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Table 1. Description of sampling sites at the Arnavon Islands and Reference Groups. Latitudes and Longitudes measured using a hand-held Global Positioning System (GPS).

a) Sites sampled in the shollow habitat

Group	Island	Site	Latitude (South)	Longitude (East)	Site description
Waghena	1	**S1**	7o 31' 05"	157o 43' 48"	Ondolou Is. - reef shelf on eastern side of beach
		S2	7o 31' 13"	157o 43' 02"	Sunda Is. - reef shelf on southern side of island, just around from the beach
		S3	7o 32' 26"	157o 42' 46"	Ghire Is. - reef shelf off western end of island, near small sand spit
		S4	7o 30' 55"	157o 43' 16"	Sunda Is. - narrow reef shelf on northeastern side of island
	2	**S5**	7o 28' 56"	157o 49' 37"	Wagina Is. - western-most site, directly offshore of small, undercut rock island, inshore of D5. Site on outer edge of terrace
		S6	7o 29' 04"	157o 50' 09"	Wagina Is. - offshore of f western tip of island with long sandy beach; inshore of D6. Site on outer edge of terrace
		S7	7o 29' 19"	157o 50' 43"	Wagina Is. - just to the west of small island with clumps of mangroves, on outer edge of terrace. Inshore of D6
		S8	7o 29' 15"	157o 51' 00"	Wagina Is. - eastern-most site, to the east of small island with mangroves, outer edge of terrace.
Arnavons	3	**S9**	7o 26' 54"	157o 59' 14"	Sikopo Is. - corner of shoreline to the east of island - behind large reef break (bommie)
		S10	7o 26' 35"	157o 58' 59"	Sikopo Is. - narrow terrace on southern side of entrance to embayment
		S11	7o 26' 16"	157o 58' 59"	Sikopo Is. - shallow narrow terrace on northeastern tip of embayment. Surf often breaks here
		S12	7o 27' 18"	157o 59' 38"	Sikopo Is. - wide terrace to the east of small island along shoreline towards the end of the island. Site adjacent to entrance to small lagoon
	4	**S13**	7o 28' 13"	158o 03' 03"	Kerehikapa Is. - outer edge of reef terrace to the northwest of Little Maleivona Is
		S14	7o29' 09"	158o 02' 50"	Kerehikapa Is. - southwestern shore of Maleivona Is.
		S15	7o 28' 48"	158o 03' 02"	Kerehikapa Is. - northeastern end of Maleivona Is., near gap between Little Maleivona & Maleivona Iss.
		S16	7o 26' 58"	158o 02' 12"	Kerehikapa Is. - northern tip of Kerehikapa Is., middle of terrace (about 3 m deep)
Ysabel	5	**S17**	7o 22' 57"	158o 05' 52"	Sibau Is. - site on inner side of long reef extending northwest of Sibau Is., south of D17
		S18	7o 22' 45"	158o 05' 10"	Un-named reef - inner (sheltered) edge of isolated reef just offshore of passage between Pizuanakelekele Reef & Sibau Is.
		S19	7o 22' 00"	158o 04' 42"	Nohabuna Is. - sand/rubble habitat approximately 500 m south of the eastern tip of island
		S20	7o 22' 00"	158o 04' 39"	Nohabuna Is. - sand/coral/rubble habitat between Nohabuna and "Gilligan's" Iss., about 150 m offshore
	6	**S21**	7o 23' 25"	158o 09' 04"	Malakobi Is. - shallow coral terrace off island
		S22	7o 24' 01"	158o 09' 53"	Un-named reef - shallow terrace on southern side of isolated reek between Malakobi and Kologilo Iss.
		S23	7o 24' 01"	158o 09' 53"	Kologilo Is. - site on shallow terrace off wide intertidal rocky shore, northern side of island. Surveys done in 2-3 m water depth
		S24	7o 23' 57"	158o 09' 20"	Kologilo Is. - shallow terrace off western tip of island, inshore and just to the south of D24
Suavanao	7	**S25**	7o 36' 42"	158o 47' 22"	Pilena Faa Is. - shallow terrace at eastern end of island
		S26	7o 37' 15"	158o 47' 23"	Un-named reef - eastern end of shallow terrace on isolated reef to the south of Pilena Faa Is.
		S27	7o 36' 37"	158o 49' 43"	Repena Is. - outer tip of large, continuous reef
		S28	7o 35' 52"	158o 49' 52"	Repena Is. - outer tip of reef, approximately 1-2 km north of S27
	8	**S29**	7o 30' 21"	158o 42' 16"	Sogumau Is. - surveyed edge of coral terrace on reef at southern end of island
		S30	7o 29' 48"	158o 42' 30"	Sogumau Is. - spur-&-groove habitat approximately 1 km north of S29, opposite small clump of trees growing on reef flat
		S31	7o 29' 49"	158o 40' 15"	Un-named Is. - northern side of small islet located between two larger islets, in the bay to the northwest of campsite
		S32	7o 30' 25"	158o 39' 40"	Putuo Is. - southern side of island, just north of D31

