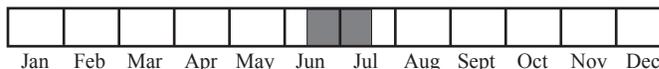


Best Survey Period



**Status:** Federal endangered; State threatened

**Global and state rank:** G1/S1

**Other common names:** Poweshiek skipperling, Poweshiek skipper

**Synonym:** *Oarisma poweshiek*

**Family:** Hesperiiidae (skippers)

**Range:** The Poweshiek skipperling has been reported from seven states and one Canadian Province. The core of its range at one time included western Minnesota, the eastern Dakotas, southern Manitoba and northern Iowa. There are scattered populations in Wisconsin and southern Lower Michigan (Opler et al. 2012) and historical records from northern Illinois and one site in northwest Indiana (Shull 1987). In recent years, this species has undergone a dramatic decline in the number of occupied sites and in the number of adults at remaining localities (Selby 2005). Because of this widespread decline, Poweshiek skipperling was listed as a federal endangered species in October 2014 (Department of the Interior, 2014).

**State distribution:** The Poweshiek skipperling has been reported from 23 sites in southern Lower

Michigan, where it has been documented from Jackson, Kent, Oakland, Lenawee, Livingston, and Washtenaw counties. However, most of these sites are historic, and the species is currently known from only eight locations in the state. Unlike the widespread and dramatic decline in overall adult numbers at sites in other states, three or four Michigan sites consistently support hundreds of adults, highlighting the overall importance of Michigan to the conservation of this species.

**Recognition:** The wingspan of the Poweshiek skipperling ranges from 0.9 – 1.25 in (26 – 32 mm). The wings are somewhat triangular and pointed at the tips. Upper wing surfaces are dark grayish-brown with an orange costal area on the forewing. The undersurface of the hindwing is pale brown and has veins covered with white scales; basal area veins are dark brown without white scales. The caterpillar is pale green with a dark green dorsal band outlined by cream lines (Nielsen 1999).

**Best survey time:** The single brooded, adult flight period for the Poweshiek skipperling stretches from mid-June through mid-July, with the peak abundance occurring in early July in most years. The best way to survey for this species is by meandering through potential habitat while checking nectar sources. Close-focusing binoculars can aid in spotting skipperlings



from a distance. In Michigan, the species consistently nectars on black-eyed Susan) or perches on flowering forbs and grasses. With experience, adults are easy to recognize by their whirling flight pattern that exhibits a lot of forewing movement with little forward velocity (Glassberg 1999).

**Habitat:** In Michigan, the Poweshiek skipperling occurs exclusively in prairie fen habitats. Prairie fen is a wetland community dominated by sedges, grasses, and other graminoids that occurs on moderately alkaline organic soil and marl south of the climatic tension zone in southern Lower Michigan (Kost et al. 2007). The community typically contains multiple, distinct zones of vegetation, some of which contain prairie grasses and forbs. The buildup of organic matter around springs and seeps allows some prairie fen complexes to support both areas of “domed fen,” which appear as broad, round hills comprised of organic soils in the middle of the wetland, and “hanging fen,” which occur as low-gradient slopes of organic soil that can span from the upland edge across the wetland to meet level vegetation zones such as sedge meadow or marl flat (Kost et al. 2007).

Common forbs in Poweshiek skipperling habitat include joe-pye-weed (*Eutrochium maculatum*), common boneset (*Eupatorium perfoliatum*), smooth swamp aster (*Symphyotrichum firmum*), side-flowering aster (*S. lateriflorum*), swamp aster (*S. puniceum*), tall flat-top white aster (*Doellingeria umbellata*), whorled loosestrife (*Lysimachia quadriflora*), Virginia mountain mint (*Pycnanthemum virginianum*), black-eyed Susan (*Rudbeckia hirta*), Ohio goldenrod (*Solidago ohioensis*), Riddell’s goldenrod (*S. riddellii*), and bog goldenrod (*S. uliginosa*). Common ferns include sensitive fern (*Onoclea sensibilis*) and marsh fern (*Thelypteris palustris*). Graminoid dominants include the sedges *Carex stricta*, *C. buxbaumii*, *C. tetanica*, and *C. lasiocarpa*, hardstem bulrush (*Schoenoplectus acutus*), Indian grass (*Sorghastrum nutans*), fringed brome (*Bromus ciliatus*), and marsh wild-timothy (*Muhlenbergia glomerata*). Characteristic shrubs and trees include shrubby cinquefoil (*Dasiphora fruticosa*), dogwoods (*Cornus* spp.), poison sumac (*Toxicodendron vernix*), bog birch (*Betula pumila*), and tamarack (*Larix laricina*).

**Biology:** The Poweshiek skipperling has a single flight each year, with adults emerging in mid to late June

through late July, depending on weather conditions. Adults have been recorded as early as 9 June and as late as 21 July. In Michigan, adults readily nectar on black-eyed susan, pale spike lobelia (*Lobelia spicata*), shrubby cinquefoil, and sticky tofieldia (*Triantha glutinosa*). Other documented nectar sources include northern bedstraw (*Galium boreale*), joe-pye-weed, Indian-hemp (*Apocynum cannabinum*) and white camas (*Anticlea elegans*).

