

Appendix

Table S1. Mean cover (%) of substrate types, and cover or density (m⁻²) of algae among sites $\pm$ 1 SD. Data collection methods were uniform point contact (UPC), percent cover within quadrats, or density along transects (n = 4 site⁻¹ time point⁻¹).

	Collection method	Arrow Point	Beyond Arrow	Empire Landing	Indian Rock	Isthmus Reef	Paradise Cove	Parsons Landing
<u>Substratum</u>								
Bedrock (> 101 cm)	UPC	46.50 $\pm$ 24.96	67.69 $\pm$ 36.00	39.84 $\pm$ 29.09	49.12 $\pm$ 21.59	62.26 $\pm$ 16.20	20.97 $\pm$ 25.32	29.59 $\pm$ 27.02
Large boulder (76 - 100 cm)	UPC	8.25 $\pm$ 12.15	16.81 $\pm$ 31.09	14.81 $\pm$ 20.02	8.36 $\pm$ 13.96	3.59 $\pm$ 7.13	7.41 $\pm$ 10.62	9.53 $\pm$ 16.40
Medium boulder (51 - 75 cm)	UPC	2.31 $\pm$ 3.61	1.94 $\pm$ 3.68	2.28 $\pm$ 5.49	2.97 $\pm$ 3.92	3.78 $\pm$ 6.62	2.47 $\pm$ 3.40	2.84 $\pm$ 4.00
Small boulder (26 - 50 cm)	UPC	2.22 $\pm$ 2.82	2.16 $\pm$ 3.89	3.19 $\pm$ 6.81	4.84 $\pm$ 5.24	2.79 $\pm$ 3.48	5.16 $\pm$ 4.95	3.81 $\pm$ 3.80
Cobble (< 25 cm)	UPC	35.78 $\pm$ 16.11	9.56 $\pm$ 7.54	8.06 $\pm$ 10.34	26.72 $\pm$ 7.33	23.55 $\pm$ 13.84	59.88 $\pm$ 24.69	52.31 $\pm$ 21.48
Sand	UPC	4.94 $\pm$ 5.18	1.84 $\pm$ 3.19	31.81 $\pm$ 16.18	7.97 $\pm$ 8.48	4.00 $\pm$ 3.88	4.13 $\pm$ 8.43	1.91 $\pm$ 2.37
Relief (m)	UPC	0.78 $\pm$ 0.26	0.89 $\pm$ 0.16	0.66 $\pm$ 0.40	0.45 $\pm$ 0.17	0.37 $\pm$ 0.09	0.23 $\pm$ 0.19	0.56 $\pm$ 0.15
<u>Algae</u>								
<i>Dictyopteris</i> sp.	(% cover)	10.42 $\pm$ 13.46	9.70 $\pm$ 13.78	1.90 $\pm$ 5.27	5.78 $\pm$ 10.64	3.68 $\pm$ 7.19	2.78 $\pm$ 6.03	9.68 $\pm$ 13.43
<i>Zonaria farlowii</i>	(% cover)	3.68 $\pm$ 7.32	1.88 $\pm$ 6.55	3.58 $\pm$ 8.98	4.58 $\pm$ 7.90	5.12 $\pm$ 9.03	10.52 $\pm$ 13.64	6.42 $\pm$ 8.90
<i>Sargassum horneri</i>	no. per quad	4.43 $\pm$ 4.92	4.12 $\pm$ 8.92	2.90 $\pm$ 5.05	4.20 $\pm$ 8.08	3.07 $\pm$ 4.53	1.55 $\pm$ 2.80	4.20 $\pm$ 5.58
<i>S. horneri</i> recruit	(% cover)	19.70 $\pm$ 18.69	11.28 $\pm$ 12.54	8.60 $\pm$ 14.46	15.42 $\pm$ 16.99	13.96 $\pm$ 18.62	2.58 $\pm$ 6.21	14.50 $\pm$ 12.74
<i>S. palmeri</i>	no. per quad	0.17 $\pm$ 0.59	0.12 $\pm$ 0.73	0.49 $\pm$ 1.49	0.34 $\pm$ 0.89	0.61 $\pm$ 1.76	0.71 $\pm$ 2.14	0.19 $\pm$ 0.67
<i>S. palmeri</i> recruit	(% cover)	0	0.04 $\pm$ 0.57	0.20 $\pm$ 2.03	0.06 $\pm$ 0.49	0.18 $\pm$ 1.08	0.22 $\pm$ 1.22	0
<i>S. muticum</i>	no. per quad	0.20 $\pm$ 1.13	0.09 $\pm$ 0.57	0.49 $\pm$ 1.51	0.17 $\pm$ 0.72	0.47 $\pm$ 1.51	0.27 $\pm$ 1.24	0.13 $\pm$ 0.54
<i>S. muticum</i> recruit	(% cover)	0.06 $\pm$ 0.49	0	0.08 $\pm$ 0.80	0.12 $\pm$ 0.97	0	0.20 $\pm$ 1.43	0.10 $\pm$ 0.74
<i>Stephanocystis neglecta</i>	no. per quad	0.10 $\pm$ 0.41	1.41 $\pm$ 2.52	0.05 $\pm$ 0.48	0.12 $\pm$ 1.06	0.18 $\pm$ 0.80	0.01 $\pm$ 0.10	0.53 $\pm$ 1.08
<i>S. neglecta</i> recruit	(% cover)	0	0.22 $\pm$ 1.80	0	0	0.02 $\pm$ 0.28	0	0
<i>Macrocystis pyrifera</i>	no. per tran	4.10 $\pm$ 4.69	27.85 $\pm$ 30.25	0	0.40 $\pm$ 0.99	0.95 $\pm$ 1.85	0	41.2 $\pm$ 67.06
<i>M. pyrifera</i> stipe	no. per tran	3.58 $\pm$ 1.98	5.78 $\pm$ 3.45	0	3.13 $\pm$ 1.31	4.07 $\pm$ 2.07	0	3.31 $\pm$ 1.43
<i>M. pyrifera</i> recruit	no. per quad	0	0.08 $\pm$ 0.89	0	0	0	0	0.34 $\pm$ 2.43
<i>M. pyrifera</i> holdfast	no. per quad	0.06 $\pm$ 0.34	0.34 $\pm$ 1.08	0.01 $\pm$ 0.07	0.02 $\pm$ 0.20	0	0	0.56 $\pm$ 1.28
<i>Eisenia arborea</i>	no. per tran	0.35 $\pm$ 0.67	0.25 $\pm$ 0.55	0	0.15 $\pm$ 0.49	0.35 $\pm$ 0.93	0.25 $\pm$ 0.79	0.15 $\pm$ 0.49

