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Cost-effective prioritization of conservation efforts in agricultural landscape under a changing climate

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Habitat fragmentation from human-based activities is the major source of biodiversity loss and ecosystem degradation that compromises an ecosystem's ability to provide the services needed by society to sustain itself and prosper. Climate change may exacerbate biodiversity loss and ecosystem degradation by directly altering natural habitats' ability to host biodiversity and provide ecosystem services and by indirectly changing the frequency and intensity of hazards across landscapes. To prevent biodiversity loss and ecosystem degradation from habitat fragmentation, landscape managers and environmental agencies set conservation goals within a conservation planning approach. My dissertation project aims to improve society's understanding of climate change´s impacts on conservation planning. Specifically, using a cost-effectiveness approach to find the optimal sequential selection of alternative conservation mechanisms with different temporal horizons across a landscape with both natural and working lands. I am currently parameterizing the model in an ecoregion of the Pacific Northwest of the United States.My current research contributes to the conservation planning literature by proposing a framework that incorporates economic optimization methods to examine how alternative mechanisms interact when aiming for cost-effective conservation strategies for identified goals. My research also contributes to the dynamic resource economic literature by incorporating the potential impacts of climate change into a dynamic optimization framework when planning conservation efforts. Lastly, it will contribute to conservation planning through its emphasis on integrating biological, biophysical, economics and planning into one framework that provides information on the tradeoffs among conservation efforts in a cost-effective approach. This research may be useful for landscape managers to attain conservation goals on landscapes or in ecoregions by providing information on tradeoffs among conservation mechanisms in static and dynamic settings.