

Information paper 12

Facilitating the non-detriment finding process via an online
eNDF tool:

*A follow-up from RTMCFA5 Working Paper 2 “What is needed
for trade in CITES-listed sea cucumber species”?*

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CITES and sea cucumber fisheries.

1. Sea cucumbers that are harvested from the wild, processed and traded on international markets provide many coastal and island communities in the Pacific Islands region with significant income from sales (Conand and Byrne 1993; Purcell et al. 2017). For at least 40 years, growing demand from Asia has driven a significant increase in price across all aspects of the value and market chain (Anderson et al. 2011). High intensity artisanal fishing, ease of harvesting, biological characteristics such as susceptibility to density-dependent reproductive success (“depensatory effects”), and illegal fishing all contribute towards the vulnerability of sea cucumbers.
2. Sea cucumbers make up just one of the many CITES groups of species PICTs are struggling to manage. Current processes to issue permits, record and report trade data and manage border clearances are difficult and require excessive human resources. Permits are often handwritten and logged using excel spreadsheets. Illegal trade supported by transnational organised crime groups is also an issue in the Asia Pacific region so when trade bans or long-term closures are in place, fishing may continue and, for some highly profitable species and their derivatives (e.g., sea cucumbers, shark fins and sea horses), can become the focus of organised crime on the black market (Phelps-Bondaroff, et al. 2015; Herath et al. 2019; Bondaroff 2021; Conand et al. 2022).
3. In recognition of declines in several sea cucumber species, a proposal to list three teatfish species¹ on Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) was accepted at the 18th Conference of the Parties on the 25th August 2019 and implemented on 28th August 2020. In August 2022, CITES Parties also voted to include the genus *Thelenota* on Appendix II, which includes three species *Thelenota ananas*, *T. anax* and *T. rubralineata*. The proposal to list the three *Thelenota* species will come into effect on 25th May 2024². Excluding *T. rubralineata*, the four other species have high relevance to commercial sea cucumber fisheries in the Pacific Islands region.
4. With the CITES appendix II listing, countries are now obligated to carry out a population-based risk assessment to continue exports of these species. This risk assessment entails a Legal Acquisition Finding (LAF), and Non-Detriment Finding (NDF). More information on the LAF and NDF process can be found in Information Paper 5 from the Regional Technical Meeting on Coastal Fisheries and Aquaculture 5 (RTMCFA5)³ and on the CITES website⁴.
5. The purpose of this Information Paper is to communicate the results of the Working Paper 2⁵ (WP2) from RTMCFA5 and provide details on the development of an online Non-Detriment Finding (eNDF) tool to facilitate and guide PICTs when making an NDF. This includes outlining what was reported as

¹ White teatfish (*Holothuria fuscogilva*) and black teatfish (*H. whitmaei* – Pacific Ocean species, and *H. nobilis* – Indian Ocean species)

² <https://cites.org/eng/app/appendices.php>

³ <https://purl.org/spc/digilib/doc/zixf6>

⁴ <https://cites.org/eng/prog/ndf/index.php>

⁵ <https://purl.org/spc/digilib/doc/2jy4t>

priorities to support PICTs so that they can comply with both the scientific and management requirements of CITES.

The development and content of the online Non-Detriment Finding tool for CITES listed sea cucumber species.

6. To make a Non-Detriment Finding (NDF) for exporting a CITES listed species, or derived products from that species, the scientific authority (SA) must scientifically verify that exports are limited in such a way that the species is maintained throughout its range and at a level consistent with its role in the ecosystem. The limited technical capacity of many national fisheries agencies in understanding the NDF process has impeded their ability to deal with the complexities of making NDFs. The NDF process is complicated further as the sea cucumber fishery is a multispecies fishery made up of those that have different habitats, life-histories and productivity characteristics. Each species is also exposed to varying levels of fishing pressure, and each respond differently to that pressure.
7. The eNDF tool was created to clarify some of the complexities of the NDF process by supporting information gathering and facilitating assessment on the effect of trade on sea cucumber species' populations. The NDF process includes assessment of the current status of sea cucumber populations, the fisheries management structure, compliance monitoring and enforcement, and the projected impact of harvesting. The tool uses this information to create an automated risk-based assessment for each species to determine how harvesting under the State's fisheries management structure could impact the population of sea cucumbers within their jurisdiction.
8. Managing a fishery requires data collected on trends in stock levels over time or data comparing local reference densities with the latest information on stock levels (baseline comparisons). Stock assessment methods can also use length based indicators (LBIs) at the population level to determine whether exploited populations are negatively impacted by harvesting.
9. In addition to the "stock assessment" information described above, assessment of the severity of fishing or trade pressures, for example magnitude of legal and illegal trade, size selectivity and discard mortality (e.g., badly processed and discarded sea cucumbers) can aid in assessing the status of the fishery.
10. Excessive trade, especially those driven by high economic values, can have detrimental effects on the survival of species, which is particularly relevant for CITES. To assess these impacts, Scientific Authorities can analyse available information on the extent and trends of both legal and illegal international and domestic trade. Examining trade dynamics can help understand fishing pressures and exploitation patterns, serving as supplementary information to use with population data (Kinch et al. 2008a, 2008b).
11. The NDF process evaluates the overall impact of domestic and international trade on fishing mortality. It's also important to consider the value of international trade, especially for species with high market values. International demand often drives increased catch, especially for species without effective management. Moreover, high international prices can elevate the risk of illegal fishing activities that are in violation of relevant laws and regulations.

