



Republic of the Marshall Islands
National Sea Cucumber Fishery
Management Plan
2012



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Approval of management plan

Pursuant to the powers and functions vested in the Marshall Islands Marine Resources Authority under Title 5 and section 207 of the Fishery Act, the Board, having given due regard to scientific, economic, cultural, environmental and other relevant considerations, has determined that the sea cucumber fishery:

- a. is important to the national interest; and
- b. requires management and development measures for effective conservation and optimum utilization.

Therefore, the Board has authorized the sea cucumber fishery as a designated fishery and hereby approved the Sea Cucumber Fishery Management Plan 2012.

Dated this . *April 19, 2012*

A handwritten signature in black ink, appearing to read 'Michael Konelios', written over a horizontal dotted line.

Hon. Michael Konelios

Chairman, Marshall Islands Marine Resources Authority Board

This management plan is based on work conducted by the Marshall Islands Marine Resources Authority (MIMRA) during 2011 and 2012, which included several internal workshop sessions (within MIMRA) and four public consultations with stakeholders.

Throughout the development of the plan, technical assistance was provided by SPC's Coastal Fisheries Programme.

The plan was approved by the Board of MIMRA on 19 April 2012. Following the approval, regulations were developed and the 'Republic of Marshall Islands Sea Cucumber Regulations of 2012' were approved by Cabinet on 22 October 2012.

Cover photo: MIMRA



Photo : Emmanuel Tardy



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Photo : Maria Sapatu



Preliminary information



1.1 Title

The title of this plan is the *Republic of the Marshall Islands National Sea Cucumber Fishery Management Plan 2012*, hereafter referred to as ‘Sea Cucumber Fishery Plan’. This plan sets out the policy of the Government of Republic of the Marshall Islands (RMI) and does not have legal effect in its own right.

1.2 Application

- a. The Sea Cucumber Fishery Plan has been prepared in accordance with section 207, 51 MIRC, ch. 2.
- b. The Sea Cucumber Fishery Plan applies to all animals belonging to the class Holothuroidea, commonly known as sea cucumbers, and to the sea cucumber fishery, and includes all activities associated with the aquaculture, ranching, collection, processing, storage, buying, selling, and exporting of sea cucumber products from Republic of the Marshall Islands fishery waters.
- c. Attachments to the Sea Cucumber Fishery Plan form part of the plan and shall be read together with the plan.

1.3 Purpose and objectives

The purpose of the Sea Cucumber Fishery Plan is to provide ecologically sustainable development and to establish an effective, conducive and enforceable management structure for the Republic of the Marshall Islands sea cucumber fishery. The objectives are to:

- a. ensure that the sea cucumber fishery is sustainable and the sea cucumber fishery has minimal impact on the marine and coastal environments; and
- b. maximize economic returns from the fishery, ensuring that the sea cucumber fishery benefits communities of Republic of the Marshall Islands.

1.4 Interpretation

Unless otherwise specified, words and expressions used in the Plan shall have the same meanings as defined in the *Marshall Islands Marine Resources Act 1997*. Where there is inconsistency between the plan and the *Marine Resources Act 1997*, the *Marine Resources Act* shall prevail.

- ‘Act’ means the Acts under Title 51 of the Marshall Islands Revised Code.
- ‘Authority’ means the Marshall Islands Marine Resources Authority.

- ‘Authorized officer’ means any person or category of persons designated pursuant to the Act.
- ‘Beche-de-mer’ means the processed boiled, smoked and dried sea cucumber product, also referred to as trepang.
- ‘Board’ means the Board of the Marshall Island Marine Resources Authority.
- ‘Designated fishery’ means any fishery designated in accordance with section 207 of 51 MIRC ch. 2.
- ‘Director’ means the Director of the Marshall Islands Marine Resources Authority.
- ‘Export license’ means a license to export sea cucumber products issued by the Authority.
- ‘Permit’ means a permit issued under the Act or under the regulations.
- ‘Sea cucumber’ means all animals belonging to the class Holothuroidea.



