



Status: State special concern

Global and state rank: G3/S3

Other common names: hollow-rooted thistle

Family: Asteraceae (aster family)

Synonyms: *Cirsium pumilum* (Nutt.) Sprengel

Total range: Hill's thistle is centered in the Great Lakes region, ranging from South Dakota and Minnesota to southern Ontario and Pennsylvania.

State distribution: Hill's thistle is concentrated in three areas the state; the Shakey Lakes oak savanna region of Menominee County in the Upper Peninsula, the jack pine barrens of northern Lower Michigan, and in alvar habitat on Drummond Island. Its stronghold is in the jack pine barrens of the northern Lower Peninsula in Crawford County. It has been documented in other widely scattered locations throughout the Lower Peninsula, particularly in former oak savanna habitat in the southern tiers of counties. Due to the highly disturbed nature of the majority of former oak savanna communities, the status of Hill's thistle in these locations is likely very poor if it is extant at all. It is also known from Beaver Island and other scattered locations.

Recognition: Hill's thistle is a generally short (25-60 cm tall), perennial thistle with a **deep, hollowed, and thickened taproot**. The **leafy stems** are soft, ridged and **sparsely pubescent or tomentose** (with woolly hairs), with 1-2 short branches near the top terminating with a **single, large, pink flower head 4-7 cm high**. The outer

bracts at the base of the flower head are tipped by slender, short, and appressed spines. The elliptic-oblong leaves form a **basal rosette** with only a few progressively smaller leaves on the stem. The **leaf margins are typically undulating to very shallowly lobed** and sometimes slightly tomentose below, but often smooth on both surfaces.

Best survey time/phenology: Surveys are best conducted during the flowering period from June through August, however with experience this species can be recognized throughout the season both by the distinctive basal rosettes and fruiting heads.

Habitat: Throughout its range Hill's thistle is known from dry, sandy, gravelly soils in prairies, jack pine barrens, oak savanna, and open woods. In Michigan and Wisconsin, it is also known from limestone pavement communities known as "alvar". Species associates include typical prairie/savanna grasses such as big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium [Andropogon] scoparius*), Indian grass (*Sorghastrum nutans*), poverty grass (*Danthonia spicata*), hair grass (*Deschampsia flexuosa*), June grass (*Koeleria macrantha*), and a variety of goldenrods, asters, and other prairie forbs.

In the pine barrens communities of Michigan jack pine (*Pinus banksiana*) and Pennsylvania sedge (*Carex pennsylvanica*), in addition to the state threatened rough fescue (*Festuca scabrella*), state special concern Cooper's milk-vetch (*Astragalus neglectus*), and state threatened pale agoseris (*Agoseris glauca*) are also frequent associates.



Biology: This perennial species blooms from June through August and persists from about two to five years. Flowering occurs one or two seasons after the establishment of the rosette, most typically in three-year-old plants. Seed production generally is abundant; however, both flowers and seeds are vulnerable to insects and fungi. Seed are dispersed by wind, with often the entire fruiting head often being broken off and blown away. *Cirsium hillii* also reproduces vegetatively by adventitious buds that form along the lateral roots. The primary taproots die with the remainder of the plant after flowering. Several lateral shoots may be produced by a single plant. Suppression of the natural fire regime in historical *Cirsium* habitat has resulted in increased litter accumulation which is thought to be responsible for poor seedling establishment. This is likely one of the primary causes for the rarity of this species.

Conservation/management: Conservation and management of this species should be directed along two major approaches. One is to make a concerted effort to locate extant populations and prevent further direct destruction of their habitat which, in addition to disruption of the natural fire regime, is a major cause of the species decline. The second approach is to address the problem of poor seedling establishment due to increased accumulation of litter. This concern is primarily an issue within the dry jack pine, savanna, and prairie habitats where lack of fire has allowed considerable encroachment of successional plants. Management in these areas with the use of prescribed fire is recommended. The accumulating duff layer is effectively removed by fire, opening up germination sites in the ground layer. Fire management may not be necessary in alvar communities where the harsh conditions appear to act as a natural check to woody species encroachment and resultant litter accumulation. In addition, in more mesic prairie/savanna communities, fire may actually have a negative effect. In these communities where lush prairie growth results from fire management, the thistle may actually be shaded out or out-competed by other species.

Research needs: The primary research needs for this species include more intensive inventory work to more adequately assess its status in Michigan, and further research on its basic life history, particularly the requirements for seed germination, seedling establishment, and vegetative reproduction, as well as the specific role of fire.

Related abstracts: alvar, pine barrens, dry sand prairie, oak savanna, Alleghany plum, pale agoseris, rough fescue, secretive locust

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