The following supplement accompanies the article

Biomass loss reduces growth and resource translocation in giant kelp *Macrocystis pyrifera*

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Marine Ecology Progress Series 562: 65–77 (2016)

Table S1. Analysis of variance (ANOVA) outputs testing for differences between sporophytes across treatments prior to biomass manipulation in June. All sporophytes were compared using the number of frond initials per sporophyte and each tissue chemistry parameter from juvenile blade tissues. Each metric was examined using a one-way fixed factor ANOVA to ensure there were no differences between treatments prior to the start of the experiment.

Variable	Factor	df	MS	*F*	p
Number of initials	Treatment	3	1.67	1.64	0.21
	Residuals	20	1.02		
$\delta^{13}C$	Treatment	3	0.95	0.36	0.78
	Residuals	19	2.66		
$\delta^{15}N$	Treatment	3	0.75	0.45	0.72
	Residuals	19	1.67		
%C	Treatment	3	3.93	1.40	0.27
	Residuals	19	2.80		
%N	Treatment	3	0.01	1.75	0.19
	Residuals	19	0.01		
C:N	Treatment	3	0.39	0.39	0.76
	Residuals	19	1.02		

Table S2. The mean value and range of each variable use to create the isotopic centroids shown in Fig. 5 and Fig. S3. Values are presented for the pre-disturbance time point and for the 5-month composite means of each treatment. The changes in the number of replicates (n) across treatments are a result of individual mortality or removal of sporophytes by wave action. The centroid mean is presented for $\delta^{13}C$, $\delta^{15}N$, %C, and %N. The range (min, max) refers to the extremes of the 10,000 means calculated by the resampling of each variable and are provided to highlight the maximum possible variability within the raw data.

Treatment	n	$\delta^{13}C$ (‰)	$\delta^{15}N$ (‰)	%C	%N
Pre-disturbance	23	-15.42 (-16.62, -14.20)	10.63 (9.59, 11.47)	27.75 (26.34, 28.97)	1.85 (1.78, 1.92)
Control	28	-16.45 (-17.83, -15.25)	10.84 (9.75, 11.75)	27.66 (25.82, 29.61)	1.93 (1.74, 2.10)
Cut Control	30	-17.15 (-18.84, -15.62)	9.65 (8.75, 10.67)	26.41 (24.29, 28.78)	1.87 (1.69, 2.06)
Canopy Removal	23	-18.41 (-20.18, -16.16)	8.98 (8.20, 9.84)	26.21 (24.06, 28.38)	1.82 (1.61, 2.04)
Full Removal	14	-19.88 (-22.76, -17.31)	7.73 (6.78, 8.83)	24.98 (21.29, 27.83)	1.73 (1.40, 2.12)

