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TITLE: Little Evidence of Benthic Community Resilience to Bottom Trawling on Seamounts After 15 Years

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ABSTRACT:

The resilience and recovery dynamics of deep-sea habitats impacted by bottom trawling are poorly known. This paper reports on a fishing impact recovery comparison based on four towed camera surveys over a 15-year period (2001-2015) on a group of small seamounts on the Chatham Rise, east of New Zealand, on which pre-disturbance benthic communities are dominated by thicket-forming scleractinian corals. The six seamounts studied encompass a range of trawl histories, including one with high and persistent levels of trawling throughout the survey period, two with intermittent and intermediate levels of trawling, two which were low/untrawled, and one, ?Morgue?, which was closed to trawling in 2001, having been heavily trawled up to that point. Still photographs from all surveys were analysed for the identification and abundance of all visible benthic fauna with effort made to ensure consistency of data among surveys. Because increases in image resolution and quality over time resulted in a persistent trend of increasing abundances, analyses were concentrated on comparisons among seamounts within surveys and how these relationships changed with time. The abundance, species richness, and diversity of benthic communities were higher on low/untrawled seamounts than on those that had been trawled. Multivariate community structure showed similar patterns at each survey point, the low/untrawled seamounts being strongly dissimilar to the persistently trawled seamount, with the others ranged between these extremes, broadly in accordance with their cumulative trawl histories. Community structure on the persistently trawled seamount was less variable than on the other seamounts throughout the study period, possibly because of regular ?re-setting? of the community by disturbance from trawling. Although there was some variability in results between whole seamount and summit sector analyses, in general communities on Morgue remained similar to those on the persistently trawled seamount, showing no indication of steps towards recovery to its pre-disturbance state following its closure. These results indicate low resilience of benthic communities on the seamounts to the effects of bottom trawling.

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