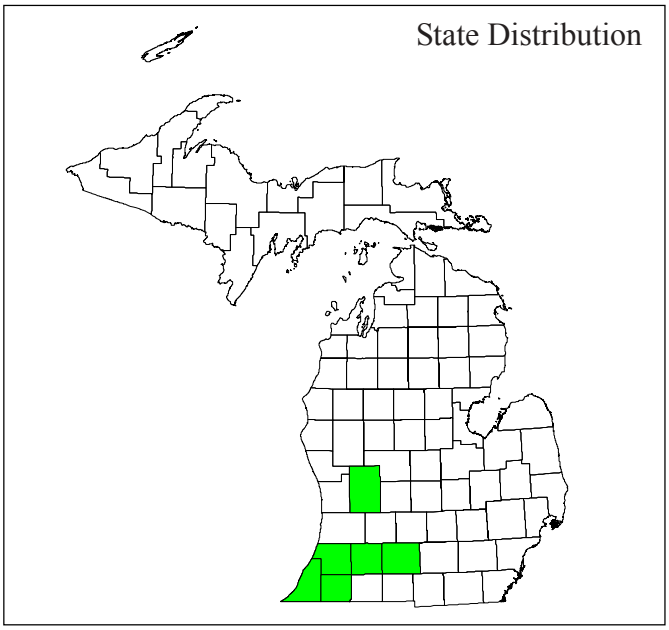
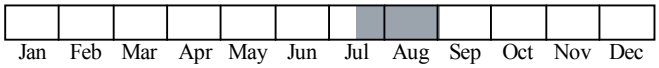
Filipendula rubra (Hill) Robbis. Queen-of-the-prairie

Photo by Ryan P. O'Connor



Best Survey Period



Status: State threatened

Global and state rank: G4/S2

Other common names: Prairie meadowsweet

Family: Rosaceae (rose family)

Taxonomy: A member of the Rosoideae subfamily, the genus *Filipendula* contains 12 species, all found in the temperate northern hemisphere. Two species are native to North America, *F. rubra* and *F. occidentalis* (queen-of-the-forest), found in the Pacific Northwest. The remaining species occur in Eurasia.

Range: Queen-of-the-prairie is distributed from Iowa and Missouri east through the Midwest to Pennsylvania and Maryland, and ranging as far south as south as North Carolina. It is considered rare nearly throughout its range, including Iowa, Illinois, Indiana, Missouri, Maryland, New Jersey, North Carolina, Pennsylvania, and Virginia (NatureServe 2006). It is also established as an introduced species, likely from garden escapes, throughout the northeastern U.S. and Canada.

State distribution: Native populations of Queen-of-the-prairie occur in six counties in southwestern Lower Michigan. The majority of occurrences are located in Kalamazoo and Calhoun Counties, with Van Buren, Cass, and Kent Counties having only one site each. Of the 18 currently known occurrences, four have not been seen since the 1950s and are considered historical observations. Populations with good viability occur at six sites, and typically contain several hundred individuals, though range as high as several thousand plants at one site. This showy species is often propagated and collections from Benzie, Emmet, and Marquette Counties, as well as observations from Jackson, Washtenaw, and Wayne County probably represent garden escapes.

Recognition: *F. rubra* is a tall, fairly robust herbaceous plant with leafy stems that may reach 1 m or more in height. The **large, alternate, pinnately compound leaves** have a **broad, stalked terminal leaflet** up to 2 dm in width that is **deeply divided into 5-9 pointed, sharply serrate lobes.** Lateral leaflets are somewhat similar but much smaller and unstalked, usually with 3-5 lobes. Well developed, kidney-shaped leafy stipules persist at the base of the leafstalks. The stems are terminated by a very **showy inflorescence of numerous small (ca. 7-10 mm wide), deep pink, five-petaled flowers** at the ends of erect branches. The pod-like fruits are oblong, erect, and arranged in a circle, reaching ca. 6-8 mm in length. *F. rubra* is easily distinguished from other members of the genus that may

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be planted in our region such as European native *F. ulmaria* (queen-of-the-meadow), which has white flowers and leaves with white undersides instead of the green found on *F. rubra*.