2

Sea cucumber fishery



2.1 Biology

Most sea cucumbers have separate sexes. Some species, like the sandfish, are relatively fast growing and reach reproductive size within a year or so, but take about two years to reach an acceptable market size. Other species grow more slowly, with a lifespan of between 5 and 15 years. For reproduction to be successful, many eggs have to be fertilized, which means that large numbers of sea cucumbers have to be present in the same place. Fertilized eggs hatch (planktonic larval stages) and drift with ocean currents for two to several weeks before settling on the sea floor as juvenile sea cucumbers. Adults appear not to move very far from the areas in which they settle.

Many species of sea cucumbers are commercially fished and exported, mainly to South-east Asia, as the boiled, smoked and dried product known as beche-de-mer or trepang. Sea cucumbers do not have cultural or traditional food importance in Republic of the Marshall Islands; however, they have recently been of interest to several commercial ventures for export to Asia. Assessments have been made in several of the atolls, including Majuro, and have found that there are 14 known species of sea cucumbers in Republic of the Marshall Islands, some of which are of high value.

2.2 Target species

The table below lists the common trade, scientific, and local names for known sea cucumber species in Republic of the Marshall Islands.

Trade name	Scientific name	Local name
Amberfish	<i>Thelenota anax</i>	Jibenben
Black teatfish	<i>Holothuria whitmaei</i>	Jibenben
Brown sandfish	<i>Bohadschia vitiensis</i>	Jibenben (Potato)
Curryfish	<i>Stichopus herrmanni</i>	Jibenben
Elephant trunkfish	<i>Holothuria fuscopunctata</i>	Jibenben
Greenfish	<i>Stichopus chloronotus</i>	Jibenben
Leopardfish	<i>Bohadschia argus</i>	Jibenben
Lollyfish #	<i>Holothuria atra</i>	Jibenben (Ramen)
Pinkfish #	<i>Holothuria edulis</i>	Jibenben
Prickly redfish	<i>Thelenota ananas</i>	Jibenben (Pineapple)
Slender sea cucumber *	<i>Holothuria impatiens</i>	Jibenben
Surf redfish	<i>Actinopyga mauritiana</i>	Jibenben
Tigertail sea cucumber *	<i>Holothuria hilla</i>	Jibenben
White teatfish	<i>Holothuria fuscogilva</i>	Jibenben

Note: Asterisk (*) denotes non-target species for beche-de-mer and number sign (#) denotes target species for ornamental trade.

2.3 Status of the fishery

The multi-species sea cucumber fishery is based on the exploitation of species belonging to the genera *Actinopyga*, *Bohadschia*, *Holothuria*, *Stichopus* and *Thelenota*. The official commercial harvesting of sea cucumber in RMI began in 2010 but anecdotal reports suggest that commercial harvesting may have occurred around 2002–2005. Commercial sea cucumber harvesting was also reported to occur briefly in 1997.

Harvesting is usually done by snorkel and hand picking (collecting or gleaning). Commercial harvesting has occurred in Arno, Ebon, Likiep, Wotje, Ailinglaplap, Enewetak and Kili. The harvesting and processing of sea cucumber in RMI is generally unregulated; however, section 227(b), 51 MIRC ch. 2 provides for permits to be issued for the export of any fish or fish product from the fishery waters.

In March 2011, a total of 9,220 pounds¹ (4,190 kg) of dried, processed sea cucumber was exported, comprising 34% *A. mauritiana*, 30% *S. chloronotus*, 15% *T. ananas* and the remainder *H. fuscogilva*, *B. argus*, and *T. anax*. Exports of live sea cucumber for the ornamental trade have occurred over the past ten years; however, they are limited to two species, *H. edulis* and *H. atra*.

Sea cucumbers extract bacteria and organic matter from bottom sediments. Some sea cucumbers are responsible for oxygenation of sediments on the sea floor. The impacts of intensive harvesting of sea cucumbers on benthic habitats are poorly understood. However, experience elsewhere (e.g. Papua New Guinea) suggests that the absence of sea cucumbers resulted in algal mats covering the sea floor and overgrowth of coral by algae. Furthermore, using local timber as fuel for boiling and smoking sea cucumbers is inadvisable in atolls where local timber is in short supply. Sea cucumber processing can also result in the production of stickwater, which contains a toxin (holothurine) that originates from the boiling of some species of sea cucumber. The release of stickwater directly into the marine environment has resulted in fish kills in shallow coastal areas. Sea cucumbers are prone to overfishing if no management is in place to control harvesting. This is due to the sluggish nature of the animal, the fact that they primarily inhabit shallow areas and the high demand for beche-de-mer products.

