Text S1. Photo Monitoring

We monitored the colonies 9, 16, and 22 d after lesion generation by photographing each lesion alongside a distance and color scale bar with the camera parallel to the wound site and scale (Figure S2). Initial colony and lesion photos were processed in the software ImageJ to estimate initial lesion area (cm^2) and colony size (cm, measured as Total Linear Extension (TLE)).

Text S2. Biological Parameter Quantification

We measured 1) symbiont density (number of zooxanthellae cm^{-2} of surface area); 2) chlorophyll-a density (ug chlorophyll-a cm^{-2} of surface area and pg chlorophyll-a per zooxanthellae cell); 3) tissue density (mg dry weight cm^{-2} of surface area); and 4) lipid density (mg lipid cm^{-2} of surface area) on the same genets but separate colonies (n = 5-6 per genotype).

Coral nubbin samples (TLE = 3-5cm) were collected from the coral nursery and stored at -4 °C for biological parameter analysis. Coral tissue was removed from the skeleton by "tissue blasting" using an airbrush connected to filtered seawater (FSW), leaving behind denuded skeleton and blastate (Johannes & Wiebe 1970). The skeletons were used to measure surface area using the "wax dipping method" (Stimson & Kinzie 1991). Additional FSW was added to each blastate sample to reach a final volume of 40 mL and was homogenized ahead of tissue analysis. Symbiont densities were quantified by placing 1 mL of blastate on a hemocytometer for enumeration under an inverted microscope at 100x magnification. Chlorophyll-a content was quantified by fluorescence analysis of filtered blastate extracted in methanol (Holm-Hansen & Riemann 1978). Lipid content was quantified via solvent extraction and gravimetric analysis of filtered blastate (Teece et al. 2011). Tissue density was quantified by measuring the dry weight of filtered blastate.

Text S3. Growth Quantification

Growth was quantified as average annual productivity, calculated as the change in colony TLE divided by the initial TLE, divided by the number of days in between measurements, and extrapolated linearly to obtain annual values (Lirman et al. 2014). We measured the growth of 1) the wounded corals over the course of the lesion experiment and 2) separate nursery colonies of the same genotypes that had not been lesioned over the same time period (n = 5-6 per genotype).