Table 1, continued.

b) Sites sampled in the deep habitat

Group	Island	Site	Latitude (South)	Longitude (East)	Site description
Waghena	1	**D1**	7o 31' 06"	157o 43' 41"	Ondolou Is. - reef slope, begin at the middle of the beach; one team goes east, the other west
		D2	7o 30' 55"	157o 42' 57"	Sunda Is. - reef slope, begin at the middle of the beach; one team goes south, the other north
		D3	7o 32' 20"	157o 42' 46"	Ghire Is. - reef slope, northeastern end of the island, along the base of a large reef
		D4	7o 32' 18"	157o 42' 25"	Ghire Is. - northwestern end of island, directly off island, off small lean-to shelter
	2	**D5**	7o 28' 56"	157o 49' 37"	Wagina Is. - directly off small rock islet with large undercut at the waterline and topped with a few scraggy trees. Offshore of S5
		D6	7o 29' 07"	157o 50' 11"	Wagina Is. - offshore of f western tip of island with long sandy beach; offshore of S6.
		D7	7o 29' 18"	157o 50' 43"	Wagina Is. - to the west of clumps of mangrove; offshore of S7
		D8	7o 29' 16"	157o 50' 55"	Wagina Is. - eastern-most site, to the east of small island with mangroves, offshore, but slightly west of S8.
Arnavons	3	**D9**	7o 27' 21"	157o 59' 45"	Sikopo Is. - steep slope offshore and slightly east of S12
		D10	7o 27' 06"	157o 59' 26"	Sikopo Is. - west of D9, survey starts off the northwestern tip of small islet and runs towards the northwest
		D11	7o 26' 24"	157o 58' 46"	Sikopo Is. - northern shore of embayment where Daula moors, site runs from small cleared area to the entrance to the embayment.
		D12	7o 26' 25"	157o 59' 02"	Sikopo Is. - about 0.5 km west of D11, along theinner slope of the long narrow reef
	4	**D13**	7o 28' 13"	158o 02' 56"	Kerehikapa Is. - off Little Maleivona Is. along NW-SE stretch of reef
		D14	7o 28' 06"	158o 02' 40"	Kerehikapa Is. - directly offshore from "Rock Islet", between Little Maleivona & Kerehikapa Iss.
		D15	7o 27' 25"	158o 02' 15"	Kerehikapa Is. - inner slope of long finger reef, off northeastern tip of Kerehikapa Island
		D16	7o 27' 42"	158o 02' 38"	Kerehikapa Is. - inner slope of long reef, opposite the southeast tip of Kerehikapa Is.
Ysabel	5	**D17**	7o 22' 56"	158o 05' 56"	Sibau Is. - site on inner side of long reef extending northwest of Sibau Is., north of S17
		D18	7o 22' 58"	158o 06' 20"	Sibau Is. - northwestern end of island, approximately 150 m offshore
		D19	7o 22' 30"	158o 06' 45"	Un-named islet - northwestern side of small islet (has huts and was used by Gilbertese fishermen)
		D20	7o 23' 06"	158o 06' 35"	Sibau Is. - off northeastern end of island
	6	**D21**	7o 23' 30"	158o 08' 52"	Malakobi Is. - east-west running shoreline on the northern side of the bay where campsite located
		D22	7o 23' 09"	158o 09' 09"	Malakobi Is. - northern side of "finger" reef to the north of campsite
		D23	7o 22' 49"	158o 09' 19"	Pareipoga Is. - southern side of island, survey runs southeast-northwest
		D24	7o 23' 57"	158o 09' 20"	Kologilo Is. - slope off western tip of island, offshore and just to the north of S24
Suavanao	7	**D25**	7o 36' 32"	158o 47' 00"	Pilena Faa Is. - sand/rubble slope on nothern side of island
		D26	7o 36' 19"	158o 47' 57"	Katere Is. - southern shore, site located at first small point back from the southeastern end of the island
		D27	7o 34' 53"	158o 46' 00"	Papatura Ite Is. - northwestern end of beach, near first potential campsite
		D28	7o 36' 35"	158o 46' 36"	Un-named reef - reef has exposed sand bar; located between Pilena Faa and Pilena Ite Iss. Site on western side.
	8	**D29**	7o 29' 51"	158o 40' 54"	Vurongona Faa Is. - slope on southwestern side of island
		D30	7o 29' 53"	158o 40' 10"	Un-named Is. - inner (sheltered = southern) side of small islet near campsite; opposite side of islet to S31
		D31	7o 30' 27"	158o 39' 37"	Putuo Is. - southern side of island, just south of S32
		D32	7o 29' 58"	158o 39' 51"	Campsite - shoreline off lagoon to the south of campsite

