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Orientation: Oceanografía biológica

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PhD project: An evaluation of international policies and local management strategies to mitigate marine mammal bycatch in data-limited fisheries

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Summary: Fisheries bycatch has been identified as the greatest threat to marine mammals worldwide. Characterizing the impacts of bycatch on marine mammals is challenging because it is difficult to both observe and quantify, particularly in small-scale fisheries where data on fishing effort and marine mammal abundance and distribution are often limited. The lack of risk frameworks that can integrate and visualize existing data have hindered the ability to describe and quantify bycatch risk. Here, we describe the design of a new geographic information systems tool built specifically for the analysis of bycatch in small-scale fisheries, called Bycatch Risk Assessment (ByRA). Using marine mammals in Malaysia and Vietnam as a test case, we applied ByRA to assess the risks posed to Irrawaddy dolphins (*Orcaella brevirostris*) and dugongs (*Dugong dugon*) by five small-scale fishing gear types. ByRA leverages existing data on animal distributions, fisheries effort, and estimates of interaction rates by combining expert knowledge and spatial analyses of existing data to visualize and characterize bycatch risk. By identifying areas of bycatch concern while accounting for uncertainty using graphics, maps and summary tables, we demonstrate the importance of integrating available geospatial data in an accessible format that taps into local knowledge and can be corroborated by and communicated to stakeholders of data-limited fisheries. Our methodological approach aims to meet a critical need of fisheries managers: to identify emergent interaction patterns between fishing gears and marine mammals and support the development of management actions that can lead to sustainable fisheries and mitigate bycatch risk for species of conservation concern.

