

Supplementary Materials

Assessing the effects of swimming net material on populations of an endangered seahorse

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Table S1. ANOVA testing for differences in seahorse density on swimming nets constructed of seahorse friendly material and regular copper braided material, with net material as fixed factor and site as random factor nested within net material

Assumptions of homoscedasticity were tested with Levene’s test and found to be violated ($P = 0.002$) even after log + 1 transformation. In spite of heteroscedasticity the results of this analysis can still be interpreted, as heteroscedasticity elevates the probability of type 1 errors and here we have retained H_0 (Underwood 1997)

Source of variation	d.f.	MS	F	P
Net material	1	0.028	0.011	0.743
Site (net material)	2	3.255	16.49	<0.001
Residual	34	0.197		

Table S2. Repeated-measures ANOVA testing for differences in seahorse density across installed panels of seahorse friendly swimming net material and regular copper braided net material, with net material as fixed factor (two levels), site as random factor (two levels) and time as the repeated-measure

As assumptions of sphericity were violated as indicated by Mauchly’s test ($P = < 0.001$), therefore Greenhouse-Geisser corrections were interpreted.

Source of variation	d.f.	MS	F	P
Net	1	6.298	3.455	0.078
Site	1	17.19	9.432	0.006
Net × site	1	3.44	1.888	0.185
Residual	20	1.823		
Time	4	3.607	5.212	0.001
Time × net	4	0.383	0.553	0.698
Time × site	4	1.78	2.572	0.044
Time × net × site	4	0.43	0.622	0.649
Residual	80	0.692		

Table S3. ANOVA testing for differences in total mobile epifauna abundance between net materials, with Net as fixed factor (two levels), site as random factor (two levels) and survey occasion as random factor (three levels)

Assumptions of homoscedasticity were tested with Levene’s test and found to be non-significant ($P = 0.156$) after square root transformation

Source of variation	d.f.	MS	F	P
Net	1	440.9	1.218	0.424
Occasion	2	9567	4.954	0.196
Site	1	5341	2.765	0.294
Net × occasion	2	384.2	0.771	0.589
Net × Site	1	387.1	0.777	0.485
Occasion × Site	2	1931	7.01	<0.001
Net × Occasion × Site	2	498.3	1.809	0.137
Residual	60	275.5		

Table S4. PERMANOVA testing for differences in multivariate mobile epifauna assemblages, with net material as fixed factor, survey occasion as random factor and site as random factor
 Data were square root transformed, and analysis was run with 999 permutations

Source of variation	d.f.	MS	F	P
Net	1	390.3	0.98	0.496
Survey occasion	2	10996	3.208	0.164
Site	1	7186	2.096	0.288
Net × survey	2	601.6	0.87	0.545
Net × site	1	502	0.726	0.563
Survey × site	2	3428	6.673	0.001
Net × survey × site	2	691.2	1.345	0.253
Residual	60	513.8		

Table S5. ANOVA testing for differences in total epibiotic growth between net materials, with Net as fixed factor (two levels), site as random factor (two levels) and survey occasion as random factor (three levels)

Assumptions of homoscedasticity were tested with Levene's test and found to be non-significant ($P = 0.052$) after square root transformation

Source of variation	d.f.	MS	F	P
Net	1	3.862	0.656	0.619
Occasion	2	1596	2.524	0.309
Site	1	912.2	1.443	0.455
Net × site	2	21.63	1.549	0.340
Net × occasion	1	5.54	0.397	0.718
Occasion × Site	2	632.2	34.83	<0.001
Net × Occasion × Site	2	13.96	0.769	0.585
Residual	59	18.15		

Table S6. PERMANOVA testing for differences in multivariate epibiotic growth assemblages, with net material as fixed factor, survey occasion as random factor and site as random factor.
 Data were square root transformed, and analysis was run with 999 permutations

Source of variation	d.f.	MS	F	P
Net	1	33.98	1.787	0.311
Survey occasion	2	5969	8.002	0.193
Site	1	630.2	0.845	0.507
Net × survey	2	5.272	0.143	0.575
Net × site	1	34.38	0.932	0.414
Survey × site	2	745.9	20.79	0.001
Net × survey × site	2	36.89	1.028	0.421
Residual	59	35.88		

