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Potential use of a hierarchical framework for the assessment and management of deepwater sharks (Project DWS-2023-01)

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<b>Abstract</b>	<p>This paper presents an update on the hierarchical stock assessment risk framework and discussion of potential management measures for deepwater sharks, initially proposed at the WS2 023-DWS. We discuss problems with conducting stock assessments for deepwater sharks, related to their being a bycaught species with low productivity. Due to their low population growth rate, deepwater sharks can be adversely impacted if their distribution overlaps with fishing. Differences in habitat, estimated from AquaMaps and other sources, highlight the need to validate model estimates of habitat using tagging and other data to ensure effective management. The use of tagging data, alongside a novel approach using Environmental DNA (eDNA) to model habitat suitability and interspecies correlations, is discussed. Based on eDNA, spatial indicators could be developed for use as a proxy for abundance of deepwater shark populations. Spatial indicator for management based on location, aggregation and range could also potentially be developed. This approach could improve our understanding and management of these species, particularly in data-limited scenarios. We also address the principles of validation and adaptive management, underscoring the need for flexible, responsive strategies in the face of ecological uncertainties. Our study therefore aims to contribute to the ongoing dialogue on deepwater shark conservation but also proposes practical solutions for their sustainable management.</p>

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