TRILLIUM RECURVATUM BECK (LILIACEAE) IN GREEN LAKE COUNTY, WISCONSIN

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Five native trilliums occur in Wisconsin: *Trillium cernuum* L., *T. flexipes* Raf, *T. grandiflorum* (Michx.) Salisb., *T. nivale* Riddell (Wisconsin threatened) and *T. recurvatum* Beck (Wisflora: Wisconsin Vascular Plant Species, 2005). Like *T. nivale, T. recurvatum* is rare statewide and listed as a "special concern" species (Wisconsin Department of Natural Resources, 2004). (*T. recurvatum* is on the state threatened species list in Michigan.) Numerous common names accompany the plant: bloody butcher, bloody noses, prairie trillium, red trillium, reflexed trillium, toadshade.

In Wisconsin *T. recurvatum* is mainly distributed in the southernmost counties that border northern Illinois, occurring in southern upland and lowland forests, mesic prairies, and oak openings (Fig. 1). Gleason and Cronquist (1991)

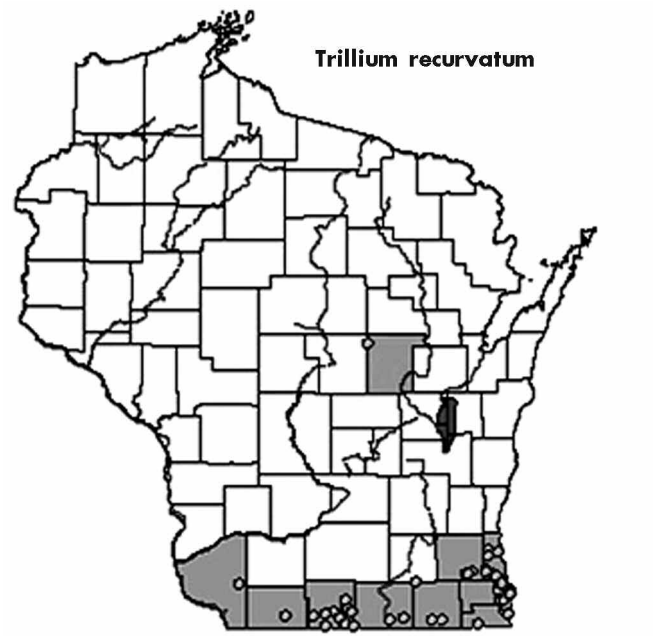

FIGURE 1. Location map for *Trillium recurvatum* in Wisconsin (Wisflora: Wisconsin Vascular Plant Species, 2005)

FIGURE 2. Note the recurved sepals in *Trillium recurvatum*. Photo by the author, 27 April 2005.

state that *T. recurvatum* ranges from western Ohio to southern Michigan, southern Wisconsin, eastern Iowa, south to Alabama, Louisiana, and eastern Texas. Case (2003) confirms this range. (It is also known from Cherokee County, Oklahoma, in the eastern part of the state—Flora of Oklahoma Project, www.biosurvey.ou.edu/floraok/, accessed 13 June 2005.)

The specific epithet, *recurvatum,* refers to the sepals that recurve downward along the stem (Fig. 2). The three whorled leaves of *T. recurvatum* are petioled and typically appear mottled (Fig. 3). In addition to seed reproduction, *T. recurvatum* reproduces by slender horizontal rhizomes. The plant flowers from April through May and unlike our other trilliums that are white flowered, *T. recurvatum* is Wisconsin's sole trillium with maroon-colored petals.

Based on the Wisconsin Floristic Quality Assessment method, *T. recurvatum* has a Coefficient of Conservatism = 6, "on a scale from 0 to 10 that represents an estimated probability that a plant species is likely to occur in a landscape relatively unaltered from what is believed to be a pre-settlement condition" and

FIGURE 3. *Trillium recurvatum* with mottled leaves. Photo by the author, 27 April 2005.

