

# Interim Core Map Documentation for Poweshiek Skipperling

January 17, 2025

Developed by US Environmental Protection Agency, Office of Pesticide Programs

## Species Summary

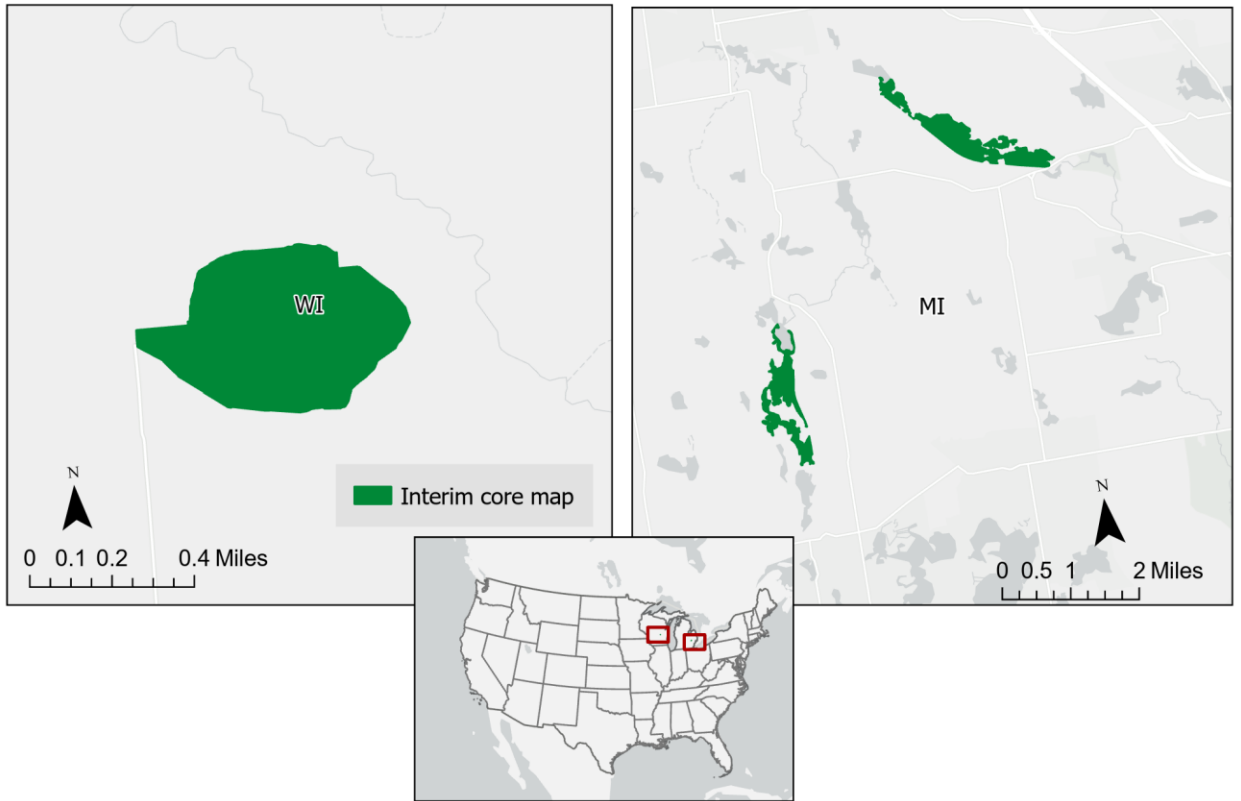
Poweshiek skipperling (*Oarisma poweshiek*; Entity ID 10147) is an endangered terrestrial invertebrate. This species' habitat includes remnant prairie areas including prairie fens, grassy lake and stream margins, moist meadows, and wet-to-dry-prairie. The species relies on high-quality habitat conditions and on natural or human disturbances that maintain the integrity of the plant communities, while minimizing mortality to vulnerable life stages. Poweshiek skipperlings need suitable grasses that serve as host plants for their larvae during the winter. Additional information on the species is provided in **Appendix 1**. This species is currently included in the Vulnerable Species Action Plan.

## Description of Core Map

The interim core map is based on biological information (known locations). The map includes three occupied critical habitat units that contain known extant populations. Areas within the species' range and critical habitat where the species has been reportedly extirpated are not included in the core map. **Figure 1** depicts the interim core map for Poweshiek skipperling. The size of this core map is approximately 770 acres.

The core map developed for Poweshiek skipperling is considered interim. This means that this core map will be used to develop pesticide use limitation areas (PULAs) that include the Poweshiek skipperling, but it will not be considered 'final' until a FWS species expert reviews the core map. Therefore, this interim core map may be revised in the future to incorporate expert feedback from FWS. This interim core map has a "limited" best professional judgment classification because limited judgment was needed to interpret GIS data sets or biological information for this core map.

This core map does not replace or revise any range developed by FWS for this species or its critical habitat. If re-introduction areas are identified in the future as part of recovery efforts, then EPA plans to update the core map to include those areas, as appropriate. Landcover categories within the core map area are included in **Table 1**. Landcover within the core map is predominantly captured by emergent herbaceous wetlands.



