

Supplementary material 1

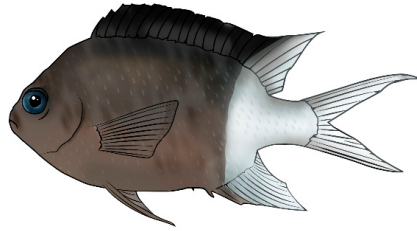
Figure S1 Colour morphs of *A. polyacanthus* among latitudes and distance strata (ie inner, mid and outer shelf). Lines indicate where a colour morph was found at more than once distance across the shelf. Where there are two fish at a latitude the line refers to the second fish colour morph on the right. Planes et al. [29] identified similar colour morphs and fish from the Capricorn Bunker Group and the Swains, these were placed in a different clade (Clade 3) to those from Lizard island to the Whitsundays (Clade 2), [29].

Inner

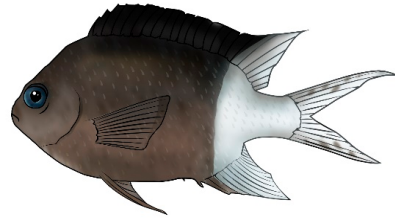
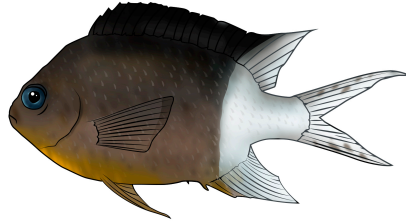
Mid

Outer

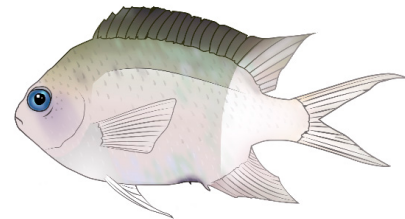
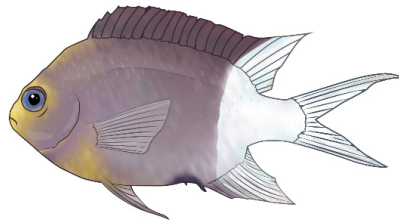
Lizard Is



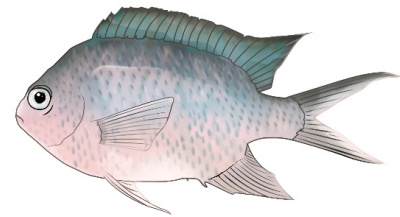
Townsville



Whitsundays



Swains



Capricorn

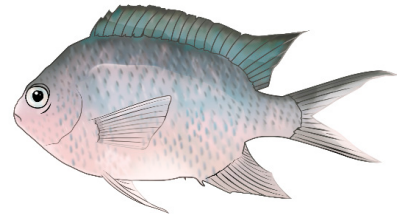


Figure S2 Temperature data collected from loggers in shallow (10 m) and deep (30 m) water at offshore three latitudes (Lizard–Yonge Reef; Townsville–Myrmidon Reef, Capricorn Bunker, One Tree Island) that encompassed the latitudinal range of the study. The x-axis is presented in two month increments for the years 2007–2009.