Table S2. Results of Principal Components Analysis (PCA) on the (a) algal assemblage and (b) physical substratum pooled across all sites and time points. Values are correlations of individual variables with each PC. PCs shown explained 42.6% and 88.2% of the variation in the abundance of different algae and different physical substrata, respectively.

(a)					
	Algal PC 1	Algal PC 2	Algal PC 3	Mean abundance	Data type
% of variation	18.9	12.46	11.27	...	...
<i>Sargassum horneri</i>	0.08	-0.35	0.54	13.98	no. per m ²
<i>S. palmeri</i>	-0.42	-0.28	-0.13	1.50%	% cover
<i>Stephanocystis neglecta</i>	0.38	-0.06	0.1	1.38%	% cover
<i>Macrocystis pyrifera</i>	0.36	0.07	-0.35	0.18	no. per m ²
<i>S. muticum</i>	-0.29	-0.19	0.17	1.03%	% cover
<i>Ecklonia arborea</i>	0.08	0.33	0.07	0.004	no. per m ²
<i>Dictyopteris sp.</i>	0.43	-0.27	-0.34	6.28%	% cover
<i>Zonaria farlowii</i>	-0.25	-0.04	-0.38	5.11%	% cover
<i>S. horneri</i> recruit	0.27	-0.44	0.03	12.29%	% cover
<i>S. palmeri</i> recruit	-0.26	-0.19	-0.12	0.10%	% cover
<i>St. neglecta</i> recruit	0.07	-0.05	0.46	0.03%	% cover
<i>S. muticum</i> recruit	-0.14	-0.48	-0.17	0.08%	% cover
<i>M. pyrifera</i> recruit	0.20	-0.34	-0.06	0.06%	% cover

(b)				
	Subs. PC 1	Subs. PC 2	Mean value	Data type
% of variation	65.42	22.61	...	...
Relief (mean height)	0.004	0.004	0.56 m	mean height (m)
Bedrock	0.81	-0.27	45.14%	% cover
Large boulder	-0.22	0.65	9.83%	% cover
Medium boulder	-0.03	0.01	2.66%	% cover
Small boulder	-0.05	-0.02	3.45%	% cover
Cobble	-0.54	-0.65	30.84%	% cover
Sand	0.02	0.27	8.08%	% cover

Table S3. Mean density of fishes (m⁻²) along n = 4 permanent transects site⁻¹ time point⁻¹ at all 7 study sites ± 1 SD.