Table 2. Asymmetrical ANOVA examining abundances of Trochus niloticus between the Arnavon Islands and reference locations, before and after the declaration of the MCA. B = "Before vs. After", T = Times, G = Group, I = Island, S = Site. "Before vs. after" is a fixed factor. M = MCA, R = References. "No test" = no appropriate MS denominator available to create F test. "Red." = redundant term due to significant lower-order interaction. Cochran's C = 0.1357, p<0.01.

Sources of variation	DF	SS	MS	F	p	F vs	Interpretation	Implication for MCA
B	1	1.8368	1.8368				Red	
T(B)	4	0.8576	0.2144				Red	
G	3	20.2569	6.7523				Red	
Gr(M)	1	8.1666	8.1666					
Gr(C)	2	12.0903	6.0452					
I(G)	4	4.9492	1.2373				Red	
I(G(M))	1	0.8889	0.8889					
I(G(C))	3	4.0903	1.3634					
S(I(G))	24	27.9306	1.1638				Red	
S(I(G(M)))	6	16.8334	2.8056					
S(I(G(C)))	18	11.0972	0.6165					
B x G	3	13.7951	4.5984	7.4613	0.0408	B x I(G)		
B x G(M)	1	11.8067	0.6163	19.1574	0.0119	B x I(G)	Variation at the MCA group, relative to reference groups, from before to after declaration	MCA has caused an increase in numbers at the scale of groups
B x G(C)	2	1.9884	0.9942	1.6132	0.3064	B x I(G)	No variation among reference groups from before to after declaration	
B x I(G)	4	2.4653	0.6163			No test		
B x I(G(M))	1	0.6806	0.6806			No test		
BA x I(G(M))	3	1.7847	0.5949			No test		
B x S(I(G))	24	26.6806	1.1117	2.9348	<0.0001	Residual		
B x S(I(G(M)))	6	15.9167	2.6528	7.0032	<0.0001	Residual	Variation at the MCA sites from before to after the declaration	MCA has caused an increase in numbers at the scale of sites
B x S(Is(G(C)))	18	10.7639	0.5980	1.5787	0.0585	Residual	No variation among control sites from before to after declaration	
T(B) x G	12	2.2396	0.1866	0.3244	0.9728	T(B) x I(G)	Eliminate	
T(Bef) x G	6							
T(Aft) x G	6							
T(B) x G(M)	4							
T(Bef) x G(M)	2	0.7443	0.3722					
T(Aft) x G(M)	2	0.0601	0.0300	0.0426	0.9584	T(B) x I(G)	No short-term temporal variation at the MCA following declaration	No short-term impact detected at scale of groups
T(B) x G(M)	8							
T(Bef) x G(C)	4	0.6481	0.1620					
T(Aft) x G(C)	4	0.7871	0.1968	0.2795	0.8869	T(B) x I(G)	No short-term temporal variation among control groups following declaration	
T(B) x I(G)	16	11.2639	0.7040	1.8585	0.0208	Residual		
T(Bef) x I(G)	8							
T(Aft) x I(G)	8							
T(B) x I(G(M))	4							
T(Bef) x I(G(M))	2	0.3889	0.1945					
T(Aft) x I(G(M))	2	7.1677	3.5834	9.4599	<0.0001	Residual	Short-term temporal variation among MCA islands following declaration	No short-term impact detected at scale of islands
T(Aft) x I(G(M)	2	7.1677	3.5834	18.4236	>0.1	T(Bef) x I(G(M))	Short-term temporal variation among MCA islands following declaration is not different from short-term variation among MCA islands prior to declaration	
T(B) x I(G(C))	12							
T(Bef) x I(G(C))	6	2.6528	0.4421					
T(Aft) x I(G(C))	6	1.0555	0.1759	0.4644	0.8349	Residual	No short-term temporal variation among control islands following declaration	
T(B) x S(I(G))	96	26.6389	0.2775	0.7326	0.973	Residual	Eliminate	
T(Bef) x S(I(G(P)))	48							
T(Aft) x S(I(G(P)))	48							
T(B) x S(I(G(M)))	24							
T(Bef) x S(I(G(M)))	12	3.1666	0.2639					
T(Aft) x S(I(G(M)))	12	8.6667	0.7222	1.9065	0.0301	Residual	Short-term variation among MCA sites following declaration	
T(Aft) x S(I(G(M)))	12	8.6667	0.7222	2.7366	>0.05	T(Aft) x S(I(G(M)))	Temporal variation among MCA sites	No impact detected
						2-tailed	after declaration is not different to temporal variation before declaration	
T(B) x S(I(G(C)))	72							
T(Bef) x S(I(G(C)))	36	8.7778	0.2438					
T(Aft) x S(I(G(C)))	36	6.0278	0.1674	0.4419	0.9983	Residual	No short term variation among control sites following declaration	
Residual	960	363.667	0.3788					
Total	1156							

