# *Utricularia purpurea* (Purple Bladderwort) occasionally weedy in northern Wisconsin

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Abstract: *Utricularia purpurea* (Purple Bladderwort) has had sporadic population explosions in some northern Wisconsin lakes within the last 20 years. It can form dense floating, nonflowering masses that impede recreational activities on the affected lakes. Three lakes in which this weediness was noted are soft water, low-nutrient, seepage lakes that experience widely fluctuating water levels and recent nutrient runoff. Excessive weediness has not been described in nearby Minnesota nor Michigan, although the plant is sporadically locally abundant. *U. purpurea* is listed as "Endangered" in Minnesota.

*Utricularia purpurea* is a rootless, aquatic, carnivorous plant. It has a wide range within eastern North America, extending along the coast from eastern Texas into Canada. The northern part of its range extends west from the northeastern United States and eastern Canadian provinces into Minnesota and Ontario. In the Great Lakes region, *U. purpurea* occurs in soft, quiet water, shallow to more than three meters deep (Black & Judziewicz 2009).

*Utricularia purpurea* is a native plant which has extended its range into Wisconsin within the last 100 years. Within the last 20 years, it has become a sporadic nuisance in several northern Wisconsin lakes. A 20 June 2014, Northwoods Star Journal article described *U. purpurea* outbreaks at Flannery and Velvet Lakes, and a third unnamed lake near Rhinelander, Wisconsin (Anon 2014). Floating masses of the plant were so dense that it tangled boat propellers. Lake goers could not swim in it nor fish through it. According to the article, large populations of *U. purpurea* reside on the lake bottoms then float up, typically beginning in mid-July, to form dense surface masses. The article reported that the plants die on the lake bottom or shortly after reaching the surface. Sporadic dense populations were also noted in nearby Frog and Shallow Lakes. These later populations grow amidst other aquatic vegetation and will flower, whereas the dense masses that occur at Flannery and Velvet Lakes typically do not flower (Susan Knight, pers. comm. 2024).

The first University of Wisconsin-Madison herbarium collection record for *U. purpurea* was in 1931. The plant was listed as "Special Concern" in Wisconsin in 1986 (Kevin Doyle, pers. comm. 2024). It was delisted in 2011 when later surveys found enough new populations and enough large populations to confirm that the species had a secure foothold in the state. Doyle was unaware of the weedy outbreaks of *U. purpurea* in the three Wisconsin lakes featured in the 2014 Northwoods Star Journal article. When informed of these outbreaks, Doyle recalled an increase in the number of aquatic plant surveys in Wisconsin starting around 2005, and an increase in the number of reports of new *U. purpurea* populations (Kevin Doyle pers. comm. 2024).

The *U. purpurea* populations at Flannery and Velvet Lakes were quantified in Warm-water Point-intercept Macrophyte Surveys conducted in 2012, 2017, and 2022. The three years of data are discussed and compared in the 2022 reports (Berg 2022a, b). The behavior of *U. purpurea* as

Figure 1: Floating mass of *Utricularia purpurea* with *Brasenia schreberi*, 30 July 2022, Flannery Lake, Oneida County, Wisconsin. Photo by Matthew Berg.

described in the lakes featured in the Northwoods Star Journal article is interesting but in partial error. At Flannery and Velvet Lakes, *U. purpurea* can indeed form dense floating masses (Figs. 1-3). However, according to Berg, the plants do not die in summer (Matthew Berg, pers. comm. 2024). The *U. purpurea* masses are often covered with sediment and other debris which can make them appear unhealthy or dead, but they do not actually die until autumn.

Berg notes that in Wisconsin he finds *U. purpurea* in tannic-stained, soft water lakes with low nutrient levels, especially in lakes with bogs. He has never seen it in eutrophic systems with high nutrient or algal loads. Berg has also seen *U. purpurea* growing in weedy masses at Kirby Lake in Barron County, Wisconsin. He notes that Flannery, Velvet, and Kirby Lakes are all seepage lakes that experience widely fluctuating water levels related to drought, rain events, and snow melt (Matthew Berg, pers. comm. 2024). Paul Skawinski notes *U. purpurea* outbreaks are also associated with development where nutrients are likely being added through runoff, fertilizers, septic systems, and the like (Paul Skawinski, pers. comm. 2024).

