Turning the tide: Aligning international policy for sea cucumber conservation

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Introduction

In light of recent, major, international policy shifts and scientific milestones in 2025, it has become increasingly clear that sea cucumber conservation is entering a new era of global scrutiny. While Horellou (this issue) provides a comprehensive overview of the diplomatic proceedings and voting outcomes at the 20th CITES Conference of the Parties (CoP20) in Uzbekistan, it is equally vital to examine the ecological imperatives that underpin these decisions. The International Union for Conservation of Nature (IUCN) Species Survival Commission Sea Cucumber Specialist Group held a workshop in Germany in October 2025 in an effort to assess the global extinction risk of sea cucumber species (this issue). These events, alongside the IUCN World Conservation Congress in Abu Dhabi (October 2025) underscored a growing international commitment to regulating the trade of high-value "non-charismatic" marine invertebrates, moving them from the periphery of fisheries management to the center of biodiversity protection.

Complementing the summary of CoP20 provided by Horellou and following the IUCN World Conservation Congress, this note aims to 1) summarize the new Appendix II listing for the golden sandfish (*Holothuria lessoni*) and the implications of the data-driven rejection of other taxa; and 2) highlight emerging evidence linking the presence of sea cucumbers to reduced coral disease and reef health

The Samarkand breakthrough: Golden sandfish protected at CITES CoP20

The inclusion of the high-value golden sandfish (*Holothuria lessoni*) in CITES Appendix II at CoP20 signals a shift toward a "preventative" management model. This transition mandates a move from opportunistic harvesting to a system governed by non-detriment findings (NDFs), placing the burden of proof for sustainability on the exporting state (Murphy et al. 2024; Cooney et al. 2021).

While the diplomatic outcomes are detailed by Horellou, the technical reality is that a lack of species-specific data remains the primary barrier to effective protection. Current "catch-all" fishery statistics are insufficient for CITES compliance. Consequently, the 18-month implementation delay (ending 5 June 2027) is a critical window for biological data collection. This period is essential for range states and professional agencies to conduct the multi-seasonal biomass and recruitment surveys required to establish sustainable harvest quotas and robust NDF frameworks.

Ecological consequences of depletion

During the IUCN World Conservation Congress and the CITES CoP20 meeting, delegates shifted the focus of discussions from sea cucumbers as mere commodities to their indispensable role as "janitors" of the reef. This dual-forum recognition reinforces the significant role of these invertebrates in coral resilience, particularly as major bioturbators and nutrient recyclers that ingest and re-work sediments, release inorganic nitrogen and phosphorus, and increase seawater alkalinity (Purcell et al. 2016; Fei 2022; Williamson et al. 2021).

Experts at the IUCN Congress highlighted how sea cucumber sediment processing sustains benthic primary producers in nutrient-poor environments, serving as a pillar for "nature-positive" reef restoration (Watkins et al. 2023). As a result, overharvesting these bioturbators disrupts reef-scale sediment structure and biogeochemistry. For instance, populations of *Holothuria atra* can process over 64,000 tonnes of sediment annually. Their removal reduces remineralization, diminishes oxygen in pore waters, and weakens a reef's capacity to buffer ocean acidification locally (Purcell et al. 2016; Williamson et al. 2021).

Perhaps the most pivotal evidence presented at CoP20 was the link between sea cucumber depletion and coral disease outbreaks. Recent field experimentations demonstrate that the removal of detritivores can increase *Acropora* coral mortality 15–fold (Clements et al. 2024). This "cleaning service" is now known to be mediated by the sediment microbiome. Sea cucumber grazing reduces microbial biomass and shifts the anaerobic metabolic potential of the substrate, effectively suppressing the growth of harmful pathogens (Maritan et al. 2025). Without this active suppression, sediment-associated diseases proliferate, making the conservation of species such as *H. lessoni* an ecological necessity for coral survival rather than just a fisheries management goal (Clements et al. 2024).

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Current IUCN Red List Status

The IUCN Red List was first established in at a workshop in 2010 (Purcell et al. 2014), and is being updated following the recent workshop in Germany by the IUCN SSC Sea Cucumber Specialist Group.

Recent publications show that many species are threatened due to range contraction and sustained fishing pressure (Wolfe and Byrne 2022; Purcell et al.2016). For instance, recent surveys in the Philippines confirm that the commercially prized *Holothuria scabra* is now endangered, following severe regional overexploitation (Junus et al. 2018).

Despite these specific insights, the Data Deficient category still comprises nearly 65% of assessed holothurians. As Conand et al. (2024) emphasize, while research has expanded into taxonomy, significant gaps remain regarding the maintenance and restoration of population resilience. This knowledge gap is a primary barrier to ecosystem-based management and CITES compliance.

To address this, the IUCN SSC Sea Cucumber Specialist Group and the Senckenberg Ocean Species Alliance are currently targeting the demographic bottlenecks that hinder trade regulation (see SOSA/MIRLA update, this issue). A technical priority is establishing population trends over three generations, incorporating sparse data on lifespan, recruitment, and reproductive age. Moving species out of the Data Deficient category is essential to prevent further stock collapses as fisheries shift toward medium- and low-value species following the serial depletion of primary stocks (Purcell et al. 2016; Fei 2022).

Conclusion

The 2025 milestones at CITES CoP20 and the IUCN World Congress signify a paradigm shift: sea cucumbers are no longer managed solely as a commodity, but as essential reef janitors whose depletion threatens overall reef health and coral survival. While the procedural successes in Samarkand provide a vital regulatory safety net, the pervasive 65% Data Deficiency across the group remains a critical barrier to broader protection. The path forward requires integrating these new trade controls the demographic and stock data targeted by recent international assessments. Only by closing this information gap during the current 18-month implementation window can we preserve both the socioeconomic value of the beche-de-mer trade and the ecological resilience of global reef systems.

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