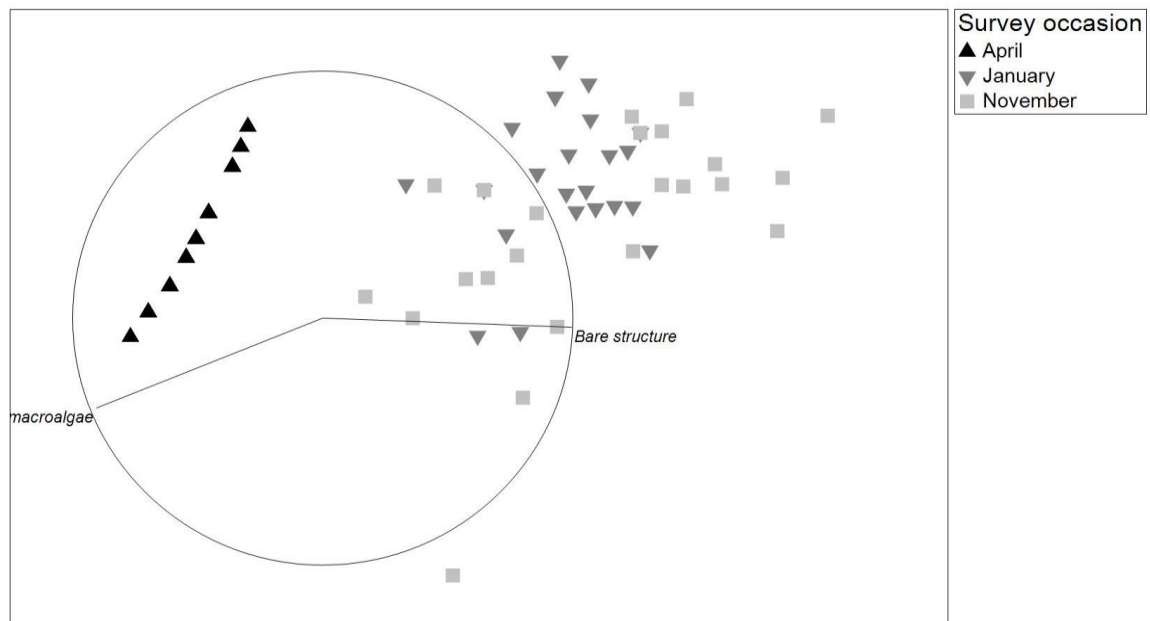


Fig. S1. Non-metric MDS plot of multivariate epibiotic growth data for three survey occasions, labelled by survey occasion (November 2018, January 2019 and April 2019). Data were square root transformed and the plot was constructed from a Bray–Curtis similarity resemblance matrix. Vectors display which taxa were most responsible for differences between samples.

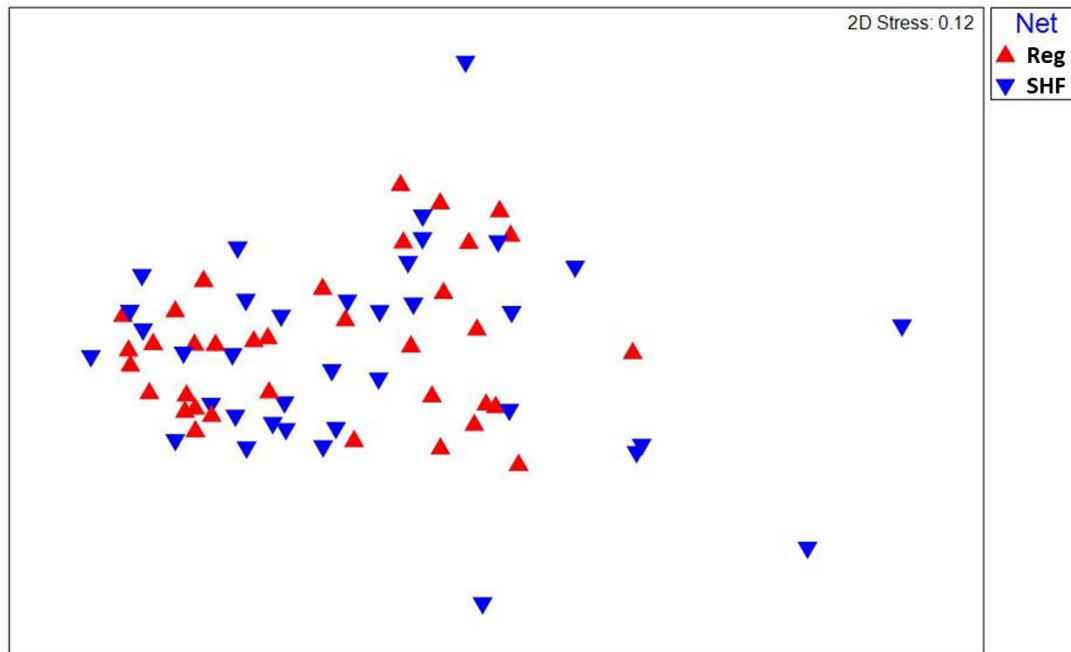


Fig. S2. Non-metric MDS plot of multivariate epibiotic growth data for three survey occasions, labelled by swimming net material (seahorse friendly or regular copper braided). Data were square root transformed and the plot was constructed from a Bray–Curtis similarity resemblance matrix.

Reference

Underwood, A. (1997). 'Experiments in Ecology: Their Logical Design and Interpretation Using Analysis of Variance.' (Cambridge University Press.)