**Figure 1. Interim core map for Poweshiek skipperling that includes three occupied critical habitat units. Total acreage of the core map is approximately 770 acres.**

**Table 1. Percentage of Interim Core Map Represented by NLCD<sup>1</sup> Land Covers and Associated Example Pesticide Use Sites/Types.**

Example pesticide use sites/types	NLCD Class/Value	% Area	Total area for landcover type
Forestry	Deciduous Forest (41)	7	7
	Evergreen Forest (42)	0	
	Mixed Forest (43)	0	
Agriculture	Pasture/Hay (81)	0	0
	Cultivated Crops (82)	0	
Mosquito adulticide, residential	Open space, developed (21)	0	0
	Developed, Low intensity (22)	0	
	Developed, Medium intensity (23)	0	
	Developed, High intensity (24)	0	
Invasive species control	Woody Wetlands (90)	2	93
	Emergent Herbaceous Wetlands (95)	91	
	Open water (11)	0	
	Grassland/herbaceous (71)	0	
	Scrub/shrub (52)	0	
	Barren land (rock/sand/clay; 31)	0	
<b>Total Acres</b>	<b>Interim Core Map Acres</b>	<b>~ 770 acres</b>	

## Evaluation of Known Location Information

Four datasets with known location information were evaluated:

- Descriptions of locations provided by FWS;
- Occurrence locations in iNaturalist;
- Occurrence locations in GBIF; and
- Occurrence locations in NatureServe.

FWS reports that there are currently 3 extant locations in the United States for this species: 2 in Michigan and 1 in Wisconsin (2024 5-year review, see Appendix 1). Recent element occurrence data reported in iNaturalist, GBIF, and NatureServe include occurrences in Michigan, Wisconsin, and Canada. Historical occurrence data were noted in other locations that are considered extirpated. These data are consistent with FWS reports. **Appendix 1** includes more information on the available known location information. The occurrence data are consistent with using the three occupied critical habitat units as the core map.

<sup>1</sup> Dewitz, J., 2023, National Land Cover Database (NLCD) 2021 Products: U.S. Geological Survey data release, <https://doi.org/10.5066/P9JZ7A03>

## Approach Used to Create the Core Map

The core map was developed using the “Process EPA Uses to Develop Core Maps for Draft Pesticide Use Limitation Areas for Species Listed by the U.S. Fish & Wildlife Service (FWS) and their Designated Critical Habitats”<sup>2</sup> (referred to as “the process”). This core map was developed by EPA using the 4 steps described in the process document:

- 1) Compile available information for a species;
- 2) Identify core map type;
- 3) Develop the core map for the species; and
- 4) Document the core map.

For step 1, the developer compiled available information for Poweshiek skipperling from FWS, as well as observational information available from various publicly available sources (including iNaturalist, GBIF and NatureServe). The information compiled for Poweshiek skipperling is included in **Appendix 1**. Influential information that impacted the development of the core map included:

- Reports from FWS that this species only has extant occurrences in two of its critical habitat units in Michigan, and in one of its critical habitat units in Wisconsin.

For step 2, compiled information was used to identify the core map type. Information considered by the developer included the species range, known locations, and biological/habitat information. EPA did not select the species range or its entire critical habitat as the core map type because the range and critical habitat include areas that do not contain extant populations of the species. The species is currently known to occur in two critical habitat units in Michigan and one critical habitat unit in Wisconsin. Therefore, the biological information core map type (focusing on occupied critical habitat units) was selected.

For step 3, the best available data sources were used to generate the core map. For this core map, EPA used occupied critical habitat units. The core map development process began with the ECOS critical habitat for the species, then selected for occupied critical habitat units MI-3, MI-4, and WI-2 (see Appendix 1 for more information on critical habitat units).

**Appendix 1 and Appendix 2** provide more details on the data and GIS analysis used to generate the core map.

## Discussion of Approaches and Data that were Considered but not Included in Core Map

The developer considered using the species range and preferred habitat within the range as the core map, but determined that the core map could be best defined by utilizing the three occupied critical habitat units.

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<sup>2</sup> Dated 2024, available online at: <https://www.epa.gov/endangered-species/process-epa-uses-develop-core-maps-draft-pesticide-use-limitation-areas>

## Appendix 1. Information Compiled for the Poweshiek Skipperling

### 1. Recent FWS Documents

- ECOS Species information. <https://ecos.fws.gov/ecp/species/9161>
- Poweshiek Skipperling (*Oarisma Poweshiek*) 5-year Review 2024 August 6, 2024. [https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public\\_docs/species\\_nonpublish/16281.pdf](https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/16281.pdf)
- Poweshiek Skipperling (*Oarisma Poweshiek*) 5-year Review. September 30, 2019 [https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public\\_docs/species\\_nonpublish/2907.pdf](https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/2907.pdf)
- Endangered and Threatened Wildlife and Plants: Dakota Skipper and Poweshiek Skipperling; Designation of Critical Habitat. October 1, 2015. <https://www.regulations.gov/document/FWS-R3-ES-2013-0017-0078>
- Endangered and Threatened Species: Designation of Critical Habitat for Dakota Skipper and Poweshiek Skipperling; Correction. April 3, 2018. <https://www.regulations.gov/document/FWS-R3-ES-2013-0017-0081>
- Recovery Plan for Poweshiek Skipperling (*Oarisma Poweshiek*). March 14, 2022. [https://ecos.fws.gov/docs/recovery\\_plan/20220310\\_POSK\\_Final%20Recovery\\_Plan\\_508.pdf](https://ecos.fws.gov/docs/recovery_plan/20220310_POSK_Final%20Recovery_Plan_508.pdf)
- Poweshiek Skipperling (*Oarisma Poweshiek*) Species Needs Assessment. July 2021. [https://ecos.fws.gov/docs/recovery\\_plan/Poweshiek%20Skipperling%20Species%20Needs%20Assessment\\_508%20compliant\\_1.pdf](https://ecos.fws.gov/docs/recovery_plan/Poweshiek%20Skipperling%20Species%20Needs%20Assessment_508%20compliant_1.pdf)

