

Fig. S1. Microprofiles of lateral light transfer in *Favia speciosa* plotted on a linear scale. Lateral light measurements (means \pm s.e.m.; $N=6-7$ corallite-level replicates) were performed across coenosarc tissue in steps of 2 mm away from the incident laser beam. Measurements were performed on the skeleton surface of an intact coral (cyan), the tissue surface of an intact coral (black) and the skeleton surface of the bare skeleton (red) (corresponding to supplementary material Fig. S3 measurement positions 1–3). (A,B) Scalar irradiance for 785 and 636 nm, respectively; (C,D) field radiance at a zenith angle of 180 deg for a laser beam of 785 and 636 nm, respectively.

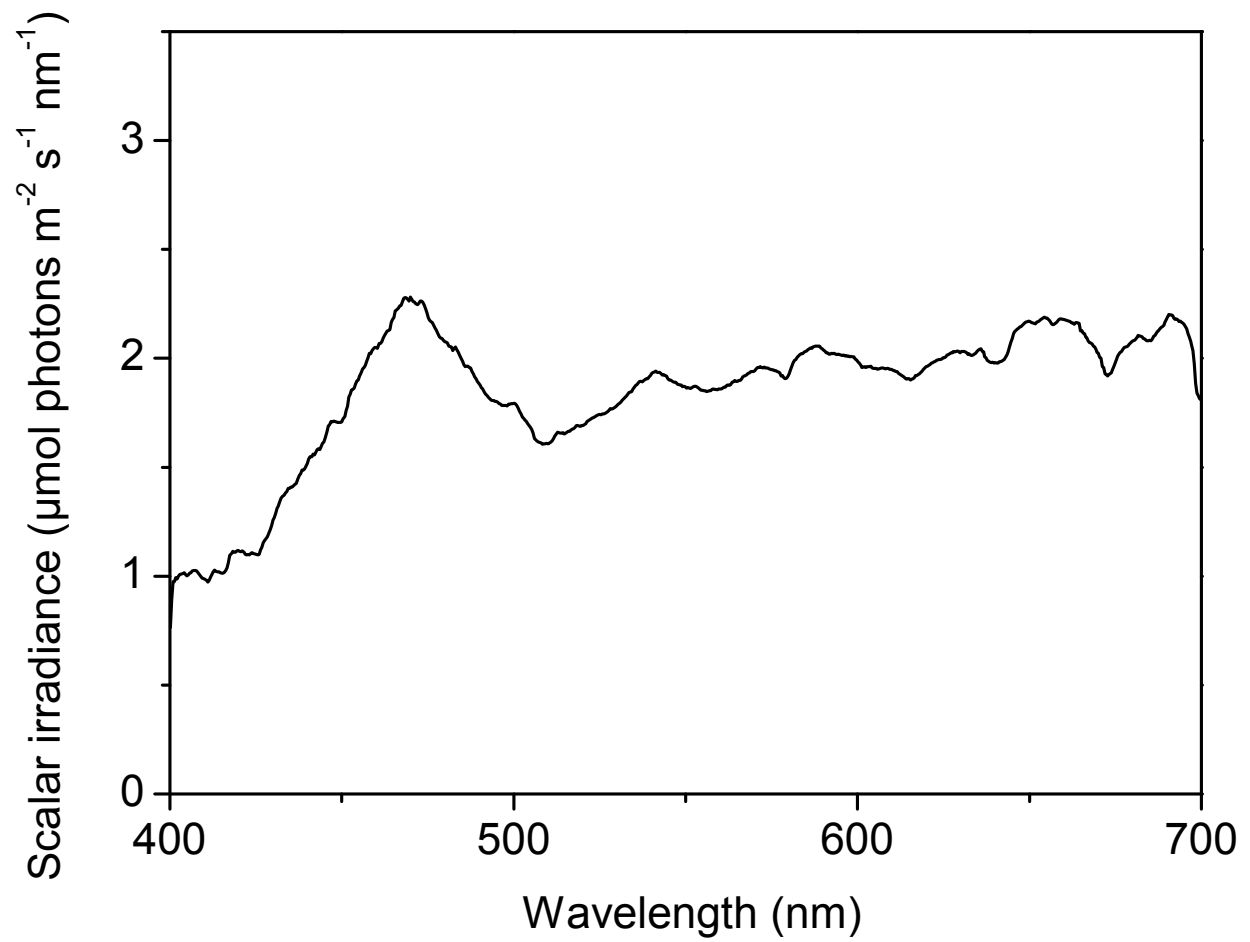


Fig. S2. Typical incident downwelling irradiance spectrum (400–700 nm) from the Heron Island reef flat at ~1 m water depth during mid-day sun on a cloudless day.