12. To manage fishing pressure, a range of management strategies are used across the Pacific, some of which are outlined in table 1. These management strategies can be used to mitigate risk of over-fishing and form part of the NDF process so are included as user selectable options in the eNDF tool.

Table 1: An example of range of management measures used to control fishing pressure on the sea cucumber fishery, which can be highlighted as a risk mitigation strategy as part of the NDF process.

Management Measure	Description
Total Allowable Catch (TAC)	Sets a maximum limit on the amount of sea cucumbers that can be harvested in a specified period within a fishery, ensuring sustainable exploitation and preventing overfishing.
Quotas	Allocates a specific portion of the total allowable catch to individuals or groups involved in sea cucumber fishing, promoting equitable distribution and preventing excessive harvesting.
Size Limits	Establishes minimum size requirements for harvested sea cucumbers, allowing them to reach maturity and reproduce before being harvested, which aids in maintaining healthy population levels.
Gear Restrictions	Imposes regulations on fishing gear used for sea cucumber harvesting (e.g. SCUBA or Hookah), such as prohibiting destructive gear types, limiting the use of certain gear materials, or enforcing mesh size restrictions to minimize bycatch and habitat damage.
Seasonal Closures	Temporarily prohibits sea cucumber fishing during specific times of the year, coinciding with spawning seasons or critical life stages, to protect reproductive populations, ensure successful reproduction and recovery of sea cucumber stocks.
Regulated Areas	Establishes regulated areas with significant sea cucumber populations to restrict or prohibit fishing activities, allowing for the conservation of sea cucumber stocks, particularly in critical habitats and spawning grounds.
Licensing and Permits	Requires fishers engaged in sea cucumber fishing, or exporters of sea cucumber products, to obtain appropriate licenses or permits, ensuring compliance with regulations and enabling effective monitoring of catch and effort or and/or export data.
Stakeholder (Community) Engagement	Involves collaboration with local communities, industry stakeholders, and scientists to ensure inclusive decision-making processes, gather traditional ecological knowledge, and implement locally relevant management strategies for sustainable sea cucumber fisheries.

13. The information outlined above is used for making an NDF, which is outlined in a step-by-step process for the eNDF tool. The eNDF facilitates the user to capture this information under four main categories.
- I. Whether the products were legally acquired under fisheries regulations/laws; this requirement is termed Legal Acquisition Finding (LAF),
 - II. Biological vulnerability of the species. The biological and population level assessment is completed using trends in stock levels over time, or by comparing to reference densities with the latest information on stock levels (baseline comparisons), assessing that current population demographics are consistent with a healthy or declining population via length Based Indicators (LBI's).
 - III. Current status of fishing and trade pressure including Illegal, Unreported and Unregulated trade and,
 - IV. The management strategies used to mitigate these legal and IUU pressures.
14. The inclusion of management strategies can be tailored to each individual nation's methods for managing their fishery. For example, length-based management strategies that limit mortality of immature individuals within a population, seasonal closures to allow stocks to recover after an open harvest season, scientifically informed calculations of total allowable catch, spatially managed areas that restrict harvests, or effective compliance monitoring and enforcement programs.
15. The information inputted under each component of the eNDF results in a risk score. Totalled, this score shows the relative risk of exports to the species' population. If any of this information is unknown, then the eNDF also uses this "unknown" aspect of the fishery as an increased risk factor in the risk assessment.

