Abstract Submitted
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Rescuing Ecosystems from Extinction Cascades[1] SAGAR SAHASRABUDHE, ADILSON MOTTER, Northwestern University — Food web perturbations stemming from climate change, overexploitation, invasive species, and natural disasters often cause an initial loss of species that results in a cascade of secondary extinctions. Using a predictive modeling framework, here we will present a systematic network-based approach to reduce the number of secondary extinctions. We will show that the extinction of one species can often be compensated by the concurrent removal of a second specific species, which is a counter-intuitive effect not previously tested in complex food webs. These compensatory perturbations frequently involve long-range interactions that are not a priori evident from local predator-prey relationships. Strikingly, in numerous cases even the early removal of a species that would eventually be extinct by the cascade is found to significantly reduce the number of cascading extinctions. Other nondestructive interventions based on partial removals and growth suppression and/or mortality increase are shown to sometimes prevent all secondary extinctions.

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