

Washington Invasive Ranking System

Washington Natural Heritage Program

Phleum pratense (Timothy)

Assessed by

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Ecological Impact Rank: **Low** (46)

Confidence: **Low** (25)

Management Difficulty Rank: High (81)

Confidence: Low (20)

Biological Characteristics of Invasiveness: Low (43)

Confidence: Moderate (42)

Concern Related to Distribution and Abundance: High (78)

Confidence: High (80)



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Ranking Notes

Phleum pratense may be confused with native *Phleum alpinum* (alpine timothy) where their range and habitat overlap (Ogle et al., 2011).

Legal Listings

[Washington State Weed Board](#): No

[Washington Invasive Species Council](#): No

Section 1: Distribution and Abundance

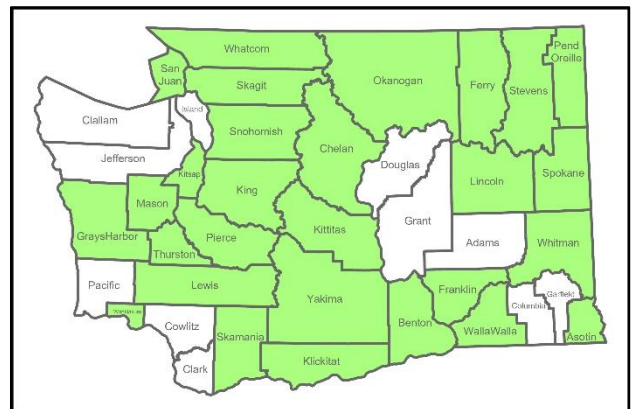


Figure 1. Distribution of counties where *Phleum pratense* has been documented in Washington State (CPNWH, 2023; EDDMapS, 2023; iNaturalist Contributors, 2023).

Q1: Current Range Size in Washington

Rating: High

Confidence: High

Phleum pratense is found in 72% counties in Washington State (CPNWH, 2023; EDDMapS, 2023; iNaturalist Contributors, 2023).

Source: Herbarium records and other observations

Q2: Current Trend in Total Range

Rating: Moderate

Confidence: Moderate

Phleum pratense occurs throughout Washington. In the last 20 years this species may have expanded in the southwestern portion of the state and in the Columbia Plateau (CPNWH, 2023; EDDMapS, 2023; iNaturalist Contributors, 2023).

Source: Herbarium records and other observations

Q3: Proportion of Potential Range Currently Unoccupied

Rating: Low

Confidence: High

According to model predictions, *Phleum pratense* is expected to expand to the remaining counties in Washington, but also experience a range contraction on the Columbia Plateau (EDDMapS, 2023).

Source: Model predictions

Q4: Local Range Expansion or Change in Abundance

Rating: Moderate

Confidence: Moderate

In the last 20 years, *Phleum pratense* abundance and local range appears to have increased the most west of the Cascades and in northeastern Washington (CPNWH, 2023; iNaturalist Contributors, 2023).

Source: Herbarium records and other observations

Q5: Diversity of Ecosystems Invaded

Ecosystem types: Forest & Woodland, Grassland & Shrubland, Emergent Open Wetland, Forested Wetland

Rating: High

Confidence: High

Phleum pratense grows in a wide range of ecosystems and can be found in both forests and grasslands. It grows in upland and wetland habitats and frequently

colonizes waterways. This species prefers deep, neutral pH, clay to loam soils, but can survive in rocky and shallow soils. It exhibits better survival in cold than warm environments and does not tolerate drought (Esser, 1993; Ogle et al., 2011). *Phleum pratense* may occasionally be found in alpine areas, but establishment above upper tree line appears to be more common elsewhere in the Rocky Mountains (T. Ramm-Granberg, pers. comm. 2025).

Source: Informal publication, Professional expertise

Section 2: Biological Characteristics

Q6: Aggressive Mode of Reproduction

Rating: Yes

Confidence: Moderate

Phleum pratense is a short lived (4–7 years) fast-growing perennial bunchgrass. This species mainly reproduces via seed and does not reproduce by rhizomes, but can reproduce vegetatively via tillers, rooting from nodes, or root fragments (Esser, 1993). Seed yields per plant were not found in the literature search, but one pound of *P. pratense* seed is approximately 1,230,000 seeds (Ogle et al., 2011). One study found seeds to consistently have germination rates of 90% or higher (Williams, 1954). Seedling germination peaked in the fall in a study from New York (Morris et al., 1986), potentially giving seedlings a head start on the spring growing season. Seedlings also grow rapidly (Esser, 1993).

Source: Published research, Informal publication

Q7: Innate Potential for Long-Distance Dispersal

Rating: No

Confidence: Low

Phleum pratense seeds don't have any specific adaptations for long distance dispersal, but they can still be dispersed by wind (Esser, 1993). Wind dispersal is likely an average of 1–2 meters, but seeds may be dispersed further by large mammals (Mouissie et al., 2005).