Table 3. Asymmetrical ANOVA examining abundances of Tectus pyramis between the Arnavon Islands and reference locations before and after the declaration of the MCA. B = "Before vs. After", T = Times, "MCA vs. references", G = Groups, I = Islands, S = Sites. M = MCA, R = Reference. "No test" = no appropriate MS denominator available for creating F test. "Red." = redundant term due to significant lower-order interaction. Data are Ln(X+1) transformed. Cochran's C = 0.0169, NS.

Sources of variation	DF	SS	MS	F	*p*	F vs	Interpretation	Implication for MCA
B	1	4.1358	4.1358			Red.		
T(B)	4	0.8971	0.2243	0.5107	0.7293	T(B) x G		
G	3	4.013	1.3377			No test		
M vs R	1	0.0133	0.0133					
G(R)	2	3.9997	1.9999					
I(G)	4	9.0441	2.2610			No test		
I(M)	1	0.6836	0.6836					
I(G(R))	3	8.3605	2.7868					
S(I(G))	24	36.2986	1.5124			Red.		
S(I(M))	6	7.4087	1.2348					
S(I(G(R))	18	28.8899	1.6050					
B x G	3	0.7919	0.2640	0.3501	0.7925	B x I(G)		
B x M vs R	1	0.6792	0.6792	0.9008	0.3963	B x I(G)	No variation at the MCA group, relative to reference groups, from before to after declaration	No effect detected at scale of groups
B x G(R)	2	0.1127	0.0564	0.0748	0.9292	B x I(G)	Pattern of variation among the reference groups was the same from before to after the declaration	
B x I(G)	4	3.0158	0.7540	No test				
B x I(M)	1	0.0362	0.0362	No test				
B x I(G(R))	3	2.9796	0.9932	No test				
B x S(I(G))	24	16.6207	0.6925	2.2202	0.0034	T(B) x S(I(G))		
B x S(I(M))	6	1.5665	0.2611	0.8371	0.5442	T(B) x S(I(G))	No change among MCA sites from before to after the declaration	Change among the control sites from before to after the declaration was co-incidental. No impact detected at scale of sites.
B x S(Is(G(R)))	18	15.0542	0.8363	2.6813	0.001	T(B) x S(I(G))	Change among reference sites from before to after the declaration	
T(B) x G	12	5.2709	0.4392	0.9202	0.5497	T(B) x I(G)		
T(B) x M vs R	4							
T(Bef) x M vs R	2	0.7800	0.3900					
T(Aft) x M vs R	2	0.5663	0.2832	0.5933	0.5642	T(B) x I(G)	No short-term temporal variation at the MCA group, relative to reference groups, following declaration	Declaration did not affect short-term temporal trend at scale of groups
T(B) x G(R)			8					
T(Bef) x G(R)	4	0.57	0.1425					
T(Aft) x G(R)	4	3.3546	0.8387	1.7572	0.1869	T(B) x I(G)	No short-term temporal variation among reference groups following declaration	
T(B) x I(G)	16	7.6375	0.4773	1.5303	0.1048	T(B) x S(I(G))		
T(B) x I(M)	4							
T(Bef) x I(M))	2	0.0224	0.0112					
T(Aft) x I(M)	2	1.3009	0.6505	2.0856	0.1298	T(B) x S(I(G))	No short-term temporal variation among MCA islands following declaration	Declaration did not affect short-term temporal trend at scale of islands
T(B) x I(G(R))		12						
T(Bef) x I(G(R))	6	2.9616	0.4936					
T(Aft) x I(G(R))	6	3.3526	0.5588	1.7916	0.1089	T(B) x S(I(G))	No short-term temporal variation among reference islands following declaration	
T(B) x S(I(G))	96	29.9389	0.3119	1.2184	0.0836	Residual		
T(B) x S(I(M))	24							
T(Bef) x S(I(M))	12	3.3052	0.2754					
T(Aft) x S(I(M))	12	2.5310	0.2109	0.8238	0.6259	Residual	No short-term temporal variation among MCA sites following declaration	Declaration did not affect short-term temporal trend at scale of sites
T(B) x S(I(G(R)))	72							
T(Bef) x S(I(G(R)))	36	7.192	0.1998					
T(Aft) x S(I(G(R)))	36	16.9107	0.4697	1.8348	0.0022	Residual	Short-term temporal variation among reference sites following declaration	
Residual	960	245.7257	0.2560					
Total		1151						