In February 2011, in response to concerns regarding the lack of management frameworks and through application of the precautionary approach, the Marshall Islands Marine Resources Authority imposed a moratorium on the export of sea cucumber (beche-de-mer) from Republic of the Marshall Islands. The moratorium is in effect until a management plan is in place.

To prevent the unsustainable harvesting of sea cucumber populations in Republic of the Marshall Islands, it is important that local governments take part in the implementation and enforcement of rules and procedures on sustainable harvesting.

¹ As a rule of thumb, during sea cucumber processing, weight losses are 90%–95% depending on species. Using this rule of thumb, 9,220 pounds of dried sea cucumber equates to around 92,200–138,000 pounds wet weight.



3.1 Local government councils

The roles of the local government councils in the management and development of sea cucumber fisheries within their area of governance will include, but not be limited to:

- a. preparation of local sea cucumber fisheries management plans, with the assistance of the Authority;
- b. recommending to the Authority the declaration of designated local sea cucumber fisheries;
- c. recommending to the Authority to promulgate sea cucumber regulations/ordinances regarding fishing operations and the issuance of licenses and permits;
- d. developing and adopting ordinances for local sea cucumber fisheries management; and
- e. issuing licenses and permits for local sea cucumber fishers.

3.2 Marshall Islands Marine Resources Authority (MIMRA)

The Authority's role in the development and management of the sea cucumber fishery of Republic of the Marshall Islands will include, but not be limited to:

- a. reviewing and providing recommendations in regard to sea cucumber export licensing and reporting;
- b. managing the fishery at ecologically sustainable levels in Republic of the Marshall Islands based on practices that will ensure the protection, conservation and effective management of the sea cucumber resources;
- c. providing recommendations to the Board and local government councils on harvestable sea cucumber quotas at the species level and/or open and closed harvest seasons;
- d. collating data on harvest and exports of sea cucumber;
- e. inspecting sea cucumbers destined for export;
- f. providing annual reports on the status of the sea cucumber fishery to the Board and stakeholders;
- g. establishing an ongoing program for monitoring and surveillance of compliance with measures stipulated under the Sea Cucumber Fishery Plan, regulations and under the Act;

- h. planning and conducting or overseeing sea cucumber resource assessments and reviewing scientific efforts to support the sustainable development and management of the sea cucumber fishery;
- i. assisting, and/or facilitating the development of local government and/or community sea cucumber resource management plans; and
- j. overseeing the revision of the Sea Cucumber Fishery Plan.



Photo : Emmanuel Tardy

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Strategies



4.1 Principal ways to achieve the objectives

Strategies to achieve the objectives of the Sea Cucumber Fishery Plan include the following:

- a. promote and encourage the management of the sea cucumber fishery at the local and community level;
- b. establish licensing arrangements to control and monitor exports, and to encourage fishing operations to be conducive to the sustainable use of the sea cucumber resources;
- c. apply restrictions on particular fishing techniques or methods as required;
- d. apply restrictions on fishing for particular sea cucumber species;
- e. close specified areas within the fishery waters to allow sea cucumber populations to recover from the pressures of fishing;
- f. establish an ongoing program for monitoring catch data, export quantities and scientific information to support management of the sea cucumber fishery; and
- g. establish an effective monitoring and enforcement system to ensure compliance with the Sea Cucumber Fishery Plan, licenses, conditions of licenses and regulations.

4.2 Consultative process

The Director shall organize consultations with key stakeholders (local government councils; Coastal Management Advisory Council [CMAC]; non-governmental organizations with an interest in the conservation, development and management of the sea cucumber fishery; sea cucumber processors, buyers, exporters, etc.) in the sea cucumber fishery at least once in each calendar year or as may be necessary. The scope of the consultations shall include matters relating to:

- a. the management and regulation of the sea cucumber fishery, including licensing and conditions of licenses;
- b. local government councils' sea cucumber fishery management initiatives;
- c. the development of fishing and processing, including investment policies, financial arrangements and projects to promote sustainable sea cucumber processing and marketing;
- d. socio-economic or environmental impacts of sea cucumber fishing and processing;
- e. awareness and extension programs; and
- f. other such issues related to the sea cucumber fishery.



