Washington Invasive Ranking System

Washington Natural Heritage Program

Myosotis discolor (Yellow and Blue Forget-me-not)

Assessed by
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Ecological Impact Rank: **Insignificant** (16)	Confidence: **Moderate** (58)
Management Difficulty Rank: Insignificant (2)	Confidence: Moderate (40)
Biological Characteristics of Invasiveness: Low (33)	Confidence: Moderate (54)
Concern Related to Distribution and Abundance: High (78)	Confidence: High (80)

Photo Credit: Keir Morse 2008, used under Creative Commons license (CalPhotos, 2024).

Ranking Notes

Relatively little information is available for *Myosotis discolor* outside of its native range.

Legal Listings

Washington State Weed Board: No

Washington Invasive Species Council: No

Section 1: Distribution and Abundance

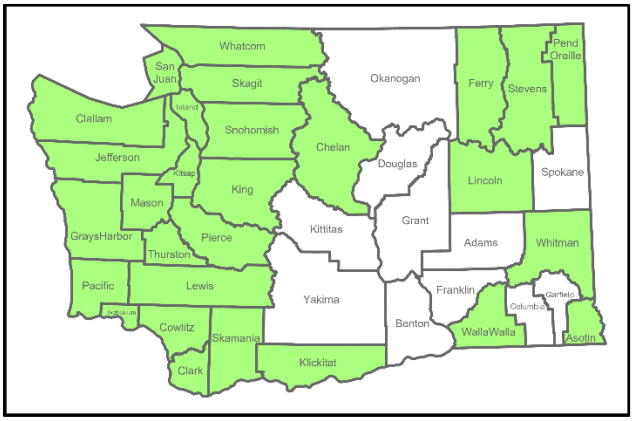

Figure 1. Distribution of counties and provinces where *Myosotis* discolor has been documented in the United States and Canada (CPNWH, 2024; EDDMapS, 2024; iNaturalist Community, 2024).

WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES

Q1: Current Range Size in Washington

Rating: High

Confidence: High

Myosotis discolor is found in 28 of 39 (72%) of counties in Washington State (CPNWH, 2024; EDDMapS, 2024; iNaturalist Community, 2024).

Source: Herbarium records and other observations

Q2: Current Trend in Total Range

Rating: Moderate

Confidence: Moderate

This species may have expanded to the northern Olympic Peninsula over the last 20 years and may also be slightly expanding in eastern Washington (CPNWH, 2024; iNaturalist Community, 2024).

Source: Herbarium records and other observations

Q3: Proportion of Potential Range Currently Unoccupied

Rating: Low

Confidence: High

Myosotis discolor is currently most abundant west of the Cascades in Washington State (CPNWH, 2024; iNaturalist Community, 2024) However, this species is predicted to be able to expand to the rest of the state (EDDMapS, 2024)

Source: Herbarium records and other observations, Model predictions.

Q4: Local Range Expansion or Change in Abundance

Rating: Moderate

Confidence: Moderate

iNaturalist records suggest a rapid increase in local abundance and local range for *Myosotis discolor* over the last 20 years (iNaturalist Community, 2024). However, herbarium records from the same timespan suggest very little expansion of local range and abundance in Washington (CPNWH, 2024). The majority of iNaturalist records are concentrated in areas of the state with the highest human populations, so some increase in records may be due to an increase in observers. However, because this species is small and easily overlooked, it appears likely that there has been at least some increase in local abundance over the last 20 years.

Source: Professional expertise, Herbarium records and other observations

Q5: Diversity of Ecosystems Invaded

Ecosystem types: Forest & Woodland; Grassland & Shrubland; Marine Coastal Shore; Emergent Open Wetland; Forested Wetland

Rating: High

Confidence: High

Myosotis discolor is found in a wide range of naturally and anthropogenically disturbed areas and can grow in both wetland and uplands. It is found in both Willamette and coastal prairies, balds, and other grasslands; savannas, woodlands, and open forests; a wide variety of open, shrubby, or forested wetlands; dunes and beaches; and cliffs and rockfaces. It may also be able to grow in salt marshes. This species is frequently associated with anthropogenic disturbances, including roadsides and other travel corridors, powerline easements, trails, and agricultural fields. *Myosotis discolor* grows in a range of sandy, loamy, or clay soils, as well as gravelly or rocky substrates (CPNWH, 2024; Feuillet, 2024; Knoke & Giblin, 2024)

