Abstract of

Managing Uncertainty in Decision Making for Conservation Science

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Science-based decision-making is the ideal. However, scientific knowledge is incomplete, and sometimes wrong. Responsible science-based policy, planning, and action must exploit knowledge while managing uncertainty. I considered the info-gap method to manage deep uncertainty surrounding knowledge that is used for decision-making in conservation. A central concept is satisficing, which means satisfying a critical requirement. Alternative decisions are prioritized based on their robustness to uncertainty, and critical outcome requirements are satisficed. Robustness is optimized; outcome is satisficed. This is called robust satisficing. A decision with a suboptimal outcome may be preferred over a decision with a putatively optimal outcome if the former can more robustly achieve an acceptable outcome. Many biodiversity conservation applications employ info-gap theory, under which parameter uncertainty but not uncertainty in functional relations is considered. I considered info-gap models of functional uncertainty, widely used outside of conservation science, as applied to conservation of a generic endangered species by translocation to a new region. I focussed on two uncertainties. The future temperature is uncertain due to climate change, and the shape of the reproductive output function is uncertain due to translocation to an unfamiliar region. The value of new information is demonstrated based on the robustness function, and the info-gap opportuneness function demonstrates the potential for better-than-anticipated outcomes.

Keywords conservation decisions; reproductive output function; uncertainty; info-gaps; robustness; decision methodology;

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