Source: Published research, Informal publication

Q8: Potential to be Spread by Human Activities

Rating: Yes

Confidence: High

Phleum pratense is grown as pasture grass and hay, particularly for horses. This species is also used in revegetation of clearcuts, rangelands, and sites disturbed by human development (e.g., roads or construction projects). *Phleum pratense* has also been used for mine rehabilitation and erosion control. Seeds can also be dispersed by livestock (Esser, 1993; Mouissie et al., 2005).

Source: Published research, Informal publication, Professional expertise

Q9: Allelopathy

Rating: Yes

Confidence: Moderate

Phleum pratense exhibits potential allelopathy both via pollen and extracts of leaves and stems. *Phleum pratense* pollen is known to inhibit pollination and seed development in at least one grass species, *Agropyron repens* (quackgrass), and perhaps other grass species as well. Some studies have also shown that leaf and stem extracts inhibit several other plant species from germination. (Wardle, 1987; Murphy & Aarssen, 1995; Rivernider et al., 2017). Allelopathic abilities may aid *P. pratense* in outcompeting tree seedlings (Esser, 1993).

Source: Published research, Informal publication

Q10: Competitive for Limiting Abiotic Factors

Rating: No

Confidence: Low

Phleum pratense is an intermediate competitor. It can be competitive against other grasses under the right circumstances (e.g., favorable moisture and soil) but will eventually be replaced by slower growing and more long-lived species (Esser, 1993). This species is frequently grown with alfalfa and other legumes for hay because it is less competitive against legumes than other grass species (Ogle et al., 2011).

The bunchgrass growth form may be an adaptation for co-existing in a highly competitive environment, allowing the plant to better exploit immediate resources (Cheplick & Chui, 2001). *Phleum pratense* senesces in the fall. This species can store food in corms for winter (Esser, 1993).

Source: Published research, Informal publication, Professional expertise

Q11: Growth Form

Rating: No

Confidence: Low

Phleum pratense can form monocultures on favorable sites and its height allows this species to be competitive for light. However *P. pratense* usually co-exists with native species instead of forming thickets or dense monocultural stands (Isselin-Nondedeu & Bédécarrats, 2009; Ogle et al., 2011).

Source: Published research, Informal publication, Professional expertise

Q12: Germination Requirements

Rating: No

Confidence: Low

Phleum pratense seeds can germinate both at and below the soil surface. Which seeds are most successful in germinating depends on soil moisture (Williams, 1954). No other information was found regarding germination needs. However, at least one source noted that this species only establishes in intact ecosystems under favorable circumstances (Ogle et al., 2011), which suggests that it may not germinate in other vegetation except under narrow circumstances.

Source: Published research, Informal publication

Q13: Invasiveness of Other Plants in Genus

Rating: Yes

Confidence: Low

Phleum phleoides was noted as an increaser and potentially invasive in a study done in Poland (Ciosek et al., 2003). No other information on invasiveness in

this genus was found. The only other *Phleum* in Washington is the native *Phleum alpinum*. *Phleum pratense* is a listed noxious weed in Virginia and New Jersey (Kasulyte & Praciak, 2022).

Source: Published research, Informal publication

Q14: Shade Tolerance

Rating: Moderate

Confidence: Moderate

Phleum pratense is usually found in open areas such as grasslands and open woodlands, but this species does tolerate partial shade. Shading reduces nutritional value and delays flowering by one or two weeks (Esser, 1993; Ogle et al., 2011).

Source: Informal publication, Professional expertise

Q15: Disturbance Tolerance

Rating: Yes

Confidence: Moderate

Phleum pratense is common in pastures, grasslands, and disturbed areas, and increases cover after disturbance. However, heavy grazing and mowing can both decrease populations, likely by damaging the corms at the base of plants that store carbohydrates. However, corms and belowground growing points also allow this plant to resprout after by fire, and tillering and seed production increases after fire (Esser, 1993; Ogle et al., 2011).

Source: Informal publication, Professional expertise

Q16: Propagule Persistence

Rating: <5 years

Confidence: High

Phleum pratense seeds can remain viable for up to five years (Esser, 1993). One study found most seeds germinate in the year they disperse. Some seeds also go dormant for the winter, allowing this species to take advantage of warm winters without risking entire generations (Morris et al., 1986).

Source: Published research, Informal publication

Q17: Palatability

Rating: No, plant is palatable

Confidence: High

Phleum pratense is cultivated as a pasture grass and hay for livestock (especially horses) and big game animals. This species can also be a significant part of elk, deer, and wild bird diets (Esser, 1993).