Photo : Emmanuel Tardy

5

Management measures



5.1 Approaches for local councils and communities

In order to ensure benefits for local communities and to minimize damage to stocks of sea cucumbers, local governments and communities are encouraged and advised to take precautionary measures when establishing local management plans within their respective jurisdictions. These measures could include, but are not limited to, the following:

- a. establish a network of permanent or rotational no fishing areas (the expectation is that young sea cucumber will be produced and these will settle in nearby areas); the no take fishing areas could comprise 5–15% of suitable sea cucumber habitat;
- b. declare and enforce periodic short-term open sea cucumber harvest seasons;
- c. establish systems of best practices regarding processing sea cucumber to improve product quality and minimize environmental damage;
- d. develop an agreed system of fair distribution of the sea cucumber resource amongst communities;
- e. establish systems of monitoring the stocks and catches;
- f. consider establishing sea cucumber cooperatives to ensure resource sustainability, improve processing standards and coordinate exports; and
- g. consult regularly with communities and agencies such as the Marshall Islands Marine Resources Authority, the Marshall Islands Conservation Society and other relevant Coastal Management Advisory Council partners.

5.2 Open and closed seasons

- a. Harvesting of sea cucumber shall be governed by limited duration harvest seasons.
- b. The local government council, after consultation with the Board, may declare from year to year an open season for such time as is deemed advisable for the harvesting and processing of sea cucumber for an island.
- c. The Authority shall assess the stock of sea cucumber for an island or make comparative assessments at appropriate intervals and advise the local government council and the Board when, where and under what conditions an open season will be sustainable.
- d. The Authority and the relevant local government council shall give public notice of the period declared for open or closed harvest seasons, and the restrictions placed on the harvesting, processing and disposal of sea cucumbers from the relevant island.

5.3 Licensing

- a. Sea cucumber export licenses will be issued by the Authority as a means of controlling and monitoring exports and recovering cost against government expenditure in the management of the sea cucumber fishery.
- b. The Authority shall call for applications for sea cucumber export licenses.
- c. When reviewing applications and issuing licenses, the following shall be taken into consideration:
 - i. whether the applicant is a registered business or entity in Republic of the Marshall Islands;
 - ii. ownership and the management of the business or entity by citizens of Republic of the Marshall Islands;
 - iii. anticipated capital contributions and revenue, and whether the generated income is likely to be re-invested in Republic of the Marshall Islands;
 - iv. whether the business or entity gives employment and provides training in sea cucumber processing or exports to citizens of Republic of the Marshall Islands;
 - v. whether the business or entity has storage facilities that are adequate and secure for storage and inspection of sea cucumber products;
 - vi. whether the business or entity has complied with the relevant laws of Republic of the Marshall Islands relating to marine resources, environment, taxation, labor and immigration.
- d. Licenses shall not be issued unless the required fees are paid.
- e. Sea cucumber exporting licenses are valid for a period of 12 months.
- f. The maximum number of sea cucumber exporting licenses issued in any licensing period shall be capped at a figure to be determined by the Authority (the recommended number of sea cucumber export licenses is three [3] for Republic of the Marshall Islands).
- g. Sea cucumber export licenses shall not be transferable.
- h. Special operating conditions may be attached to export licenses.
- i. The licensee shall not hold more than one sea cucumber export license at a time; this restriction applies to any manner of holding, whether as a legal holder, a beneficiary holder, a part holder or by the use of any nominee;



- j. The licensee will allow and assist any authorized enforcement officer to carry out his/her duties, including inspection of packing and export facilities, inspection of reporting log forms, taking photographs and collection of specimens if necessary.

5.4 Data collection

Data are important to the management of the fishery. All licensed exporters must complete a log sheet, detailing the quantity (total numbers and weight) of sea cucumber by species purchased or received from any atoll/island on a monthly basis. The Authority will make log sheets available to license holders.

5.5 Gear prohibitions

Fishing for sea cucumber shall be restricted to hand picking or collecting by either free diving or wading (reef walking) and during daylight hours.

