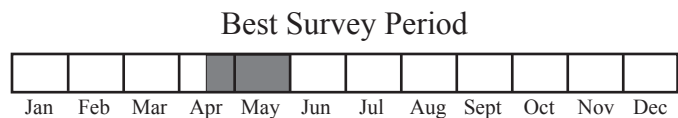
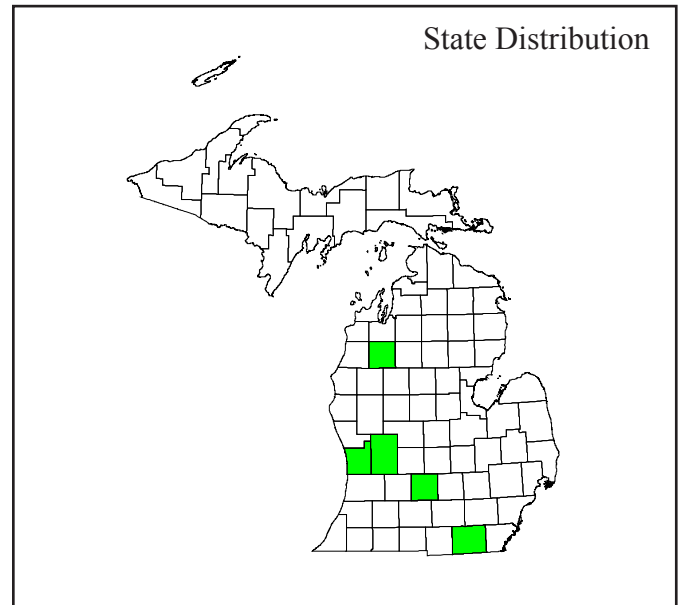




Photo by Ryan P. O'Connor



Status: Endangered

Global and state rank: G5/S1S2

Other common names: Virginia cowslip

Family: Boraginaceae (borage family)

Synonym: Pringle (2004) emphasizes in his overview of the nomenclature of *M. virginica* that *M. pulmonarioides* Roth, a name that has been applied increasingly in horticultural literature and seed and nursery catalogues, is incorrect and should not be used.

Taxonomy: Molecular analyses by Downie and Palmer (1992) suggest that the Boraginaceae is closely related to the Hydrophyllaceae (waterleaf family) in contrast to the traditional alignment of borages with the mint (Lamiaceae) and vervain (Verbenaceae) families.

Total range: Virginia bluebells is a species of eastern North America, occurring from Ontario and Quebec south to Georgia, Alabama, and Mississippi, and largely ranging in the western portion of its distribution from Minnesota to Arkansas with the westernmost locality occurring in Kansas. It is considered rare in Delaware, Georgia, Kansas, Mississippi, New Jersey, North Carolina, and Ontario (NatureServe 2009).

State distribution: Just over ten state localities for Virginia bluebells have been documented in Michigan, not including sites known or strongly suspected to be garden escapes. The vast majority – including most of the state's extant populations – occur in Kent and Ottawa counties, with two extant stations known in Ottawa County and seven localities (four of which are considered to be extant) documented in Kent County. An additional locality for this species is Lenawee County, where an occurrence documented in 1987 is presumed to be extant. All of the state's populations consist of very localized occurrences, although hundreds of plants may be present.

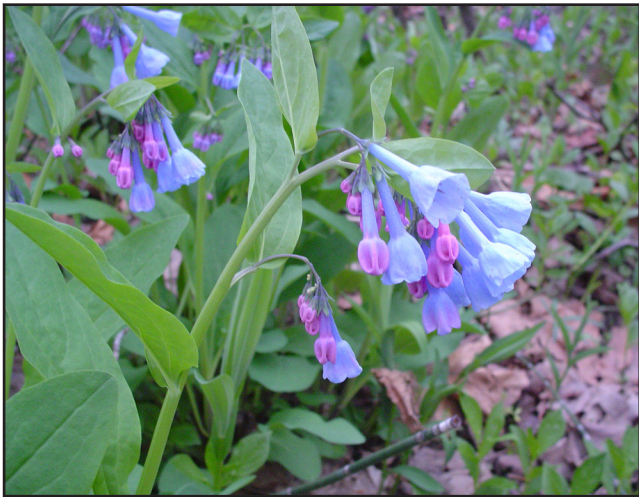
Recognition: *M. virginica* is a leafy spring forb that is entirely hairless and somewhat glaucous (bluish-green) arising from a stout root, ranging from 3-7 dm in height with well-spaced, alternate, **smooth-margined leaves (5-15 cm) that are stalked and have blunt, rounded tips**. The stems terminate in clusters of **bell-like blue flowers with long floral tubes and blunt calyx lobes, the often roundish flower clusters** hanging from arching stalks (cymes) at the tips of the branches. This striking spring forb, which is also a popular ornamental species, is unlikely to be confused with anything else when in flower; the related *M. paniculata* is restricted to the western Upper Peninsula, and can be distinguished by its hairy leaves, stems, pedicels, and much smaller



