# SEACUSEY: Co-management of the sea cucumber fishery in the Seychelles (2017–2018)

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## Project background

The sea cucumber fishery has been of major national importance to the Seychelles over the past 10 years, second only to the tuna industry. This fishery's sustainability has been an exception in the south-western region of the Indian Ocean (Aumeeruddy and Payet 2004; Aumeeruddy et al. 2005), but a downward trend in catches has been observed in recent years (Figure 1). A formal co-management agreement between the Seychelles Fishing Authority (SFA) and the Association of Members of Seychelles' Sea Cucumber Industry (AMSSI) was in place from December 2013 through to 2017. The challenge now is to strengthen the governance process between the SFA, AMSSI, and the new Skipper and Fishermen Association through collaborative adaptive management.

In this context, the SEACUSEY project's specific objective is to define and implement operational sea cucumber fishery management measures that are appropriate for the resource's diversity, genetic structure, abundance, distribution and trends in the four main commercial species ('pentard' – *Holothuria* 'pentard'; white teatfish – *H. fuscogilva*; black teatfish – *H. nobilis*; and prickly redfish – *Thelenota ananas*).

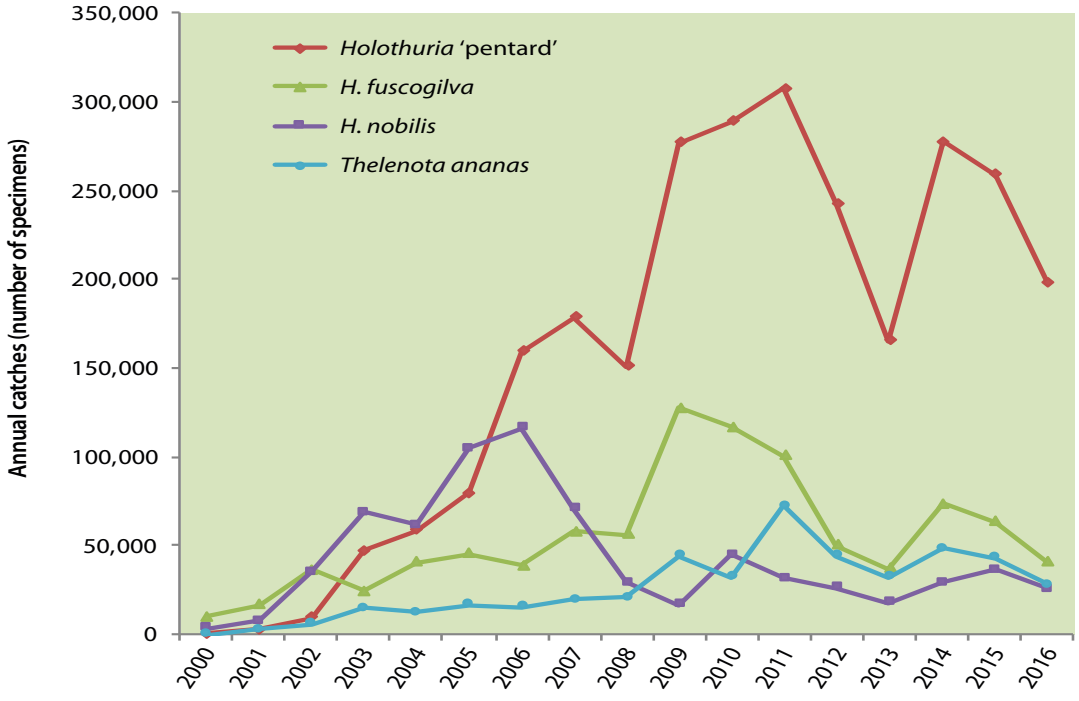


**Figure 1.** Catch trends (in number of specimens) for the four main commercial sea cucumber species from 2000 to 2016 (Source: SFA).

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## Project content

*Part 1. Characterising sea cucumber diversity and genetic structure throughout the Seychelles*

Although sea cucumber species in the Seychelles have been subject to intense commercial fishing since the late 1990s, curiously little is known about them (Aumeeruddy 2007; Aumeeruddy and Conand 2008). SEACUSEY proposes to analyse the genetic and biological characteristics of these resources in order to support the co-management process. More specifically, samples will be collected in 2018 from on-board commercial fishing boats in order to determine: 1) the size at sexual maturity of the four main commercial species; and 2) the spatial structures of their populations by analysing their microsatellite DNA markers. This information will be used to both implement appropriate minimum catch sizes and determine possible management units for these species, given that in the Seychelles the fishing grounds are spread over several thousand square kilometres.

*Part 2. Proposing co-management measures as part of an adaptive approach*

An experiment has made it possible to measure fishers' catches under real conditions using a sea cucumber density gradient. A statistical model was developed and will be applied to fishing logsheet data in order to statistically estimate the main commercial stocks' abundance and distribution. With this in mind, the project will get fishers more involved in both the fishery monitoring system and in producing resource status indicators, via the development of an electronic logbook. A smartphone application (via the Open Data Kit: http://docs.opendatakit.org/collect-intro/) will allow skippers to accurately record relevant dive-fishing data faster and with a lower risk of error. An information system (BDMer, see Léopold 2014 for


**Figure 2.** The SEACUSEY project mobilises stakeholders and vessels from the sea cucumber fishery and the SFA to carry out experimental fishing (B, C, D) and study the main commercial species' genetic structure and size at maturity (A).

a previous version) hosted on the SFA server will carry out semi-automatic downloading and storage of these data, which will then undergo routine analysis by a dedicated web application so as to estimate sea cucumber abundance.

By strengthening the fishery's technical capacities and optimising management costs, the project will support the SFA's management role in collaboration with the sector's stakeholders. Over the longer term this will inform discussions about the relevance of a future national sea cucumber fishery co-management plan. A national workshop will be held in the Seychelles in August 2018 to evaluate the outcomes of these actions, possible extensions and interactions that could be considered with other countries in the region.

For further information on project progress, see http://seacusey.ird.nc/.

**References**

Aumeeruddy R. 2007. Sea cucumbers in Seychelles. pp. 41–52. In: Conand C. and Muthiga N.A. (eds). Commercial sea cucumbers: a review for the Western Indian Ocean. WIOMSA Book Series No. 5.

Aumeeruddy R. and Conand C. 2008. Seychelles: a hotspot of sea cucumber fisheries in Africa and the Indian Ocean region. pp. 195–209. In: Toral-Granda V., Lovatelli A. and Vasconcellos M. (eds). Sea cucumbers. A global review of fisheries and trade. FAO Fisheries and Aquaculture Technical Paper 516.

Aumeeruddy R. and Payet R. 2004. Management of the Seychelles sea cucumber fishery: status and prospects. pp. 239–46. In: Lovatelli A., Conand C., Purcell S., Uthicke S., Hamel J-F. and Mercier A. (eds). Advances in sea cucumber aquaculture and management. FAO Fisheries Technical Paper. No. 463.

Aumeeruddy, R., Skewes, T., Dorizo, J., Carocci, F., Coeur de Lion, F., Harris, A., Henriette, C. and Cedras, M. 2005. Resource assessment and management of the Seychelles sea cucumber fishery. FAO Project Number: TCP/Seychelles/2902(A). 37 p.

Léopold M. 2014. BDMer Version 2.0 User Guide. 74 p. [http://bdmer.ird.nc/index1.php?lang=en&pays=vnt] Accessed 14 March 2018.