DRAFT WRITTEN FINDINGS OF THE WASHINGTON STATE NOXIOUS WEED CONTROL BOARD

SCIENTIFIC NAME:	*Marsilea mutica* Mett.
SYNONYMS:	None
COMMON NAMES:	Australian water clover, large-leaved nardoo, nardoo
FAMILY:	Marsileaceae
LEGAL STATUS:	Washington State Noxious Weed and Seed Quarantine (WAC 16-752-610:). Noxious Weed Monitor List (added in 2017).



Figure 1. *Marsilea mutica* growing in Lake William Symington, Kitsap County.



Figure 2. *Marsilea mutica* leaves, Lake William Symington, Kitsap County.

DESCRIPTION AND VARIATION:

text

OVERALL HABIT:

text

STEMS:

text

LEAVES:

text

FLOWERS:

text

FRUITS/SEEDS:

Text

ROOTS:

text

SIMILAR SPECIES:

text

HABITAT:

Text

BIOLOGY

GROWTH AND DEVELOPMENT:

text

REPRODUCTION:

text

GEOGRAPHIC DISTRIBUTION:

NATIVE DISTRIBUTION

The native range of *M. mutica* is northern and eastern Australia and New Caledonia.

NON-NATIVE DISTRIBUTION

Introduced throughout the eastern United States and several locations in the west (see below).

HISTORY:

WASHINGTON:

Marsilia mutica has been found growing aggressively in several small private ponds (≤ 0.5 acre) following intentional and unintentional introduction. Nuisance growth in small private ponds has been reported in the following counties: King (Enumclaw, 2010), Whatcom (Bellingham, 2004), Pacific (Seaview, 2005), and Island (Langley, 2013). These reports led to the species' eventual listing on the quarantine list (WAC 16-752-610:) and noxious weed monitor list in 2017. In all cases reported to the Department of Ecology's Aquatic Invasive Plant Management Program, control was attempted by the landowner and/or local noxious weed control staff. The population in King County has been confirmed as eradicated (landowner correspondence in 2024), the population in Whatcom County presumed eradicated (correspondence from Whatcom County Coordinator in 2025), and the population from Island County presumed eradicated (correspondence from landowner in 2014). However, the population in Pacific County, southwest of the town of Seaview has persisted since at least 2005 despite multiple years of management with herbicides (see below). This population is growing in a small manmade pond with no known connection to another waterbody (Fig. 6).

In 2010, a population of *M. mutica* was identified in Echo Lake, Snohomish County—a public and much larger waterbody than previously observed for this species in Washington. The population was quickly controlled using a bottom barrier made of landscape fabric (see below). The plants were not observed in subsequent yearly surveys by Snohomish County and the Department of Ecology and the Echo Lake population is considered eradicated.

In 2023, a large population of *M. mutica* was reported by a resident of Lake William Symington in Kitsap County and was confirmed by the Department of Ecology later that year. The resident first noticed the plants in 2013 growing near a neighbor's waterfront and observed them spreading to the current levels. The only prior survey conducted by the Department of Ecology at Lake William Symington was conducted in 1998 and *M. mutica* was not recorded at that time. Subsequent surveys at the lake with Kitsap County, Department of Ecology staff, and the lake resident in 2024 and 2025 confirmed and documented the extent of the infestation along much of the littoral zone of the lake, extending to within ~150 m of the lake's outflow to Big Beef Creek. The current infestation is estimated to cover ~15 acres of the 58.7-acre lake (Figs. 4 and 5). The *Marsilea mutica* infestation at Lake William Symington is the only known Washington population in a waterbody connected to other waters.