flowers with acute, hairy calyx lobes.

Best survey time/phenology: Virginia bluebells is an early spring forb, and in Michigan this species has been collected in bud or flower from the last week of April through approximately mid-May, thus the period from mid-April through May should adequately capture this species during its optimal survey window.

FQI Coefficient and Wetland Category: 10, FACW



Ryan P. O'Connor

Habitat: In Michigan, Virginia bluebells grows in southern floodplain forests and rich ravines under a canopy of such species as *Acer saccharinum* (silver maple), *A. rubrum* (red maple), *Platanus occidentalis* (Eastern sycamore), *Celtis occidentalis* (hackberry), and *Populus deltoides* (Eastern cottonwood); *Carpinus caroliniana* (blue beech), *Asimina triloba* (pawpaw), *Lindera benzoin* (spicebush), *Staphylea trifoliata* (bladdernut), *Euonymus obovata* (creeping strawberry bush), *Fraxinus americana* (white ash), *Fagus grandifolia* (beech), *Acer saccharum* (sugar maple), and *Tilia americana* (American basswood) may also be present. Associates include a wide and rich diversity of spring forbs, including such species as *Allium tricoccum* (wild leek), *Asarum canadense* (wild ginger), *Isopyrum biternatum* (false rue anemone), *Phlox divaricata* (phlox), *Dentaria laciniata* (toothwort), *Floerkea proserpinacoides* (false mermaid), *Trillium grandiflorum* (large trillium), and *Hydrophyllum canadense* (Canada waterleaf), among many other common and also rare forbs. In the Chicago region, bluebells grows on floodplains under *Acer nigrum* (black maple), silver maple, and *Ulmus americana* (American elm), and in mesic forests dominated by sugar maple and a diversity of other tree species (Swink

and Wilhelm 1994). Elsewhere within its broad eastern North America range, Virginia bluebells is usually found in loamy soils in moist to wet woods.

Biology: This herbaceous perennial begins flowering at the very end of April and into May. Bees are prominent among its insect pollinators. In his study of the pollination ecology of vernal angiosperms, Macior (1978) noted that bumblebees were the primary and nearly exclusive pollinator of *Mertensia* in contrast to several associated species that are also enabled to be pollinated by solitary bees as well as small flies. In an analysis of flowering phenology trends over a 30-year period in Washington, DC (Abu-asab et al. 2001), *M. virginica* was included in a group of spring flowering taxa determined to have statistically significant advances (in days) of first flowering, with an advance of more than 17 days for *M. virginica*, possibly in a collective response to global warming.

Conservation/management: Where this species grows on floodplains, natural river hydrology--especially with regard to the cyclical, seasonal flooding regimes--should be maintained. At least one Kent County population lies on nature center property, another occurs on land owned by the local Audubon chapter as a natural area, and one population lies within a steep ravine on the campus of Grand Valley State University.

Comments: This species has been naturalized in forests at several locations. Populations that do not occur in floodplains habitats and/or outside its historical southwestern range in the state are likely to represent naturalized occurrences.

Research needs: Status surveys and monitoring are high priority needs, owing to the lack of detailed population and habitat information for many occurrences, as very limited data exist concerning specific population sizes, reproductive success, threats, and other aspects relevant to establishing conservation ranks and priorities.

Related abstracts: Floodplain forest, Blanding's turtle, box turtle, cerulean warbler, red-shouldered hawk, smallmouth salamander, yellow-throated warbler, American beak grass, cup-plant, heart-leaved plantain, pumpkin ash, purple turtlehead, red mulberry, snow trillium, Virginia water-horehound.

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