

Climate Change Vulnerability Index

Plant Species Assessment

Completed by John Gamon, Washington Natural Heritage Program

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Name: *Delphinium viridescens*

Index Result: Moderately Vulnerable

Exposure to Climate Change:

- 1) Temperature – All occurrences fall within the same temperature category (3.9-4.4^o F warmer).
- 2) Moisture – Occurrences fall within three of the moisture metric categories. Estimates are based on locations/sites rather than numbers of individuals. If based on the latter, it would be considerably more skewed. 85% in -0.051 - -0.073 category; 15% in the -.0735 - -.0965 category; 5% in the -.0965 - -.119 category.

Climate: Indirect

- 1) Exposure to sea level rise - Neutral
- 2) Distribution relative to barriers
 - a. Natural barriers – Neutral. Occurs in a range of habitats that are reasonably well distributed without obvious imposing barriers to movement.
 - b. Anthropogenic barriers – Selected ‘Somewhat increase’ because of increasing development within the range of the species, which could have an impact on availability of habitat for species movement. **COME BACK TO THIS!!**
- 3) Predicted impact of land use changes resulting from human responses to climate change - Neutral

Species-Specific Factors:

- 1) Dispersal and movements – Selected ‘Somewhat increase’ based on expectation that at least 5% of seeds disperse at least 10 meters but not more than 100 meters from parent plant.
- 2) Predicted sensitivity to temperature and moisture changes
 - a. Predicted sensitivity to changes in temperature
 - i. historical thermal niche – Neutral. Species has experienced average temperature variation of 57.1^o - 77^o F over the last 50 years.
 - ii. physiological thermal niche - Neutral
 - b. Predicted sensitivity to changes in precipitation, hydrology, or moisture regime
 - i. historical hydrological niche – Neutral. The species has experienced average precipitation variation in the last 50 years (21-40 inches).
 - ii. physiological hydrological niche – Selected ‘Increase’ due to seasonally wet nature of habitat.
 - c. Dependence on a specific disturbance regime likely to be impacted by climate change – Selected ‘Neutral,’ because the habitat-specific effects of a potential increase in fire frequency are complex, so a projected impact on the species’ vulnerability isn’t obvious.
 - d. Dependence on ice, ice-edge, or snow-cover habitats – Selected ‘somewhat increase’ because of the current apparent significance of snowpack in the overall hydrologic regime of sites with this species.
- 3) Restriction to uncommon geological features or derivatives – Selected ‘Neutral’ although the species is primarily restricted to a particular parent material, but the parent material is more widespread than the plant.
- 4) Reliance on interspecific interactions
 - a. Dependence on other species to generate habitat – Selected ‘Neutral.’ Elk may play a role in helping to maintain suitable habitat, but that probably would not be a limiting factor under changing climate.
 - b. Dietary versatility (animals only)
 - c. Pollinator versatility (plants only) – Selected ‘Somewhat increase’ because of species’ reliance on bumble bees for pollination. Could potentially select ‘Increase.’
 - d. Dependence on other species for propagule dispersal
 - e. Forms part of an interspecific interaction not covered by 4a-d
- 5) Genetic factors
 - a. Measured genetic variation – Selected ‘Somewhat decrease’ based on published work by Richter et al. (1994) in which genetic variation is reported to be higher than other species with similarly narrow geographic distributions.
 - b. Occurrence of bottlenecks in recent evolutionary history (*use only if 5a is "unknown"*)
- 6) Phenological response to changing seasonal temperature and precipitation dynamics - Unknown