### 2. Background Information

- **Status:** Federally listed as endangered in 2014
- **Habitat, Life History, and Ecology**  
Poweshiek skipperling habitat includes remnant prairie areas including prairie fens, grassy lake and stream margins, moist meadows, sedge meadows, and wet-to-dry prairie.” (2022 Recovery Plan)

“The species relies on high-quality habitat conditions and on natural or human disturbances that maintain the integrity of the plant communities, while minimizing mortality to vulnerable life stages.” (2022 Recovery Plan)

“The species overwinters as a larvae above ground on the blades or stem of the host plant; thus they also need habitat that provides a suitable microclimate for shelter during winter.” (2022 Recovery Plan)

- **Diet:** “During the short time adults are alive (2-4 weeks in summer), they need sufficient high-quality nectar from flowers for feeding and healthy and abundant suitable grasses (host plants) for oviposition (laying eggs). Larvae need sufficient host grasses to feed on throughout the summer, as well as suitable microhabitat (temperature and humidity).” (2022 Recovery Plan)

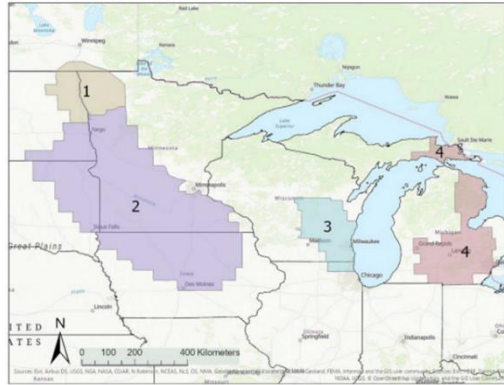
- **Taxonomy:** Terrestrial invertebrate

- **Relevant Recovery Criteria and Recovery Actions**

Below is information taken from the 2022 recovery plan for the Poweshiek skipperling regarding recovery criteria and recovery actions.

**Recovery criteria** (2022 Recovery Plan)

- “36 populations distributed among 4 conservation units.” Recovery units are illustrated in Figure A1-1.
- “Threats and causes of decline have been reduced or eliminated and mechanisms are in place that provide a high level of certainty that the downlisting criteria will continue to be met into the foreseeable future.”
- “Population abundance, numbers, and distribution will be maintained at the levels that meet downlisting criteria.”
- “Sufficient quality and quantity of suitable habitat will be maintained, with implementation of compatible management regimes.”
- “The negative effects of the primary threats (both those that are currently known and those that are identified in the future, including but not limited to, habitat loss and degradation, small population dynamics, pesticides, disease, and effects of climate change) will be eliminated or reduced to a level that the downlisting criteria will be maintained. Maintaining these reduced threat levels may necessitate ongoing management commitments.”



**Figure 1.** Map of Poweshiek skipperling conservation units (shaded polygons, labeled with respective unit numbers). Conservation unit boundaries encompass unique adaptive diversity of the species, including genetics, habitat, and historical distribution. Boundary lines are generally drawn to county lines for ease of conservation implementation.

**Criterion A:** A minimum number of healthy populations of Poweshiek skipperling exist in each of the 4 conservation units (Figure 1) as specified in Table 1.

Table 1: Number of healthy populations distributed throughout the unit.

Conservation Unit	Number of Healthy Populations
1: Southeastern Manitoba, Northwestern Minnesota, and Northeastern North Dakota	6 (At least 2 populations in Canada and 2 in the United States)
2: Southeastern North Dakota, Central and Southwestern Minnesota, Northeastern South Dakota, and Central and Northern Iowa	23
3: Southeastern Wisconsin and Northeastern Illinois	2
4: Michigan	5

**Figure A1-1. Identification of Conservation Units and target minimum number of healthy populations in each unit (actual number of healthy and extant populations in each recovery unit are in Figure A1-2 below)**

- **Recovery Actions** (taken from the 2022 Recovery Plan)
  - **Manage, protect, and enhance populations.** Actions include: (1) augmenting existing populations through captive rearing; (2) restoring key historical populations through reintroductions or translocations; (3) developing and refining captive rearing collection, husbandry, and release techniques; and (4) conducting research to understand biological and ecological, genetic, and life-history requisites to maintain or restore populations.
  - **Manage, protect, and enhance habitat.** Actions include: (1) creating and implementing population-specific adaptive land management and protection plans; (2) maintaining and enhancing habitat at existing populations and at potential reintroduction sites; (3) creating and implementing best management practices across the range; (4) conducting land acquisition as needed to maintain or enhance existing and new populations; (5) monitor habitat restoration and refine management using adaptive management; and (6) conducting research to understand habitat requisites and management practices to maintain or restore populations.
  - Assess population and habitat status through monitoring and surveys.
  - Increase understanding of threats and alleviate threats into the foreseeable future:

- Research to determine the pesticide loads at extant sites and potential reintroduction sites and to determine the effects of pesticides on Poweshiek skipperling or an appropriate surrogate species.
  - Research the effects of: (1) climate on the species and determine measures to alleviate those effects; (2) pests, pathogens, and parasites and determine measures to alleviate those effects; and (3) interacting and emerging threats and determine measures to alleviate those effects.
  - Implement informed practices to reduce the effects of threats.
- Engage the public and partners in Poweshiek skipperling conservation.

