needed to better understand the trends in the status of Nukulaelae coastal fisheries resources. To bring more consistent improvements to Nukulaelae's coastal resources, a coastal fisheries management plan is being developed and will be implemented in 2023.

Note: The catch reported do not include offshore fish species such as Atu (skipjack tuna). These pelagic species accounted for 48% of the total catch numbers and 83% of the biomass recorded in the creel surveys (2015-2022).

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 2015-2021
2. Instead of using the average CPUE, which can be influenced by really low or really high numbers, we report median CPUE

Appendix I: Size of maturity (L_m) for top 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 (2016-2020)

	Species	Local Name	% in catch	2016	2017	2018	2020	2022	Grand Total
1	<i>Acanthurus lineatus</i>	Ponelolo, Alogo, Pone hamao	0.1%		100%				100%
2	<i>Acanthurus triostegus</i>	Manini, Koinava	4.1%			42%		38%	74%
3	<i>Aphareus furca</i>	Palusega, Kotua, Taelepe, Takuoga	0.9%		85%			100%	86%
4	<i>Aprion virescens</i>	Utu	0.0%			0%			0%
5	<i>Carangoides plagiotænia</i>	Aseu uluuli	0.0%			100%			100%
6	<i>Caranx ignobilis</i>	Tino ulua (lge), Lupo (small), Aseu (med); Mea tal	0.1%				100%		100%
7	<i>Caranx lugubris</i>	Tafauli, Tino tafauli (large), Aheu tafauli, Uluat	4.4%		18%			100%	80%
8	<i>Caranx melampygus</i>	Aseu, Ulua, Fuaika	12.4%	80%	46%	77%	67%	95%	68%
9	<i>Caranx sexfasciatus</i>	Teu	3.2%		42%	80%			44%
10	<i>Cephalopholis argus</i>	Loi	0.8%	0%	17%	0%			11%
11	<i>Crenimugil crenilabis</i>	Kanase	3.4%					100%	100%
12	<i>Ctenochaetus binotatus</i>	Pone uli	1.0%		0%	25%			25%
13	<i>Decapterus macarellus</i>	Atule	1.4%		0%				0%
14	<i>Elagatis bipinnulata</i>	Kamai, Kamaa, Kami	1.2%	80%	67%	33%	0%	100%	65%
15	<i>Epinephelus fuscoguttatus</i>	Munua	0.3%		50%	100%			57%
16	<i>Epinephelus macrospilos</i>	Gatala (Ff), fapuku (Nm)	2.7%		90%	50%			89%
17	<i>Epinephelus maculatus</i>	Fapuku	1.5%		44%	20%			37%
18	<i>Epinephelus merra</i>	Gatalaliki	0.7%	0%	0%				0%
19	<i>Fistularia petimba</i>	Taotaoama	0.3%		100%				100%
20	<i>Hipposcarus longiceps</i>	Ulafi	11.2%		8%	42%			10%
21	<i>Kyphosus vaigiensis</i>	Nanue (Ff, Nm)	0.6%		42%	0%			38%
22	<i>Lethrinus amboinensis</i>	Noto, Gutulo, Sapotu	0.8%	0%	0%				0%
23	<i>Lethrinus erythracanthus</i>	Saputu	0.0%		0%				0%
24	<i>Lethrinus microdon</i>	Kapatiko	1.1%	0%	29%	0%			25%
25	<i>Lethrinus microdon</i>	Filoa, Kapatiko	0.1%			100%			100%
26	<i>Lethrinus obsoletus</i>	Tanutanu	6.6%	6%	44%	29%			37%
27	<i>Lethrinus variegatus</i>	Noto, Tanutanu	0.8%	0%	0%				0%
28	<i>Lethrinus xanthochilus</i>	Tanutanu	0.0%				0%		0%

29	<i>Liza vaigiensis</i>	Kafakafa	0.3%		0%	0%		100%	50%
30	<i>Lutjanus argentimaculatus</i>	Tagau	0.4%		100%	100%			100%
31	<i>Lutjanus bohar</i>	Fakamea, Fagamea	0.2%	100%	100%			100%	100%
32	<i>Lutjanus fulvus</i>	Tagau, Takape	1.0%	0%	100%	0%			13%
33	<i>Lutjanus gibbus</i>	Taea	26.4%	72%	52%	89%	0%	100%	66%
34	<i>Lutjanus kasmira</i>	Savane	1.0%		100%				100%
35	<i>Lutjanus monostigma</i>	Taiva	0.6%	0%	18%	0%			14%
36	<i>Macolor macularis</i>	Tonu	0.7%		100%	7%			13%
37	<i>Monotaxis grandoculis</i>	Muu, Mufala	1.2%	29%	29%				29%
38	<i>Monotaxis heterodon</i>	Ma gutu pukupuku (Ff), Ma (Nm), ma gutu puku	0.6%		8%				8%
39	<i>Myripristis adusta</i>	Malau fagamea, Malau matakelkele	0.3%		43%				43%
40	<i>Myripristis pralinia?</i>	Malau puku	0.2%		0%				0%
41	<i>Naso caesius</i>	Ume (Ff?), pokapoka	0.8%		6%				6%
42	<i>Naso lituratus</i>	Maninilakau	1.4%		0%	0%			0%
43	<i>Naso unicornis</i>	Ume, Pokapoka	0.9%		11%	0%			10%
44	<i>Naso vlamingii</i>	Pokapoka lanulanu	0.1%		50%				50%
45	<i>Parupeneus cyclostomus</i>	Kaivete piniki	0.1%		0%	100%			50%
46	<i>Plectropomus leopardus</i>	Tonu	0.2%		0%				0%
47	<i>Sargocentron spiniferum</i>	Tamalau	0.4%	100%	50%				60%
48	<i>Sargocentron tiera</i>	Malau gutu loa, Malua mata loa	0.1%		33%				33%
49	<i>Siganus argenteus</i>	Maiava	1.3%					100%	100%
50	<i>Sphyræna forsteri</i>	Taotao	0.4%			0%			0%
	Grand Total		100.0%	59%	37%	62%	35%	96%	49%