5.6 Species prohibitions and restricted areas

- a. Collection or possession of sea cucumbers smaller than the live or wet lengths for the species provided in Attachment 1 shall be prohibited.
- b. Possession of dried sea cucumber smaller than the processed dry lengths provided in Attachment 1 shall be prohibited.
- c. Collection and export of sea cucumber for ornamental or aquarium trade shall be restricted to the annual average exports by species over the period 2000–2010.
- d. Consideration shall be given for the protection of rare or threatened sea cucumber species in RMI.
- e. Fishing or collecting of sea cucumber shall be prohibited within areas established as protected areas by the national government, local governments or communities, and within world heritage sites.

5.7 Export prohibitions and requirements

- a. The export of sea cucumber requires prior approval from the Director.
- b. The export of sea cucumber parts, or broken and damaged sea cucumber, shall be prohibited.

- c. Exporters shall report to the Authority all sea cucumber products they intend to export; this report shall be in the form of a 'Sea Cucumber Export Declaration Form' (attachment 2) detailing the species, quantity, export destination and value;
- d. Sea cucumber products for export shall be packed separately by species and the holding containers clearly labeled with the species name, quantity of the product and the license number of the exporter;
- e. Consignments of sea cucumber taken or sent overseas for personal consumption shall be limited to 12 pieces per person; each consignment requires a permit issued by the Marshall Islands Marine Resources Authority.

5.8 Sea cucumber aquaculture requirements

- a. Any person or company intending to produce sea cucumber via hatchery technology or be involved in sea cucumber ranching shall first obtain written permission from the Director.
- b. Potential sea cucumber hatchery or aquaculture investors, or persons or companies interested in ranching sea cucumber are required to submit to the Director a proposal. This will include an outline of the planned operation and its objectives and goals, the planned activities, the source and quantity of brood stock species, the site of the proposed operation, the monthly or yearly production, an evaluation of environmental impacts and procedures to avoid detrimental ones, a business plan, indicators to measure the success of the operation and other information as may be required by the Director.

5.9 Monitoring and enforcement

- a. The Authority will monitor monthly reports from licensees and provide written summaries to the Board on a quarterly basis.
- b. Authorized officers will frequently monitor the premises of licensed exporters and examine the sea cucumber product in these premises to search for breaches of this plan and the *Marine Resources Act 1997* and breaches of the conditions of the export licenses and regulations.
- c. The Director will monitor the quarterly level of sea cucumber exports by species and by atoll/island. If the level threatens the sustainable level for successful spawning at the species level, the Director may apply additional measures, after consulting stakeholders and the Board. This is in the best interest of sea cucumber biodiversity, the sustainability of the resource and the economic viability of the sea cucumber fishery.



5.10 Review and amendments

- a. The Director shall conduct an analysis of the conservation and management measures set out in this Sea Cucumber Fishery Plan, and determine whether the plan should be reviewed. The Sea Cucumber Fishery Plan may be reviewed upon the written approval of the Authority.
- b. In reviewing the Sea Cucumber Fishery Plan the Director shall have particular regard to the following factors, amongst others:
 - i. the objectives of the Act and this plan;
 - ii. the effectiveness of the data collection and monitoring programs;
 - iii. the status of the stocks, including changes in yield, species and size composition or distribution;
 - iv. benefits to communities;
 - v. the status and economic viability of the fishery;
 - vi. the appropriateness of fees and charges;
 - vii. the effectiveness of the conservation and management measures.
- c. Having conducted the review, the Director shall make recommendations to the Board as to the continued management of the sea cucumber fishery. In particular the Director may make recommendations regarding the amendment, revocation or continuation of the Sea Cucumber Fishery Plan.
- d. The Director shall consult with key stakeholders prior to making any recommendation to the Board and Minister relating to the result of the review.
- e. The Authority may revise and amend the attachments as necessary.
- f. Any proposed amendments shall be submitted to the Board; after reviewing the proposed amendments, the Board will approve the revised plan.
- g. Any amendments or revisions to this plan will be made public.

