Fish-based herbivory and the natural maintenance of algal fouling on coral nurseries used across the Great Barrier Reef.

Gemma M. Gillette[1*], Emma F. Camp [1], John Edmondson[3], David J. Booth[2], Rachael I. Scott[1], David J. Suggett[4]

[1]Climate Change Cluster, University of Technology Sydney, Ultimo, NSW, 2007, Australia
[2]School of Life Sciences, University of Technology Sydney, Ultimo, NSW, 2007, Australia
[3]Wavelength Reef Cruises, 6/43 Macrossan St., Port Douglas, QLD, 4877, Australia
[4]King Abdullah University of Science and Technology (KAUST), Thuwal 23955-6900, Kingdom of Saudi Arabia

*Correspondence: gillette.gemma@gmail.com

Keywords: coral reef ecology, restoration ecology, cost-effectiveness, coral nurseries, cage exclusion, Great Barrier Reef, fish herbivory

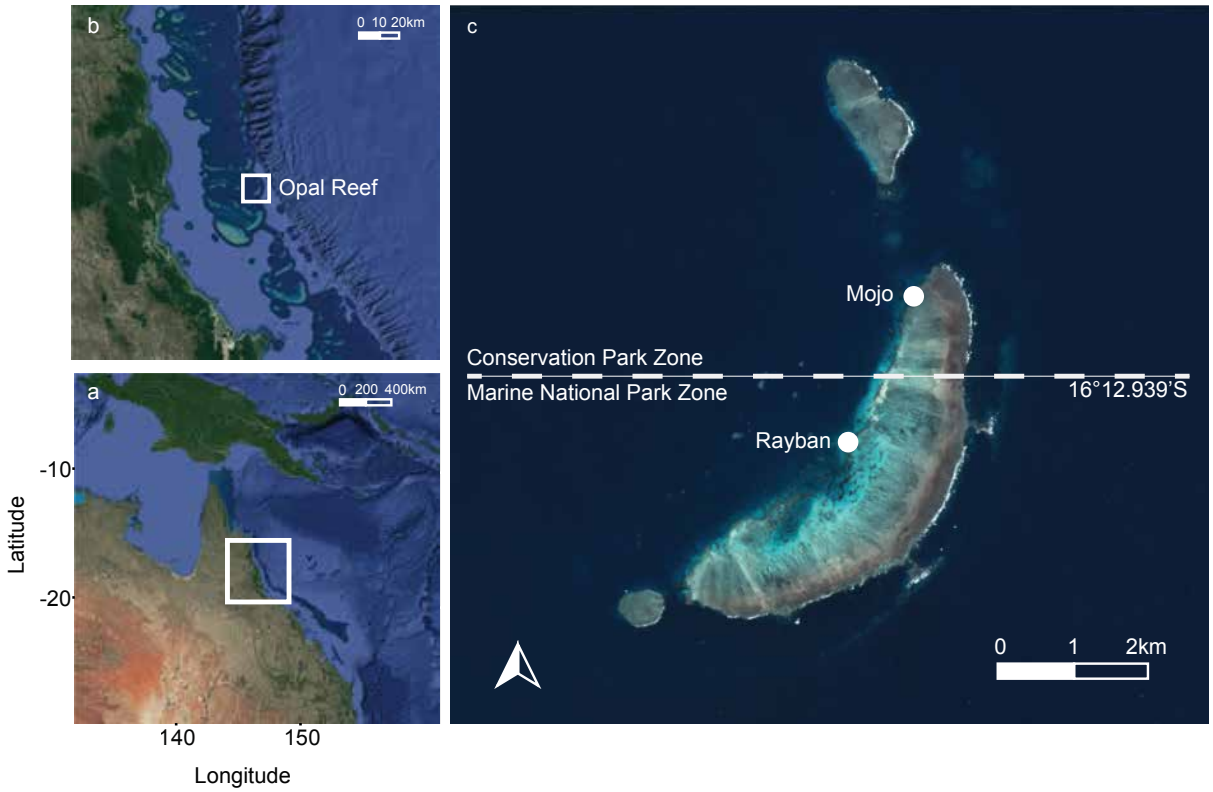


Fig S1 Location of sites on Opal Reef, Great Barrier Reef (Australia), including tourism mooring sites Mojo (16°12'23.6"S 145°53'53.7"E) and RayBan (16°13'27"S 145°53'22"E) in relation to their location within the region and country. Map images © Google 2023 and © Allen Coral Atlas 2023