"based on that species' tolerance for disturbance and fidelity to a particular pre-settlement plant community type" (Wisflora: Wisconsin Vascular Plant Species, 2005). As a Wetland Indicator, *T. recurvatum* is ranked FACU- (Facultative Upland), meaning that its occurrence in non-wetlands is an estimated probability of 67%–99%. The negative sign indicates a frequency toward the lower end of the category, i.e. less probable in wetlands.

According to the Wisconsin Botanical Information System (Wisflora: Wisconsin Vascular Plant Species, 2005), 85 herbarium records of *T. recurvatum* are reported from 11 Wisconsin counties (Grant, Lafayette, Green, Rock, Walworth, Kenosha, Racine, Milwaukee, Waukesha, and Waupaca). Of these, the earliest collected voucher came from Racine County (v0046330WIS) on 14 May 1880, while the most recent record was collected in Rock County (UWSP128725) on 10 May 1999. One specimen, UWSP16148, not shown on the location map (Figure 1), was collected from Dane County on 15 May 1971.

Trillium recurvatum was discovered in Green Lake County on 27 April 2005 by Randal Maurer, environmental consultant with Native Solutions, Appleton, WI. A clump of three plants was observed growing on a 1.5-acre parcel within the City of Green Lake (NW ¼ NW ¼ Section 29, R13E, T16N; N43°50.227′ W88°58.350; elevation 837′) at the junction of Forest Avenue and South Lawson Street. Judging by the early land survey records and the modern-day vegetation, the original vegetation cover was oak savanna. Between sections 20 and 29, and

29 and 30, the field notes report "Land rolling second rate . . . . Scattering W. B & Bur oak" (Field notes, 1834).

The property, which was gifted to and is held in trust by the Green Lake Conservancy Foundation, Inc., is the site of an oak savanna restoration effort. In 1999 an abandoned gas station was razed and the eastern half of the property was seeded with a mixture of native grasses and forbs. In 2000, the remainder of the property (west from the old gas station) was planted with a similar mixture. There have been periodic managed burns since 1999.

It is unlikely that *T. recurvatum* was introduced by human activity at the Forest Avenue oak savanna. It is much more likely that a mature relict population survived the restoration efforts completed in 2000 or that seeds of *T. recurvatum* were present in an existing seed bank or were introduced by wildlife and germinated following the reintroduction of fire. Although *T. recurvatum* tolerates some disturbance and has been known to colonize disturbed areas (Coefficient of Conservatism = 6), it doesn't tolerate picking or overgrazing (Jones, 2003). Case and Case (1997) further clarify the point: "It is true that repeated picking of the same plant, season after season before it can manufacture enough food to maintain itself, will eventually kill *Trillium*. A far greater threat to most wild *Trillium* populations than human picking is grazing by wild or domestic animals."

Soils at the Forest Avenue oak savanna are nearly level, well-drained and classified in the Kidder-Rotamer-Grellton association. The topsoil is Grelton (GnB) fine sandy loam, with loam and loam clay subsoil, then underlain by calcareous gravel and glacial till (USDA, 1977). Albeit improbable, it is possible that seeds of *T. recurvatum* were introduced in clean topsoil that was spread and graded at the location in 1999 and 2000. It takes a trillium seed two years to produce a leaf and another six years for the plant to flower (Priestly, 2000). Thus, it is far more plausible that a population 1) was already present at the site and reemerged from rhizomes or 2) became established from an existing seed bank or was introduced by wildlife. Whatever the case, the plant apparently has benefited from periodic managed burns since 1999.

The role of fire in maintaining many fire-dependent communities should not be underestimated. Apfelbaum and Haney (1987) report that *T. recurvatum* is among those species that increased in frequency following the burning of closed-canopied woodlands at the Reed-Turner Woodland Nature Preserve, Long Grove, Lake County, Illinois. In fact, the overall response of ground cover vegetation in closed-canopied woodlands at Reed-Turner to the autumn 1986 burning involved a 10% increase in plant diversity.

T. recurvatum joins *T. grandiflorum* as the second trillium species known from Green Lake County (Eddy, 1996). It is serendipitous that this rare trillium appeared on a property being restored to oak savanna and now protected in perpetuity.

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