### 3. Range

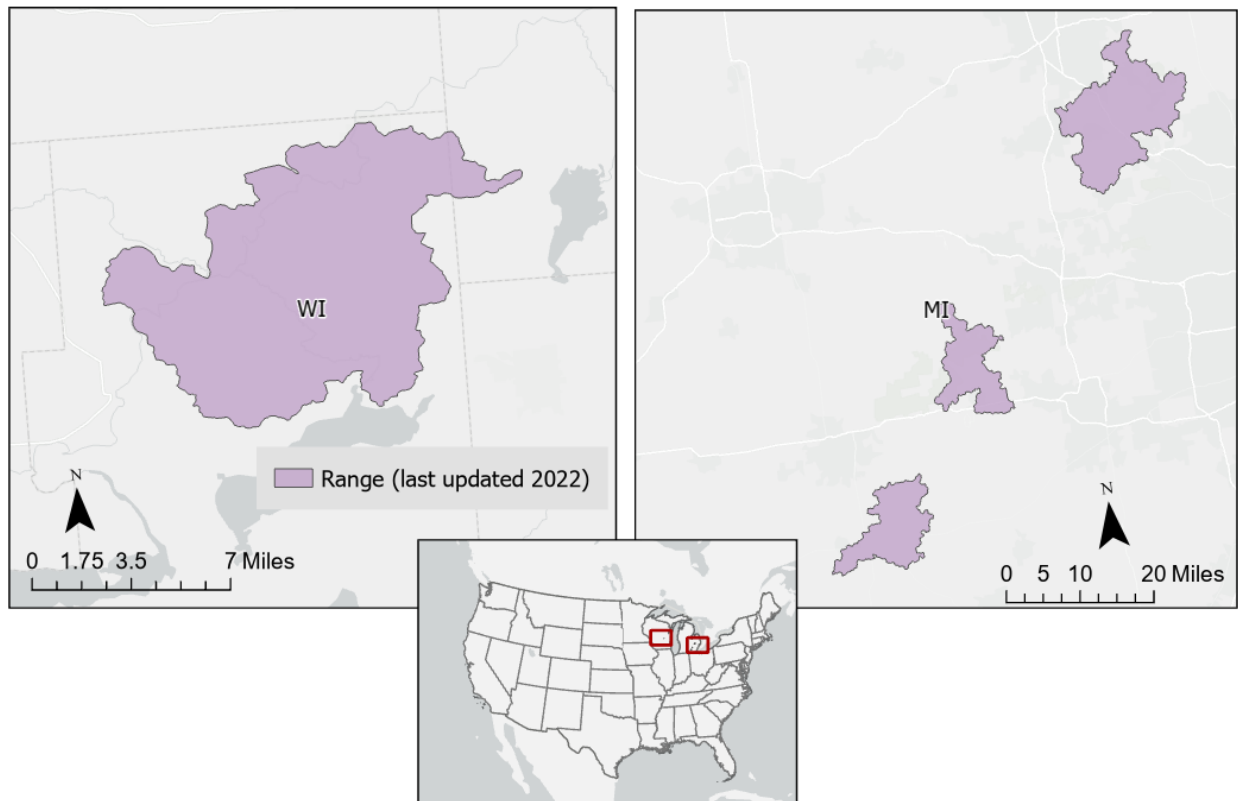
- Species range was last updated in 2024 (5-Year Review)
- “Out of the 298 historically documented Poweshiek skipperling sites, there are currently 3 sites (Springfield Township (Michigan), Rose Valley (Michigan), and Tallgrass Prairie Reserve (Manitoba)) where the species is considered present (2024 5-year Review).”
- Table 1. (below), shows the number of populations in the different conservation units within the range for the Poweshiek skipperling (2024 5-Year Review).

**Table 1.** Number of healthy populations distributed throughout each unit as of 2023.

Conservation Unit	Target Number of Healthy Populations (per the Recovery Criteria)	Current Number of Extant Populations (not currently healthy)	Current Number of Healthy Populations
1: Southeastern Manitoba, Northwestern Minnesota, and Northeastern North Dakota	6  (At least 2 populations in Canada and 2 in the United States)	Canada: 2  U.S.: 0	0
2: Southeastern North Dakota, Central and Southwestern Minnesota, Northeastern South Dakota, and Central and Northern Iowa	23	0	0
3: Southeastern Wisconsin and Northeastern Illinois	2	0	0
4: Michigan	5	2	0

**Figure A1-2.** Table 1 from the 2022 5-Year Review, which tabulates the target number of healthy populations, number of extant populations, and current number of healthy populations in 4 recovery units