Paul Skawinski notes that *U. purpurea* is pollinated by terrestrial insects and growing conditions must allow the plant to get its flowering stalk above the water surface and maintain it there. He notes that *U. purpurea* tends to flower when growing among water lilies or other vegetation that provides extra support for the flowering stalks and some buffering against wave energy (Figs. 4, 5).

Figure 2: *Utricularia purpurea* surrounding a dock on Flannery Lake, 30 July 2022. Photo by Matthew Berg.

Figure 3: Underwater view of *Utricularia purpurea* floating mass at Velvet Lake, Oneida County, Wisconsin, 2017. Photo by Brian M. Collins.

Skawinski also notes that the dense weedy masses of *U. purpurea* typically do not flower (Paul Skawinski, pers. comm. 2024). Donna Perleberg has observed *U. purpurea* to have "boom and bust" years; large population swings year to year may be a natural cycle of this species (Donna Perleberg, pers. comm. 2024).

The earliest collection of *U. purpurea* at the University of Minnesota herbarium is 1992. In Minnesota, it was listed as "Special Concern" in 1996 and the designation strengthened to "Endangered" in 2013. There have been over 2,000 targeted botanical surveys of the lakes statewide and *U. purpurea* was found in only 20 locations. The documented occurrences of *U. purpurea* remain low despite high survey efforts (Courtney Schirmers, pers. comm. 2024). While *U. purpurea* can occasionally grow abundantly within a water body or portion of a water body, it is listed as "Endangered" in Minnesota due in part to its limited distribution (Donna Perleberg, pers. comm. 2024).

The earliest collection of *U. purpurea* at the Michigan State University herbarium is 1892. While *U. purpurea* can also be locally abundant in some years, the plant has not been observed to form dense, floating, nonflowering masses as it does in Wisconsin. (Tom Alwin, pers. comm. 2024).

In conclusion, *U. purpurea* has been observed to occasionally form dense, weedy masses in some northern Wisconsin lakes. This phenomenon had not been noted by state biologists in Wisconsin nor in nearby Minnesota or Michigan. Attention was drawn to this phenomenon in northern Wisconsin when it negatively affected lake residents' recreational activities. This may be a rare event most

Figure 4: *Utricularia purpurea* flowering among *Nymphaea odorata* in Frog Lake, Iron County, Wisconsin. Photo by Susan Knight.

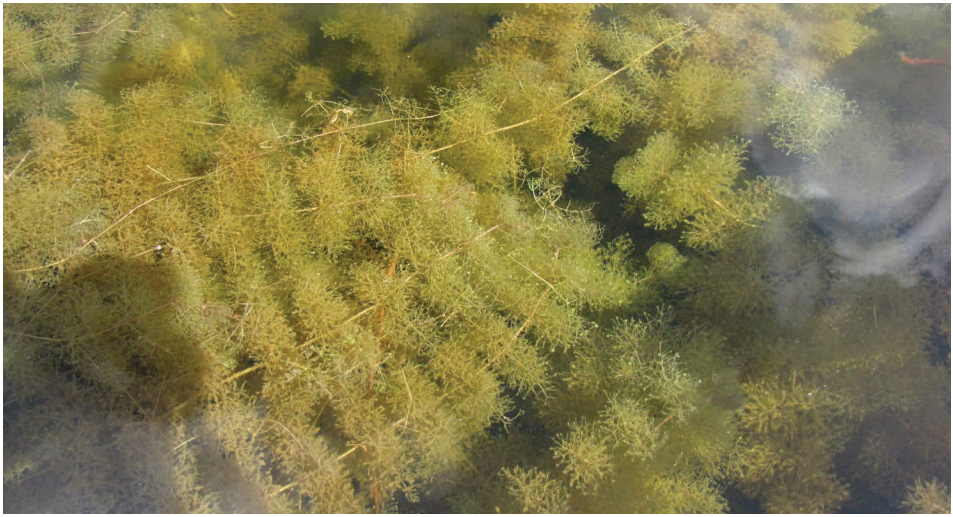

Figure 5: Non-blooming dense, normal clump of *Utricularia purpurea*. Photo by Paul Skawinski.

likely to sporadically occur in soft water, low-nutrient, seepage lakes that experience widely fluctuating water levels and recent nutrient additions in runoff.

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