

Session 2: Finding Refugia

Session Moderator: Adam Linnard

Location: TBC

Date/Time: Tuesday, December 13, 10:30 am to 12:15 pm

- [Gabe Schepens](#) - Synthesizing habitat models for wolverine (*Gulo gulo*): Identifying snow refugia in a changing climate
- [Christine Kuntzman](#) - Predicting fire refugia across the Thompson Okanagan region of British Columbia, Canada
- [Jessica Stolar](#) - Using climate-change refugia and corridors to inform multi-scale conservation planning

Gabe Schepens

Contractor

Synthesizing habitat models for wolverine (*Gulo gulo*): Identifying snow refugia in a changing climate

Abstract:

Wolverines are a wide-ranging and at-risk species in North America. Recent reports of low population densities both within and outside protected areas highlight the importance of effective conservation planning across large landscapes. To assess cross-boundary habitat needs, we synthesized available wolverine habitat models in the Columbia and Rocky Mountains (63 000 km²). We used coefficients from four existing habitat models to create spatial predictions over environmental datasets including snow, landcover, and roads. We averaged the four predictions using distance-weighted mean of equal-area percentile habitat values, and validated the output by comparison to independent data. Because persistent spring snow is important for wolverines, we assessed 2080 spring snow cover forecasts (under RCP 8.5 high emissions scenario) to identify potential habitat refugia. High quality habitat was predicted along mountain ranges, notably in the Purcell Mountains and the Columbia Icefield in the Rocky Mountains. Mean habitat value was 0.71 inside protected areas and 0.55 outside protected areas. The study area is forecasted to lose 44% of persistent spring snow cover by 2080, with declines identified inside many protected areas. Synthesis of existing habitat research and climate forecasts provides information important to management and planning, including recreation access and the establishment of protected areas.

Contributors:

- Karine Pigeon, BC Ministry of Lands, Water, and Resource Stewardship

Contributors:

- Diana Stralberg, Canadian Forest Service
- Doug Lewis, Government of BC
- Ellen Whitman, Canadian Forest Service
- Scott Nielsen, University of Alberta

Acknowledgements:

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Jessica Stolar

Department of Renewable Resources, University of Alberta

Using climate-change refugia and corridors to inform multi-scale conservation planning**Abstract:**

As climate change impacts biodiversity, identifying conservation actions that are resilient to climate-induced ecological shifts is increasingly imperative. Changes in climatic suitability threaten the long-term persistence of British Columbia's ecosystems and biodiversity values, increasing the need to identify strategic, climate-informed conservation actions. Climate-change refugia (i.e., areas with high potential for species to persist in a changing climate) can serve as the cornerstone of a resilient planning framework. For species with limited in-situ refugia options, connectivity between locations of current and future habitat facilitates pathways for migration in response to shifting climate niches. Here we developed a suite of new spatial datasets to represent refugia and corridor metrics for British Columbia, including ecological niche models for 863 rare species under current and future climate scenarios. We then used systematic conservation planning software (Zonation) to identify climate-informed spatial priorities for conservation at provincial and eco-provincial scales under a range of land-use and climate-change scenarios. Prioritization was based on macro-refugia potential (climate velocity and species distributions), microrefugia potential, persistence of old growth forest, and climate and landscape connectivity. From a standpoint of climate-change adaptation, priorities for habitat protection and adaptive management were defined as regions of high refugia potential and high climate connectivity with low and high anthropogenic pressures, respectively. We discuss the spectrum of management actions that will be required to ensure the long-term persistence of British Columbia's biodiversity, including partnerships with Indigenous governments through the Province's Modernized Land Use Planning process.

Contributors:

- Diana Stralberg, Canadian Forest Service, Natural Resources Canada
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