Attachment 1: Minimum harvest and purchase/export sizes

Common name	Code name	Scientific name	Wet length (inches)	Dry length (inches)
Amberfish	HLX	<i>Thelenota anax</i>	14	6
Black teatfish	HFN	<i>Holothuria whitmaei</i>	10	5
Brown sandfish	BDV	<i>Bohadschia vitiensis</i>	10	6
Curryfish	JCV	<i>Stichopus herrmanni</i>	12	4
Elephant trunkfish	HOZ	<i>Holothuria fuscopunctata</i>	14	6
Greenfish	JCC	<i>Stichopus chloronotus</i>	8	3
Leopardfish	KUW	<i>Bohadchia argus</i>	12	6
Lollyfish	HFA	<i>Holothuria atra</i>	8	3
Pinkfish	HFE	<i>Holothuria edulis</i>	8	4
Prickly redfish	TFQ	<i>Thelenota ananas</i>	12	6
Surf redfish	KUY	<i>Actinopyga mauritiana</i>	8	4
White teatfish	HFF	<i>Holothuria fuscogilva</i>	12	6



Attachment 2: Sea cucumber export declaration form

Name of exporter: _____

Export license no.: _____

Date of shipment: _____

Sea cucumber species	Number of bags	Number of pieces per bag	Total weight of each bag (pounds)	Export destination	Value/currency per pound
TOTAL					

Amberfish (HLX), Black teatfish (HFN), Brown sandfish (BDV), Curryfish (JCV), Elephant trunkfish (HOZ), Greenfish (JCC), Leopardfish (KUW), Lollyfish (HFA), Pinkfish (HFE), Prickly redfish (TFQ), Surf redfish (KUY), White teatfish (HFF).

Signature: _____ Date: _____

Sea cucumber exporter

Signature: _____ Date: _____

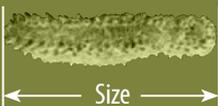
Fisheries Inspector/Authorized officer

Send completed form to: The Director, Marshall Islands Marine Resources Authority, PO Box 860, Majuro, Marshall Islands 96960. Telephone: (692) 625-8262/5632; Fax: (692) 625-5447.

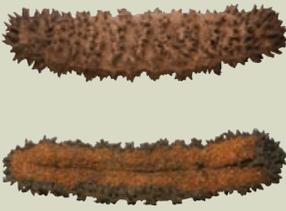
Attachment 3: Republic of the Marshall Islands sea cucumbers – Live and processed forms and minimum size limits

Trade name		
Scientific names	Live form	Processed form
FAO code		
<p>Amberfish</p> <p><i>Thelonota anax</i></p> <p>HLX</p> <p>size</p>	 <p>14 inches</p>	 <p>6 inches</p>
<p>Black teatfish</p> <p><i>Holothuria whitmaei [ex. nobilis]</i></p> <p>HFN</p> <p>size</p>	 <p>10 inches</p>	 <p>5 inches</p>
<p>Brown sandfish</p> <p><i>Bohadschia vitiensis</i></p> <p>BDV</p> <p>size</p>	 <p>10 inches</p>	 <p>6 inches</p>
<p>Curryfish</p> <p><i>Stichopus herrmanni [ex. variegatus]</i></p> <p>JCV</p> <p>size</p>	 <p>12 inches</p>	 <p>4 inches</p>

Trade name	Live form	Processed form
Scientific names FAO code Elephant trunkfish <i>Holothuria fuscopunctata</i> HOZ size	 14 inches	 6 inches
Greenfish <i>Stichopus chloronotus</i> JCC size	 8 inches	 3 inches
Leopardfish <i>Bohadschia argus</i> KUW size	 12 inches	 6 inches
Lollyfish <i>Holothuria atra</i> HFA size	 8 inches	 3 inches



Photos: amberfish & leopardfish: P. Laboute, IRD; black teatfish, brown sanfish, lollyfish & prickly redfish: S. Purcell; curryfish: K. Friedman; greenfish: A. Desurmont; elephant trunkfish & pinkfish: WorldFish; surf redfish & white teatfish: J.-L. Menou, IRD

Trade name Scientific names FAO code	Live form	Processed form
<p>Pinkfish</p> <p><i>Holothuria edulis</i></p> <p>HFE</p> <p>size</p>	 <p>8 inches</p>	 <p>4 inches</p>
<p>Prickly redfish</p> <p><i>Thelonota ananas</i></p> <p>TFQ</p> <p>size</p>	 <p>12 inches</p>	 <p>6 inches</p>
<p>Surf redfish</p> <p><i>Actinopyga mauritiana</i></p> <p>KUY</p> <p>size</p>	 <p>8 inches</p>	 <p>4 inches</p>
<p>White teatfish</p> <p><i>Holothuria fuscogilva</i></p> <p>HFF</p> <p>size</p>	 <p>12 inches</p>	 <p>6 inches</p>



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