Conservation Decision Making in Social-ecological Systems

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Abstract

Biodiversity conservation must compete with other societal priorities. Conservation therefore requires an understanding of both the ecological and the socio-economic system. I will describe new theory and methods for prioritising where, when, and how to invest funds for protecting biodiversity and ecosystem services and will illustrate with examples of this research in Australia and Borneo. In this presentation I will profile methods to plan for multi-functional landscapes and the delivery of diverse outcomes, systematically evaluate the impact of conservation strategies, and forecast the impacts of alternative policy options and alternative futures.

Throughout the talk there will be a strong focus on initiatives to safeguard ecosystem services, which are providing increasing incentives for land protection and management. While numerous assessments have quantified, mapped, and valued the services provided by ecosystems that are important for human wellbeing much of the literature does not clarify how the information gathered in such assessments will be used to inform decisions to manage ecosystem services or policy settings. I will describe the outcomes of our research that has assessed the relative performance of a variety of policy instruments in providing cost-effective carbon sequestration and biodiversity outcomes through reforestation. The policy instruments included different payment schemes, land use constraints, and targeting strategies as well as a biodiversity premium and carbon levy. When policy targets are already established, a useful tool for planning in social-ecological systems is scenario analysis. Our scenario analysis for the Island of Borneo has revealed that public policy targets can be much more efficiently achieved through coordination between governments and modifications to existing land-use allocations. I will also describe research that has employed scenario analysis of alternative land use planning options with the specific aim to explore the advantages afforded by land sharing or land sparing strategies.

Finally, and time permitting, I will describe research that asks a key question for the conservation of biodiversity. What is the best form of management to protect tropical rainforests? We tested this problem in Kalimantan, applying causal inference principles and techniques. Our findings have important consequences for environmental management and conservation policy in Indonesia. First, government-identified land types (‘i.e. degraded’) may be more important in driving deforestation than legal protective status (e.g. protected). This strongly suggests that the definition of ‘degraded land’ needs to be rectified to strictly include non-forested areas. Second, illegal logging activities in concession-free areas remain prevalent in Kalimantan and requires existing controls to be enhanced and enforced. Third, logging concessions reduce the rate of deforestation compared to both plantation concessions and concession-free areas and supports recommendations for reclassifying logging concessions as protected areas under the IUCN Protected Area Category VI.