Trailing Blackberry | gʷədbixʷ

Trailing blackberry (*Rubus ursinus*), also known as Pacific blackberry, California blackberry or Douglasberry, is a native, perennial, trailing shrub growing from northern California to British Columbia. It is particularly abundant between the Pacific Coast and the Cascade Range, and is found in a variety of plant communities throughout its range (Tirmenstein 1989).

No studies have yet evaluated the observed or projected impacts of climate change on native blackberries. Here, we describe ecological and climatic processes and conditions that influence the abundance of trailing blackberry in western Washington in an effort to infer how it may respond to future changes in climate.

Ecological and Climatic Drivers

- **Summer Drought Stress**
  Once established, trailing blackberry is a drought-tolerant species. However, water stress can negatively affect blackberry fruit yield. Summer water deficit[1] across the Puget Sound lowlands is projected to increase throughout the 21st century; while this may not negatively affect established plants, it may result in lower fruit production.

- **Disturbance**
  Trailing blackberry quickly establishes following disturbances (e.g., wildfire, logging) and is able to outcompete conifer seedlings; it is often one of the dominant species on recently logged or burned forests (Tirmenstein 1989). While wildfire is relatively infrequent in western Washington forests compared to the eastside, hotter, drier summer conditions are expected to increase the potential

[1] Amount of soil moisture available relative to atmospheric demand for water via evaporation, either from water bodies or vegetation.

for wildfires in this region. This increasing wildfire risk may provide additional post-fire establishment opportunities for trailing blackberry.

- **Invasive Species**
  Himalayan blackberry (*Rubus armeniacus*) and evergreen blackberry (*Rubus laciniatus*) are invasive, non-native blackberry species that grow into dense thickets and produce large fruits (King County Noxious Weeds). These invasive species are difficult to control, quickly overtaking recently disturbed sites and frequently outcompeting trailing blackberry. Increased rates of disturbance (e.g., fire) from climate change may provide additional opportunity for establishment of Himalayan and evergreen blackberries. Further, when herbicides are used to control their spread, the chemicals employed can make trailing blackberry fruits inedible or toxic.

Synthesis and Key Conclusions

- While trailing blackberry is drought tolerant following establishment, water stress can negatively affect fruit yield. Projected increases in summer water deficit may thus result in lower fruit production.
- Increasing wildfire on the westside may benefit trailing blackberry, which readily establishes following disturbance.
- Himalayan and evergreen blackberry may benefit from climate-driven disturbances and can outcompete the native trailing blackberry; application of herbicide to control these invasive blackberries can contaminate trailing blackberry fruit growing in adjacent areas.

Opportunities and Considerations for Applying Results

- *Identify future research needs*: To date, no studies have evaluated the potential impacts of climate change on trailing blackberry or trailing blackberry habitat. Research is needed to create higher resolution spatial models of projected changes in climatic variables relevant to trailing blackberry.
- *Integration with local knowledge:* Application of results will be most effective if combined with the local knowledge and expertise of Tribal scientists and knowledge keepers. For example, knowledge of the location of trailing blackberry populations that have fruited well through times of regional water stress, or have not been out-competed by invasive blackberry species could be used to prioritize those habitats for protection or restoration.
- *Use of traditional practices:* Traditional management practices, including the use of prescribed burns, could be used to create opportunities for trailing blackberry

establishment. However, close monitoring will be needed to prevent establishment of invasive blackberries.

References:

King County Webpage. Himalayan blackberry identification and control. King County Noxious Weeds. https://kingcounty.gov/services/environment/animals-and-plants/noxious-weeds/weed-identification/blackberry.aspx

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Appendix A. Conceptual Model of Climate Impacts on Trailing Blackberry

We created a conceptual model that summarizes the ecological and climatic drivers of trailing blackberry abundance in western Washington. This model can be used to identify intervention points where management action or traditional practices could help reduce climate risks to trailing blackberry.

In the model, green arrows indicate a positive correlation between linked drivers or processes (i.e., as variable *x* increases variable *y* increases; orange arrows indicate a negative relationship between variables (i.e., as variable *x* increases, variable *y* decreases); and dashed gray arrows indicate the absence of a directional trend or an area where additional research is needed. Light red boxes are used to highlight human management activities (e.g., forest management or traditional practices) that directly or indirectly influence the abundance of trailing blackberry in western Washington.

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