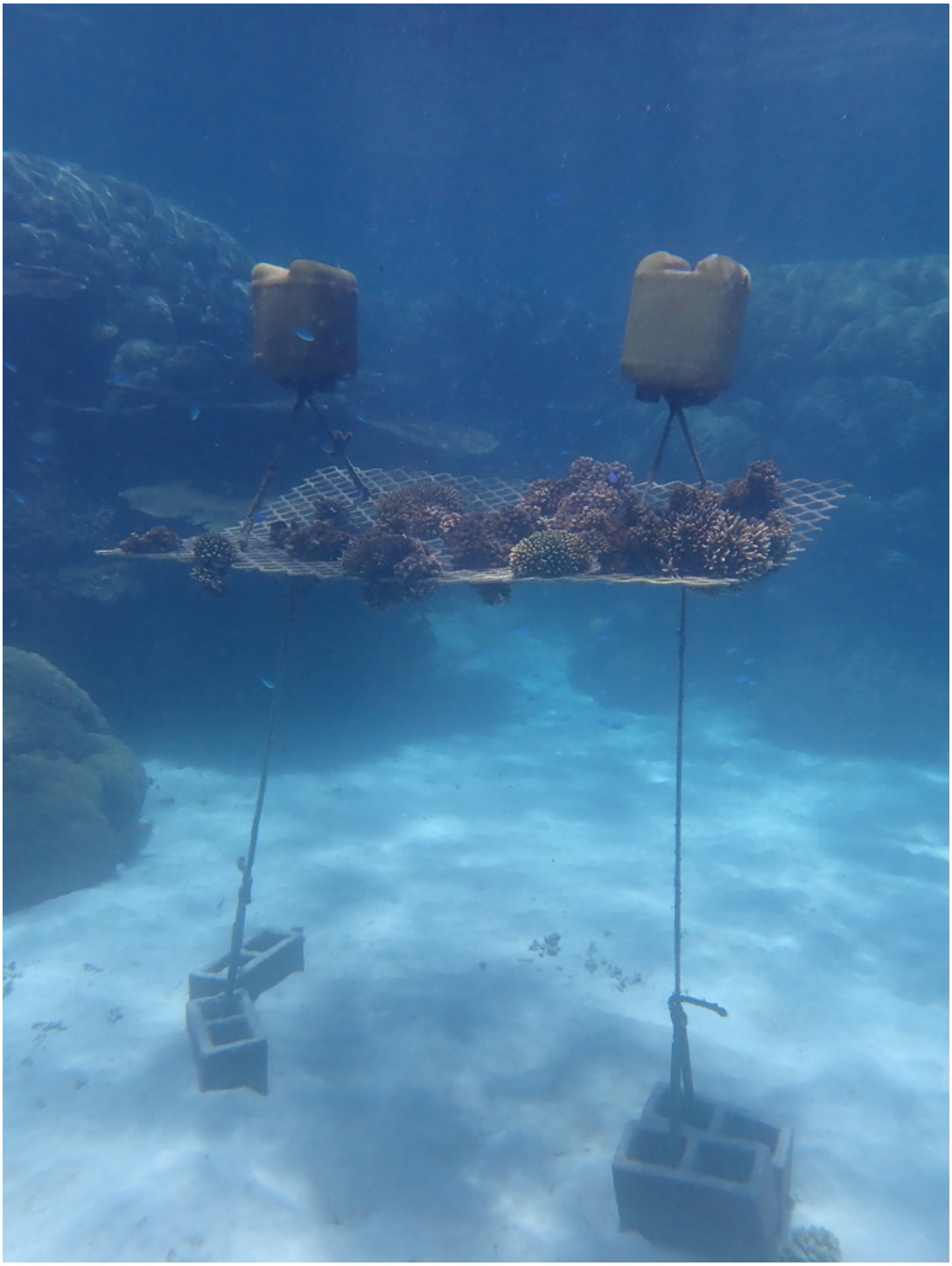


Fig S2 Example of a coral propagation nursery managed by a Coral Nurture Program tourism partner at Mojo tourism mooring site, Opal Reef, Great Barrier Reef. Nurseries consisted of a floating frame positioned 1-2m from natural reefs comprised of a 2.0×1.2 m aluminium diamond-mesh supported by two-four 9kg besser blocks and two 20 L floats. Nurseries are deployed under GBRMPA permit G20/43740.1. Photo credit: Gemma M Gillette

Fig S3 Fish video survey setup consisting of a GoPro Hero 8 camera attached to a GoPro Jaws: Flex Clamp and clipped onto a toilet roll holder made of chrome plated iron wire (50cm (H) x 14cm (Diameter)). Roll holders are fixed on top of nursery floats using nylon rope so that cameras were high enough to capture the entirety of a nursery frame. Photo credit: Gemma M Gillette