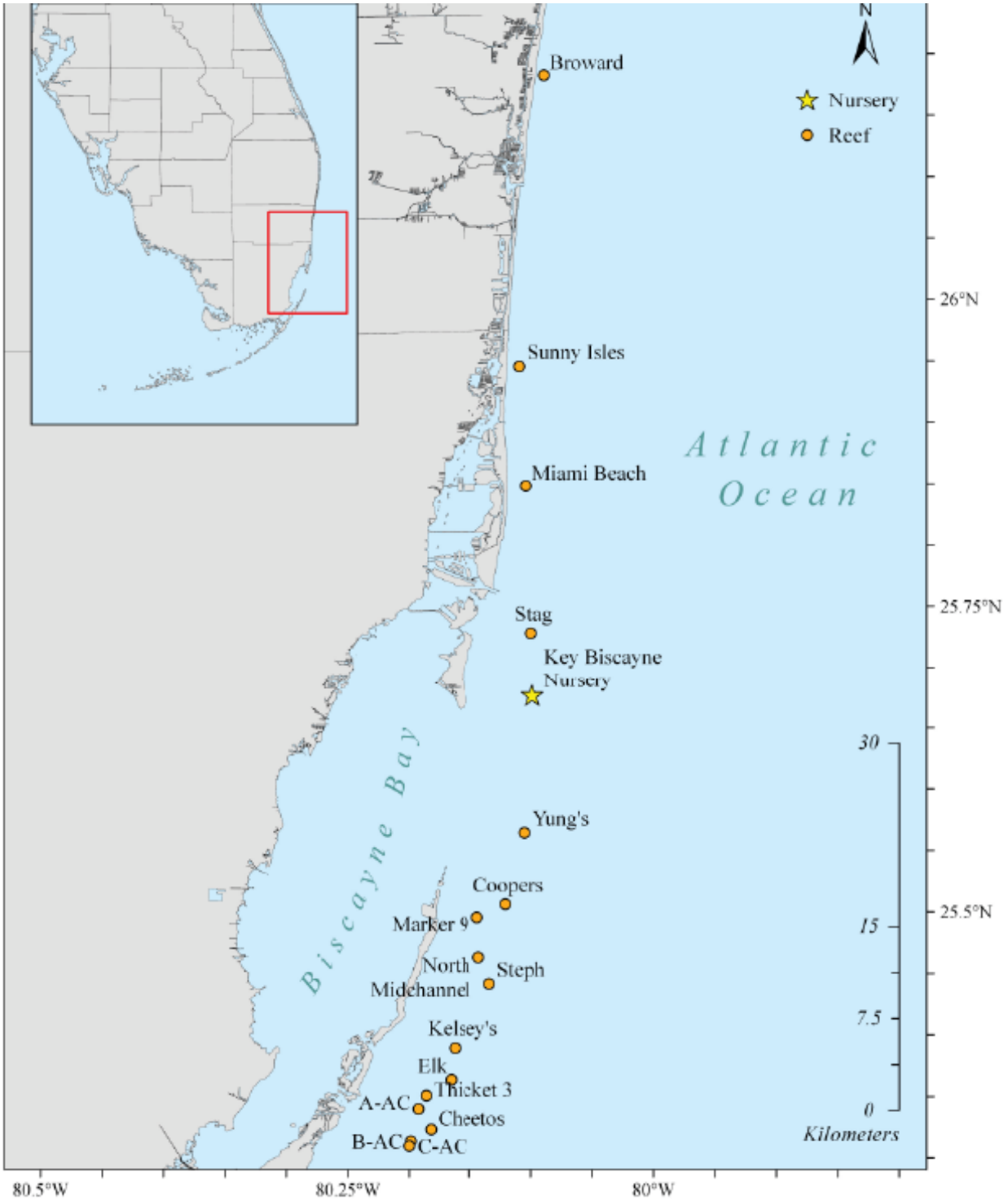


Figure S1. Key Biscayne Nursery and genotype source reef locations.

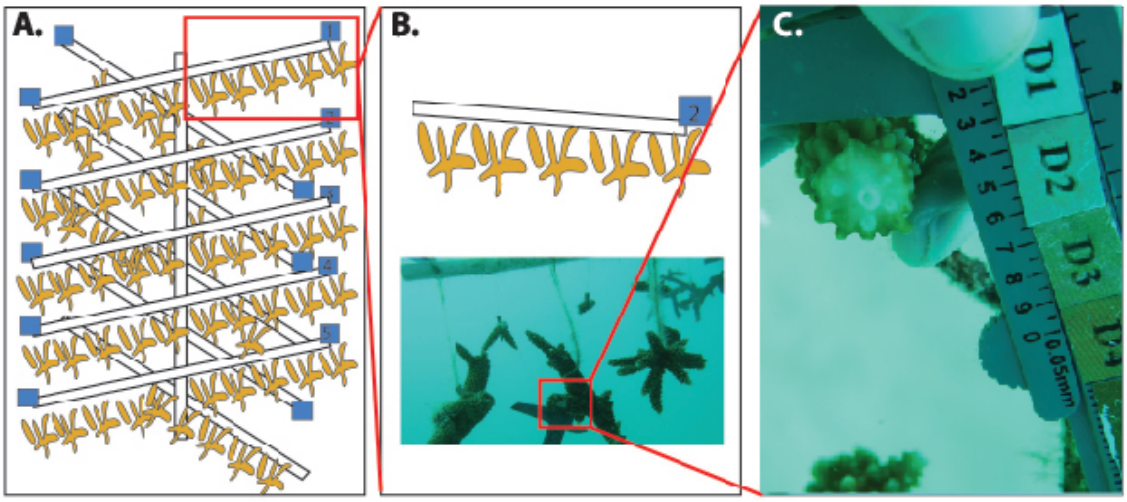
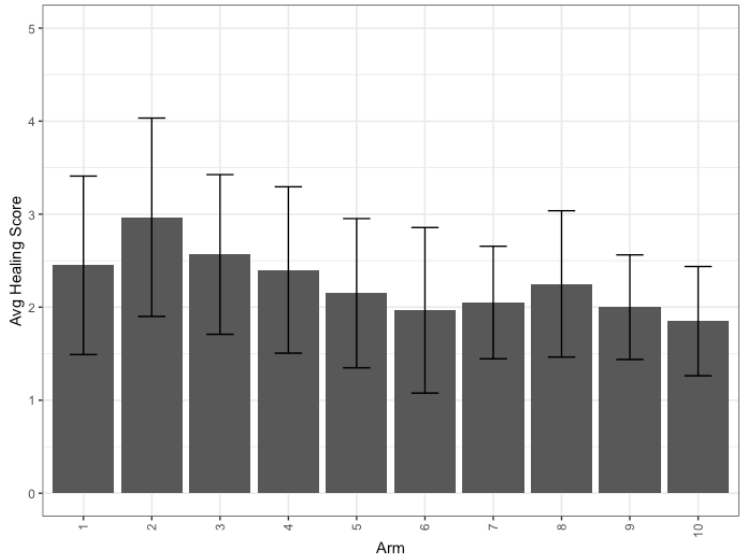


Figure S2. Nursery experiment design consisting of A) One of two lesion trees with each genotype denoted by a cowtag on an arm; B) a genotype arm with 10 replicate coral colonies; and C) an example of a lesion photograph taken during monitoring with a color and distance scale. There were no apparent patterns of recovery based on arm height (Figure S3) and the difference in light (photosynthetically active radiation, PAR) between the top and bottom of trees was not large enough to contribute to differential growth between arms (Figure S4).