Table 4. Asymmetrical ANOVA examining variation in abundances of clams (all species combined) between the Arnavon Islands and reference locations, before and after the declaration of the MCA. B = "Before vs. After", T = Times, G = Groups, I = Islands, S = Sites. M = MCA, R = References. "Red." = redundant term due to significant lower-order interaction. Data are Ln(X+1) transformed. Cochran's C = 0.0184, NS

Sources of variation	DF	SS	MS	F	*p*	F vs	Interpretation	Implication for MCA
B	1	33.4608	33.4608	61.3397	<0.001	B x S(I(G))	Variation from before to after declaration	
T(B)	4	2.778	0.6945			Red.		
G	3	24.4887	8.1629	0.8049	0.553	I(G)		
M vs R	1	10.0769	10.0769					
G(R)	2	14.4118	7.2059					
I(G)	4	40.5661	10.1415	1.635	0.198	S(I(G))		
I(M)	1	0.9941	0.9941					
I(G(R))	3	39.572	13.1907					
S(I(G))	24	148.8663	6.2028			Red.		
S(I(M))	6	35.1959	5.8660					
S(I(G(R)))	18	113.6704	6.3150					
B x G	3	0.5213	0.1738	0.1183	0.9447	B x I(G)		
B x M vs R	1	0.0001	0.0001	<0.0001	0.9982	B x I(G)	Pattern of variation at the MCA group from before to after declaration was the same as at the reference groups	No effect detected at scale of groups
B x G(R)	2	0.5212	0.2606	0.1774	0.8437	B x I(G)	Pattern of variation among reference groups was the same from before to after the declaration	
B x I(G)	4	5.8744	1.4686	2.69	0.05534	B x S(I(G))		
B x I(M)	1	0.0833	0.0833	0.153	0.699	B x S(I(G)	No change between the MCA islands from before to after the declaration	No effect detected at scale of islands. Change among reference islands was co-incidental with declaration
B x I(G(R))	3	5.7911	1.9304	23.1741	>0.20	B x S(I(G)) 2-tailed		
B x I(G(R))	3	5.7911	1.9304	3.5388	0.0298	B x S(I(G))	Change among the reference islands from before to after declaration	
B x S(I(G))	24	13.092	0.5455	1.271	0.2057	T(B) x S(I(G))		
B x S(I(M))	6	4.1775	0.6963	1.6223	0.1492	T(B) x S(I(G))	No change among the MCA sites from before to after the declaration	No effect detected at scale of sites
B x S(I(G(R)))	18	8.9145	0.4953	1.154	0.3151	T(B) x S(I(G))	No change among the reference sites from before to after the declaration	
T(B) x G	12	2.9102	0.2425	0.565	0.865	T(B) x S(I(G(P)))		
T(B) x M vs R	4	0.7653	0.1913					
T(Bef) x M vs R	2	0.5365	0.2683					
T(Aft) x M vs R	2	0.2288	0.1144	0.2665	0.7666	T(B) x S(I(G))	No short-term temporal variation at the MCA group, compared with reference groups, following declaration	No short-term effect detected at scale of groups
T(B) x G(R)	8	2.1449	0.2681					
T(Bef) x G(R)	4	1.3139	0.3285					
T(Aft) x G(R)	4	0.831	0.2078	0.4840	0.7474	T(B) x I(G)	No short-term temporal variation among reference groups following declaration	
T(B) x I(G)	16	8.1168	0.5073	1.182	0.2963	T(B) x S(I(G))		
T(B) x I(M)	4							
T(Bef) x I(M)	2	0.7727	0.3864					
T(Aft) x I(M)	2	0.9275	0.4638	1.0806	0.3435	T(B) x S(I(G))	No short-term temporal variation between MCA islands following declaration	No short-term effect detected at scale of islands
T(B) x I(G(R))	12							
T(Bef) x I(G(R))	6	2.6919	0.4487					
T(Aft) x I(G(R))	6	3.7247	0.6208	1.4464	0.2051	T(B) x S(I(G))	No short-term temporal variation among reference islands following declaration	
T(B) x S(I(G))	96	41.2059	0.4292	1.3612	0.0152	Residual		
T(B) x S(I(M))	24							
T(Bef) x S(I(M))	12	10.3314	0.8610					
T(Aft) x S(I(M))	12	3.4536	0.2878	0.9128	0.5333	Residual	No short-term temporal variation among MCA sites following declaration	No short-term effect detected at scale of sites
T(B) x S(I(G(R)))	72							
T(Bef) x S(I(G(R)))	36	13.256	0.3682					
T(Aft) x S(I(G(R)))	36	14.1649	0.3935	1.2493	0.1509	Residual	No short-term temporal variation among reference sites following declaration	
Residualidual	960	302.7282	0.3153					
Total	1156							

