SPC assists Federated States of Micronesia with a sea cucumber assessment in Pohnpei

Ryan Ladore of OFA surveying a reef benthos transect (image: Pauline Bosserelle).

Sea cucumbers are an important and valuable resource in the Pacific island countries and territories (PICTs). In the face of high global demand, particularly from Asian markets for beche-de-mer, and due to a lack of effective management, sea cucumber resources in many PICTs have become overexploited. In Pohnpei, Federated States of Micronesia (FSM), the fishery has been closed since the early 1990s. However, there is renewed interest in opening the fishery.

Overview of the sea cucumber fishery in Pohnpei

Commercial sea cucumber fishing in the FSM started in the late 1800s, and sea cucumbers were harvested extensively up until the Second World War. Pohnpei State was one of the main producers, and in 1941 exported around 90 tonnes (t) wet weight of sea cucumbers (Smith 1992). World War II did not provide a reprieve for sea cucumbers in the FSM; rather, populations were heavily impacted during the war, as large numbers of soldiers based in the FSM had limited food, and subsequently harvested sea cucumbers to supplement their diets (Kinch et al. 2008). Following the war, commercial exploitation continued until around the late 1980s to 1990s; however, harvests and exports over this time were largely unregulated and poorly documented. In the early 1990s, the Pohnpei State Government realised stocks were depleted and in 1991, the senate declared a moratorium on exports. However, harvest of species – such as brown curryfish, curryfish, dragonfish, sandfish, grey impatient sea cucumber and red impatient sea cucumber – for subsistence use and for sale of processed products – such as guts and shredded body walls at the local markets – is permitted.

One-day harvest of 2016

More than 20 years into the moratorium, Pohnpei State Governments' Office of Fisheries and Aquaculture (OFA) decided to reopen the fishery in 2016.

Many stakeholders protested this decision and took the matter to court claiming that there was not enough scientific evidence to prove stocks have fully recovered and the fishery lacked a management plan and harvest strategies.

After only a day of harvest, the court ordered a temporary restraining order ceasing any further harvesting of sea cucumber until a rigorous assessment of sea cucumber stocks in Pohnpei was completed and a management plan developed.

Accordingly, the Department of Resources and Development of the FSM National Government (FSM DRD) and OFA requested assistance and technical expertise from the Pacific Community's (SPC) Fisheries, Aquaculture and Marine Ecosystem (FAME) Division.

Training and in-water survey

FAME staff travelled to Pohnpei in May 2017 to provide the training and lead the sea cucumber assessment. Before the in-water survey commenced, training on the use of SPC invertebrate in-water survey methods and species identification was conducted at OFA. The survey was conducted by staff members from SPC, OFA, Pohnpei Staff Department of Resources and Development (PS DRD) FSM DRD staff members around Pohnpei and Ant Atoll. The sampling effort was designed to cover a range of habitats within and outside marine protected areas. In all possible instances, stations were placed as close as possible to locations of a previous assessment that was conducted in 2013 by OFA, FSM DRD and SPC. All large invertebrates were counted, measured where possible and recorded using manta tow, reef benthos transect, soft benthos transect and reef front transect survey methods.

Assessment results

The 2017 survey covered an area of over 250 km^2. More than 23,000 individual sea cucumbers were recorded, and belonged to seven genera and 24 species (Table 1). Lollyfish (*Holothuria atra*) was the dominant species, representing almost 69% of all sea cucumbers observed. Other frequently encountered species were pinkfish, greenfish, snakefish, tigerfish and surf redfish.

Densities for all species – except for pinkfish on the reef flat and the coastal fringe and surf redfish on the reef crest – were below regional reference densities for healthy stocks outlined in Pakoa et al. (2014). Densities of high valued species such as white teatfish and sandfish were critically low. Comparisons of this and another recent survey by the College of Micronesia (Bougoin and Pelep 2017) with the 2013 assessment, revealed declines in densities of tigerfish, brown sandfish, black teatfish, hairy blackfish, surf redfish, sandfish and chalkfish. Mean lengths of most species were below regional common lengths, revealing that the populations in Pohnpei were largely made up of juvenile and sub-adult individuals.