**Figure A1-3.** ECOS Range for poweshiek skipperling. Total acreage of range is approximately 268,000 acres.

#### 4. Critical Habitat

- Final critical habitat was designated in 2015 and updated in 2018. The following information was taken from [50 CFR Part 17](#), which describes the critical habitat designation for this species.
- FWS is “designating 56 units as critical habitat for Poweshiek skipperling. The critical habitat areas described in the FR 2015 constitute the best assessment at this time of areas that meet the definition of critical habitat. Those 56 units are: (1) PS Iowa Units 1-11; (2) PS Michigan Units 1-9; (3) PS Minnesota Units 1-20; (4) PS North Dakota Units 1 and 2; (5) PS South Dakota Units 1-8, 15-18; and (6) PS Wisconsin Units 1 and 2. (The unit numbers are discontinuous because the same unit names that were used in the proposed designation were retained, although some units have been excluded in the final determination.)” (2015 Designation of Critical Habitat)
- These units are determined by 4 primary constituent elements (PCE) that identify the physical or biological features essential to the conservation of the Poweshiek skipperling in areas occupied at the time of listing. (2015 Designation of Critical Habitat)

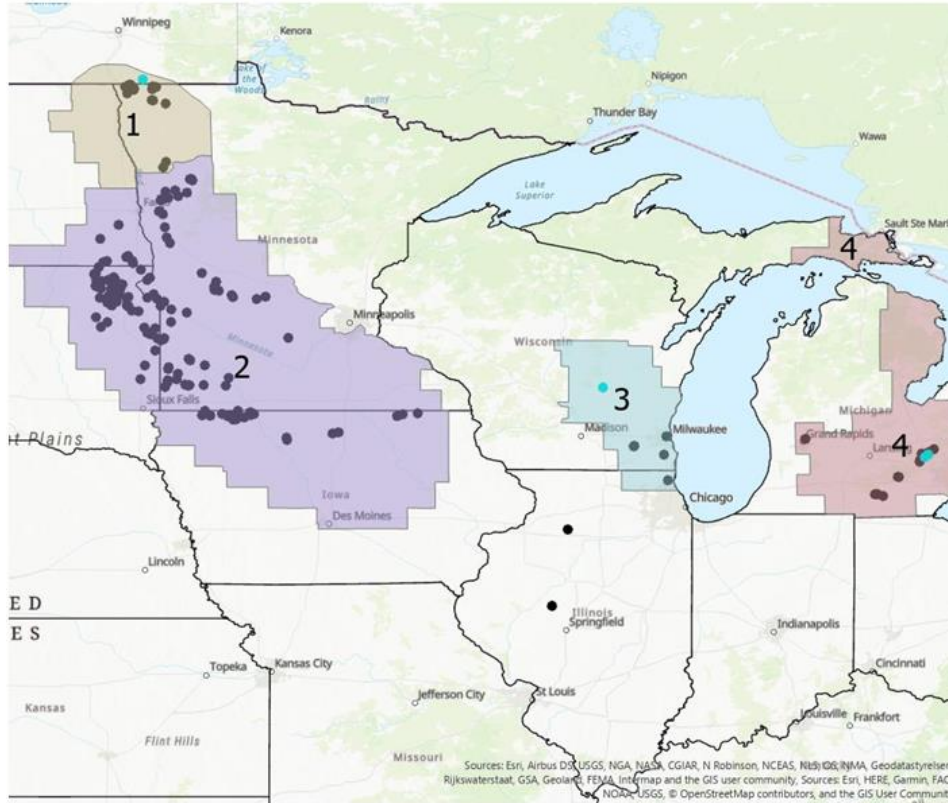
- PCE1: “Wet-mesic to dry tallgrass remnant untilled prairies or remnant moist meadows containing a predominance of native grasses and native flowering forbs; and undisturbed (untilled) glacial soil types including, but not limited to, loam, sandy loam, loamy sand, gravel, organic soils (peat), or marl that provide the edaphic features conducive to Poweshiek skipperling larval survival and native prairie vegetation.” PCE2: “Prairie fen habitats containing features listed in PCE1; depressional wetlands or low wet areas, within or adjacent to prairies that provide shelter from high summer temperatures and fire; and Hydraulic features necessary to maintain prairie fen plant communities.” PCE3: “Native grasses and native flowering forbs for larval and adult food and shelter.” PCE4: “Dispersal grassland habitat that is within 1 km (0.6 mi) of native high quality remnant prairie (as defined in Primary Constituent Element 1) that connects high quality wet-mesic to dry tallgrass prairies, moist meadows, or prairie fen habitats. Dispersal grassland habitat consists of the following physical characteristics appropriate for supporting Poweshiek skipperling dispersal: Undeveloped open areas dominated by perennial grassland with limited or no barriers to dispersal including tree or shrub cover less than 25 percent of the area and no row crops.”

The critical habitat designation documents report that “In total, approximately 25,888 acres (10,477 hectares) in Cerro Gordo, Dickinson, Emmet, Howard, Kossuth, and Osceola Counties, Iowa; Hillsdale, Jackson, Lenawee, Livingston, Oakland, and Washtenaw Counties, Michigan; Chippewa, Clay, Cottonwood, Douglas, Kittson, Lac Qui Parle, Lincoln, Lyon, Mahanomen, Murray, Norman, Pipestone, Polk, Pope, Swift, and Wilkin Counties, Minnesota; Richland County, North Dakota; Brookings, Day, Deuel, Grant, Marshall, Moody, and Roberts Counties, South Dakota; and Green Lake and Waukesha Counties, Wisconsin, fall within the boundaries of the critical habitat designation for Poweshiek skipperling.” (2015 Designation of Critical Habitat).