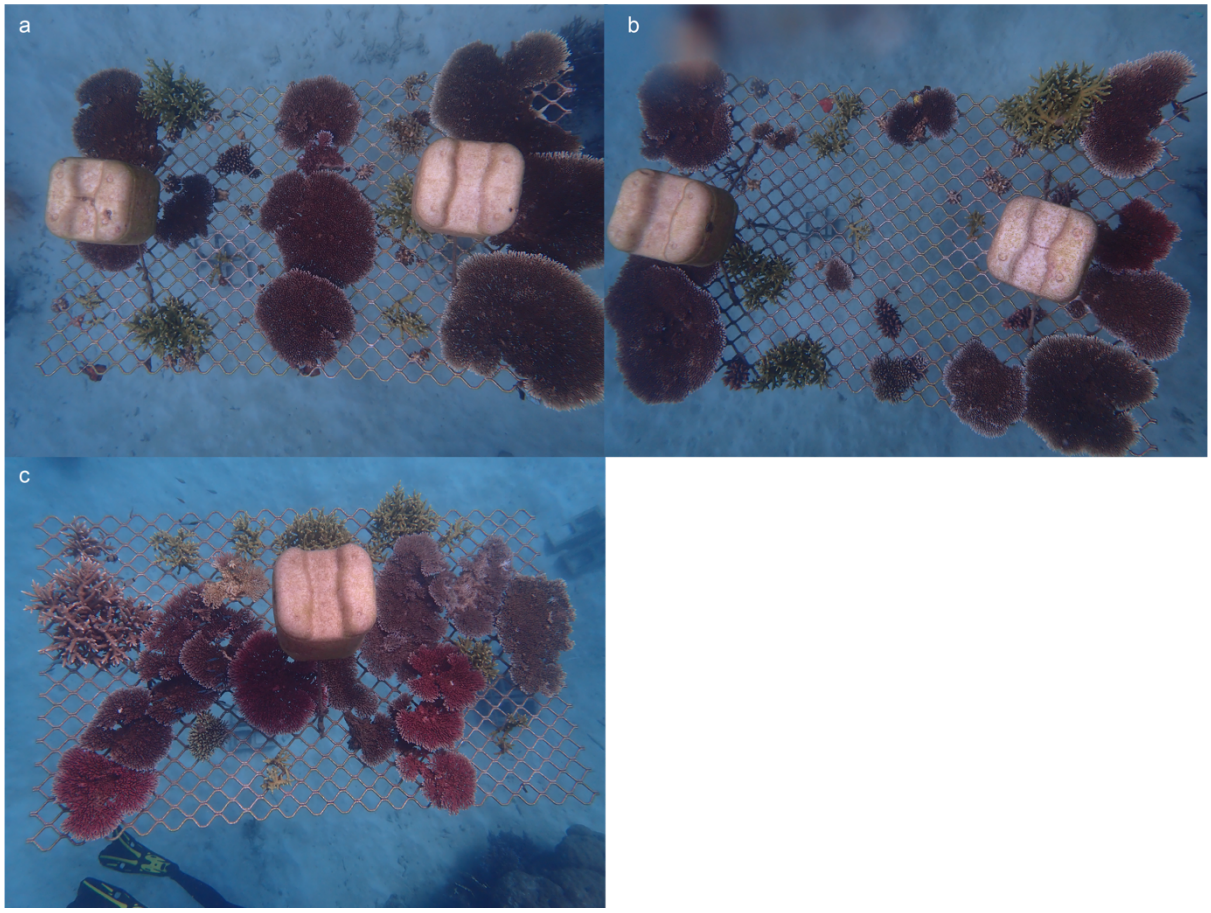


Fig S4 Nursery frames ~18 hours after the removal of full, half and control cage treatments. Panel 'a' is nursery one, 'b' is nursery two and 'c' is nursery three, all managed by tourism partner Wavelength Cruises at Mojo tourism mooring