

Communications...

from: *Steven W. Purcell and Alessandro Lovatelli*

SCEAM: A forum to strengthen an ecosystem approach to managing sea cucumber fisheries

Pandemic overfishing to critical levels threatens the existence of sea cucumber fisheries and the important role they play in the livelihoods of coastal fishers (Toral-Granda et al. 2008). Sea cucumbers are a key resource, contributing to poverty alleviation for more than 3 million fishers globally (Purcell et al. 2012). They are fished in every Pacific Island country (PIC) (Kinch et al. 2008) and are a vital marine export commodity for numerous countries elsewhere (Anderson et al. 2011).

To help fisheries managers, the Australian Centre for International Agricultural Research (ACIAR) and the Food and Agriculture Organization of the United Nations (FAO) coordinated and published manuals on sea cucumber fisheries management (Lovatelli et al. 2004; Friedman et al. 2008; FAO 2010; Purcell 2010). The manuals provide a “roadmap” and guidelines for developing and implementing better management of sea cucumber fisheries. To further assist fisheries agencies, a strategy was developed to hold workshops in each major region of the world where sea cucumbers are fished artisanally. To this objective, FAO, ACIAR, the Secretariat of the Pacific Community (SPC) and the Southern Cross University (SCU) partnered to coordinate the first regional workshop in the Pacific during November 2011: Sea Cucumber Fisheries: an Ecosystem Approach to Management (SCEAM).

The three and a half-day workshop aimed to bring about significant changes to management systems (both regulatory measures and actions by fishery agencies) in 13 PICs, focussing on the approaches provided in the ACIAR and FAO manuals. Participants were fishery managers or senior fishery officers in charge of managing sea cucumber fisheries. Each one submitted responses to questions about current management regulations, enforcement capacity, management capacity, stakeholder participation and fishing activities in their fishery.

Seminars by the workshop facilitators (Steven Purcell, Ian Bertram, Kalo Pakoa and Alessandro Lovatelli) included topics such as sea cucumber biology, management principles and regulations, management actions and the preparation of management plans. Participants then used the ACIAR and FAO manuals to assess the status of their fishery stocks using various indicators, and decided on appropriate regulatory measures and management actions, and ranked fishery objectives. Regulatory measures, management actions and constraints were also examined more closely for four important case-study fisheries.

The three primary outputs of the workshop will be:

- sets of regulatory measures and management actions decided on by each participant to be applied in their sea cucumber fishery;
- an FAO report summarising the outcomes; and
- a paper on the constraints, needs, management practices and potential solutions for the 13 fisheries reviewed.

Collation of responses to a post-workshop survey showed that most participants felt the workshop was neither too long nor too short. Most strongly agreed that they gained new knowledge from the workshop presentations and all stated that the workshop will be useful to the future management of their fishery. As a measure of success, all participants responded that the workshop had changed their opinion about how best to manage the sea cucumber fishery in their own country.

Future steps will be to coordinate similar workshops in other regions, namely the Indian Ocean, Southeast Asia and Latin America. The next phase is expected to be a “SCEAM Indian Ocean” workshop in Zanzibar at the end of 2012, depending on identification of suitable funding.

Acknowledgements

SCEAM Pacific was funded through FAO, ACIAR and SPC. Resources for logistics were given by SCU. We thank the participants for their responses and engagement at the workshop.

