

Climate Change Vulnerability Index

Plant Species Assessment

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Name: *Sullivantia oregana*

Index Result: Moderately Vulnerable

Climate: Indirect

- 1) Exposure to sea level rise - Neutral
- 2) Distribution relative to barriers
 - a. Natural barriers - Steep topography within Columbia River Gorge thought to be a barrier. Species restricted to narrow elevation range, as well as narrow east-west portion of Gorge, and to reasonable proximity to Columbia River.
 - b. Anthropogenic barriers
- 3) Predicted impact of land use changes resulting from human responses to climate change - No mitigation land uses known or contemplated.

Species-Specific Factors:

- 1) Dispersal and movements - Somewhat increase vulnerability: gravity, either with the aid of flowing water or not, is probably largely responsible for dispersal of propagules, which means little chance of dispersal to adjacent creeks/drainages. Wings on seeds aid the above-mentioned dispersal mechanisms (wind, water, gravity).
- 2) Predicted sensitivity to temperature and moisture changes
 - a. Predicted sensitivity to changes in temperature
 - i. historical thermal niche
 - ii. physiological thermal niche - Selected both 'neutral' and 'somewhat increase.' Species occurs in microsites kept somewhat cooler than surrounding areas because they are near or in waterfall spray zones, moist seepage areas, shaded areas, etc. Didn't rate it higher (i.e., more vulnerable) since this variable has to do with temp., not moisture regime.
 - b. Predicted sensitivity to changes in precipitation, hydrology, or moisture regime
 - i. historical hydrological niche - Selected 'somewhat decrease' based on value of the precip variation GIS cover. However, my guess is that the true exposure to precip variation is somewhat less than 40, which would change the value for this variable to neutral.
 - ii. physiological hydrological niche - Selected 'increase' because species is largely restricted to moist seeps and waterfall spray zones.
 - c. Dependence on a specific disturbance regime likely to be impacted by climate change - Selected 'neutral,' although one could argue that an increase in fire frequency could have a negative impact on the seep and spray zone habitat by reducing shading, altering hydrologic flow regimes, etc.
 - d. Dependence on ice, ice-edge, or snow-cover habitats - Selected 'neutral,' although upslope snowpack may contribute to water delivery to seeps that harbor the species.
- 3) Restriction to uncommon geological features or derivatives
- 4) Reliance on interspecific interactions
 - a. Dependence on other species to generate habitat
 - b. Dietary versatility (animals only)
 - c. Pollinator versatility (plants only) - *Sullivantia* is characterized by having a variety of insect pollinators. HOWEVER, Soltis also noted that there are few insect visitors to individual plants.
 - d. Dependence on other species for propagule dispersal - No known dependence on animals for dispersal.
 - e. Forms part of an interspecific interaction not covered by 4a-d
- 5) Genetic factors
 - a. Measured genetic variation - Selected 'somewhat increase.' Although other species of *Sullivantia* are similarly low in genetic variation, all are low compared to other, more distantly related members of the Saxifrage family.
 - b. Occurrence of bottlenecks in recent evolutionary history (*use only if 5a is "unknown"*)
- 6) Phenological response to changing seasonal temperature and precipitation dynamics