

## **SEA CUCUMBER FISHERY**

### **1. Sea Cucumber Species Found in Fiji.**

#### **Sea Cucumber Resources**

There are **25 species** of sea cucumber that are of commercial importance in Fiji, three of these species, sandfish (*Holothuria scabra*, **dairo**), golden sandfish (**dairo-kula**), and chalkfish (*Bohadschia marmorata*, **mudra**) are important as traditional food items.

**The common, scientific and local names for sea cucumbers are provided in table 1 (Below).**

Most of the sea cucumber species in Fiji feed on benthic or sediment detritus matter in the first few millimetres of the lagoon or reef floor, this helps in reducing nutrient loads and controlling micro-algal growth.

All the sea cucumbers in Fiji move slowly, and the majority of species are found in depths less than 20 meters. Most species reproduce sexually while a few species, such as lollyfish and greenfish are capable of asexual reproduction. Few studies have investigated the effect of egg/sperm fertilisation as a function of sea cucumber densities. Studies have shown that tigerfish (*Vula ni cakau*, *Vulawadrawadra*) fertilisation rates are high (>75%) when breeding pairs are within one meter apart, this fertilisation rate diminishes to less than 5% when breeding pairs are between 20 to 40 meters apart. These biological characteristics render sea cucumbers vulnerable to fishing pressures, and as a consequence a reduction in densities therefore reducing reproduction success on the reef system.

	<b>Common name</b>	<b>Scientific name</b>	<b>Fijian name</b>	<b>Value group</b>
1	amberfish	<i>Thelenota anax</i>	Basi	Medium

				(M)
2	Black teatfish	<i>Holothuria whitmaei</i>	Loaloa	High ( H)
3	Brown curryfish	<i>Stichopus vastus</i>	Laulevu	M
4.	Brown sandfish	<i>Bohadschia vitiensis</i>	Vula	M
5	Curryfish	<i>Stichopus hermanni</i>	Kari, Laulevu	M
6	Chalkfish	<i>Bohadschia marmorata</i>	Mudra	M
7	Deepwater blackfish	<i>Actinopyga palauensis</i>	Dri-ni-cakau	M
8	Deepwater redfish	<i>Actinopyga echinites</i>	Tarasea	H
9	Dragon/Peanut fish	<i>Stichopus horens</i>	Katapila	M
10	Elephant trunk fish	<i>Holothuria fuscopunctata</i>	Dairo ni cakau	M
11	Flower fish	<i>Pearsonothuria graeffei</i>	Senikau	M

12	Golden sandfish	<i>Holothuria lessoni</i>	Dairo kula	Very high (VH)
13	Green fish	<i>Stichopus chloronotus</i>	Dri-droka	H
14	Hairy blackfish	<i>Actinopyga miliaris</i>	Dri, Driloa	M
15	Loli's mother	<i>H. coronopertusa</i>	Tina-ni-loli	Low (L)
16	Lolly fish	<i>H. atra</i>	Loliloli	L
17	Pinkfish	<i>H. edulis</i>	Lolipiqi	M
18	Prickly redfish	<i>Thelenota ananas</i>	Sucudrau	H
19	Sandfish	<i>H. scabra</i>	Dairo	VH
20.	Red sea cucumber	<i>Actinopyga flammea</i>	Dri-sedamu	H
21	Starry sea cucumber	<i>Actinopyga spinea</i>	Dri-oria	M
22	Eyed sea cucumber	<i>Bohadschia ocellata</i>	Vula-saisai	L
23	Tiger fish	Bohadschia	Vula wadra	M

		argus		
24	Snakefish	H.coluber	Dri-balavu	L
25		H. leucospilota	Dri-seasea	M

## 1. Geographical Distribution of Stocks- across Fiji.

All the 25 species are found across the Fiji Group, but due to high fishing pressure , only a few species may be found in a given geographical region across Fiji, for example, there are more species in areas where there is low fishing pressure, than in areas closer to main townships across the country. If one compares the species found across Viti Levu and Vanua Levu, more species would be found where there are still less fishing pressure today, then in areas closer to urban centres. As one moves away from the main islands (say for Viti Levu), more sea cucumber species would be found across the isolated barrier reef- systems further away from Viti Levu, then in the nearshore fringing reef systems (e.g the Coral Coast region will have less than 10-12 species) compared to

the Mamanuca and the Yasawa Group (which would have above 17 species)

### **3.0 Status of the Sea cucumber stocks across Fiji:**

The status of the Sea cucumber stocks across the Fiji Group is all the same: **that is, all are at an overfished status**, and this is across the board for all the high value species, down to the lower value species. There is local extinction of the high and medium value species occurring in some localities across the Fiji Group, where fishing pressure has been very high from the last 20-25 years. Declines in sea cucumber stocks, particularly those of valuable species reflect regional, and global trends of BDM overfishing. Fishing gears introduced to increase catches, for example the use of compressed air which allowed fishers to take BDM from deeper waters as shallower stocks declined, kept pressure on stocks in areas that had once been important refuges.