Only units MI-3, MI-4, and WI-2 are considered occupied (Five Year Review, 2024).

### **Known Locations**

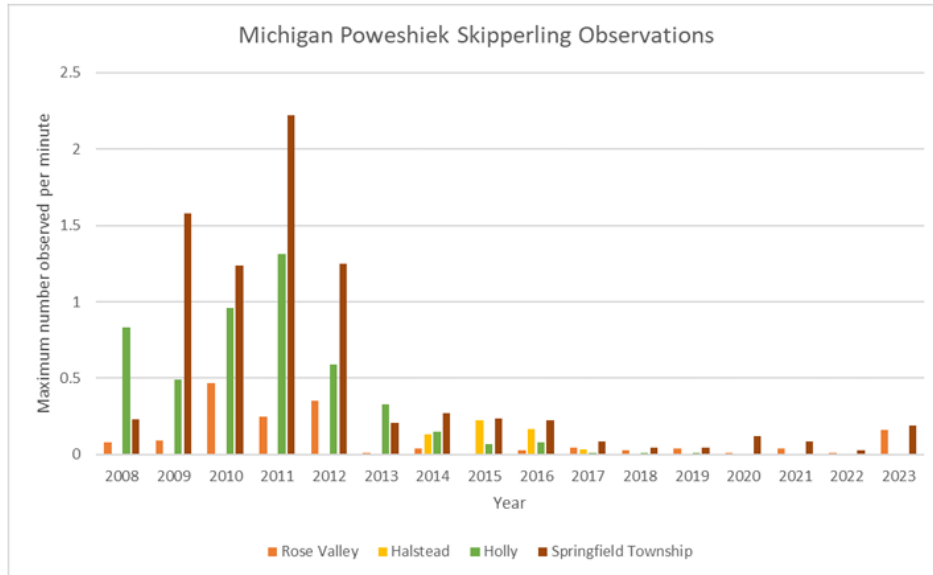
- Known locations summarized in FWS reports:
  - Based on the 2024 5-Year Review, there are currently 3 extant locations in the United States for this species: 2 in Michigan and 1 in Wisconsin (see image below from the 2024 5-Year Review, black dots are historical occurrences, blue dots are current). In addition to these locations, there is one extant population in Manitoba, Canada.



**Figure 1.** Conservation Units as delineated in the 2022 Recovery Plan for the Poweshiek Skipperling. Blue dots represent areas where the species is still considered extant as of 2023, except for the blue dot in Wisconsin, where the status is unknown. Black dots indicate historical records of the species.

**Figure A1-4.** Figure 1 from the 2024 5-year review showing current and historical occurrences.

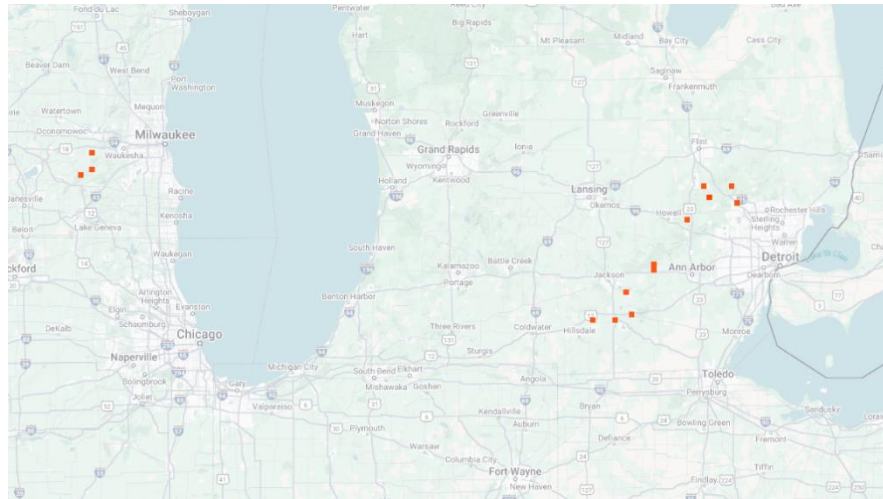
- Michigan sites include two currently occupied sites, Rose Valley and Springfield Township. Springfield township includes 3 sub-sites. “Two Michigan sites are currently classified as present, out of the nine that had present status at the time of listing and 3 at the time of the last five-year status review.” (2024 5-Year Review). The numbers of individuals detected at these remaining present sites have been variable since the last status review, with daily counts of 19 individuals in 2023 at Rose Valley and 58 individuals at Springfield Township” (2024 5-Year Review, see image below which includes a figure from the 2024 5-Year Review with counts found at each site).



**Figure 2.** Maximum number of Poweshiek skipperling individuals observed per minute by year for the Michigan sites where the species is currently considered present. Note that 3 sub-sites are grouped within the Springfield Township site.