Table 5. Asymmetrical ANOVA examining variation in abundances of Tridacna maxima between the Arnavon Islands and Control locations, before and after the declaration of the MCA. B = "Before vs. After", T = Times, G = Groups, I = Islands, S = Sites. M = MCA, R = References. "No test" = no appropriate MS denominator available for creating F test. "Red." = redundant term due to significant lower-order interaction. Data are Ln(X+1) transformed. Cochran's C = 0.0167, NS.

Sources of variation	DF	SS	MS	F	p	F vs	Interpretation	Implication for MCA
B	1	29.2957	29.2957			Red.		
T(B)	4	3.4566	0.8642	2.8307	0.0237	Res		
G	3	6.086	2.0287	0.2903	0.8313	I(G)		
M vs R	1	0.2515	0.2515					
G(R)	2	5.8345	2.9173					
I(G)	4	27.9499	6.9875	3.1792	0.0314	S(I(G))		
I(M)	1	0.4673	0.4673					
I(G(R))	3	27.4826	9.1609					
S(I(G))	24	52.7506	2.1979			Red		
S(I(M))	6	28.744	4.7907					
S(I(G(R)))	18	24.0066	1.3337					
B x G	3	0.1679	0.0560	0.1013	0.9551	B x I(G)		
B x M vs R	1	0.0912	0.0912	0.1649	0.7055	B x I(G)	Pattern of variation at the MCA group from before to after declaration was the same as at the reference groups	No effect detected at scale of groups
B x G(R)	2	0.0767	0.0384	0.0694	0.934	B x I(G)	Pattern of variation among reference groups was the same from before to after the declaration	
B x I(G)	4	2.212	0.5530			No test		
B x I(M)	1	0.0103	0.0103			No test		
B x I(G(R))	3	2.2017	0.7339			No test		
B x S(I(G))	24	14.0511	0.5855	1.9178	0.0228	Residual		
B x S(I(M))	6	4.3238	0.7206	1.3335	>0.5	B x S(I(G(R)) 2-tailed	Variation among MCA sites following declaration does not differ to variation among control sites	No effect detected at scale of sites
B x S(I(M)))	6	4.3238	0.7206	2.3604	0.0287	Res	Variation among MCA sites from beforeto after declaration	Change among the reference sites from before to after the declaration was co-incidental.
B x S(I(G(R)))	18	9.7273	0.5404	1.7701	0.0245	Res	Variation among reference sites from before to after declaration	No effect detected at scale of sites
T(B) x G(P)	12	2.3474	0.1956	0.5004	0.8853	T(B) x I(G)	Eliminate	
T(B) x G(M)	4							
T(Bef) x M vs R	2	0.3025	0.1513					
T(Aft) x M vs R	2	0.3475	0.1738	0.4446	0.6488	T(B) x I(G)	No short-term variation between MCA groups following declaration	No short-term effect detected at scale of groups
T(B) x G(R)	8							
T(Bef) x G(R)	4	1.4602	0.3651					
T(Aft) x G(R)	4	0.2372	0.0593	0.1517	0.9595	T(B) x I(G)	No short-term variation among reference groups following declaration	
T(B) x I(G)	16	6.2537	0.3909	1.2804	0.202	Res		
T(B) x I(M)	4							
T(Bef) x I(M)	2	0.8849	0.4425					
T(Aft) x I(M)	2	0.6525	0.3263	1.0688	0.3438	Residual	No short-term variation between MCA islands following declaration	No short-term effect detected at scale of islands
T(B) x I(G(R))	12							
T(Bef) x I(G(R))	6	2.3089	0.3848					
T(Aft) x I(G(R))	6	2.4074	0.4012	1.3141	0.2479	Residual	No short-term variation among reference islands following declaration	
T(B) x S(I(G))	96	31.8912	0.3322	1.0881	0.2726	Residual	Eliminate	
T(B) x S(I(M))	24							
T(Bef) x S(I(M))	12	7.2714	0.6060					
T(Aft) x S(I(M))	12	2.9934	0.2495	0.8172	0.6329	Residual	No short-term variation among MCA sites following declaration	No short-term effect detected at scale of sites
T(B) x S(I(G(R)))	72							
T(Bef) x S(I(G(R)))	36	10.4647	0.2907					
T(Aft) x S(I(G(R)))	36	11.1617	0.3100	1.0154	0.4451	Residual	No short-term variation among reference sites following declaration	
Residual	960	293.1231	0.3053					
Total	1151							

