



Supplement 1. Fig. S1. Side-scan sonar imagery of the two sites of observed *Lutjanus campechanus* excavation. Site (A) is an excavated tire pile surveyed on May 21, 2015. Site (B) is an excavated pyramid-shaped reef module surveyed on August 12, 2016. The white squares represent the approximate location of the S-BRUV. The two smaller pockmarks near Site (B) were not observed and are of unknown origin.

Table S1. Environmental conditions where *Lutjanus campechanus* excavation activities were observed and the physical characteristics of the two excavations at the excavated tire pile, and excavated pyramid-shaped reef module

Site	Environment			Excavation characteristics					
	Sal.	Temp. (°C)	DO (mg l ⁻¹)	Water depth (m)	Distance to shore (km)	Diameter (m)	Excavation depth (m)	Berm height (m)	Total height (m)
Tire Pile	36.4	24.7	5.8	42	45	10	0.8	0.8	1.6
Pyramid	37.4	24.2	4.9	30	25	10	1.3	0.6	1.9

Table S2. Summary of *Lutjanus campechanus* excavation activity observed from video recorded at the excavated tire pile, and excavated pyramid-shaped reef module. There were 24 excavation events observed at the tire pile during four discrete work periods during which *L. campechanus* worked continuously, followed by a short rest prior to the subsequent work period. Work periods consisted of five, five, six, and five events separated by 269, 136, and 226 s rest periods (mean and standard error or SE of 210.3 ± 39.2 s). Individual excavation events ranged from 24–40 s in duration (mean and SE of 30.4 ± 1.2 s). A total of 9 min 44 s was spent excavating (39% of the video). Five excavation events were observed at the pyramid during five work periods that were more dispersed than those at the tire pile. Events were separated by rest periods of 170, 132, 218, and 343 s in duration (mean and SE of 215.8 ± 45.9 s). Excavation events were 46, 27, 39, 24, and 41 s in duration (mean and SE of 35.4 ± 4.2 s). A total of 2 min 57 s was spent excavating (10% of the video). The time of the event is referenced from the start of each video recording.

Site	Excavation event	Time of event (min:s)	Time between events (min:s)	Time spent excavating (s)	Time between work periods (s)
Tire pile Videoed August 24, 2015	1	01:49	Undetermined	Undetermined	Undetermined
	2	02:29	00:40	40	0
	3	02:59	00:30	30	0
	4	03:23	00:24	24	0
	5	03:59	00:36	36	0
	6	08:28	04:29	Undetermined	269
	7	08:56	00:28	28	0
	8	09:26	00:30	30	0
	9	09:55	00:29	29	0
	10	10:30	00:35	35	0
	11	11:08	00:38	38	0
	12	13:24	02:16	16	136
	13	13:48	00:24	24	0
	14	14:12	00:24	24	0
	15	14:43	00:31	31	0
	16	15:09	00:26	26	0
	17	15:33	00:24	24	0
	18	16:11	00:38	38	0
	19	19:57	03:46	Undetermined	226
	20	20:25	00:28	28	0
	21	20:55	00:30	30	0
	22	21:21	00:26	26	0
	23	21:48	00:27	27	0
	24	22:28	00:40	40	0
Pyramid Videoed July 27, 2017	1	10:39	Undetermined	46	Undetermined
	2	13:29	02:50	27	170
	3	15:41	02:12	39	132
	4	19:19	03:38	24	218
	5	25:02	05:43	41	343

Table S3. Relative abundances (MaxN) of all species identified from stereo baited remote underwater video at the excavated tire pile and the excavated pyramid-shaped reef module. *Note: “Scads” refers to one or more of the genera *Decapterus*, *Selar*, and *Trachurus* spp.

Taxon	Site	
	Tire pile	Pyramid
Gray triggerfish <i>Balistes capriscus</i>	1	.
Bank sea bass <i>Centropristis ocyurus</i>	.	8
Sea basses <i>Centropristis</i> spp.	.	4
Scads*	.	47
Sand perches <i>Diplectrum</i> spp.	.	2
Tomtate grunt <i>Haemulon aurolineatum</i>	27	6
Wrasses <i>Halichoeres</i> spp.	7	.
Wrasses Labridae sp. (wrasses)	.	1
Red snapper <i>Lutjanus campechanus</i>	2	2
Lancer dragonet <i>Callionymus bairdi</i>	1	.
Flatfishes Pleuronectiformes spp.	.	2
Dartfishes <i>Ptereleotris</i> spp.	2	.
Lionfishes <i>Pterois</i> spp.	7	21
Vermilion snapper <i>Rhomboplites aurorubens</i>	37	11
Tattler <i>Serranus phoebe</i>	1	.
Unidentified baitfish	.	120