Temporal and spatial trends in size, biomass and abundance of groupers (Epinephelinae) in Mafia Island Marine Park: fishers' perceptions and underwater visual census surveys

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Abstract
Fishers' perceptions of changes in grouper size and abundance were compared with scientific data collected via underwater visual censuses (UVCs) before (1995) and after (2006 and 2011) the establishment of the Mafia Island Marine Park. Perceptions on changes in the size structure of groupers differed among communities due to differences in fishing capacities. Fishers in one village had mixed perceptions, while in another village the majority (66%) perceived a decline in size, with small groupers dominating the catch. Similarly, UVCs indicated that size structure was dominated by small groupers at all times surveyed. Consistent with fishers' perceptions, UVC indicated that biomass and abundance of groupers declined in both no-take zones (NTZs) and specified-use zones (SUZs) between 1995 and 2006, with no substantial changes between 2006 and 2011. The NTZs had higher density and diversity of grouper species than SUZs, as would be expected from the differences in bottom topography in these two types of areas. The idea that NTZs could increase the biomass and abundance of groupers to benefit fished zones was not found, thus indicating that NTZs are not necessarily the best option for managing reef fisheries.

Keywords: Coral reef fish, Ecological traits, Fisheries management, Fishers' knowledge, No-take zones, Small-scale fisheries.