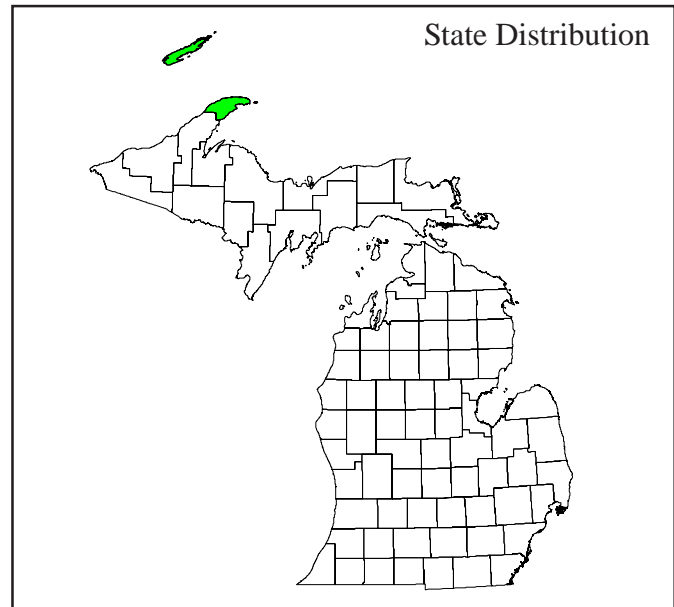
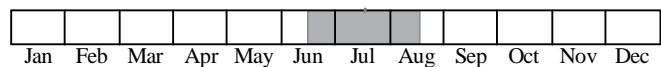




Photo by Emmet J. Judziewicz



Best Survey Period



**Status:** State threatened

**Global and state rank:** G5/S1

**Other common names:** phacelia, scorpion-weed

**Family:** Hydrophyllaceae (waterleaf family)

**Taxonomy:** Considerable research on the Hydrophyllaceae, of which *Phacelia* is the largest genus, has been conducted, primarily to determine taxonomic and systematic relationships, ranging from more recent studies involving DNA sequencing (Ferguson 1998) to studies of pollen morphology (Constance and Chuang 1982), corolla venation pattern (Lee 1986), and chromosome number (Constance 1963) to derive classifications and evolutionary relationships within both the family and genus.

**Range:** Franklin's phacelia is largely a species of northwest North America and the central Canadian provinces and territories, occurring from Alaska south through British Columbia and Idaho to Utah, and ranging east in the Canadian prairie provinces to Hudson Bay and northern Lake Superior. It is considered rare in Alaska, British Columbia, Minnesota, Ontario, Utah, Washington, and Wyoming (NatureServe 2007).

**State distribution:** All Michigan records for this species—totaling fewer than ten collections—are from Isle Royale National Park.

**Recognition:** *Phacelia franklinii* is an erect forb, branching from just above a basal rosette (which may not be present) or branching above. The stems range from ca. 2-6 dm in height and the entire plant is **hairy and somewhat sticky-glandular throughout**. The leaves are **alternate and pinnately divided into 5-15 segments, the uppermost segment usually lobed or coarsely toothed**. Each branch terminates in a congested cluster of **violet to pale lavender or blue flowers that are broadly bell-shaped (campanulate)** and 8-10 mm long. *P. franklinii* is one of three *Phacelia* species that occur in Michigan, the other two consisting of single, historical records of a non-native species (*P. tanacetifolia*) collected in 1904 in Alger County and a southern adventive (*P. purshii*) collected in 1917 in Ingham County. It is unlikely that either of these taxa would be found within the Michigan range of Franklin's phacelia. However, *P. tanacetifolia* can be distinguished by its stamens, which are smooth and extend well beyond the mouth of the corolla, in contrast to the hairy filaments in *P. franklinii* that barely reach or extend beyond the corolla mouth. *P. purshii* has a flat corolla that lacks a floral tube and bears fringed corolla lobes, whereas in Franklin's phacelia the corolla is



distinctly bell-shaped with a pronounced floral tube (Voss 1996).

**Best survey time/phenology:** There are few collection data for this species, but most observations and collections have indicated a flowering period (the optimal time for identification) from approximately mid-June to early August.