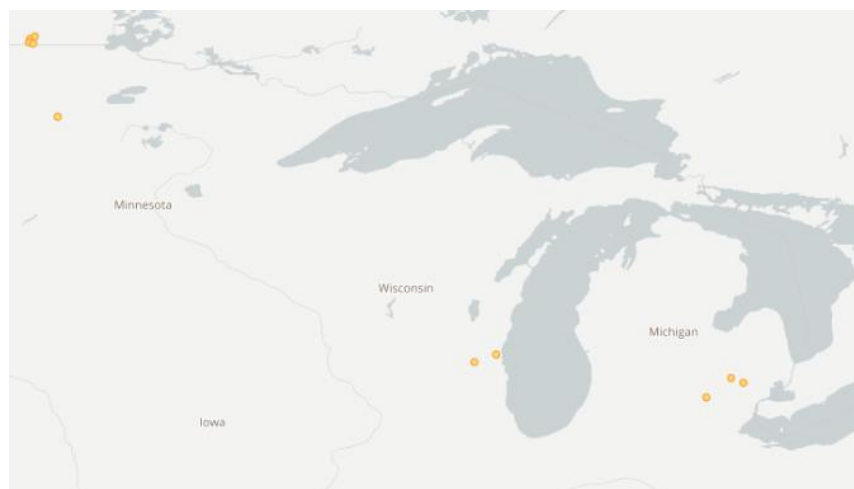
**Figure A1-5.** Figure 2 taken from the 2024 5-year review showing additional information on occurrences in MI.

- Wisconsin currently includes 1 extant site the Puchyan Prairie. “At the time of listing, there were three sites with unknown occupancy and one site where Poweshiek skipperling were present. The three sites with previously unknown occupancy are now all considered extirpated. The site with Poweshiek skipperling presence, Puchyan Prairie, is still considered to be present. Since 2012, no more than three Poweshiek skipperlings have been observed in a given year at that site. In both 2017 and 2018, there was one individual sighted; however, no photo documentation confirms these sightings.” (2019 5-Year Review)
- Minnesota, Indiana, Illinois, Iowa, North Dakota, and South Dakota do not currently have occupied sites. "Since the time of listing, there have been no sightings in Minnesota, Indiana, Illinois, North Dakota, and South Dakota. There are no sites where the Poweshiek skipperling is currently considered present in those states." (2024 5-Year Review).
- iNaturalist Occurrences of the Poweshiek skipperling can be found [here](#).
  - iNaturalist includes 16 research grade occurrences found in either Michigan (12) or Wisconsin (4) between July of 2010 and July of 2023 (see map below). [A total of 28 research grade](#) observations are available between July 2010 and July 2024 which include sites in Canada and a site without coordinate information.



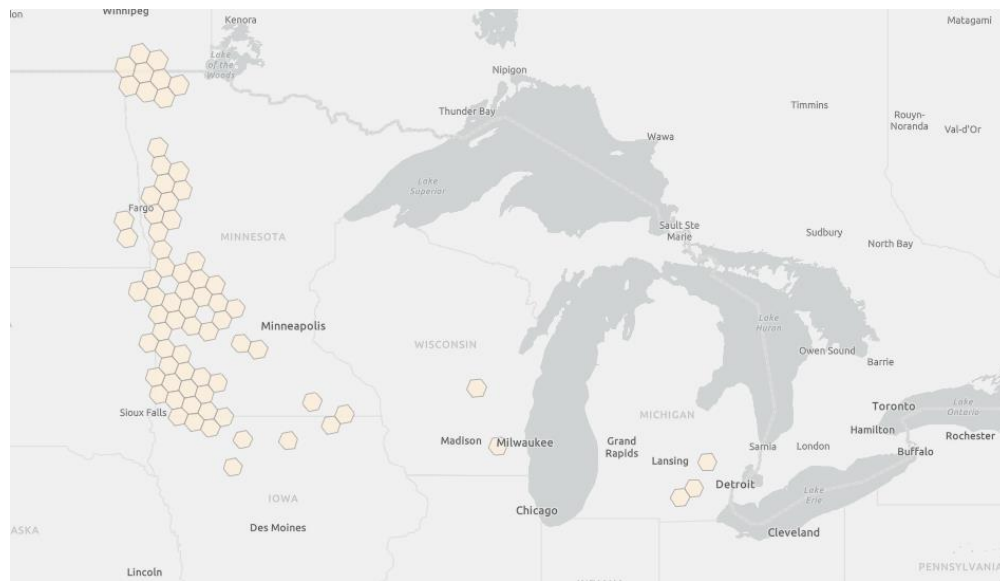
**Figure A1-6. iNaturalist occurrences for the Poweshiek Skipperling.**

- Global Biodiversity Information Facility (GBIF): [Link for 21 US occurrences and 38 total occurrences dated between 2009-2024](#)
  - The 21 observations or occurrences from 2009-2024 include the research grade observations from iNaturalist and several occurrences from the Lepidopterists’ Society Season Summary. The US occurrences are found in Michigan or Wisconsin. Additional occurrences are available outside of the US.
  - Occurrences from NatureServe are noted but do not include coordinates.
  - When considering a larger date range, additional occurrences found in Minnesota are added; however, FWS has stated these areas are extirpated. [Link for all occurrences](#)
  - No additional areas are identified for the core map by these occurrences, see map below.



