To what extents are species richness and abundance of reef fishes along a tropical coast related to latitude and other factors?

Michael J. Travers, Kenneth R. Clarke, Stephen J. Newman, Norman G. Hall, Ian C. Potter

PII: S0278-4343(18)30243-7
DOI: https://doi.org/10.1016/j.csr.2018.08.006
Reference: CSR3804

To appear in: *Continental Shelf Research*

Received date: 18 May 2018
Revised date: 15 August 2018
Accepted date: 21 August 2018

Cite this article as: Michael J. Travers, Kenneth R. Clarke, Stephen J. Newman, Norman G. Hall and Ian C. Potter, To what extents are species richness and abundance of reef fishes along a tropical coast related to latitude and other factors?, *Continental Shelf Research,* https://doi.org/10.1016/j.csr.2018.08.006

To what extents are species richness and abundance of reef fishes along a tropical coast related to latitude and other factors?

Michael J. Travers[a,b,*], Kenneth R. Clarke[c], Stephen J. Newman[a], Norman G. Hall[a,b], Ian C. Potter[a,b]

[a]Western Australian Fisheries and Marine Research Laboratories, Department of Primary Industries and Regional Development, Government of Western Australia, P.O. Box 20, North Beach, WA 6920, Australia.

[b]Centre for Sustainable Aquatic Ecosystems, Harry Butler Institute, Murdoch University, South Street, Murdoch, WA 6150, Australia.

[c]Plymouth Marine Laboratory, Prospect Place, West Hoe, Plymouth PL1 3DH, UK.

*Corresponding author. Tel.: +61 (0) 8 9203 0170. Mike.Travers@dpird.wa.gov.au

ABSTRACT

This study has employed an integrated statistical approach to determine the extents to which species richness and abundance (catch rate) of fishes over reefs along an extensive coastline were related to various factors. Fish were thus sampled by trapping over deep (~ 22 m) and shallow (~ 12 m) reefs along the ~1,500 km tropical coast of north-western Australia (NWA). Fish were caught during day and night in both dry and wet seasons at two well-spaced locations in each of the Kimberley (13-16 °S), Canning (16-19°S) and Pilbara (20-22 °S) bioregions. Species richness and abundance were both typically less at the two locations at the lowest latitude than at the two at the highest latitudes. This trend, which contrasts with the paradigm regarding latitudinal trends for these biotic variables, is attributable to the far more extreme hydrological conditions in the Kimberley than Pilbara. Indeed, both biotic variables peaked in the Canning, presumably reflecting, *inter alia*, the better development of reef and suspension feeder habitats in that bioregion. The peak in abundance was attributable to particularly high numbers of the NWA endemic *Lethrinus punctulatus*. A greater species richness and abundance of fishes in deeper than shallow water during the wet season, and particularly in areas of greater cyclonic activity, reflect the movement of