

# Climate change isolates Rocky Mountain butterflies

August 13 2007

---

Expanding forests in the Canadian Rocky Mountains are slowly isolating groups of alpine butterflies from each other, which may lead to the extinction of the colourful insects in some areas, says a new study from the University of Alberta.

A rising tree line in the Rockies due to global warming, and a policy not to initiate "prescribed burns" (intentionally started, controlled fires) in order to manage forest growth, has created the tenuous condition for the alpine butterflies, said Jens Roland, a biological scientist at the University of Alberta.

The alpine Apollo butterfly (*Parnassius*) inhabits open meadows because they, like other types of butterflies, need sunlight to generate enough body heat in order to fly, and forests are generally too shady for them and inhibit their ability to move.

However, expanding forests are pinching off the *Parnassius* from their neighbors in nearby meadows.

"The risk of local extinction and inbreeding depression will increase as meadows shrink, the population sizes decrease and the populations become more isolated," Roland said.

"The gene pool of this species is getting more and more fragmented, and gene flow is reduced, which means these populations are more vulnerable," he added.

One particularly cold winter or summer season may be enough to wipe out an entire meadow of *Parnassius*, said Roland, who is the lead author of a paper on this research that appears today in the *Proceedings of the National Academy of Sciences*.

Roland also said the *Parnassius* are not currently a threatened species, but they and smaller species native to Rocky Mountain meadows, including some insects and rodents, will suffer "several consequences" if forests continue to expand unchecked.

"Often forest management practice is led by the needs of larger species, such as mountain sheep, elk and grizzly bears, while the interests of the smaller species, such as butterflies, are overlooked," he said.

Prescribed burns, which protect and create meadows and generally foster diversity in forests, are undertaken in the Canadian Rocky Mountain national parks but are rare outside of them, Roland said.

Roland has completed earlier studies that showed expanding forests are restricting *Parnassius*'s movements in parts of the Rocky Mountains. He feels his latest study is a natural extension of his previous work.

"It's important to study movement among populations that are becoming more and isolated due to shrinking habitats; but, ultimately, we need to study the population dynamics to find out if the habitat allows the species to reproduce and persist," Roland said.

"This latest study shows that as populations function with less synchrony and become more independent of each other—as we've shown the *Parnassius* is becoming in certain areas in the Canadian Rockies—the local extinction rate of small populations will increase," he added.

Source: University of Alberta

Citation: Climate change isolates Rocky Mountain butterflies (2007, August 13) retrieved 20 April 2024 from <https://phys.org/news/2007-08-climate-isolates-rocky-mountain-butterflies.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.