	Arrow Point	Beyond Arrow	Empire Landing	Indian Rock	Isthmus Reef	Paradise Cove	Parsons Landing	All sites
<i>Lythrypnus dalli</i> ^Q	16.10 ± 13.02	8.34 ± 10.62	9.66 ± 12.64	21.38 ± 16.37	16.86 ± 12.34	9.48 ± 13.17	5.78 ± 7.10	12.52 ± 12.19
<i>Chromis punctipinnis</i>	2.40 ± 1.30	1.60 ± 1.77	4.02 ± 2.50	2.89 ± 1.70	2.80 ± 2.50	2.09 ± 2.60	1.30 ± 1.00	2.40 ± 1.91
<i>Oxyjulis californica</i>	0.15 ± 0.30	0.93 ± 2.91	0.04 ± 0.12	0.08 ± 0.19	0.10 ± 0.19	0.31 ± 0.57	0.40 ± 0.59	0.28 ± 0.70
<i>Halichoeres semicinctus</i>	0.20 ± 0.081	0.06 ± 0.05	0.32 ± 0.28	0.24 ± 0.14	0.30 ± 0.24	0.65 ± 0.45	0.19 ± 0.17	0.28 ± 0.20
<i>Paralabrax clathratus</i>	0.18 ± 0.20	0.18 ± 0.17	0.27 ± 0.19	0.21 ± 0.14	0.26 ± 0.13	0.16 ± 0.14	0.15 ± 0.11	0.20 ± 0.16
<i>Atherinops affinis</i>	0.005 ± 0.02	0.12 ± 0.24	0	0.47 ± 0.80	0.04 ± 0.18	0.06 ± 0.15	0.054 ± 0.14	0.11 ± 0.22
<i>Hypsypops rubicundus</i>	0.11 ± 0.05	0.08 ± 0.05	0.12 ± 0.06	0.13 ± 0.07	0.11 ± 0.07	0.09 ± 0.07	0.07 ± 0.05	0.10 ± 0.06
<i>Semicossyphus pulcher</i>	0.08 ± 0.04	0.04 ± 0.05	0.03 ± 0.02	0.06 ± 0.04	0.16 ± 0.12	0.01 ± 0.02	0.06 ± 0.05	0.06 ± 0.05
<i>Rhinogobiops nicholsii</i> ^Q	0.12 ± 0.29	0	0.06 ± 0.20	0.06 ± 0.20	0.04 ± 0.12	0.02 ± 0.09	0.12 ± 0.32	0.06 ± 0.17
<i>Girella nigricans</i>	0.02 ± 0.03	0.03 ± 0.08	0.08 ± 0.24	0.03 ± 0.08	0.09 ± 0.20	0.04 ± 0.04	0.008 ± 0.01	0.04 ± 0.09
<i>Scorpaena guttata</i> ^Q	0.04 ± 0.12	0.02 ± 0.09	0.02 ± 0.09	0.04 ± 0.12	0	0.04 ± 0.04	0.04 ± 0.12	0.03 ± 0.10
<i>Medialuna californensis</i>	0.009 ± 0.01	0.06 ± 0.07	0.04 ± 0.07	0.02 ± 0.03	0.04 ± 0.10	0.005 ± 0.01	0.02 ± 0.03	0.03 ± 0.05
<i>Trachurus scombrinus</i>	0.004 ± 0.02	0	0	0	0	0.11 ± 0.34	0	0.02 ± 0.05
<i>Gymnothorax mordax</i>	0.02 ± 0.09	0	0	0.02 ± 0.09	0	0	0.02 ± 0.09	0.009 ± 0.04
<i>Lythrypnus zebra</i> ^Q	0	0.02 ± 0.09	0	0.02 ± 0.09	0	0	0	0.006 ± 0.03
<i>Gibbonsia elegans</i> ^Q	0	0.02 ± 0.089	0	0.02 ± 0.09	0	0	0	0.006 ± 0.03