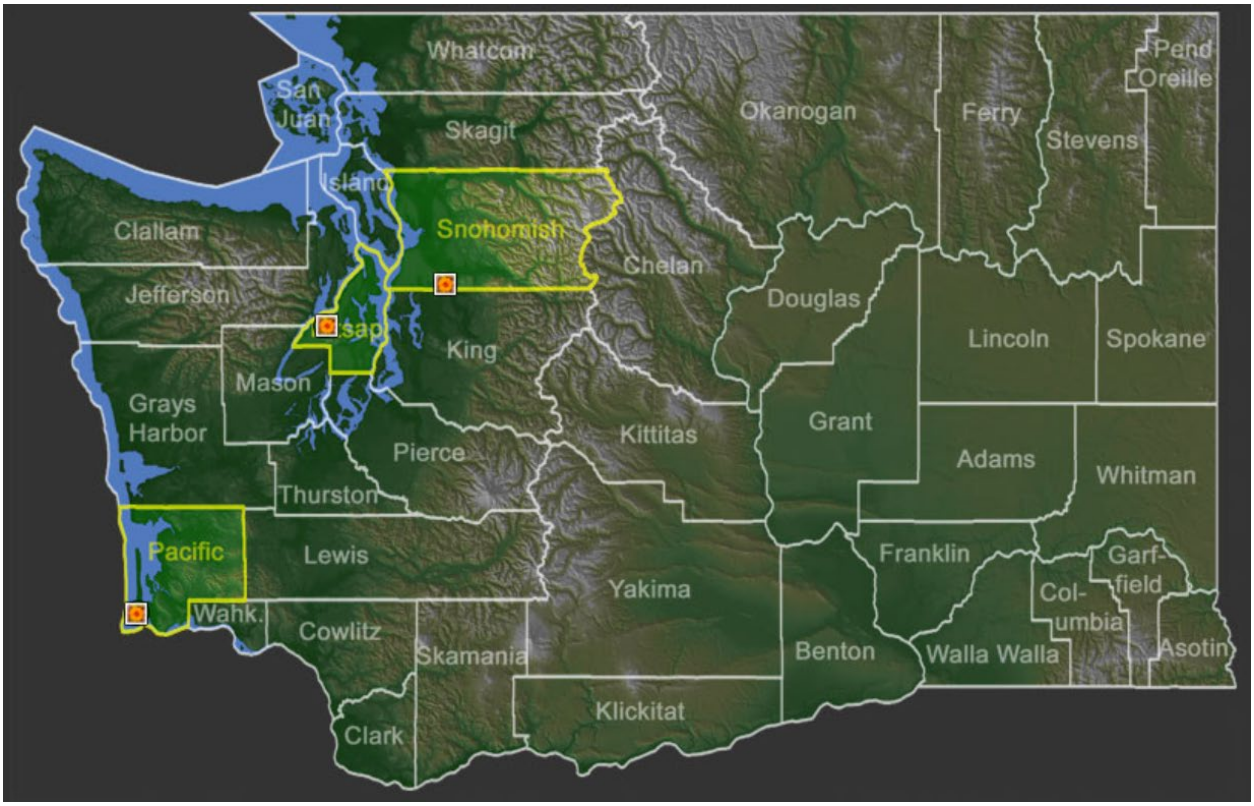


Figure 3. Known distribution of *Marsilea mutica* in Washington based on Burke Herbarium database. Note that Snohomish County population has been eradicated.