Table 6. Asymmetrical ANOVA examining variation in the abundance of holothurians found in the shallow habitat between the Arnavon Islands and reference locations before and after the declaration of the MCA. B = "Before vs. After", T = Times, G = Group, I = Island, S = Site. M = MCA, R = References. "No test" = no appropriate MS denominator available to create F test. "Red." = redundant term due to significant lower-order interaction. Data are Ln(X+1) transformed. Cochran's C = 0.0211, NS.

Sources of variation	DF	SS	MS	F	*p*	F vs	Interpretation	Implication for MCA
B	1	0.3971	0.3971	1.0250	0.3686	B x I(G)		
T(B)	4	0.1264	0.0316			Red		
G	3	20.8936	6.9645	1.9745	0.261	I(G)		
M vs R	1	5.485	5.4850					
G(R)	2	15.4086	7.7043					
I(G)	4	14.1088	3.5272			No test		
I(M)	1	4.6351	4.6351					
I(G(R))	3	9.4737	3.1579					
S(I(G))	4	22.2437	0.9268			Red.		
S(I(M))	6	2.9948	0.4991					
S(I(G(R))	18	19.2489	1.0694					
B x G	3	1.4899	0.4966	1.2819	0.3944	B x I(G)		
B x M vs R	1	1.445	1.4450	3.73	0.1256	B x I(G)	No variation at the MCA group, relative to reference groups, from before to after declaration	Effect detected at scale of groups
B x G(R)	2	0.0449	0.0225	0.0581	0.9443	B x I(G)	No change among control groups from before to after declaration	
B x I(G)	4	1.5496	0.3874			No test		
B x I(M)	1	0.1806	0.1806			No test		
B x I(G(R))	3	1.369	0.4563			No test		
B x S(I(G))	24	2.9343	0.1223	0.7522	0.7846	T(B) x S(I(G))	Eliminate	
B x S(I(M))	6	1.3205	0.2201	1.3536	0.2413	T(B) x S(I(G))	No change among MCA sites from before to after declaration	No effect detected at scale of sites
B x S(Is(G(R)))	18	1.6138	0.0897	0.5517	0.9246	T(B) x S(I(G))	No change among reference sites from before to after declaration	
T(B) x G	12	3.8552	0.3213	1.4037	0.2591	T(B) x I(G)	Eliminate	
T(B) x M vs R	4							
T(Bef) x M vs R	2	1.6717	0.8359					
T(Aft) x M vs R	2	1.2186	0.6093	2.6619	0.1005	T(B) x I(G)	No short-term temporal variation a the MCA group relative to the reference groups following declaration	No short-term temporalt variation at scale of groups
T(B) x G(R)	8							
T(Bef) x G(R)	4	0.2732	0.0683					
T(Aft) x G(R)	4	0.6917	0.1729	0.7554	0.5691	T(B) x I(G)	No short-term temporal variation among control groups following declaration	
T(B) x I(G)	16	3.6624	0.2289	1.4077	0.1545	T(B) x S(I(G))		
T(B) x I(M)	4							
T(Bef) x I(M))	2	0.2938	0.1469					
T(Aft) x I(M)	2	0.3168	0.1584	0.9742	0.3812	T(B) x S(I(G))	No short-term temporal variation among reference islands following declaration.	No short-term impact detected at scale of islands
T(B) x I(G(R))	12							
T(Bef) x I(G(R))	6	0.9533	0.1589					
T(Aft) x I(G(R))	6	2.0985	0.3498	2.1513	0.0544	T(B) x S(I(G))	No short-term temporal variation among reference islands following declaration	
T(B) x S(I(G))	96	15.6097	0.1626	1.2723	0.046	Residual		
T(B) x S(I(M))	24							
T(Bef) x S(I(M))	12	2.1262	0.1772					
T(Aft) x S(I(M))	12	4.8536	0.4045	3.1651	0.0002	Residual	Short-term temporal variation among MCA sites following declaration	
T(Aft) x S(I(M))	12	4.8536		0.2827	>0.1	T(Bef) x S(I(G(M))) 2-tailed	Short-term temporal variation among MCA sites following declaration does not differ from variation before declaration	No short-term effect detected at scale of sites
T(B) x S(I(G(R)))	72							
T(Bef) x S(I(G(R)))	36	5.543	0.1540					
T(Aft) x S(I(G(R)))	36	3.0869	0.0857	0.6708	0.9317	Residual	No short term temporal variation among reference sites following declaration	
Residual	960	122.6911	0.1278					
Total	1156							