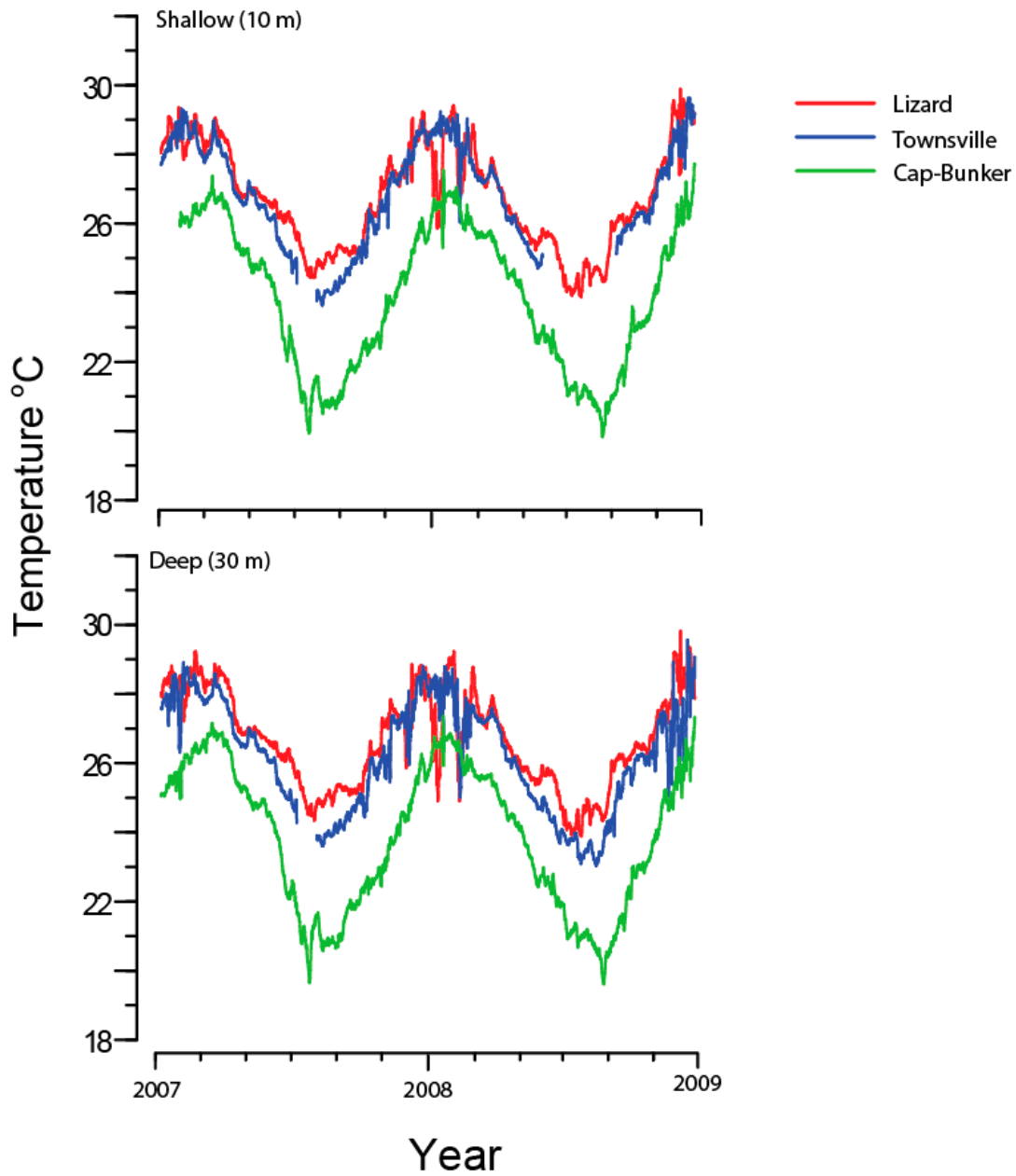


Table SP 1. Analysis 3, a partially hierarchical ANOVA, testing for differences among Distance strata and Zone (MPA and fished) n = 4 fish; dependent variable Standard Length top 10% (SLMAX10%) and Age top 10% (AMAX10%); * p < 0.05; *** p < 0.001. Locations (ie where MPA and fished reefs were in close proximity) were sampled within each combination of zone and distance C = Cochran's Test for homogeneity of the data, k = 18, df = 3.

		SL 10% C= 0.21 ns		Age 10% C=0.14, ns	
Source of Variation	df	MS	F	MS	F
Distance	1	760.5	0.7	0.03	0.03
Zone	1	312.5	0.3	5.3	5.8
D*Z	1	66.1	0.06	47.5	52.5*
Loc(Dist.)	2	1089	6.33	0.9	1
Loc(Dist.)*Zone	2	172.1	39.1***	0.9	1
Residual	24	4.4		0.9	

Table SP 2 Reef status comparison of age and growth parameters between Protected zones (Marine National Park Zone –Green = unfished MPA) with General Use Zone (Blue–fished).

		n	L_{inf}	K	To	r²	AMax	Time Green (Years)
Havannah	Inner	82	79.98	1.39	-0.05	0.37	10	
Pandora	Inner	43	77.43	1.39	-0.05	0.66	9	14
Myrmidon	Outer	81	103.29	1.27	-0.04	0.53	11	
Barnett Patches	Outer	113	100.073	1.17	-0.04	0.71	11	14
Lamont	Outer	73	92.52	1.36	-0.04	0.61	6	
One Tree Island	Outer	81	77.13	1.46	-0.05	0.60	6	20
Martin	Inner	160	88.49	1.37	-0.04	0.63	7	
Eagle	Inner	92	90.18	1.25	-0.05	0.63	8	9

Table 3. Mean size of *A. polyacanthus* at ages 2 and 3 collected from different distances across the shelf and latitude strata on the GBR, Australia.

Location	Shelf Position	LAT (°S)	<i>n</i>	Mean size at 2 (SE)	<i>n</i>	Mean size at 3 (SE)
Lizard Island	Inner	14°	110	83 (0.55)	50	86 (0.78)
	Mid	14°	63	90 (0.83)	67	93 (0.74)
	Outer	14°	82	88 (0.74)	50	92 (0.54)
Townsville	Inner	18°	16	71 (2.68)	26	79 (1.04)
	Mid	18°	20	86 (2.14)	57	97 (1.26)
	Outer	18°	66	93 (1.11)	51	100 (0.72)
Whitsundays	Inner	19°	41	75 (1.08)	23	81 (1.39)
	Mid	19°	40	80 (1.16)	11	78 (2.79)
	Outer	19°	38	87 (0.71)	31	90 (0.86)
Swains	Outer	22°	67	89 (0.60)	37	91 (0.83)
Cap/ Bunker	Outer	23°	52	78 (0.85)	36	83 (1.30)

Table SP 4 Three factor ANOVA, Factors, distance and latitude with the response variable SL for fish aged 2 and 3 (Analysis 5). Reefs within distances at each latitude were pooled for this analysis. The data were checked for homogeneity with Cochran's C, k = 9 and df = 19; Age 2 C = 0.17 NS; Age 3 C = 0.23 *.

Source of Variation	df	SL at age 2 C= 0.17 ns		SL at age 3 C=0.23, *	
		MS	F	MS	F
Distance	2	1497	27.3***	1393	31.1***
Latitude	2	789.6	14.4***	262.8	5.9**
D*L	4	318.5	318.5***	192.7	4.3*
Residual	171	4.4		44.8	