Results of the RTMCFA5 working paper to guide the development of the eNDF

16. During the Regional Technical Meeting on Coastal Fisheries and Aquaculture five (RTMCFA5) in October 2022, nations were asked specific questions regarding their sea cucumber fishery including fisheries monitoring programs, management strategies, legal frameworks and compliance and enforcement of fisheries regulations/laws. PICTs were also asked of their current capacities and abilities to deal with the NDF process including whether developing an online step by step eNDF guidance tool would be helpful to the SA. 17 PICTs responded to the survey and the majority (75%, 12 of 17) were in support of this development.
17. It is evident that countries will benefit from guidance on how to conduct an NDF. Exporting sea cucumbers has occurred in most countries with some currently or planning to export. Of those 17 countries, 12 collect data on sea cucumber populations for stock assessment. These stock assessments all use fishery-independent data collection methods, while seven countries also use landing surveys. These data are pertinent to making an NDF and can be used in the eNDF tool.
18. In terms of fisheries management, a wide range of strategies are used with varying levels of compliance and enforcement. Almost all PICTs surveyed (94%, 16 of 17) have management strategies in place. The most common management strategies are "closed or open season" (8 responses), followed by "size limits" (7 responses), "total allowable catch" (6 responses) and "spatial closures" (5 responses). Other management strategies mentioned were the ban or complete closure of the fishery

(4 responses), use of licensing and permitting (1 response) and traditional rotational closures (1 response).

19. As of the survey date (October 2022), only three of 16 respondents reported to have completed an NDF. More than half of respondents (56%, 9 of 16) plan to update an existing or create a new NDF (Figure 1).
20. Guided by this information, the eNDF was developed so that it can accommodate the varying management regimes and data collection programs used by SPC's members. The eNDF however does not consider each management strategy independent of another. For example, those countries that have more management strategies to mitigate fishing and IUU pressures on the fishery, and better compliance strategies (Figure 2), are more likely to achieve a non-detriment finding, provided that stock assessment data also reflect healthy stock levels (i.e., limited declines in abundance, distribution, or healthy sizes).

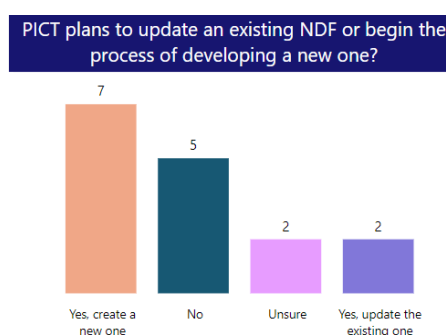


Figure 1. SPC member responses to determine whether existing NDFs will be updated or new NDFs created.

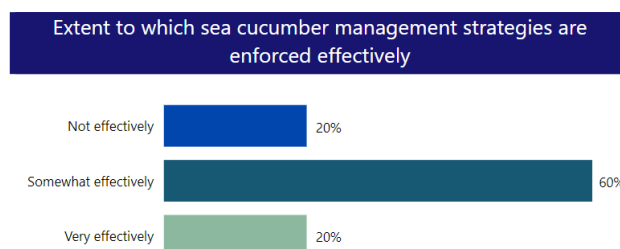


Figure 2: SPC member reporting effectiveness of fisheries management strategies in place.

Conclusion

21. The creation of this eNDF tool will increase access and facilitate the NDF process. However, this tool while helpful as a guide in the process, is but one piece of the sea cucumber fishery management cycle. The eNDF will guide users on how to populate information for assessing risk as a result of exports and guide decision making, but a positive NDF can only be made when good monitoring and

management frameworks are in place. It is therefore essential that continued investment in fisheries management takes place so that these CITES listed sea cucumbers, which are usually of high value, can continue to sustainably provide economic benefits to the communities that rely on them.

22. It is now essential for national fisheries agencies, that are usually the designated CITES SA for marine species, to be able to efficiently develop an NDF for each marine species listed so that exports of these species may continue legally. The eNDF can currently be adapted to suit other marine species listed on Appendix II of CITES, for example giant clam (*Tridacna spp.*). However, staff with the technical expertise and skills, and the reporting systems that support them, are needed so that both scientific and management authorities can meet their monitoring and reporting obligations to CITES. To develop an NDF requires a well-resourced SA to determine population status via stock assessment, setting and policing sustainable export quotas, establish monitoring, recording and reporting of exports. SA's need significant financial and technical support and resources to effectively make this happen.
23. The information gathered through WP2 has allowed SPC to detail the current capacity of member countries and territories to:
 - a. collect key scientific information related to making an NDF such as targeted population assessments and stock monitoring, evaluation and reporting of listed teatfish and *Thelenota* spp.,
 - b. implement risk mitigation strategies in areas that assist fisheries management and making an NDF and
 - c. identify information gaps that can be used to inform fisheries management improvement programs.
24. This information has also allowed SPC to assess the suitability of current electronic-data management systems developed by SPC's Coastal Fisheries and Aquaculture Programme and develop a relevant eNDF that can be an addition to SPC's coastal fisheries science and management digital toolbox for the Pacific.

Further reading

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