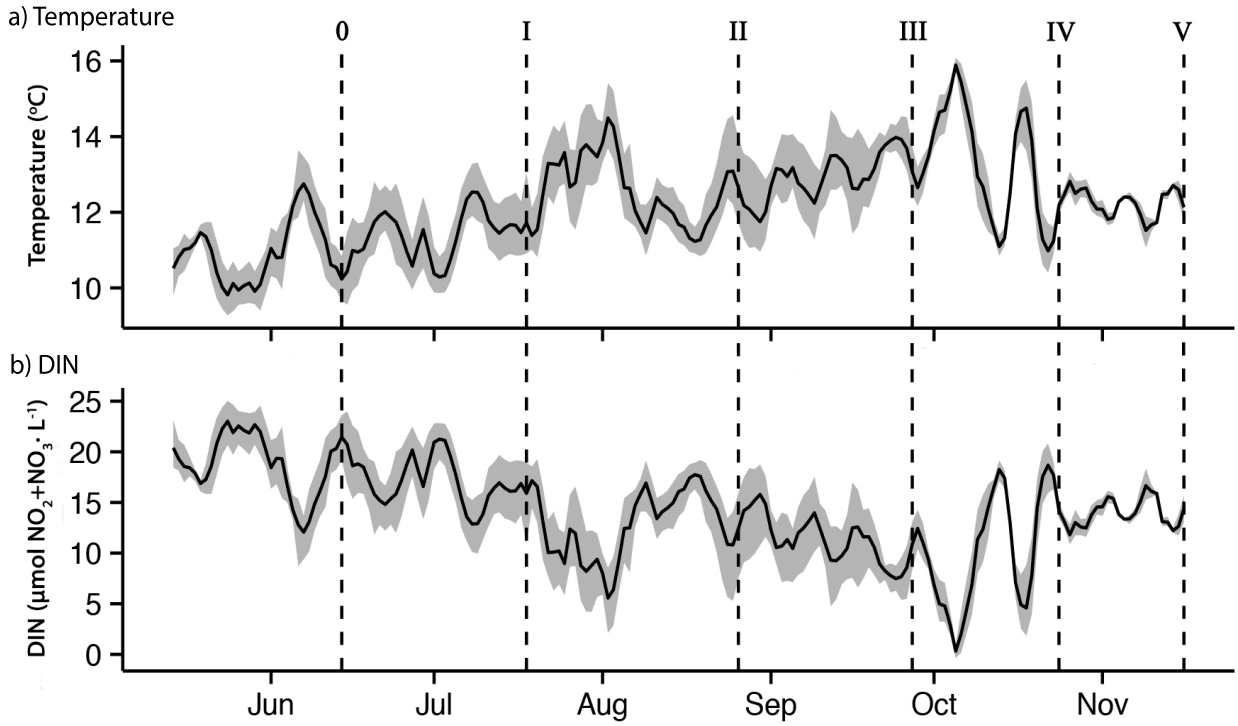

Fig. S1. Time-series of water column temperature and dissolved inorganic nitrogen (DIN) from the Stillwater Cove mooring from May 14 to November 16, 2011. (a) Daily mean water column temperature derived from measurements recorded at five-minute intervals from 0.5, 4, 8, and 13.5 m depth. (b) Daily mean DIN concentration calculated by the empirical relationship between water temperature and DIN at the study site (DIN = 59.68 (± 2.94) – 3.75 (± 0.25) * Temp, r^2 = 0.818). In both plots, the solid line represents the mean value throughout the water column and the shaded region represents the range of values observed between the surface water (0.5 m) and bottom water (13.5 m). The vertical dashed lines indicate the sampling intervals of the experiment (0 = before manipulation (June); 5 = end of experiment (November)).