site, Opal Reef, Great Barrier Reef. Photo credit: Gemma M Gillette

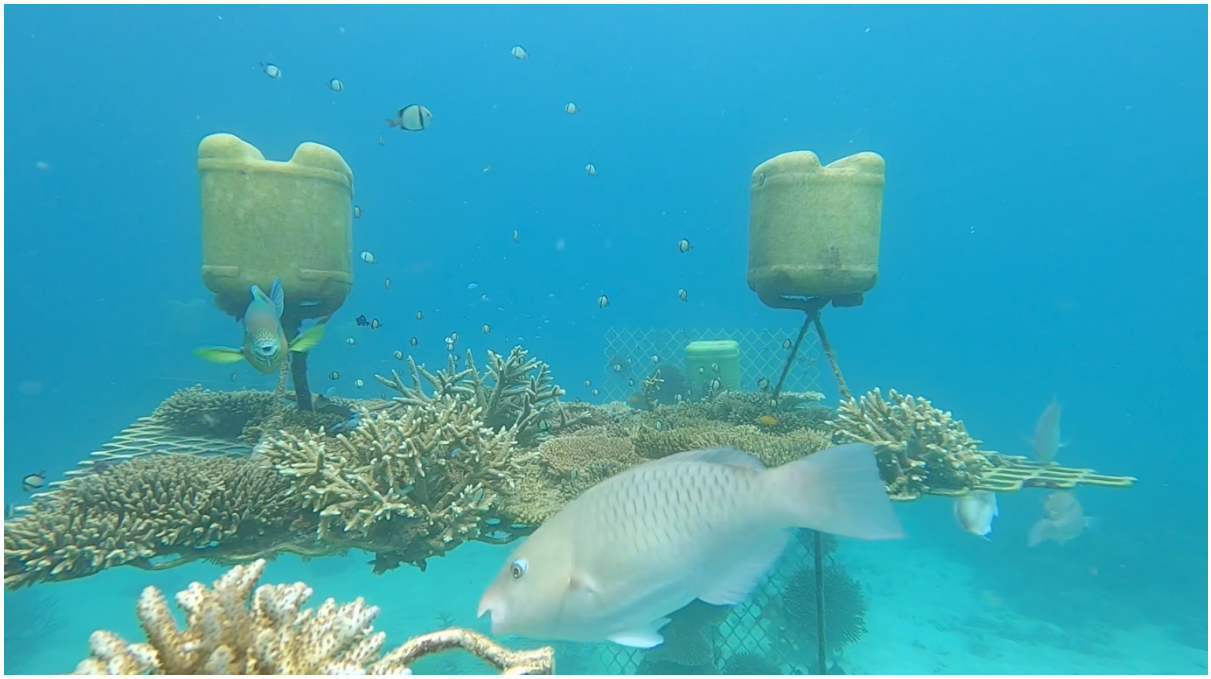


Fig S5 Fish feeding on coral propagation nurseries managed by a Coral Nurture Program tourism partner at Mojo, Opal Reef, Great Barrier Reef. Photo credit: Gemma M Gillette