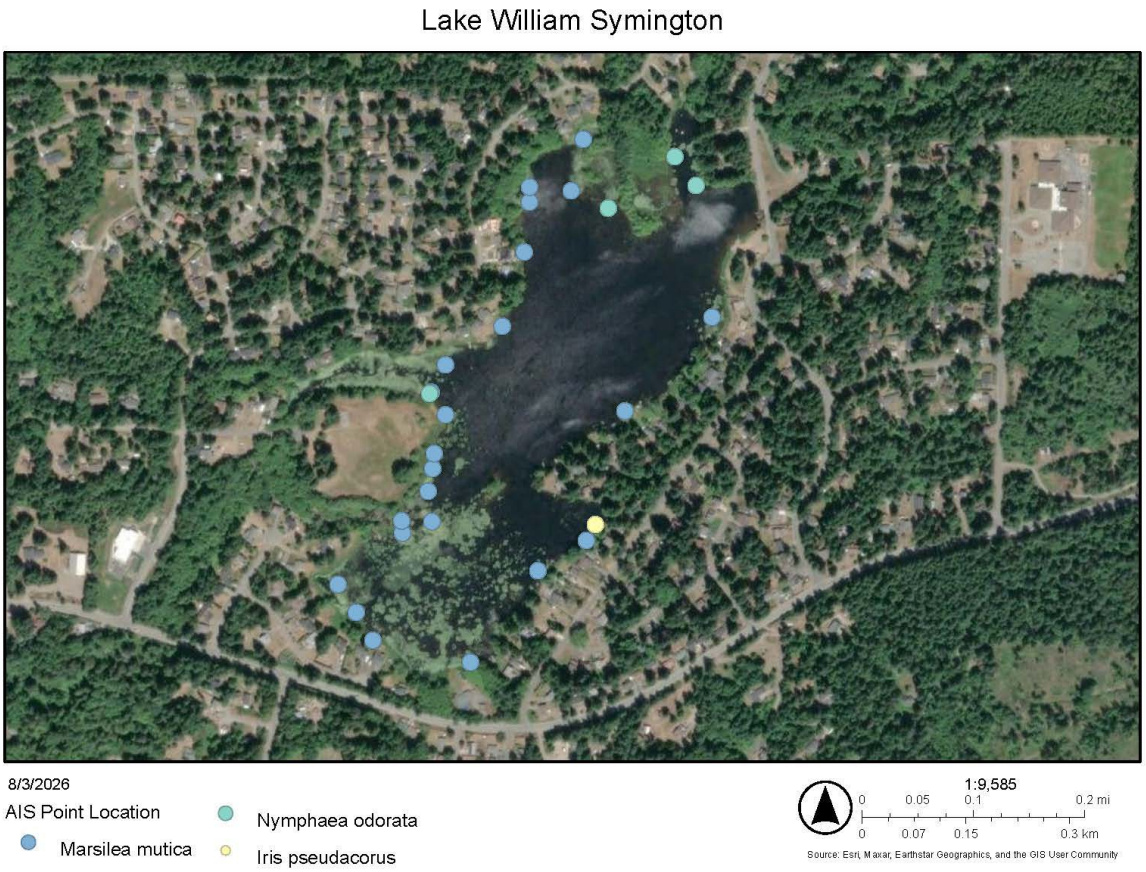


Figure 4. Locations of *Marsilea mutica* beds (blue circles) in Lake William Symington, Kitsap County.



Figure 5. Large *Marsilea mutica* population on Lake William Symington, Kitsap County.

NEARBY TO WASHINGTON:

OREGON:

Two Research Grade observations on iNaturalist: Observations · iNaturalist.

IDAHO:

No known populations.

BRITISH COLUMBIA:

No known populations

CALIFORNIA

No herbarium records or Research Grade observations have been recorded in California, but several populations are noted on the USGS NAS database (based on iNaturalist records). These plants may not be wild: Australian water-clover (Marsilea mutica) - Species Profile.

LISTINGS:

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ECONOMIC AND ECOLOGICAL IMPORTANCE:

DETRIMENTAL:

Marsilea mutica can grow aggressively in ponds where it has been planted and has spread outside of planted locations in Washington and elsewhere in the United States. Wild populations of *M. mutica* have been documented throughout the southeastern United States (Jacono and Johnson 2006) and have more recently been found in Texas (Moorhead 2021).

There are no known studies on the ecological impacts of *M. mutica*. However, it's ability to spread rapidly and produce floating leaves that cover the water's surface may negatively impact native aquatic plants that are light-limited and aquatic fauna that depend on open water habitat.

BENEFICIAL:

Marsilea mutica is widely sold in the water garden trade.

CONTROL:

MECHANICAL:

Private pond owners have manually removed *M. mutica* from their ponds using hand-pulling and rakes, but their methodology has not been well documented. Hand-digging and pulling small plants has been successfully used in combination with bottom barriers.

Landscape fabric was used to successfully control a small 10 ft. × 20 ft population of *M. mutica* at Echo Lake in Snohomish County. The entire patch was covered with landscape fabric, which was held down with concrete blocks, forming a bottom barrier. The fabric was placed in 2011 and removed in 2016. Some plants were still observed in 2012, but no plants have been observed since that time during surveys by Snohomish County and the Department of Ecology

CULTURAL:

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BIOLOGICAL:

There are currently no established biological controls for *M. mutica*.

