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Implications of fragmented seagrass meadows for fish communities in a World Heritage Area

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## Abstract (max 200 words)

The effects of habitat fragmentation on marine fauna are equivocal. Here we used seascape metrics to assess change in seagrass meadow composition and configuration of the globally important meadows in Shark Bay World Heritage Area in response to the 2010/11 marine heatwave (MHW). We identified a temporal lag in dense seagrass loss with greater declines apparent 6 years (1382 Ha) relative to 3 years (344 Ha) post-MHW, while the increased proportion of sparse seagrass resulted in fragmentation. We then explored the relationship between fragmentation metrics (e.g. patch area, perimeter) and community measures of small-bodied fishes (sampled via trawling) and larger more mobile fishes (surveyed by remote underwater video). Total fish abundance and biomass were greater in meadows dominated by *Amphibolis antarctica* compared with *Posidonia australis*. Furthermore, smaller bodied fishes were more common in meadows with high seagrass cover and canopy height, while larger individuals were more abundant in seagrass patches ~2 km from shore, near deep channels. These findings highlight the importance of structurally complex canopies for fish and the potential for MHW driven seagrass loss to impact larger bodied species if patches near deep channels fragment, while decreased seagrass cover could exert a greater effect on small-bodied fish.