**Figure A1-7. GBIF occurrences for the Poweshiek Skipperling**

- [NatureServe Explorer Pro](#)
  - Available public occurrence information from NatureServe Explorer Pro includes recent observations (2009- present) found in Michigan and Wisconsin, which aligns with the available research grade information from iNaturalist. No additional areas are identified.
  - In addition to the observations in Michigan and Wisconsin, NatureServe Explorer Pro includes older observation found in Minnesota, Iowa, North Dakota and South Dakota (pre 2009). FWS documents indicated the areas with the older observations are now considered extirpated.



**Figure A1-8. NatureServe Explorer Pro occurrences for the Poweshiek Skipperling**

## Appendix 2. GIS Data Review and Method to Develop the Core Map

The critical habitat was taken from the FWS ECOS page, and critical habitat units MI-3, MI-4, and WI-2 were selected from within the critical habitat to represent the core map for Poweshiek skipperling.

### 1. References and Software

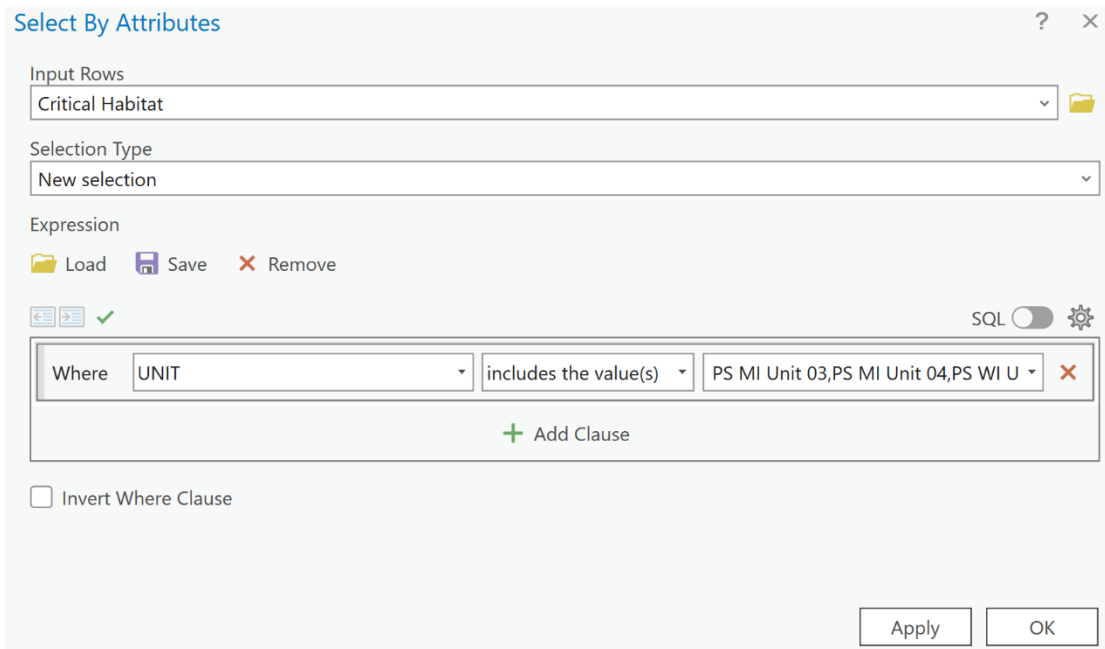
- USFWS Species critical habitat:  
[https://ecos.fws.gov/docs/crithab/zip/FCH\\_Oarisma\\_poweshiek\\_20151001.zip](https://ecos.fws.gov/docs/crithab/zip/FCH_Oarisma_poweshiek_20151001.zip)
- Software used: ArcGIS Pro version 3.2

## 2. Datasets Used in Core Map Development

### 2.1. Critical habitat

The critical habitat layer found in ECOS includes the 56 critical habitat units designated by FWS for Poweshiek skipperling: (1) PS Iowa Units 1-11; (2) PS Michigan Units 1-9; (3) PS Minnesota Units 1-20; (4) PS North Dakota Units 1 and 2; (5) PS South Dakota Units 1-8, 15-18; and (6) PS Wisconsin Units 1 and 2. Among the units, MI-3, MI-4, and WI-2 were selected from within the critical habitat to represent the core map for Poweshiek skipperling because these are the occupied areas for the species.

- 1) Units MI-3, MI-4, and WI-2 were selected using ArcGIS Pro “select by attributes” as below.



### 3. Create the Core Map

To create the core map, the selected features were exported into a separate layer using the export features tool. Core map name: Poweshiek\_Skipperling\_Interim\_Core\_Map.shp

### 4. Datasets Considered but Not Used in Core Map Development

EPA considered using the species range and preferred habitat within the range as the core map. However, this analysis would have resulted in greater uncertainty and would have included areas where the species is no longer extant. Therefore, the additional analysis would not have improved the core map. FWS documents clearly indicated where the extant populations exist, which are already mapped by critical habitat units. Therefore, the developer chose to base the core map on the three occupied critical habitat units.

- USFWS Species Range:  
[https://ecos.fws.gov/docs/species/shapefiles/usfws\\_IOW1\\_I01\\_Oarisma\\_poweshiek\\_current\\_range.zip](https://ecos.fws.gov/docs/species/shapefiles/usfws_IOW1_I01_Oarisma_poweshiek_current_range.zip)

