

Cumulative Effects of Land Uses in Alberta's Southern East Slope Watersheds

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Cumulative Effects of Land Uses and Conservation Priorities in Alberta's Southern East Slopes. See the abstract. **Sarah Milligan, ALCES**

Alberta's Southern East Slopes of Alberta are rich in both natural resources and biodiversity, including habitat for several threatened species. In recognition of the region's ecological value, watershed management and headwater protection has been identified as the region's highest priority. Using scenario analysis, the goal of this study was to explore the cumulative effects of land use and climate change in the Southern East Slopes in order to provide guidance on implications to valued ecosystem components and to explore conservation priorities, with a focus on threatened trout species. Our analysis prioritized watersheds based on the cost-effectiveness of protection, where cost was interpreted as natural resource sector GDP and effectiveness was interpreted as reduction in risk to trout. A business-as-usual scenario demonstrated substantial risk to bull trout and westslope cutthroat trout and negative impacts to indicators of hydrology, water quality, and intact land cover. Protection scenarios suggested that the environmental benefits are greatest and the economic costs of protection are lowest in the western portion of the study area. Expanding the protected areas network in the western portion of the study from 30% (current level of protection) to 40% resulted in a sharp improvement in trout sustainability indices. As a first step towards understanding conservation challenges and opportunities in Alberta's Southern East Slopes, our findings suggest conservation efforts should be focused on western catchments to maximize benefits and minimize costs.