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Climate change and the conservation of BC's leading-edge species at risk

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Issue

British Columbia (BC) has the highest biodiversity (number of species) of any province in Canada, but this diversity faces numerous threats, including climate change. BC also has the highest number of species at risk (SAR), with many of their northernmost ranges barely extending into Canada. Some of these "leading-edge peripheral species", as they are called, may be more common further south in the United States (US), but many are not. Because these species are at the northern edge of their range, they are a key component of climate change management in the province, as they will be the first to populate habitats further north as temperatures warm. Many of these species are already listed as SAR, and there is significant debate over whether to spend any management dollars on them when they may be more common further south. The federal Minister of Environment has declined to list at least one such BC species – the Coast Manroot – for this reason. These "leading-edge" species, however, may possess characteristics, such as excellent migration ability, that would help track changes in habitat caused by climate change. Leading-edge peripheral species that occur in BC take on renewed conservation importance when climate change promotes movement northward and is negatively impacting populations to the south. Conserving them, therefore, is of the utmost importance.

Background

The border between the US and Canada cuts through multiple ecoregions, effectively cleaving the majority of them to the south and leaving small northern extents reaching into Canada. Associated with these is the majority of the country's SAR[i]: endangered species that are rare partly because their habitats have only a small spatial extent in Canada. BC, in particular, is home to many of these species in the Okanagan region, the Lower Mainland, and southeastern Vancouver Island and the Gulf Islands. Research shows that some species, for reasons that are not entirely clear, go extinct from the core of their range outward, making peripheral species the most important ones to protect, because they may be the only surviving members of their kind.

Additionally, in many cases, BC has better remaining habitat than the US for these species to colonize.

Both the federal and provincial governments are responsible for protecting these SAR. The most important applicable legislation is the federal Species at Risk Act; BC itself has no legislation focused specifically on SAR, and those that do exist —the BC Forests and Range Practices and BC Wildlife acts—cover only a small percentage of all SAR. The Committee on the Status of Endangered Wildlife in Canada (COSEWIC), which determines the status of SAR, has always struggled with whether to list and manage those species that may be rare in the northern part of their global range within Canada, but relatively common to the south[ii].

As climate change forces species to move north, governments at all levels have a global responsibility to protect and maintain populations of SAR along the Canada – US border. These peripheral species may already be pre-adapted to the cooler conditions north of their range, and so comprise the leading edge of climate-driven migration. The edges of their ranges and ecoregions are locations where the impacts of climate change may appear to be strongest. By actively managing these species, BC can play a global role in ensuring that they will survive to colonize poleward habitats.

Recommendations

The following should be included in a climate-change adaptation approach that supports biodiversity:

1.Gather knowledge about climate change impacts on biodiversity through a combination of observation and projections of likely future scenarios. Obtaining the best available data on current occurrences of peripheral species and creating models to predict their future ranges can identify barriers to persistence or migration.

2. Minimize impacts of identified threats by creating new protected areas or no-take zones. In the Okanagan, this may include support for new protected areas, and throughout BC, this includes working with municipalities, private landowners, and the Crown to develop species management strategies aimed at protecting remaining individuals and habitat. An excellent example already in place is the Garry Oak Ecosystems Recovery Team (GOERT) on Vancouver Island and the Gulf Islands..

3. Incorporate knowledge and harm-minimization strategies in an adaptive management framework. For example current management activities for peripheral species should be maintained and new strategies developed as threats change. Current highest priorities are the maintenance of viable populations of these species, and ensuring the existence of appropriate movement corridors and landscape connectivity.

Conclusion

For several reasons, leading edge peripheral species are of high importance to BC's conservation and adaptation strategy. Many predictions show that the boundaries of BC’s current biogeoclimatic zones will move north with climate change, and individuals peripheral species are best adapted to keep up with these future conditions because by having reached the edge of their current range they may be pre-adapted to climate related impacts. Their conservation in BC requires better integration of climate change-related risks with an understanding of such dynamic processes as migration and evolution.

Sources

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[i] Bunnell et al. 2004, Gibson et al. 2009

[ii] Bunnell et al. 2004, Gibson et al. 2009