<i>Paralabrax nebulifer</i>	0.0008 ± 0.004	0.02 ± 0.07	0.01 ± 0.04	0.002 ± 0.006	0	0.004 ± 0.01	0.0008 ± 0.004	0.006 ± 0.02
<i>Heterostichus rostratus</i>	0.004 ± 0.009	0.007 ± 0.01	0	0.0008 ± 0.004	0.003 ± 0.009	0.003 ± 0.02	0.003 ± 0.01	0.003 ± 0.008
<i>Seriola lalandi</i>	0	0	0.02 ± 0.05	0	0	0.0008 ± 0.004	0	0.003 ± 0.008
<i>Paraclinus integripinnis</i> ^Q	0.02 ± 0.09	0	0	0	0	0	0	0.003 ± 0.01
<i>Anisotremus davidsonii</i>	0	0.009 ± 0.04	0.005 ± 0.02	0	0	0.0008 ± 0.004	0	0.002 ± 0.009
<i>Brachyistius frenatus</i>	0.002 ± 0.007	0.005 ± 0.002	0	0	0	0	0.007 ± 0.02	0.002 ± 0.005
<i>Sebastes serripes</i>	0.0008 ± 0.002	0.0008 ± 0.004	0	0	0	0.008 ± 0.03	0	0.001 ± 0.006
<i>Sebastes atrovirens</i>	0	0.003 ± 0.009	0	0	0	0	0.0008 ± 0.004	0.0006 ± 0.002
<i>Rhacochilus toxotes</i>	0.002 ± 0.006	0	0	0	0	0	0.002 ± 0.005	0.0006 ± 0.002
<i>Caulolatilus princeps</i>	0	0	0	0.0008 ± 0.004	0.003 ± 0.008	0	0	0.0005 ± 0.002
<i>Sebastes auriculatus</i>	0.002 ± 0.006	0	0	0	0	0	0.0008 ± 0.004	0.0005 ± 0.001
<i>Embiotoca jacksoni</i>	0.0008 ± 0.002	0.0008 ± 0.002	0	0	0	0	0.0008 ± 0.004	0.0004 ± 0.002
<i>Heterodontus francisci</i>	0.0004 ± 0.002	0	0	0.001 ± 0.003	0	0	0.0004 ± 0.002	0.0003 ± 0.001
<i>Rhacochilus vacca</i>	0.002 ± 0.00745	0	0	0	0	0	0	0.0002 ± 0.001
<i>Apogon guadalupensis</i> ^Q	0	0	0.0008 ± 0.002	0	0	0	0	0.0001 ± 0.0005
<i>Stereolepis gigas</i>	0	0.007 ± 0.007	0	0.0004 ± 0.002	0.0004 ± 0.002	0	0	0.0001 ± 0.0005
<i>Alloclinus holderi</i> ^Q	0	0.0008 ± 0.004	0	0	0	0	0	0.0001 ± 0.0005
<i>Balistes polylepis</i>	0	0	0	0.0004 ± 0.002	0	0	0	0.00006 ± 0.0003
All fishes (minus <i>L. dalli</i>)	3.36 ± 1.40	3.25 ± 3.20	5.03 ± 2.60	4.28 ± 2.40	3.95 ± 2.76	3.59 ± 2.50	2.37 ± 1.40	3.69 ± 2.30
All fishes (minus <i>L. dalli</i> and <i>C. punctipinnis</i>)	0.96 ± 0.59	1.60 ± 3.07	1.02 ± 0.502	1.40 ± 1.10	1.15 ± 0.64	1.50 ± 0.72	1.10 ± 0.95	1.25 ± 1.10