Best survey time/phenology: Queen-of-the-prairie is most reliably surveyed while in flower, which typically occurs in mid-July through August, though the leaves are quite distinctive anytime during the growing season.

Habitat: In Michigan, queen-of-the-prairie occurs in prairie fens with a calcareous substrate of Houghton muck (pH 7 to 8) saturated by a constant supply of mineral-rich groundwater. Dominant associates may include such species as *Potentilla fruticosa* (shrubby cinquefoil), *Spartina pectinata* (prairie cordgrass), *Sorghastrum nutans* (Indian grass), *Carex aquatilis* (sedge), *Carex stricta* (tussock sedge), *Pycnanthemum virginianum* (mountain mint), and *Solidago riddellii* (Riddell's goldenrod). Other common fen associates include *Eupatorium maculatum* (joe-pye-weed), *E. perfoliatum* (boneset), *Thelypteris palustris* (marsh fern), and *Bromus ciliatus* (fringed brome grass). Elsewhere, this species occurs in other moist, calcareous habitats including wet meadows, wet prairies, and low woods (Swink and Wilhem 1994).

Biology: *F. rubra* is a persistent clonal perennial arising from rhizomes. Flowers typically bloom in mid-July and are pollinated by small bees, with fruits usually ripening from August to September. Seedset is general low for this self-incompatible species, especially when a few large, genetically identical clones make up the majority of the population (Aspinwall and Christian 1992a). Despite this limitation, most new populations arise from seed rather than fragmentation of clones, though seedling establishment and recruitment is thought to be quite low, possibly due to vigorous competition from already established *F. rubra* clones and other dense, lush vegetation (Aspinwall and Christian 1992b). Between clones, genetic diversity is high, with virtually every clone a unique genotype both within and between sites. In general, larger populations contain more genotypic diversity than small populations, and diversity within a given site is higher in the central portion of the species range.

Conservation/management: Only two populations are considered protected, one within a nature preserve and the other on federal land. At all sites regardless of ownership, populations are threatened by encroachment of native and non-native shrubs, especially *Cornus* spp. (dogwoods) and *Rhamnus frangula* (glossy buckthorn). Control of shrub growth is necessary in order to maintain the open fen habitat required by this species. Cutting brush and treating stumps with an approved herbicide, followed by prescribed burning is an especially desirable management tool for suppressing woody plant succession and encouraging the growth of Queen-of-the-prairie as well as other rare prairie species. Anecdotal evidence suggests *F. rubra* clones are stimulated by fire, and burning also may improve germination and establishment rates of new seedlings, increasing genetic diversity by establishing new clones (Aspinwall and Christian 1992b). Ensuring the hydrologic integrity of prairie fens is also critical for the maintenance of viable populations and overall habitat quality.

Comments: This attractive species is occasionally cultivated. However, there is significant potential for plants to escape and persist in wetland habitats, and hybridize with native colonies, especially in its natural range in southwest Michigan. Individuals interested in propagating and growing this species are encouraged to seek local genotypes from native plant nurseries and avoid planting domesticated or horticultural varieties.

Research needs: This species has been the subject of significant pollination biology ((Aspinwall and Christian 1992a) as well as genetic work (Aspinwall and Christian 1992b) but questions remain regarding the mechanisms by which a genetically identical clone, which often comprises the entire population in small, isolated colonies, produces viable seed and how new seedlings and clones are established.

Related abstracts: prairie fen, Jacob's ladder, mat muhly, prairie Indian-plantain, prairie dropseed, purple milkweed, shooting-star, white lady-slipper, Blanchard's cricket frog, Blanding's turtle, spotted turtle, eastern massasauga, Mitchell's satyr butterfly, blazing star borer, and silphium borer.

Selected references:

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Abstract citation:

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