Sea stars critical to kelp forest resilience

August 13 2018

Credit: Simon Fraser University

A study by Simon Fraser University resource and environmental management researcher Jenn Burt reveals that sunflower sea stars play a critical role in the resilience of B.C.'s kelp forests, which are among the most productive ecosystems on Earth. Similar to land-based forests, kelp forests provide essential habitat for species and also help remove CO2 from the atmosphere.

Burt and her team discovered sea otters and sunflower stars are complementary predators of sea urchins, which inhabit rocky reefs and voraciously eat kelp. Without natural predators, sea urchins quickly devour entire kelp forests.

"We showed that sea otters feed on large sea urchins, whereas the sunflower sea stars eat the small and medium-sized urchins that otters ignore," says Burt. "We observed kelp density was highest at reefs with both sea otters and sunflower stars."

The researchers made this discovery after Sea Star Wasting Disease killed 96 per cent of the sunflower star biomass on the Central oast in 2015 and 2016. During this period there was a 311 per cent increase in small and medium-sized sea urchins, which corresponded to a 30 per cent decrease in kelp density.

Burt says ecological surprises such as mass mortality events can reveal new insights into species interactions and ecosystem dynamics. She says these will become more important to learn from as climate change and other stressors make our future ocean ecosystems more unpredictable.

More information: Jenn M. Burt et al, Sudden collapse of a mesopredator reveals its complementary role in mediating rocky reef regime shifts, *Proceedings of the Royal Society B: Biological Sciences* (2018). DOI: 10.1098/rspb.2018.0553

Provided by Simon Fraser University

Citation: Sea stars critical to kelp forest resilience (2018, August 13) retrieved 26 April 2024 from https://phys.org/news/2018-08-sea-stars-critical-kelp-forest.html

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