Poweshiek skipperlings in Michigan occur very locally within fens and are rarely found a great distance from either prairie dropseed (*Sporobolus heterolepis*, state special concern) or mat muhly (*Muhlenbergia richardsonis*, state threatened). Because of this close association, these grasses are suspected but not confirmed to be the larval host plants in Michigan. Prairie dropseed has been confirmed as a larval hostplant in Wisconsin (Borkin 1995). The common citation of golden-seeded spike-rush (*Eleocharis elliptica*) as the larval host plant is based on a single observation of a female Poweshiek skipperling ovipositing on that species (Holzman 1972). In southern Michigan, *Eleocharis elliptica* is a very widespread spike-rush (Reznicek et al. 2011), and many prairie fens which contain *E. elliptica* have been surveyed and have not yielded Poweshiek skipperlings. Thus, golden-seeded spike-rush is not a likely host plant for Poweshiek skipperling in Michigan.

Eggs are laid on or very near the host plant and hatch approximately 10 days later. Larvae continue to feed and, at the fifth instar, they initiate diapause (late September) and overwinter (Selby 2005 summarizing McAlpine 1972). Larvae do not construct shelters for overwintering like some skippers, but rest head down on grass blades or stems between periods of feeding. Larvae overwinter in a similar position (Borkin 1995; R. Dana, Minnesota DNR, pers. comm.). Larval activity and feeding resumes in early spring (around April 1); the total number of instars is not definitively known but likely numbers eight or nine (McAlpine 1972).

**Conservation/management:** Small colony sizes and isolation due to past habitat loss are the primary threats facing the Poweshiek skipperling in Michigan. Current stressors include habitat destruction for residential and commercial development, incompatible agricultural practices, and the rapid spread of invasive species. These disturbances and potentially others, have reduced



the distribution of this species to a few remaining high quality prairie fen systems.

At some Poweshiek skipperling sites nutrient contamination (especially encroachment of Na and Cl) from septic tanks, drain fields, and road salt application, is suspected of facilitating the spread and eventual dominance of invasive plant species such as *Typha angustifolia* (narrow-leaved cat-tail) and *Phragmites australis* subsp. *australis* (common reed). This phenomenon has been documented in fens in northern Illinois (Panno et al. 1999) and in Massachusetts (Richburg et al. 2001).

Management of prairie fen habitat for Poweshiek skipperling is complicated by a variety of factors. A well-designed habitat management plan that outlines specific goals, quantifiable objectives, and a detailed monitoring plan should be completed and implemented for each site that supports Poweshiek skipperling. Some prairie fens currently occupied by Poweshiek skipperling could benefit from burn management, which can increase acreage of open habitat zones, increase plant diversity (Bowles et al. 1996), and increase populations of prairie dropseed (Dix and Butler 1954, Ehrenreich and Akiman 1957) and mat muhly (Anderson and Bailey 1980). Prescribed fire can also be used to reduce woody cover and reduce populations of invasive plant species that are not adapted to fire (Kohring 1982, Zimmerman 1983). However, burns alone will not control certain invasive species such as cattail (Nelson 1966). Prescribed fire at sites which contain cattail should be used with caution. Other management practices, such as cutting and application of herbicide to cattail stems, are recommended prior to the implementation of prescribed fire. If burn management is to be used at Poweshiek sites, burn units should be established with special attention to microgeographic variation in the distribution of rare species and their host plants (Opler 1981). Dividing sites into several management units, burned in a rotation, should assure that a substantial fraction of the population be unexposed to fire in any prescribed burn. For this method to be effective, however, the distribution of Poweshiek skipperling within a site must be established and delineated so that it can be divided among several management units (Dana 1991).

**Research needs:** Dispersal capabilities and propensities have not been investigated, but field

observation suggests that non-prairie fen habitats are a strong barrier. Therefore, immigration is unlikely to help sustain small colonies or to reestablish colonies in suitable habitat once the species has been extirpated from a given site. Loss of genetic diversity due in part to this lack of dispersal is thus another possible threat. Life history studies should be conducted in the Great Lakes region to guide the development of more appropriate, specific management recommendations for this species. Studies should focus on larval ecology, population dynamics, dispersal capabilities of adults, and information on habitat requirements including larval foodplants.

Inventories should be conducted to determine where the skipperling occurs within a specific site before any management activities are implemented. For example, over the past three years, MNFI biologists have documented with GPS the locations of adults at seven fen sites being managed by agencies and partners for conservation (Slaughter et al. 2010), and this work should continue. Information on the speed and magnitude of recolonization by this species of burned fen management units should be collected to support the adaptive management process. The specific locations of overwintering larvae should also be determined. Questions such as the effect of prescribed burning on Poweshiek skipperling larval survival under different burn intensities and at different burn seasons should be addressed to better time burns or implement other management activities at sites that may pose a lesser threat to larval survival.

**Related abstracts:** prairie fen, prairie dropseed, mat muhly

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