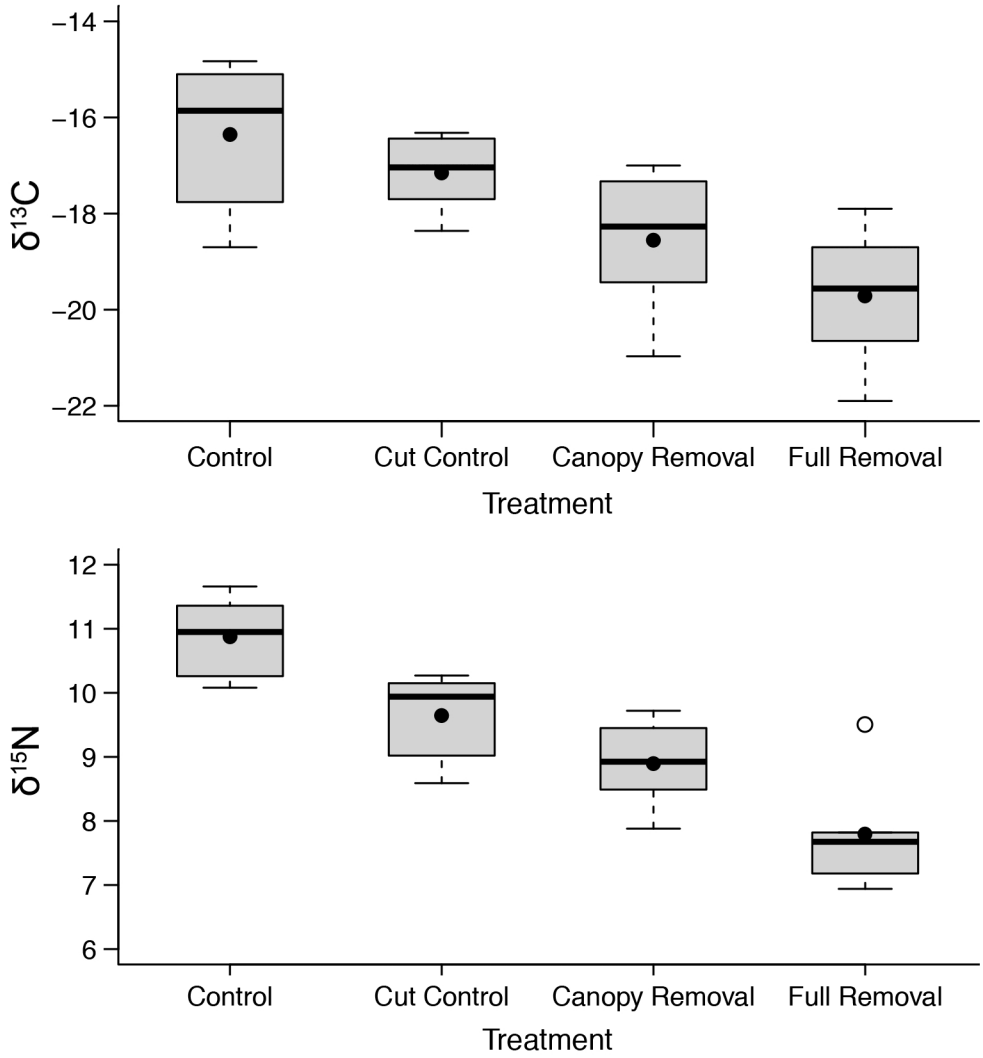

Fig. S2. Five-month composite means of the $\delta^{13}C$ and $\delta^{15}N$ values in juvenile blade tissue for each treatment. Data are calculated as the composite mean from the six sporophytes in each experimental treatment from July to November. Treatment means are displayed with a black dot. Box represents the lower and upper quartiles with the median value of the data shown with the black line. Whiskers represent the minimum and maximum values of the data that are not greater than 1.5 times the difference between the upper and lower quartiles. All data beyond this limit are displayed as points.

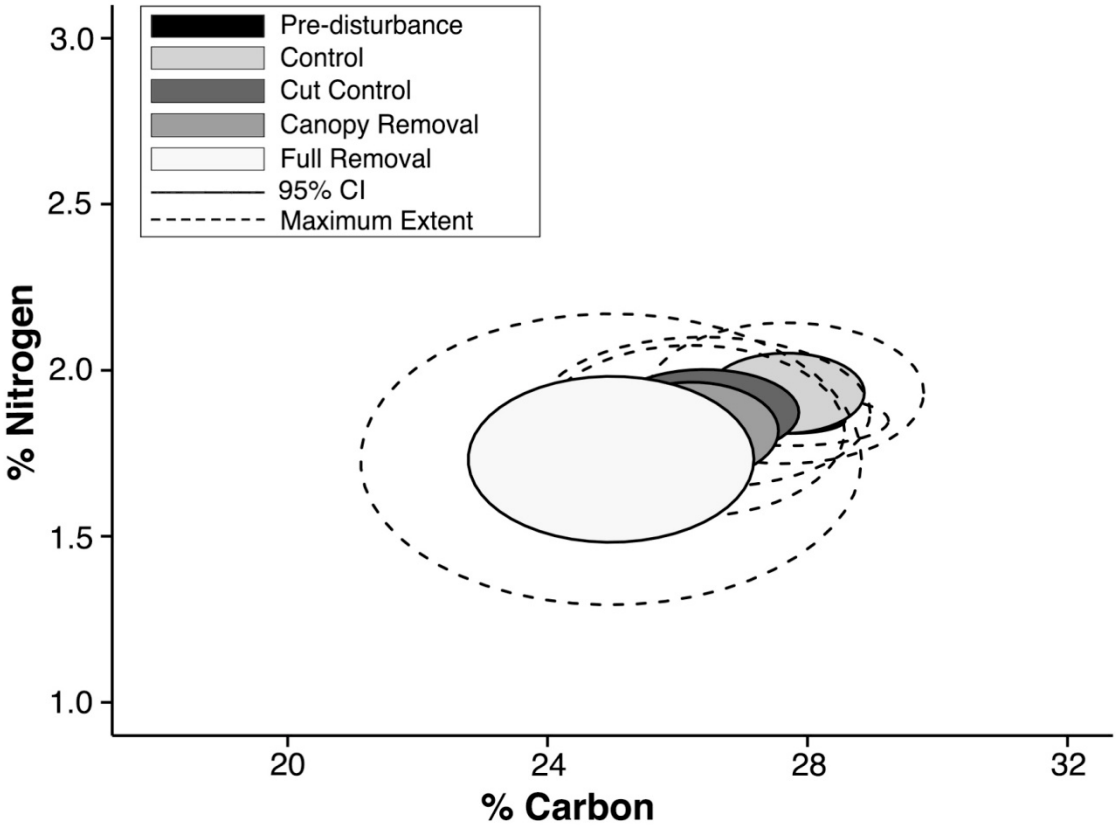

Fig. S3. Total variation of the bulk % Carbon and % Nitrogen of juvenile blades within each treatment expressed relative to the five-month mean centroid. The solid black line around each filled ellipse denotes the 95% confidence interval around the centroid of the five-month means for all individual sporophytes within a treatment. Thus these circles represent the most likely mean chemical composition of juvenile blade tissue for a sporophyte that has experienced a particular degree of biomass loss. The data for each treatment were resampled 10,000 times, and the dashed line represents the most extreme values in both dimensions generated through resampling. The solid black ellipse (behind the control ellipse in this figure) and associated 95% confidence interval represents the centroid of means from all 24 experimental sporophytes prior to biomass manipulation at the beginning of the experiment. Non-overlapping colored ellipses can be considered significantly different at the $p < 0.05$ level.