Microclimate affinities and ground survey detection for an old-growth forest canopy lichen growing near its range limit

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Background

- Lichens contribute substantially to forest biodiversity and ecosystem services, and may be vulnerable to climate change.
- Ground surveys are widely used to monitor canopy lichen populations, but their reliability has been little explored.

Questions

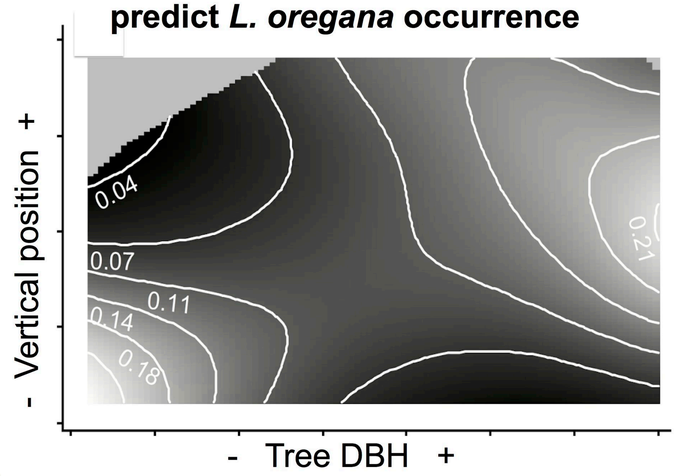
1. Does *Lobaria oregana*, an old-growth forest lichen, naturally occur in cooler, wetter microclimates near its southern range limit?
2. Do ground surveys effectively detect canopy populations via litterfall?

Lobaria oregana – Oregon lungwort
Photo by Linda Geiser, USFS

Methods

- We climbed 168 Douglas fir trees in Six Rivers National Forest, near the equatorial range limit of this Pacific Northwest species.
- We recorded the vertical and horizontal positions where *L. oregana* occurred.
- We noted whether it occurred in litterfall under surveyed trees.

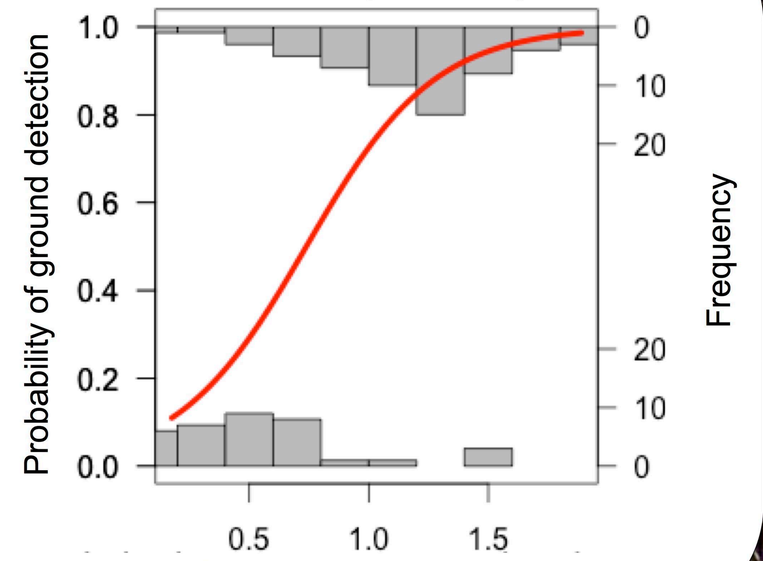
Canopy poistion and tree size predict *L. oregana* occurrence



Results

1. *L. oregana* was most abundant in two distinct habitats: in the mid-canopy branches of large trees, and on the lower boles of small trees.
2. *L.oregana* thalli were usually found in litterfall when it was abundant in the canopy, but not when it was rare.

Canopy abundance predicts ground detection probability



Conclusions

1. Cool, wet microclimates may be important for allowing lichens to persist near range limits in a warming climate.
2. Ground surveys do not always detect canopy lichens when they occur at low abundance in the canopy.

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