Source: Informal publication, Professional expertise

Section 3: Ecological Impact

Q18: Impact on Ecosystem Abiotic Processes

Abiotic Processes: Geomorphology, Light Availability

Rating: Low

Confidence: Low

Phleum pratense is sometimes used in combination with other species for erosion control, though its shallow roots mean that it is not an ideal erosion control agent when planted alone (Esser, 1993). This species also grows tall enough to outcompete at least some plant species for light (Isselin-Nondedeu & Bédécarrats, 2009).

Source: Published research, Informal publication

Q19: Impact on Ecosystem Structure

Rating: Low

Confidence: Moderate

Phleum pratense is most commonly found in graminoid-dominant ecosystems in Washington and is unlikely greatly alter the structure of communities. In other circumstances, *Phleum pratense* can either hinder or aid establishment of conifer seedlings. This species may sometimes prevent conifer seedlings from establishing through a combination of outcompeting seedlings for light and potentially allelopathy. However, if seedlings are already established, *P. pratense* may be able to exclude other plant species, reducing the overall competition that tree seedlings face. In some ecosystems, *P. pratense*



can tip the balance from forest to grassland (Esser, 1993).

Source: Informal publication

Q20: Impact on Ecosystem Composition

Rating: Low

Confidence: Low

In some cases, *Phleum pratense* can reduce community diversity and prevent establishment of native species. In Glacier National Park, this species is known to prevent establishment of native grasses and cryptogams (Tyser, 1992; Esser, 1993). An experiment in the French Alps found that a cultivar of *P. pratense* prevented a subset of co-occurring species from colonizing disturbed areas and reduced community diversity (Isselin-Nondedeu & Bédécarrats, 2009).

Source: Published research, Informal publication

Q21: Impact on Particular Native Species

Rating: Unknown

Confidence: Not Rated

Phleum pratense provides cover for small animals, particularly game birds and waterfowl, throughout its range. It can also provide significant forage for big game animals (Esser, 1993). Bees, including native bumblebees, and syrphids have been documented feeding on *P. pratense* in North America. In Maine, *Bombus* species were observed actively collecting *P. pratense* pollen, and on average greater than 70% of the pollen they carried was from this species. The value and nutrition of *P. pratense* pollen for bees is not known, but this species is also frequently included in pollinator mixes (Rivernider et al., 2017).

Source: Published research, Informal publication

Q22: Observed Ability to Invade Undisturbed Ecosystems

Rating: Moderate

Confidence: Low

At least some sources suggest that *Phleum pratense* can invade undisturbed forest, grassland, and tundra

habitats (Esser, 1993; Ogle et al., 2011). However, invasion of neighboring vegetation communities may only occur in a limited number of circumstances (Esser, 1993; Ogle et al., 2011).

Source: Informal publication

Q23: Observed Ability to Invade Naturally Disturbed Ecosystems

Rating: Yes

Confidence: High

Phleum pratense is commonly found in grassland and woodland habitats that experience significant natural disturbance (Esser, 1993).

Source: Informal publication, Professional expertise

Section 4: Management Difficulty

Q24: General Management Difficulty

Rating: High

Confidence: Low

As of 2011, *Phleum pratense* is still recommended for revegetation projects (AKNHP, 2011) and commonly grown for hay and silage. This species appears to be widely regarded as non-aggressive, so very little literature focuses on managing it as a weed. Where management is needed and possible, removal coupled with planting of desirable competitive species is recommended. There are some areas (e.g., Glacier National Park) where this species has proven troublesome and not practical to remove. In those cases, avoiding spread or introduction to new areas is recommended (Tyser, 1992; Esser, 1993).

Source: Published research, Informal publication

Q25: Minimum Time Commitment

Rating: Moderate

Confidence: Moderate

Phleum pratense reproduces mainly by seed, so the minimum time commitment for treatment is likely the same as seed bank longevity (4–7 years) (Esser, 1993). Ongoing monitoring is likely necessary to

prevent recolonization, since source populations are quite common.

Source: Informal Publication, Professional Expertise

Q26: Impacts of Management on Native Species

Rating: Moderate

Confidence: Low

Herbicide use to remove *Phleum pratense* populations will likely have negative effects on co-occurring native species, particularly grasses. Native grasses are typically the dominant plants in the ecosystems where *Phleum pratense* most commonly occurs. In some cases, the management impacts may outweigh the benefits of trying to eliminate this species.

Source: Professional expertise

Q27: Inaccessibility of Invaded Areas

Rating: Moderate

Confidence: Low

Phleum pratense is widespread in Washington (CPNWH, 2023; EDDMapS, 2023; iNaturalist Contributors, 2023) and many populations are likely to be inaccessible.

Source: Professional expertise, herbarium records and other observations

Q28: Sociopolitical Implications of Management

Rating: High

Confidence: Moderate

Phleum pratense is grown as a high-value hay and pasture grass, particularly for horses. It seems likely that large-scale efforts to manage this species as an invasive would receive objections.

Source: Professional expertise

Additional Comments

None

References

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