**FQI Coefficient and Wetland Category:** 8, UPL

**Habitat:** There are few collection data for most occurrences of this species. On Isle Royale, Franklin's phacelia has been found in openings in rocky to gravelly soil, and on a basaltic, lichen-encrusted ridge with *Picea glauca* (white spruce) and *Betula papyrifera* (paper birch). In these sites, additional woody and herbaceous associates have included such species as *Arctostaphylos uva-ursi* (bearberry), *Shepherdia canadensis* (buffaloberry), *Rosa acicularis* (wild rose), *Juniperus communis* (common or ground juniper), *Lonicera dioica* (honeysuckle), *Aralia nudicaulis* (wild sarsaparilla), the state threatened *Castilleja septentrionalis* (pale Indian paintbrush), *Deschampsia cespitosa* (hair grass), *Campanula rotundifolia* (harebell), *Carex rugosperma* (sedge), *Corydalis sempervirens* (pink corydalis), *Woodsia ilvensis* (rusty woodsia), and *Selaginella rupestris* (rock spike-moss). On the north side of Lake Superior in Ontario, Franklin's phacelia inhabits sand and gravel roadsides, lakeshores, and riverbanks (Keddy 1984), whereas Hultén (1968) simply notes the habitat in Alaska as sandy soils in disturbed sites. Dorn categorizes the habitat as "moist places in the mountains" in Wyoming (1992) and Montana (1984), and Howell (1945) generalized the habitat throughout the wide range as mountain slopes, meadows, burns, and clearings, typically occurring in gravelly soil.

**Biology:** *P. franklinii* grows as an annual or a biennial (Gillett 1960). Beyond this modest information, there is relatively little knowledge of the life history of this species, in contrast to the numerous taxonomic and systematic studies of the genus and family. Gillett (1963) conducted a detailed greenhouse study to determine flowering responses in the *P. franklinii* "group", an assemblage of six allied species similar in morphology, anatomy, and in their distinctive distributions north of 45° north latitude, the latter contrasting with most other phacelias. *P. franklinii* was confirmed as being a long-day regime species, with or without the application of

growth hormones (e.g. gibberellin). This is consistent with its range into far northern latitudes (up to 60° N), and perhaps corroborates its early emergence as a species within the genus prior to its subsequent northward migration and eventual wide distribution.

**Conservation/management:** Little is known about the current status of this somewhat obscure species on Isle Royale. Because records are so few, considerable care should be taken to protect known colonies and their habitats, and periodic monitoring is warranted in addition to surveys to identify new populations.

**Comments:** Gillett (1960) described *P. franklinii* as being perhaps the most widely distributed species in the genus, and noted that it tends to remain highly uniform throughout its range, displaying only slight variations in flower color and the stamens.

**Research needs:** Owing to the apparent paucity of natural history knowledge, virtually any study on the biology and ecology of this species would yield information useful for its management and perpetuation.

**Related abstracts:** Volcanic bedrock glade, downy oatgrass

#### Selected references:

- Constance, L. and T.I. Chuang. SEM survey of pollen morphology and classification in Hydrophyllaceae (waterleaf family). *Am. J. Bot.* 69: 40-53.
- Constance, L. 1963. Chromosome number and classification in Hydrophyllaceae. *Brittonia* 15: 273-285.
- Dorn, R. D. 1992. Vascular plants of Wyoming. Mountain West Publishing. Second edition. Cheyenne, Wyoming. 340 pp.
- Dorn, R. D. 1984. Vascular plants of Montana. Mountain West Publishing. Cheyenne, Wyoming. 276 pp.
- Ferguson, D.M. 1998. Phylogenetic analysis and relationships in Hydrophyllaceae based on ndhF sequence data. *Syst. Bot.* 23: 253-268.



Gillett, G. W. 1963. Flowering responses and phylogeny in the *Phacelia franklinii* group (Hydrophyllaceae). *Am. J. Bot.* 50: 798-801.

Gillett, G. W. 1962. Evolutionary relationships of *Phacelia linearis*. *Brittonia* 14: 231-236.

Gillett, G. W. 1960. A systematic treatment of the *Phacelia franklinii* group. *Rhodora* 62: 205-222.

Howell, J.T. 1945. Studies in *Phacelia* – revision of species related to *P. douglasii*, *P. linearis*, and *P. pringlei*. *Am. Midl. Nat.* 33: 460-494.

Hultén, E. 1968. *Flora of Alaska and neighboring territories*. Stanford University Press. 1008 pp.

Keddy, C. J. 1984. *Phacelia franklinii* (R. Br.) Gray in G. W. Argus & D. J. White, eds. *Atlas of the rare vascular plants of Ontario*. National Mus. Nat. Sci., Ottawa.

Lee, G.J. 1986. Systematic studies in the *Phacelia* Humiles group (Hydrophyllaceae): corolla venation patterns. *Am. J. Bot.* 73: 230-235.

NatureServe. 2007. NatureServe Explorer: an online encyclopedia of life [web application]. Version 6.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: October 15, 2007).

Slavick, A.D. and R.A. Janke. 1987. The vascular flora of Isle Royale National Park. *Mich. Bot.* 26: 91-134.

**Abstract citation:**

Penskar, M.R. 2008. Special Plant Abstract for *Phacelia franklinii* (Franklin's phacelia). Michigan Natural Features Inventory. Lansing, MI. 3 pp.

Copyright 2008 Michigan State University Board of Trustees.

Michigan State University Extension is an affirmative-action, equal-opportunity organization.

This project was funded, in part, by:

The Michigan Coastal Management Program,  
Michigan Department of Environmental Quality

and the

National Oceanic and Atmospheric Administration  
U.S. Department of Commerce

