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Dear Professor Fox,

Please find attached our manuscript “*Habitat and fishing control grazing potential on coral reefs*”, to be considered for publication as a Research Article in *Functional Ecology*. On tropical coral reefs, small-scale studies have shown that the grazing functions carried out by cropping and scraping fishes help to maintain coral-dominated states. Despite the importance of herbivory in raising reef resilience to human disturbances, we lack an understanding of how habitat and human pressures drive herbivory at ecosystem scales (i.e. entire coral reefs).

To address this gap, we integrate feeding observations with fish abundance datasets for 62 coral reefs across the Indo-Pacific. **We demonstrate that cropping function is determined by benthic habitat condition while scraping function is driven by fishing pressure.** We also identify links between grazing and fish assemblage size structure, with reefs dominated by small-bodied fishes characterized by greater grazing pressure. Our findings suggest that **cropping functions will respond strongly when physical disturbances induce habitat turnover (e.g. coral bleaching or storms)**, and that **protection from fishing pressure is insufficient to restore wilderness levels of scraping function.**

By estimating grazing rates of fish assemblages resident on reefs spanning coral- and macroalgal-dominated states and under heavily-fished and wilderness conditions, we extend our small-scale understanding of reef herbivory processes to macroecological scales. We believe that our focus on quantifying critical ecosystem functions in an imperilled ecosystem will be of general interest to a broad audience. For functional ecologists, we also provide a framework for uniting feeding observations with abundance datasets which can be applied to quantify herbivory in other systems.

We confirm that all of the material in our manuscript is original and that it is not under consideration for publication with any other journal. Additionally, all authors have approved this submission in its final form. Thank you in advance for your consideration.

Sincerely,

Dr James PW Robinson

Senior Research Associate

Lancaster Environment Centre

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On behalf of coauthors Jamie McDevitt-Irwin, Jan-Claas Dajka, Jeneen Hadj-Hammou, Samantha Howlett, Alexia Graba-Landry, Andrew Hoey, Kirsty Nash, Shaun Wilson, Nicholas Graham.