A.



B.

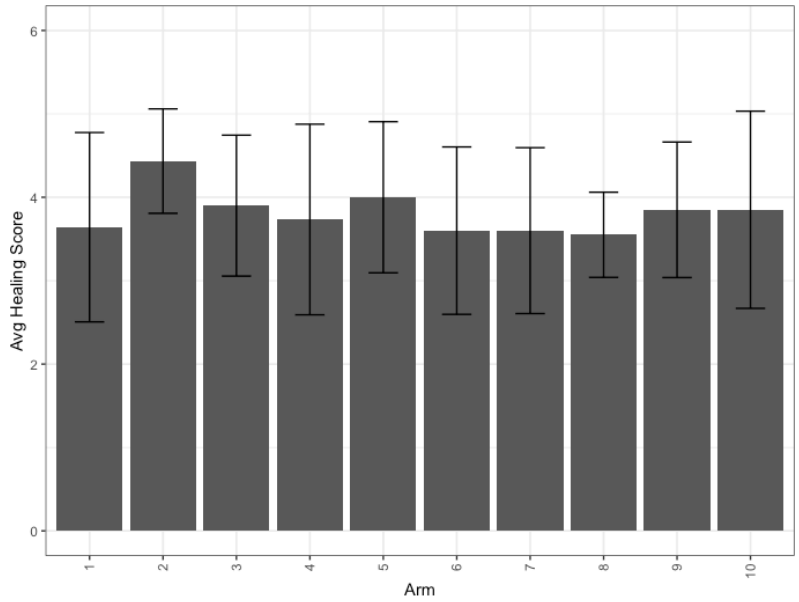


Figure S3. Average healing score by experimental PVC coral tree arm, 1 being the top arm and 10 being the bottom arm, A) 9 days after wounding and B) 16 days after wounding. Error bars indicate standard deviation.

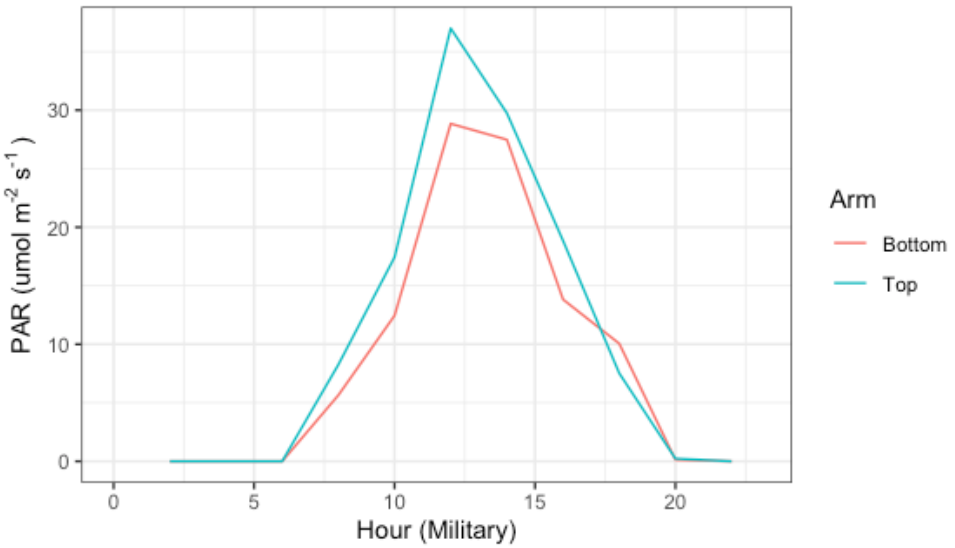


Figure S4. PAR values for the top (blue) and bottom (red) arms of a lesion recovery experimental tree representing hourly averages for 12 days, recorded on ONSET data loggers. The difference in PAR between the top and bottom of trees was not large enough to contribute to differential staghorn growth between arms (Drury et al. 2017).

Table S1. Lesion experiment colony measurements

	Mean	**SD**	**Min**	**Max**
Colony Size (TLE) (cm)	23.2	17.4	2.18	71.2
Initial Lesion Area (cm^2)	0.92	0.40	0.17	2.49