

## Climate Change Vulnerability Index

### Plant Species Assessment

Completed by John Gamon, Washington Natural Heritage Program

December 2013

Name: *Corydalis aquae-gelidae*

Index Result: Moderately Vulnerable

#### Exposure to Climate Change:

- 1) Temperature – All occurrences fall within the same temperature category (<3.9° F warmer).
- 2) Moisture – All occurrences fall within the same moisture metric category (-0.074 - -0.096).

#### Climate: Indirect

- 1) Exposure to sea level rise - Neutral
- 2) Distribution relative to barriers
  - a. Natural barriers - Neutral
  - b. Anthropogenic barriers - Neutral
- 3) Predicted impact of land use changes resulting from human responses to climate change - Neutral

#### Species-Specific Factors:

- 1) Dispersal and movements – Selected 'Neutral' due to the combination of water transport of seeds and the explosive nature of the capsules. As animals brush up against a mature plant, the capsules dehisce explosively, launching the seeds several meters, and potentially onto the animals fur, to then be transported (potentially) between nearby drainages.
- 2) Predicted sensitivity to temperature and moisture changes
  - a. Predicted sensitivity to changes in temperature
    - i. historical thermal niche - Selected 'Increase' vulnerability: Considering the mean seasonal temperature variation for occupied cells, the species has experienced small (37 - 47° F/20.8 - 26.3° C) temperature variation in the past 50 years. Includes facultative cave invertebrates.
    - ii. physiological thermal niche – Selected 'Increase' vulnerability. Species is moderately (50-90% of occurrences or range) restricted to relatively cool or cold environments that may be lost or reduced in the assessment area as a result of climate change.
  - b. Predicted sensitivity to changes in precipitation, hydrology, or moisture regime
    - i. historical hydrological niche – 'Somewhat decrease' vulnerability. Considering the range of mean annual precipitation across occupied cells, the species has experienced greater than average (> 40 inches/1,016 mm) precipitation variation in the past 50 years.
    - ii. physiological hydrological niche – 'Greatly increase vulnerability.' Completely or almost completely (>90% of occurrences or range) dependent on a specific aquatic/wetland habitat or localized moisture regime that is highly vulnerable to loss or reduction with climate change AND the expected direction of moisture change (drier or wetter) is likely to reduce the species' distribution, abundance, or habitat quality.
  - c. Dependence on a specific disturbance regime likely to be impacted by climate change - Neutral
  - d. Dependence on ice, ice-edge, or snow-cover habitats – Selected 'Somewhat increase' vulnerability due to likelihood of snowpack, at least in most years, making a significant contribution to the hydrology within sites that harbor this species.
- 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) – Neutral.
  - d. Dependence on other species for propagule dispersal - Neutral
  - 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"*) - Neutral
- 6) Phenological response to changing seasonal temperature and precipitation dynamics - Unknown