

Climate Change Vulnerability Index

Plant Species Assessment

Completed by John Gamon, Washington Natural Heritage Program

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Name: *Trifolium douglasii*

Index Result: Moderately Vulnerable

Exposure to Climate Change:

- 1) Temperature – Selected values in calculator based on number of EOs, rather than on #s of plants or population size.
- 2) Moisture – Selected values based on number of EOs per moisture category.

Climate: Indirect

- 1) Exposure to sea level rise
- 2) Distribution relative to barriers
 - a. Natural barriers – No natural barriers to movement identified, given the historic distribution of sites and the landscape context of those sites.
 - b. Anthropogenic barriers – Selected both ‘somewhat increase’ and ‘increase’ given the degree to which agricultural development has occurred around one historical site, grazing around a second, and the proximity of a 3rd to Pullman. The fourth, and only known extant site, is in the Blue Mtns., where the anthropogenic barriers are much less.
- 3) Predicted impact of land use changes resulting from human responses to climate change – There are no known or anticipated mitigation land-uses.

Species-Specific Factors:

- 1) Dispersal and movements – Selected ‘neutral’ based on assumption only that seeds are probably dispersed by insects and larger animals that move considerable distances.
- 2) Predicted sensitivity to temperature and moisture changes
 - a. Predicted sensitivity to changes in temperature
 - i. historical thermal niche – In the 57-77 range.
 - ii. physiological thermal niche – Selected ‘neutral.’
 - b. Predicted sensitivity to changes in precipitation, hydrology, or moisture regime
 - i. historical hydrological niche - Neutral
 - ii. physiological hydrological niche – Selected ‘increase’ due to wet meadow habitat of the species.
 - c. Dependence on a specific disturbance regime likely to be impacted by climate change – Selected ‘neutral’ although habitats may to some extent be maintained by extreme wet years reducing invasion by trees and shrubs.
 - d. Dependence on ice, ice-edge, or snow-cover habitats - Neutral
- 3) Restriction to uncommon geological features or derivatives - Neutral
- 4) Reliance on interspecific interactions
 - a. Dependence on other species to generate habitat - Neutral
 - b. Dietary versatility (animals only)
 - c. Pollinator versatility (plants only) – ‘Somewhat increase’ due to flower structure favoring bumblebees and honey bees and apparent general decline in bees. Other morphologically similar (in terms of flower structure) species of clover (*T. trifolium*) have documented Lepidopteran pollinators as well.
 - d. Dependence on other species for propagule dispersal - Unknown
 - e. Forms part of an interspecific interaction not covered by 4a-d
- 5) Genetic factors
 - a. Measured genetic variation - Unknown
 - 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