Stock estimates and quotas were calculated for pinkfish and surf redfish that exceeded regional reference densities. The pinkfish population was estimated at 1,769,941 individuals, of which the harvestable stock (30% of adult population) represented 39,717 individuals, equating to just under 0.5 t dry weight. The surf redfish population was estimated at 255,354 individuals of which the harvestable stock was estimated at 11,859 individuals, equating to just over 0.5 t dry weight. A preliminary analysis of costs and benefits suggests that exploitation of these two species would be financially unsustainable for most of the parties involved.

Stakeholder workshop

At the end of the in-water assessment, a sea cucumber stakeholder workshop was organised by SPC, OFA and FSMRD on the 26 May 2017, and was held in the Pohnpei State Governor's Conference Room. More than 30 participants attended this meeting, including resource managers from national and state government, representatives from non-governmental organisations, and community leaders and chiefs.

The primary objective of this meeting was to present the preliminary results of the in-water survey of Pohnpei and Ant Atoll and to discuss the possibility of commercially

Table 1. Sea cucumber species recorded at Pohnpei and Ant Atoll during the in-water assessment in May 2017.

Common name	Scientific name	Total counts	Relative composition (%) to total no. of individuals
Lollyfish	*Holothuria atra*	15,968	68.8
Pinkfish	*Holothuria edulis*	2,788	12.0
Greenfish	*Stichopus chloronotus*	1,117	4.8
Snakefish	*Holothuria coluber*	725	3.1
Tigerfish	*Bohadschia argus*	668	2.9
Surf redfish	*Actinopyga mauritiana*	473	2.0
Curryfish	*Stichopus herrmanni*	291	1.3
Brown curryfish	*Stichopus vastus*	282	1.2
Prickly redfish	*Thelenota ananas*	173	0.7
Tiger tail	*Holothuria hilla*	162	0.7
Elephant trunkfish	*Holothuria fuscopunctata*	154	0.7
Flowerfish	*Pearsonothuria graeffei*	136	0.6
Black teatfish	*Holothuria whitmaei*	95	0.4
Red snakefish	*Holothuria flavomaculata*	83	0.4
Hairy blackfish	*Actinopyga miliaris*	32	0.1
Brown sandfish	*Bohadschia vitiensis*	22	0.1
Deepwater redfish	*Actinopyga echinites*	15	0.1
Amberfish	*Thelenota anax*	13	0.1
White teatfish	*Holothuria fuscogilva*	7	<0.1
Sandfish	*Holothuria scabra*	7	<0.1
Deepwater blackfish	*Actinopyga palauensis*	6	<0.1
Chalkfish	*Bohadschia similis*	3	<0.1
Stonefish	*Actinopyga lecanora*	1	<0.1
Spotted-worm sea cucumber	*Synapta maculata*	1	<0.1

Stakeholder meeting group-discussion on management related issues (image: Pauline Bosserelle).

harvesting sea cucumbers from around Pohnpei for export, the management of sea cucumber harvests, and the monitoring strategies for stocks.

Two presentations were delivered to the participants. The first, presented by SPC, provided preliminary findings from the survey. OFA delivered the second presentation, which focused on the 2016 harvest and the management strategies that were adopted. Following the presentations, the participants were divided into working groups to get their views on the 2016 harvest, the management that was in place, and suggestions on how harvests could be better managed in the future should sustainable harvests be deemed possible.

Stakeholders raised several issues with management strategy in the 2016 harvest, namely that there were too many (3500) permits issued, the absence of a management plan and harvest strategies, the lack of transparency when determining species quotas and species available for harvest, a lack of transparency in the selection process for the single export licence, and a lack of tracking of individual fisher permits. Stakeholders proposed several options for improving on these issues, which will be invaluable in formulating the management plan for the fishery.

Next steps

Following completion of survey and data analysis, FAME will produce an assessment report that will include recommendations for management. Furthermore, FAME staff members will coordinate and implement a review of the sea cucumber fishery in all states of FSM. This review is part of the Pacific Islands Regional Oceanscape Programme (PROP) that is administered by the Forum Fisheries Agency (FFA) and will explore options that may assist in regulating the sea cucumber fishery at the sub-regional or regional levels.

References

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