CHEMICAL:

Imazamox was used to treat a population of *M. mutica* in a private pond in Pacific County for several years. From correspondence with Dr. Kim Patton of Washington State University, Imazamox provided good within-year control, especially when applied twice a season at 0.1 ppm. However, plants consistently recovered the year following treatment and eradication was never achieved. Imazapyr and penoxulam were also used for treatment of this population, but details of these treatments are unknown. As of 2026 the population is still present and found throughout the pond (Fig 6). Glyphosate is listed as an effective herbicide for *Marsilea* species on the Texas A&M University Extension's AquaPlant website (https://aquaplant.tamu.edu/management-options/how-to-control-water-clover/), however there is not documentation of it's effective use. More work is needed to determine the best herbicide(s) and concentrations for effective *M. mutica* control.

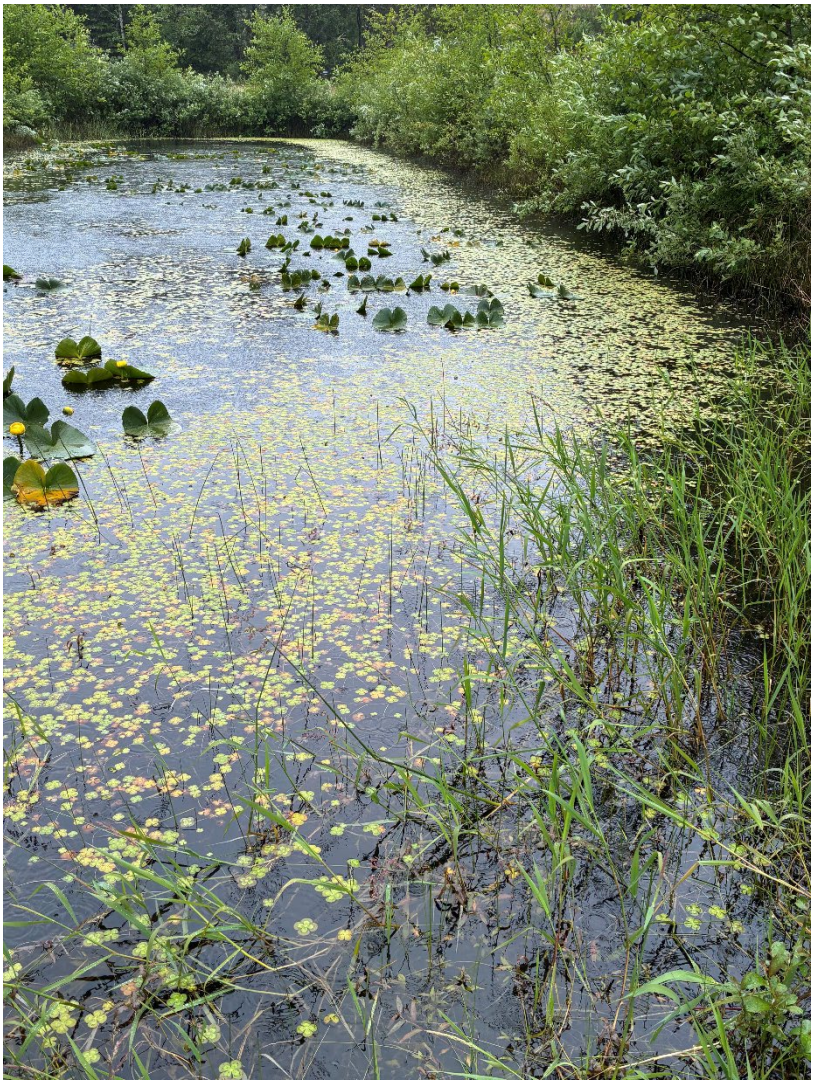


Figure 6. Population of *Marsilea mutica* in private pond near Seaview, Pacific County.

RATIONALE FOR LISTING:

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REFERENCES:

1. Australian water-clover (Marsilea mutica) - Species Profile
2. Moorhead, O. W. W. 2021. *Marsilea mutica* (Marsileaceae) newly reported in Texas. Journal of the Botanical Research Institute of Texas 15:711–713.
3. Jacono, C., and D. Johnson. 2006. Water-clover ferns, Marsilea, in the Southeastern United States. Castanea 71:1–14.