Species with superscript "Q" were counted within quadrats along transects.

Table S4. Test statistics of dbRDA and general linear models testing how well the multivariate fish assemblage (identity and density of each fish species), total fish density, fish diversity (H'), vertical distribution, and biomass were predicted by physical substratum and site combined with either the densities of the four dominant algal species (*M. pyrifera*, *Sargassum horneri*, *S. muticum*, and *Stephanocystis neglecta*), or algal height, volume, or surface area, and also alone with just physical substratum and site (“Habitat”). Results are from dbRDA for the multivariate fish assemblage and general linear models for all other response variables. Samples were pooled across sites and time points ($n = 140$). Results are shown with and without highly abundant species ($\dagger$ = without *L. dalli*, $\ddagger$ = without *L. dalli* and *C. punctipinnis*). Proportion of fish density in the water column is shown as “Vertical distribution”. Statistically significant p -values are in bold and best models determined by AICc are denoted by grey boxes.

Dependent variable	Fish assemblage		Fish density $\dagger$		Fish density $\ddagger$		Fish diversity (H')		Water column fish		Fish biomass	
	p	Pseudo-F	p	β	p	β	p	β	p	β	p	β
<u>Species Model</u>												
Site	0.001	1.58	0.23	...	0.66	...	0.04	...	0.05	...	0.08	...
<i>S. horneri</i>	0.14	1.52	0.21	0.04	0.68	-0.02	<0.001	-0.06	0.05	0.12	0.75	-0.01
<i>S. palmeri</i>	0.05	1.98	0.08	0.14	0.27	0.12	0.09	-0.07	0.17	0.20	0.001	0.33
<i>M. pyrifera</i>	0.001	4.16	0.43	0.20	0.68	0.14	0.97	-0.005	0.004	1.36	0.88	-0.05
<i>S. neglecta</i>	0.65	0.74	0.16	-0.12	0.11	-0.19	0.19	-0.06	0.04	-0.34	0.046	-0.22
Substr. PC 1	0.002	4.19	0.91	-0.01	0.11	0.27	0.56	-0.04	0.31	0.24	0.96	-0.01
Substr. PC 2	0.25	1.21	0.02	0.34	0.60	-0.10	0.50	0.05	0.31	-0.27	0.01	0.47
<u>Height Model</u>												
Site	0.001	1.53	0.03	...	0.23	...	0.001	...	0.16	...	0.01	...
Height	0.1	1.67	0.19	-0.14	0.56	0.08	<0.001	0.22	0.03	-0.43	0.56	-0.08
Substr. PC 1	0.002	4.05	0.99	0.001	0.12	0.27	0.47	-0.05	0.18	0.32	0.90	-0.02
Substr. PC 2	0.27	1.17	0.003	0.41	0.87	-0.03	0.75	0.02	0.39	-0.22	<0.001	0.62
<u>Volume Model</u>												
Site	0.001	1.67	0.40	...	0.67	...	0.003	...	0.27	...	0.04	...
Volume	0.001	1.67	<0.001	-0.39	<0.001	-0.53	<0.001	0.21	0.63	0.11	0.12	-0.23
Substr. PC 1	0.002	4.43	0.87	0.02	0.07	0.30	0.43	-0.05	0.22	0.30	0.95	-0.01
Substr. PC 2	0.22	1.28	0.002	0.41	0.60	-0.09	0.93	-0.01	0.62	-0.13	<0.001	0.62
<u>Surface-area Model</u>												
Site	0.001	15.1	0.21	...	0.53	...	0.008	...	0.28	...	0.03	...
Surface area	0.001	15.1	<0.001	-0.33	<0.001	-0.42	0.006	0.23	0.58	0.05	0.08	-0.14
Substr. PC 1	0.002	4.55	0.82	0.02	0.04	0.20	0.45	-0.08	0.22	0.13	0.97	-0.004
Substr. PC 2	0.21	1.31	0.002	0.31	0.55	-0.06	0.88	-0.02	0.62	-0.05	<0.001	0.36
<u>Habitat</u>												
Site	<0.001	15.1	0.01	...	0.25	...	0.007	...	0.24	...	<0.001	...
Substr. PC 1	0.002	4.55	0.98	-0.003	0.11	0.17	0.56	-0.06	0.21	0.13	0.89	-0.01
Substr. PC 2	0.21	1.31	0.001	0.33	0.79	-0.03	0.75	-0.03	0.60	-0.06	<0.001	0.37

Table S5: Comparisons of general linear models testing how well densities of individual fish species were predicted by physical substratum and site combined with either the densities of the four dominant algal species (*M. pyrifera*, *Sargassum horneri*, *S. muticum*, and *Stephanocystis neglecta*), or algal height, volume, or surface area, and also alone with just physical substratum and site (“Habitat”). Samples were pooled across sites and time points ($n = 140$). The best model as determined by AICc denoted in gray boxes.

