

Stressor equivalents: A framework to prevent perverse outcomes in data-poor systems

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Abstract

Environmental systems suffer from multiple interacting stressors. Each stressor can act on different parts of the system and at different time scales. This hampers measuring and predicting the stressors' impacts on ecosystems. We propose a conceptual method that integrates available data with physical constraints over relevant time scales to predict management outcomes in data-scarce systems affected by multiple stressors. We first predict the combined stressor levels that threaten a management target and then define stressor equivalents to convert between. These “ball-park” estimates of critical stressor levels help to identify how the threat posed by interacting stressors responds to its management. Our approach assists managers in the decision-making process regarding when to manage a system and how to monitor. We illustrate our concept with a case study of an invaded island ecosystem, yet our approach is useful for other data-poor environmental systems that suffer from multiple cumulative stressors.

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