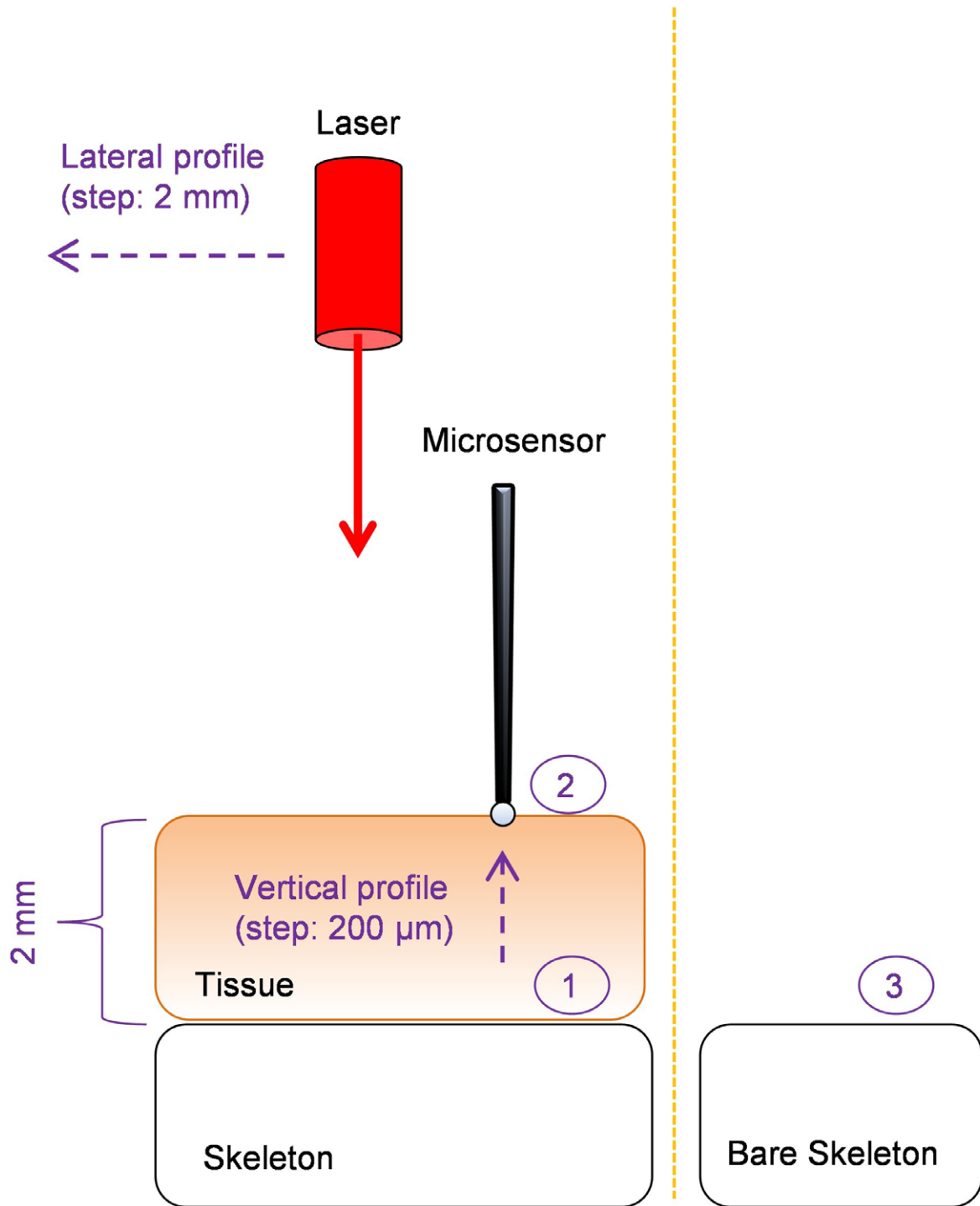


Fig. S3. Experimental design and measurement locations. Vertical profiles were done with fibre-optic microsensors (scalar irradiance or field radiance) in steps of $200\ \mu\text{m}$ upwards from the skeleton surface ($0\ \text{mm}$) until the tissue surface was reached ($\sim 2\ \text{mm}$). At each vertical position, a lateral profile was taken with the laser beam in steps of $2\ \text{mm}$ over a lateral distance of $\sim 2\ \text{cm}$. The same measurements were performed on the bare skeleton with coral tissue removed. Numbers (1–3) indicate the measurement locations that were used to estimate lateral light attenuation: 1, skeleton surface of an intact coral (defined as the measurement on the skeleton surface and the next measurement step $200\ \mu\text{m}$ above the surface); 2, tissue surface of an intact coral (defined as the measurement on the tissue surface and the previous measurement step $200\ \mu\text{m}$ below the surface); 3, skeleton surface of the bare skeleton (defined as the measurement on the skeleton surface and the next measurement step $200\ \mu\text{m}$ above the surface). The first step size (i.e. $+ \text{ or } - 200\ \mu\text{m}$) was included in all averages to reduce a potential bias in mispositioning of the sensor.