Model	Degrees of freedom	AICc	Δ_i	r^2
<i>C. punctipinnis</i>				
Species	15	433.39	1.83	0.31
Height	12	431.56	0	0.29
Volume	12	432.31	0.75	0.28
Surface area	12	432.62	1.06	0.28
Habitat	11	432.28	0.72	0.27
<i>L. dalli</i>				
Species	15	591.33	34.96	0.33
Height	12	593.01	36.64	0.26
Volume	12	561.85	5.48	0.46
Surface area	12	556.37	0	0.48
Habitat	11	597.82	41.46	0.22
<i>P. clathratus</i>				
Species	15	370.07	7.79	0.19
Height	12	370.93	8.65	0.14
Volume	12	362.96	0.67	0.19
Surface area	12	362.29	0	0.19
Habitat	11	369.23	6.95	0.14
<i>H. semicinctus</i>				
Species	15	330.21	4.64	0.44
Height	12	327.15	1.58	0.42
Volume	12	327.52	1.95	0.42
Surface area	12	325.57	0.00	0.43
Habitat	11	326.03	0.46	0.42
<i>H. rubicundus</i>				
Species	15	269.63	29.14	0.15
Height	12	260.56	20.07	0.16
Volume	12	247.08	6.59	0.24
Surface area	12	240.49	0	0.27
Habitat	11	262.59	22.10	0.13
<i>O. californica</i>				
Species	15	540.73	11	0.13
Height	12	540.73	11.44	0.08
Volume	12	535.60	6.30	0.11
Surface area	12	529.30	0.00	0.15
Habitat	11	538.52	9.23	0.08

Table S6. Test statistics of general linear models testing how well densities of individual species were predicted by physical substratum and site combined with either algal height, volume, or surface area. Samples were pooled across sites and time points ($n = 140$). Statistically significant p -values are in bold and best models determined by AICc are denoted by grey boxes.

Dependent variable	<i>C. punctipinnis</i>		<i>L. dalli</i>		<i>P. clathratus</i>		<i>H. semicinctus</i>		<i>H. rubicundus</i>		<i>O. californica</i>	
	p	β	p	β	p	β	p	β	p	β	p	β
<u>Species Model</u>												
Site	0.009	...	0.01	...	0.06	...	<0.001	...	0.19	...	0.31	...
<i>S. horneri</i>	0.46	0.04	0.60	0.05	0.49	-0.03	0.71	0.01	0.55	-0.02	0.01	0.22
<i>S. palmeri</i>	0.04	0.30	0.03	0.56	0.02	0.27	0.78	0.03	0.14	0.12	0.36	-0.19
<i>M. pyrifera</i>	0.31	0.46	0.003	-2.38	0.14	0.53	0.04	-0.63	0.57	-0.14	0.34	0.64
<i>S. neglecta</i>	0.05	-0.32	0.79	0.07	0.62	-0.06	0.51	0.07	0.93	0.01	0.50	-0.15
Substr. PC 1	0.23	-0.27	0.90	-0.05	0.51	0.12	0.86	-0.03	0.20	0.16	0.28	-0.36
Substr. PC 2	0.03	0.55	0.88	-0.07	0.003	-0.61	0.51	0.11	0.12	0.22	0.70	-0.14
<u>Height Model</u>												
Site	0.009	...	<0.001	...	0.04	...	<0.001	...	0.03	...	0.23	...
Height	0.08	-0.34	0.01	-0.92	0.41	0.13	0.26	-0.15	0.04	-0.22	0.67	0.12
Substr. PC 1	0.29	-0.24	0.88	-0.06	0.53	0.12	0.77	-0.05	0.21	0.16	0.39	-0.29
Substr. PC 2	0.008	0.65	0.50	0.29	0.004	-0.57	0.34	0.16	0.12	0.21	0.96	0.02
<u>Volume Model</u>												
Site	0.006	...	<0.001	...	0.10	...	<0.001	...	0.16	...	0.04	...
Volume	0.15	-0.11	<0.001	-2.26	0.003	-0.49	0.34	-0.14	<0.001	-0.48	0.02	-0.71
Substr. PC 1	0.31	-0.10	0.74	-0.13	0.40	0.15	0.79	-0.04	0.14	0.18	0.46	-0.25
Substr. PC 2	0.004	0.29	0.65	0.18	<0.001	-0.63	0.28	0.18	0.09	0.21	0.86	-0.06
<u>Surface-area Model</u>												
Site	0.003	...	0.001	...	0.10	...	<0.001	...	0.17	...	0.02	...
Surface area	0.21	-0.1	<0.001	-0.50	0.002	-0.26	0.09	-0.12	<0.001	-0.41	<0.001	-0.30
Substr. PC 1	0.59	-0.05	0.80	-0.02	0.39	0.09	0.82	-0.02	0.12	0.15	0.50	-0.07
Substr. PC 2	<0.001	-0.32	0.59	0.05	0.001	-0.35	0.29	0.09	0.08	0.18	0.82	-0.02
<u>Habitat</u>												
Site	0.007	15.1	<0.001	...	0.05	...	<0.001	...	0.02	...	0.19	...
Substr. PC 1	0.28	-0.10	0.83	-0.02	0.51	0.07	0.75	-0.03	0.24	0.12	0.39	-0.09
Substr. PC 2	0.003	0.30	0.28	0.11	0.003	-0.33	0.25	0.10	0.06	0.21	0.98	-0.002