While little is known of the sustainable levels of BdM harvest in Fiji several features of sea cucumber biology can make them vulnerable to unmanaged fishing:

(1) they are fairly sedentary and can therefore be harvested at rapid rates;

(2) they have low and irregular recruitment rates; and

(3) reproduction fails when populations fall below critical density thresholds (known as the 'Allee effect' or 'depensatory effect') which can happen when populations are reduced by fishing.

Understanding and managing for such population characteristics are critical for sustainable long-term use of such species. Although *H. scabra* is protected under national law it is still marketed illegally despite efforts by the Fiji government to control the trade with a 3 inch (7.6 cm) minimum (dried) size limit and a ban on its export in 1988. The size limit was not well enforced and is often broken by agents; undersize BdM are also sold in local markets .

#### **4.0 Value at point of Purchase (local and abroad).**

The price across Fiji are still relatively low, and perhaps largely controlled by Middlemen buyers. The price for dried and processed sea cucumber would depend on many things, and one of which would be poor and good quality processing of the dried products ( or beche-de-mer) and storage facilities.

The price to fishers for **dried sea cucumber** today would range from around **\$25- \$150 per kg**, and the price would be dictated by the species, and where White-teatfish, Black teatfish, and green fish would fetch higher prices per kg.

Fresh white teatfish would get very higher prices per piece, if they are larger specimen above 25cm, and each could easily fetch a price of around **\$80-100 per piece (FJ)**. The low value species would fetch a lower price, such as for Lollyfish- you will be lucky to get \$1/ piece for fresh product.

Retail prices at Hong Kong and Main Land China would get very high, and could easily range from around **US\$450-550**



**per Kg**, particularly for the Higher Value species ( which are White teatfish, Sandfish and Golden Sandfish).e

### **5.0 Sea cucumber Exports from Fiji.**

<b>Year</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>
Export volume (Est.) in MT.	198.43	268.31	322.59	90.14	43.22

The figures on the table suggests that exports over the years has declined.

### **6.0 Way forward to ensure that stocks status improve, and thus harvest sustained for the future:**

Clearly the Government, through the Ministry of Fisheries, should give priority to formalizing and implementing the proposed **National Fiji Sea Cucumber Management Plan** (which has been compiled and put together from the last four years (since 2012).

**The objectives of the Management Plan (MP) are as follows:**

The overall objectives are to:

- a) commence a logical adaptive approach to the management and sustainable utilisation of sea cucumber resources ,
- b) support and maintain a profitable and sustainable sea cucumber fishery ,and thus ensuring that the fishery benefits communities in Fiji,
- c) re-build and maintain sea cucumber stocks at economically and ecologically sustainable levels for current and future generations,
- d) protect diversity and resilience of the marine ecosystem against human and environment impacts,
- e) ensure adequate provisions of resources for the implementation, monitoring and enforcement of the fishery plan and
- f) strengthen partnerships, and ensure accountability for all stakeholders.

## **Strategies for achieving the objectives**

The ecosystem and the precautionary approaches to fisheries management will be applied to the sustainable development and management of the sea cucumber fishery. To achieve the objectives of the MP, the following strategies shall apply:

- a) Continue to undertake consultation with key stakeholders regarding the current status and the need for pro-active management of this very important fishery,
- b) develop, implement and enforce legal framework and regulations for the fishery ,
- c) promote and encourage participation in the sustainable management of the sea cucumber fishery at national government, provincial, industry, and community levels,
- d) establish a sea cucumber fishery advisory committee,
- e) establish clear and transparent licensing arrangements to control and monitor exports,;
- f) establish a mechanism for managing the fishery by quota at the species level,

- g) closure of specified areas within fishery waters to allow sea cucumber stocks to recover from pressures of fishing,
- h) apply restrictions on fishing techniques or methods,
- i) apply restrictions (size limits, restricted species etc.) on sea cucumber species,
- j) establish requirements for sea cucumber aquaculture and other processed sea cucumber products,
- k) establish an ongoing program for monitoring sources of production, export quantities, stock surveys and other information to support management of the sea cucumber fishery,
- l) establish effective monitoring and enforcement systems to ensure compliance with the sea cucumber management plan, licenses, conditions of licenses, regulations and community management initiatives and
- m) provide support to communities for the management of resources, and to improve the value of marine products.