References

- Anderson S.C., Flemming J.M., Watson R. and Lotze H.K. 2011. Serial exploitation of global sea cucumber fisheries. *Fish and Fisheries* 12:317–339.
- Friedman K., Purcell S., Bell J. and Hair C. 2008. Sea cucumber fisheries: A manager's toolbox. ACIAR Monograph No. 135. Australian Centre for International Agricultural Research, Canberra, Australia. 32 p. www.aciar.gov.au/publication/mn135
- Kinch J., Purcell S., Uthicke S. and Friedman K. 2008. Population status, fisheries and trade of sea cucumbers in the Western Pacific. p. 7–55. In: Toral-Granda V., Lovatelli A., Vasconcellos M. (eds). *Sea cucumbers: A global review on fisheries and trade*. FAO Fisheries Technical Paper. No. 516. Rome, FAO. [ftp://ftp.fao.org/docrep/fao/011/i0254e/i0254e.pdf](http://ftp.fao.org/docrep/fao/011/i0254e/i0254e.pdf)
- Lovatelli A., Conand C., Purcell S., Uthicke S., Hamel J.-F. and Mercier A. 2004. *Advances in sea cucumber aquaculture and management*. FAO Fisheries Technical Paper No. 463. FAO, Rome, 425 p. [ftp://ftp.fao.org/docrep/fao/007/y5501e/y5501e00.pdf](http://ftp.fao.org/docrep/fao/007/y5501e/y5501e00.pdf)
- Purcell S.W. 2010. *Managing sea cucumber fisheries with an ecosystem approach*. Edited and compiled by Lovatelli A., Vasconcellos M. and Yimin Y. FAO Fisheries and Aquaculture Technical Paper No. 520. FAO, Rome. 157 p. www.fao.org/docrep/012/i1384e/i1384e.pdf
- Purcell S.W., Mercier A., Conand C., Hamel J.-F., Lovatelli A., Toral-Granda V., Uthicke S. 2012. *Sea cucumber fisheries: Global analysis of stocks, management measures and drivers of overfishing*. *Fish and Fisheries* DOI: 10.1111/j.1467-2979.2011.00443.x
- Toral-Granda V., Lovatelli A., Vasconcellos M. (eds). 2008. *Sea cucumbers: A global review on fisheries and trade*. FAO Fisheries Technical Paper. No. 516. Rome, FAO. [ftp://ftp.fao.org/docrep/fao/011/i0254e/i0254e.pdf](http://ftp.fao.org/docrep/fao/011/i0254e/i0254e.pdf)



Participants and facilitators at the 15–18 November 2011 meeting of SCEAM Pacific in Fiji.

from: Maria Byrne¹

Sea cucumbers could be key to preserving coral reefs

Source: The University of Sydney – <http://sydney.edu.au/news/84.html?newsstoryid=855930> – January 2012

Tropical sea cucumbers could play a key role in saving coral reefs from the devastating effects of climate change, say scientists at One Tree Island, the University of Sydney's research station on the Great Barrier Reef.

"We have found that sea cucumbers play a vital role in reducing the harmful impact of ocean acidification on coral growth," said Professor Maria Byrne, the director of One Tree Island Research Station.

"When they ingest sand, the natural digestive processes in the sea cucumber's gut increases the pH levels of the water on the reef where they defecate, countering the negative effects of ocean acidification," said Professor Byrne.

One of the byproducts of the sea cucumber's digestion of sand is calcium carbonate (CaCO_3) a key component of coral. To survive, coral reefs must accumulate CaCO_3 at a rate greater than or equal to the CaCO_3 that is eroded from the reef.

"The research at One Tree Island showed that in a healthy reef, dissolution of calcium carbonate sediment by sea cucumbers and other bio-eroders appears to be an important component of the natural calcium carbonate turnover," said Professor Byrne.

"The ammonia waste produced when sea cucumbers digest sand also serves to fertilise the surrounding area, providing nutrients for coral growth," she added.

The research, recently published in the *Journal of Geophysical Research*,² was carried out by an international group of scientists from the University of Sydney, the Carnegie Institute for Science, Stanford, and several other institutions studying the impact of climate change on coral reefs.

Sea cucumbers are among the largest invertebrates found on tropical reefs. Some 30 species are commercially harvested by the fishery industry along the Great Barrier Reef and throughout the tropics.

"We urgently need to understand the impact of removing sea cucumbers and other invertebrates on reef health and resilience at a time when reefs face an uncertain future," Professor Byrne said.



Stichopus herrmanni,
Lizard Island, Australia

¹ Professor of Marine and Developmental Biology, Deputy Director One Tree Island Research Station, Schools of Medical and Biological Sciences, University of Sydney. Email: mbyrne@anatomy.usyd.edu.au

² <http://www.agu.org/journals/jgr/>