Fig. S1: Conceptual model of how a change in the height of dominant benthic macroalga influences the vertical distribution of fishes of rocky reef fishes. Reefs dominated by tall algae like *Macrocystis* have higher richness and density of fishes throughout the water column. Reefs dominated by shorter algae like invasive *Sargassum horneri* have fewer fish species high in the water column (although similar richness overall), but occasionally have dense aggregations of schooling species (e.g., *Chromis punctipinnis*). Behavior and habitat use of dominant predators (e.g. *Paralabrax clathratus*) and prey (e.g., *C. punctipinnis*) differ between reefs dominated by tall vs. shorter algae, with predators camouflaged among tall algae high in the water column and prey schooling in small groups, versus predators attacking from resting positions near the bottom and prey schooling in large groups higher in the water column where areas are dominated by shorter algae.

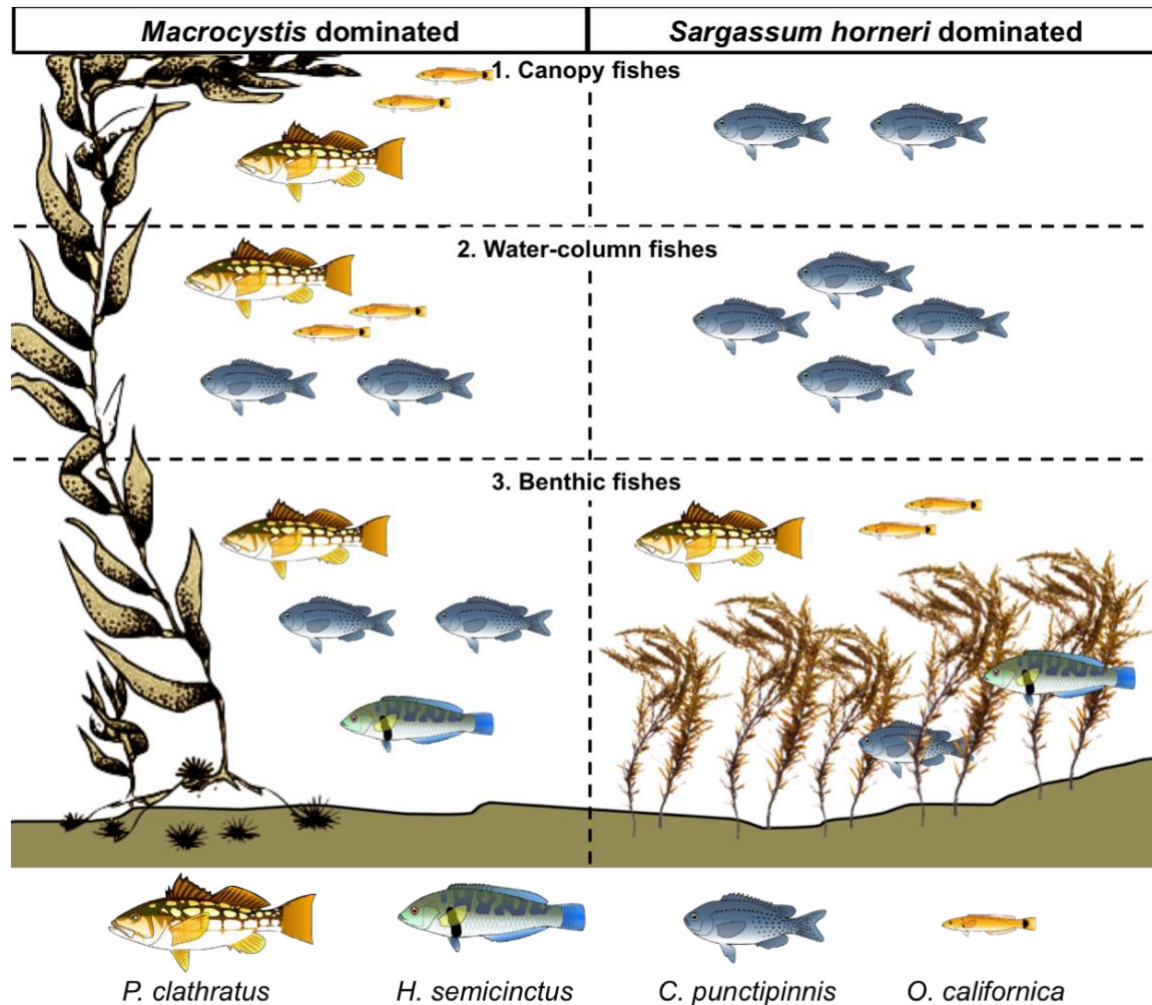


Fig. S2: Relationships between volume and surface-area for four macroalgal species: *Macrocystis pyrifera* (MAPY), *Sargassum horneri* (SAHO), *Sargassum palmeri* (SAPA), and *Stephanocystis neglecta* (STOS).

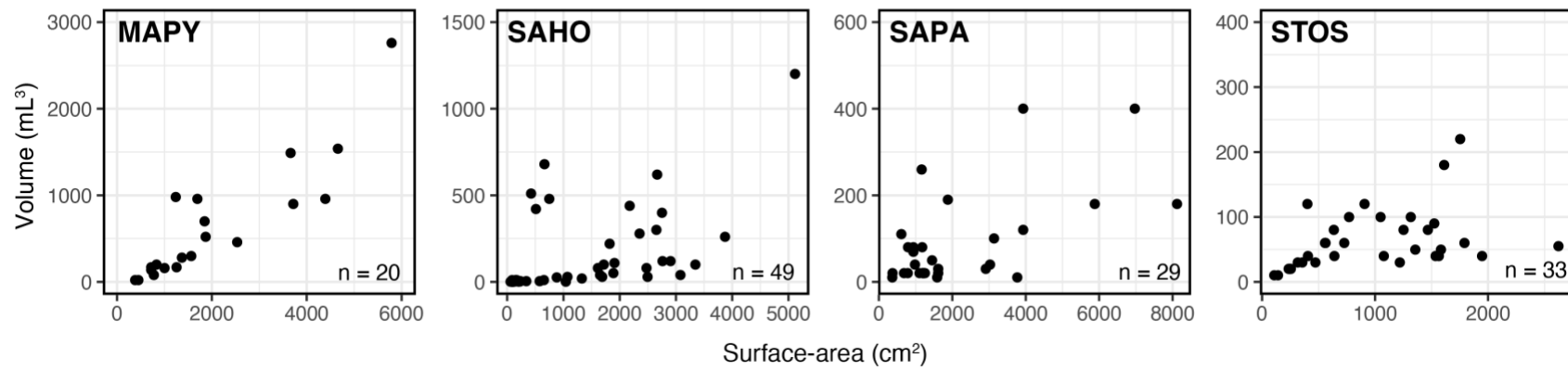


Fig. S3: Correlations between summed macroalgal height, volume, surface area and abundance along transects of four macroalgal species: *Macrocystis pyrifera* (MAPY), *Sargassum horneri* (SAHO), *Sargassum palmeri* (SAPA), and *Stephanocystis neglecta* (STNE).