Source: Professional expertise, Herbarium records and species treatment

Section 2: Biological Characteristics

Q6: Aggressive Mode of Reproduction

Rating: No

Confidence: Moderate

Myosotis discolor is a self-compatible annual or occasionally biennial species (Parachnowitsch & Elle, 2005; Kelley & Joyal, 2012). This species likely reproduces only by seed. Reproductive information was only available from this species' native range, and seed production rates could be different in its

introduced range. Two studies from England documented reproductive output for *M. discolor* and both found low seed production. One study harvested 132 seeds in approximately 10 square meters (Smith et al., 1996). The other study found that this species produced on average 55 seeds per plant and exhibited relatively poor colonization (Asefa, 2011).

Source: Published research, Professional expertise, Thesis, Jepson eFlora treatment

Q7: Innate Potential for Long-Distance Dispersal

Rating: Yes

Confidence: Moderate

A study in England found that *Myosotis discolor* was more likely to disperse into areas with rabbit pellets, compared to areas where rabbit pellets were removed, suggesting that this species can be dispersed in the manure of small mammals. This species has also been suggested to disperse in the fur of animals (Pakeman et al., 1998). Dispersal by wind or gravity occurs over relatively short distances. Another study from England found a mean dispersal distance of 9.6 cm and a maximum distance of 47 cm from the parent plant for *M. discolor* seeds (Asefa, 2011).

Source: Published research, Thesis

Q8: Potential to be Spread by Human Activities

Rating: Yes

Confidence: Moderate

No direct evidence for human dispersal was found in the literature but given that *Myosotis discolor* has spread to many parts of the world, this species has at least some potential to be dispersed by human activities.

Source: Professional expertise

Q9: Allelopathy

Rating: No

Confidence: Low

No information on secondary chemicals in *Myosotis discolor* was found. However, the species habit does not suggest that it is allelopathic.

Source: Professional expertise

Q10: Competitive for Limiting Abiotic Factors

Rating: No

Confidence: Moderate

While some research suggests *Myosotis discolor* can be competitive with selected annual species in its native range (Asefa, 2011), in the Pacific Northwest this species appears to be found either in ruderal places or in trace amounts underneath dominant plant species (CPNWH, 2024), suggesting it is not a strong competitor.

Myosotis discolor is a winter annual, in England it germinates in the fall and overwinters as a rosette before growing in the spring (Asefa, 2011).

Source: Professional expertise, Thesis, Herbarium records

Q11: Growth Form

Rating: No

Confidence: High

While *Myosotis discolor* can be locally abundant where found, it does not form smothering or tall monocultural stands. This species usually grows under mixed communities of other plants and does not appear to be competitive for light.

Source: Professional expertise

Q12: Germination Requirements

Rating: No

Confidence: Low

Given that *Myosotis discolor* is mostly found in areas of natural or anthropogenic disturbance, it may require bare ground or disturbance to establish, but no information was found about germination requirements.

Source: Professional expertise

Q13: Invasiveness of Other Plants in Genus

Rating: Yes

Confidence: High

Several other *Myosotis* species are tracked by the University of Georgia's Center for Invasive Species and Ecosystem Health (EDDMapS, 2024).

Source: Professional Expertise, EDDMaps database

Q14: Shade Tolerance

Rating: Moderate

Confidence: Moderate

Myosotis discolor can be found growing in partial shade to full sun (CPNWH, 2024). This species frequently grows beneath other plant species when it occurs in meadows or prairies.

Source: Professional expertise, Herbarium records

Q15: Disturbance Tolerance

Rating: No

Confidence: High

Myosotis discolor is found in a wide variety of ruderal ecosystems and other areas that experience regular disturbance (CPNWH, 2024). A study in southwestern Oregon found presence of this species indicated burned areas (Sikes, 2005). However, disturbance responses likely do not provide *M. discolor* an advantage over co-occurring native species.

Source: Professional expertise, Thesis, Herbarium records

Q16: Propagule Persistence

Rating: <5 years

Confidence: Moderate

A study in England documented *Myosotis discolor* seeds persisting up to four years in the seed bank, but no longer (Asefa, 2011).

