

# TRAITS OF

# EXTINCTION: THE CONSERVATION OF SPECIES AT RISK IN BRITISH COLUMBIA



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## INTRODUCTION

We are in the midst of a global biodiversity crisis where extinction is occurring at unnaturally high rates as a response to human activities<sup>1</sup>.

More species are at risk of extinction in BC than we would expect for a province with relatively large undeveloped areas, possibly because of increased concentration of biodiversity and human land-use in southern regions<sup>2</sup>.

By developing an explanatory framework of attributes that predispose species to extinction in the face of disturbance, we can better predict future scenarios and minimize human impact on biodiversity<sup>3</sup>.

These attributes are termed “correlates of extinction” and can enable the rapid assessment of poorly understood species groups based on their similarities to other species<sup>4</sup>.



Large numbers of species at risk relying on “hotspot”



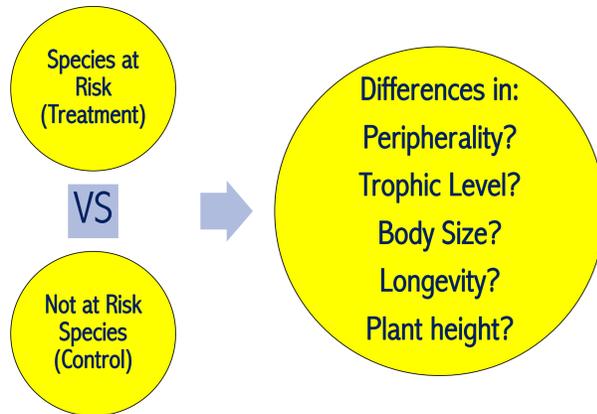
Vancouver Island's Garry Oak Ecosystems



Extensive land-conversion and degradation

## METHODS

We examined the relevance of correlates of extinction across multiple taxa in two species at risk hotspots (Vancouver Island & Okanagan) by comparing attributes of species at risk to not at risk species.



## CONCLUSIONS

Correlates of extinction identified here, such as peripherality and small plant height, may prove useful in undertaking assessments of data-limited species. Using a precautionary approach, if the species possesses these traits, it may have an increased risk of extinction.

## RESULTS

Peripherality was more common in species at risk compared to not at risk species in both BC hotspots.

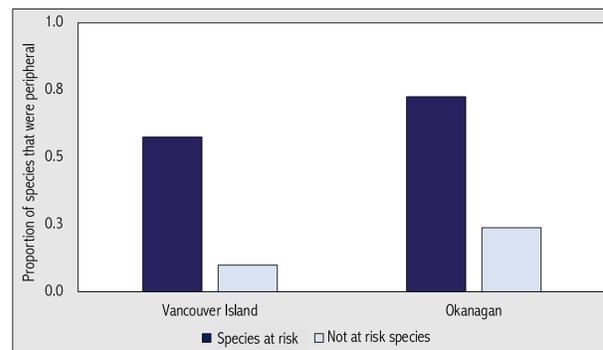


Figure 1. Proportion of species at risk and not at risk species that were peripheral in southern Vancouver Island and southern Okanagan species at risk hotspots. 57% of Vancouver Island species at risk (n=40) were peripheral compared to 10% of not at risk species (n=40). 72.5% of Okanagan species at risk (n=40) were peripheral compared to 23.7% of not at risk species.

Plant species at risk tended to be shorter than not at risk plants.

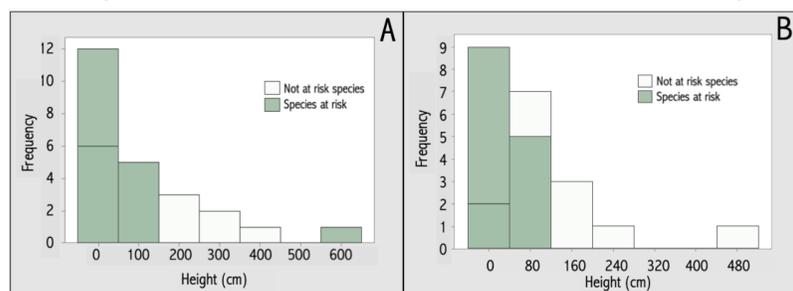


Figure 2A. Histogram of maximum height of vascular plant species at risk (n=18) and not at risk species (n=17) for southern Vancouver Island. B. Histogram of maximum height of vascular plant species at risk (n=14) and not at risk species (n=14) for southern Okanagan.

This may be because peripheral species in BC are often restricted to rare habitat types and/or climate conditions present along the southern border and therefore have smaller populations<sup>5</sup>, face the greatest number of threats, and have the least protection<sup>6</sup>.

This may be because the absence of fire on a landscape favors taller plants, and (or) because competition from aggressive exotic plants selectively eliminates short-statured plants<sup>7</sup>.

## RECOMMENDATIONS



Increased protection of unique ecosystems that host large numbers of species at risk



Increased funding for species at risk research to identify population trends



Increased restoration of critical species at risk habitat with a focus on restoring ecosystem processes

### Acknowledgments

This project would not have been possible without open source citizen science data from iNaturalist and moral support from the Starzomski Lab of the University of Victoria. Pictures of Barn Swallows, Bear's-foot Sanicle, Shooting Star, and Sidney Spit restoration taken by Brian Starzomski and used with permission.

References  
1. Chapin et al. (2000). Consequences of changing biodiversity. *Nature*. 2. Coristine & Kerr (2011). Habitat loss, climate change, and emerging conservation challenges in Canada. *Canadian Journal of Zoology*. 3. Purvis et al. (2000). Extinction. *BioEssays*. 4. Anderson et al. (2011). Correlates of vertebrate extinction risk in Canada. *Bioscience*. 5. Macdougall et al. (2004). Defining conservation strategies with historical perspectives: a case study from a degraded oak grassland ecosystem. *Conservation Biology*. 6. Kerr & Chlar, (2004). Patterns and causes of species endangerment in Canada. *Ecological Applications*. 7. Duncan & Young (2000). Determinants of plant extinction and rarity 145 years after European settlement of Auckland, New Zealand. *Ecology*