Table S1 Tide times at Port Douglas (ausmarinescience.com) and start times of fish video surveys at Rayban and Mojo tourism mooring sites, Opal Reef, Great Barrier Reef

Date	Tide	Time	Meters
5/6/2022	High	3:52	1.18
	Low	9:12	2.06
	High	15:32	0.42
	Low	22:28	2.87
	Rayban	10:23	
	Mojo	11:38	
6/6/2022	High	4:51	1.25
	Low	10:02	1.92
	High	16:20	0.53
	Low	23:24	2.8
	Rayban	10:25	
	Mojo	12:01	
7/6/2022	High	6:08	1.3
	Low	11:06	1.78
	High	17:15	0.69
	Rayban	10:22	
	Mojo	11:46	

Table S2 Experimental treatment plots (full, half and control) fitted with coral fragments (Mojo: *Acropora verweyi*; Rayban: *Acropora muricata*, *Acropora cerealis*) and graze plate assays (~30 x 9 cm nursery frame aluminium diamond-mesh) upon completion of the experiment (week 17). Full cage experimental plots had their cages removed prior to being photographed. Photo credit: Gemma M Gillette

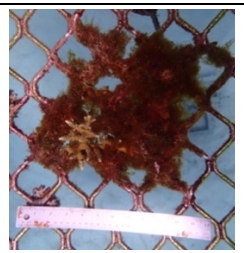
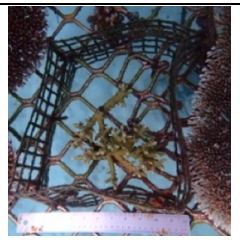
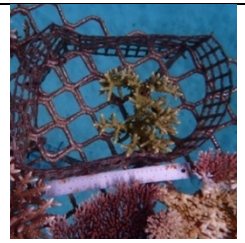
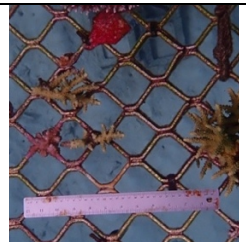
	Mojo			**Rayban**		
	Frame 1	Frame 2	Frame 3	Frame 1	Frame 2	Frame 3
Full						
Half						
Control						

Table S3 Coral cover on survey coral nursery frames at Rayban and Mojo tourism mooring sites on the Great Barrier Reef as of 8th of June 2022. Contributions of *Acropora* spp. and *Pocillopora* spp. to coral cover

Location	Frame number	Coral cover (%)	*Acropora* spp. (%)	*Pocillopora* spp. (%)
Mojo	1	66.74	99.98	0.02
	2	51.77	99.97	0.03
	3	57.84	100.00	0.00
Rayban	1	10.42	99.42	0.58
	2	20.60	99.45	0.55
	3	21.85	99.95	0.05

Table S4 Coral fragment survival at Rayban and Mojo tourism mooring sites on the Great Barrier Reef. At Rayban 2 x *Acropora muricata* and 2 x *Acropora cerealis* fragements were included per treatment and at Mojo 2 x *Acropora verweyi* fragments were included. Species specific survivorship is reported at Rayban, whereby *Acropora muricata* survival in a treatment is a percentage of the total *Acropora muricata* planted within that treatment. Total survivorship at Rayban is the percentage survivorship of all corals within the treatment

Treatment	Species	Rayban	Species	Mojo
		Survival (%)		Survival (%)
Full	*Acropora muricata*	0.00	*Acropora verweyi*	100
	Acropora cerealis	16.67		
	Total	8.33		
Half	*Acropora muricata*	33.33	*Acropora verweyi*	100
	Acropora cerealis	33.33		
	Total	33.33		
Control	*Acropora muricata*	16.67	*Acropora verweyi*	100
	Acropora cerealis	83.33		
	Total	50.00		