							from before to after the declaration	scale of islands
B x I(G(R))	3	0.4481	0.1494	0.2962	0.8278	B x S(I(G))	No change among reference islands from before to after the declaration	
B x S(I(G))	24	12.1066	0.5044	1.7429	0.0150	Residual		
B x S(I(M vs R))	6	1.096	0.1827	0.6313	0.7053	Residual	No change among MCA sites from before to after the declaration	Change among the reference sites from before to after the declaration was co-incidental.
B x S(Is(G(R)))	18	11.0106	0.6117	2.1137	0.0043	Residual	Reference sites vary from before to after the declaration	
T(B) x G	12	3.5443	0.2954	1.0207	0.4270	Residual	Eliminate	
T(B) x M vs R	4							
T(Bef) x M vs R	2	0.2202	0.1101					
T(Aft) x M vs R	2	0.9996	0.4998	1.7270	0.1784	Residual	No short-term variation at the MCA group following declaration	No short-term effect detected at scale of groups
T(B) x G(R)	8							
T(Bef) x G(R)	4	0.5807	0.1452					
T(Aft) x G(R)	4	1.7438	0.4360	1.5066	0.1981	Residual	No short-term variation among control groups following declaration	
T(B) x I(G)	16	2.2378	0.1399	0.4834	0.9557	Residual	Eliminate	
T(B) x I(M vs R)	4							
T(Bef) x I(M vs R))	2	0.0253	0.0127					
T(Aft) x I(M vs R)	2	0.5791	0.2896	1.0007	0.3680	Residual	No short-term variation between MCA islands following declaration	No short-term effect detected at scale of islands
T(B) x I(G(R))	12							
T(Bef) x I(G(R))	6	0.3619	0.0603					
T(Aft) x I(G(R))	6	1.2715	0.2199	0.7322	0.6237	Residual	No short-term variation among reference islands following declaration	
T(B) x S(I(G))	96	23.0133	0.2397	0.8283	0.8791	Residual	Eliminate	
T(B) x S(I(M vs R))	24							
T(Bef) x S(I(M vs R))	12	3.1268	0.2606					
T(Aft) x S(I(M vs R))	12	4.1901	0.3492	1.2066	0.2732	Residual	No shor-term variation among MCA sites following declaration	No short-term effect detected at scale of sites
T(B) x S(I(G(R)))								
T(Bef) x S(I(G(R)))	36	7.8524	0.2181					
T(Aft) x S(I(G(R)))	36	7.844	0.2179	0.7522	0.8553	Residual	No short-term variation among reference sites following declaration	
Residual	960	277.8657	0.2894					
Total	1151							