Source: Thesis

Q17: Palatability

Rating: No, plant is palatable

Confidence: Moderate

In England, rabbits eat *Myosotis discolor* frequently enough to be a significant source of seed dispersal (Pakeman et al., 1998).

Source: Published Research

Section 3: Ecological Impact

Q18: Impact on Ecosystem Abiotic Processes

Abiotic Processes: None listed

Rating: Insignificant

Confidence: Moderate

Little information was available on the abiotic effects of *Myosotis discolor*. While it can compete with other small annual species in its native range (Asefa, 2011), it does not have easily observable impacts on ecosystem processes in the Pacific Northwest. This species is usually present only as a trace component in prairies and grasslands, suggesting its effects on abiotic processes are insignificant.

Source: Professional Expertise, Thesis

Q19: Impact on Ecosystem Structure

Rating: Insignificant

Confidence: Moderate

The assessor has observed that this plant has trace cover in relevé surveys of Willamette prairie in Oregon and does not appear to change community structure. Little information on structural impacts were available in the literature, though it may be competitive against some annual grasses in its native range (Asefa, 2011).

Source: Professional expertise, Thesis

Q20: Impact on Ecosystem Composition

Rating: Insignificant

Confidence: Moderate

The assessor has observed that this plant has trace cover in relevé surveys of Willamette prairie in Oregon, suggesting an insignificant change in community composition.

Source: Professional expertise

Q21: Impact on Particular Native Species

Rating: Insignificant

Confidence: Moderate

The abundance of annual plants is a concern in *Castilleja levisecta* habitat, as annuals are poor hosts. An overabundance of annuals can reduce *C. levisecta* habitat quality and individual survival. However, *Myosotis discolor* is usually only a trace component of these communities, and its effects on species like *C. levisecta* are more likely as a minor component of a larger community shift, not because of *Myosotis discolor*'s presence alone.

Source: Professional expertise

Q22: Observed Ability to Invade Undisturbed Ecosystems

Rating: Low

Confidence: Moderate

Based on habitat preferences, *Myosotis discolor* likely needs either natural or anthropogenic disturbance to establish.

Source: Professional expertise

Q23: Observed Ability to Invade Naturally Disturbed Ecosystems

Rating: Yes

Confidence: High

Myosotis discolor is found in remnant prairie and other naturally disturbed ecosystems in Washington (CPNWH, 2024).

Source: Professional expertise, Herbarium records

Section 4: Management Difficulty

Q24: General Management Difficulty

Rating: Insignificant

Confidence: Moderate

Carbon addition can reduce abundance of *Myosotis discolor* in Pacific Northwest prairies (Mitchell & Bakker, 2011), but otherwise little research has been done on weed management of this species. Control of *M. discolor* would likely require exhausting the seed bank and removing populations that can recolonize areas. *Myosotis discolor* likely is a low priority for treatment, especially given its limited ecological impact, and is therefore rated as insignificant.

Source: Published Research, Professional Expertise

Q25: Minimum Time Commitment

Rating: Insignificant

Confidence: Moderate

Given the relatively short span of seed viability, *Myosotis discolor* populations without an outside seed source could be treated in less than five years. This species may not need treatment at all, given its limited ecological impacts.

Source: Professional expertise

Q26: Impacts of Management on Native Species

Rating: Unknown

Confidence: Not Rated

Management techniques are not well-developed for *Myosotis discolor*, likely because it has limited ecological impact compared to other nonnative species in the Pacific Northwest. Effects of management techniques for *M. discolor* on co-occurring native species are therefore not known. However, costs of treatment to native plants should be carefully weighed against the likely limited benefits gained by treating *M. discolor*.

Source: Professional Expertise

Q27: Inaccessibility of Invaded Areas

Rating: Low

Confidence: Moderate

Known populations of *Myosotis discolor* are most abundant near areas of anthropogenic disturbance. It seems likely that the majority of populations of this

species are relatively accessible (CPNWH, 2024; iNaturalist Community, 2024).

Source: Professional expertise, Herbarium records and other observations

Q28: Sociopolitical Implications of Management

Rating: Insignificant

Confidence: Moderate

Myosotis discolor is not used in agriculture or as an ornamental species, and it seems unlikely that objections would extend beyond general objections to herbicide use.

Source: Professional expertise

Additional Comments

None

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