Conservation of a rare plant requires different methods in different habitats: demographic lessons from Actaea elata

I. General Information
Citation:

Summary/Abstract:
Understanding species decline and conserving endangered species requires demographic information, and variation in the environment may affect demography. Actaea elata is a globally rare, perennial herb found in a range of Pacific Northwest forest stand types that differ in canopy openness. Canopy openness increases reproductive output in this species and so was expected to have demographic impact. We performed a demographic analysis of A. elata in contrasting forest stands (broadleaved vs. coniferous) over two annual intervals, and predicted that population growth rate would be higher in the open-canopy broadleaved stand. Population growth was determined using stage-based matrix models, and the most influential transitions were identified using elasticity analyses. The finite rate of population increase ($\lambda$) was lower for the two transition periods at the broadleaved stand than at the coniferous stand ($\lambda = 0.86$ and 0.87 vs. 0.94 and 0.98), even though the former population was more fecund. The decline in the broadleaved stand reflects greater mortality and retrogression to previous stages, partly as a consequence of herbivory. In contrast, lower recruitment occurred in the coniferous stand, but there was also less mortality and retrogression. Our results suggest that management decisions for conservation of A. elata should be tailored to differing habitats, with a focus on preventing mortality in some populations and increasing recruitment in others.

Keywords:
elasticity, endangered species, finite rate of increase, population projection, tall bugbane, Actaea elata

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Project Type:
Research

II. Species Relevant to Project
Taxonomic Group:
Vascular Plants

Species:
Vascular Plants > tall bugbane > Actaea > elata > elata
III. Location and Habitat

Project Location:
Chilliwack River Valley

Forest District:
Chilliwack

Regional District:
Fraser Valley

South Coast Municipalities:
Chilliwack

Watershed:
Chilliwack

BEC Zone:
Coastal Western Hemlock

Habitat:
Forest

IV. Additional Information

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Other Information:
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