Interim Core Map Documentation for Tiny Polygala

Version 1

Review Completed: April 2026

Core Map Developer: U.S. Environmental Protection Agency (EPA) Office of Pesticide Programs (OPP)

Species Summary

The tiny polygala (*Polygala smallii*; Entity ID #989) is an endangered terrestrial plant (dicot). There is no designated critical habitat for this species. This species inhabits Pine Rockland and Florica Scrub habitat in southern Florida. The tiny polygala is fire dependent and appears, flowers, and lays dormant until the next fire. Additional information is provided in **Appendix 1**.

Description of Core Map

The core map for the tiny polygala is based on biological information. The outer extent of this core map was defined by six counties in southern Florida. EPA further refined this area to create the core map by removing habitats which aren't suitable to the species' biological needs.

Figure 1 depicts the resulting interim core map for the tiny polygala. The size of this core map is approximately 202,401 acres. Landcover categories within the core map area are included in **Table 1**. Wetlands constitute most of the core map. This is likely because hammocks from the statewide Florida Cooperative Land Cover map were included in the core map. Hammocks are island-like areas found on slightly higher ground in Florida's wetlands, and the suitable habitat for the tiny polygala (scrub and pine rockland) may exist in such elevated areas. In a national level dataset like NLCD, hammocks would appear blended in with the surrounding wetlands. By using the Florida Cooperative Land Cover map, unsuitable habitat for the species including swamps and mangroves and the various wet area surrounding hammocks could be stripped out of the core map, allowing only the areas that contain scrub and/or pine rockland (such as woody wetlands, evergreen forest, and cultivated lands) to be included in the core map.

The core map developed for the tiny polygala is considered interim. This core map will be used to develop pesticide use limitation areas (PULAs) that include the tiny polygala. This core map incorporates information developed by FWS and made available to the public; however, the core map has not been formally reviewed by FWS. This interim core map may be revised in the future to incorporate species expert feedback from FWS. This interim core map has an "average" (3) best professional judgment classification to describe major uncertainties/limitations. The map is based on locations described by FWS, and EPA removed some additional areas based on biological needs of the species. This core map does not replace or revise any range or designated critical habitat developed by FWS for this species.

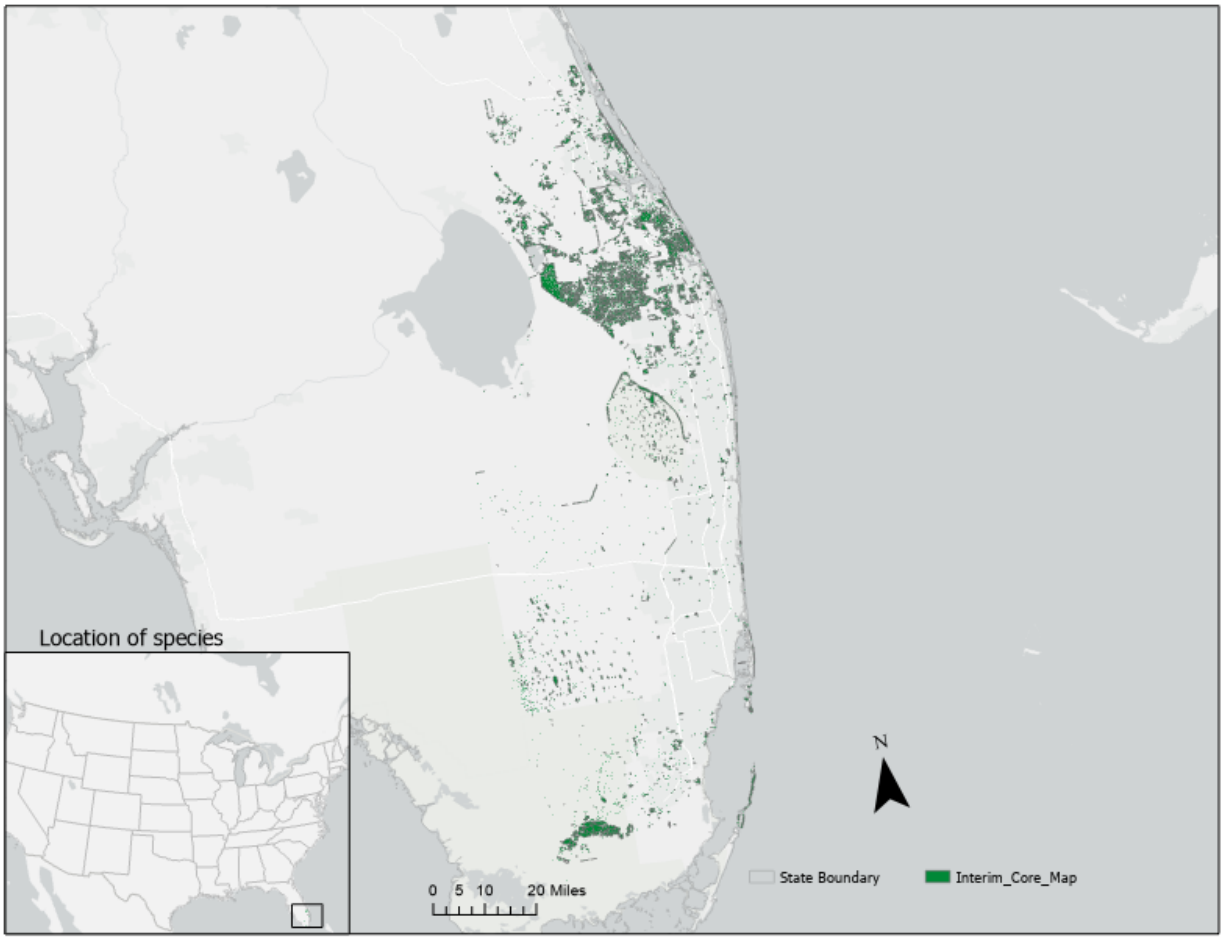

Figure 1. Interim core map for the tiny polygala. The map covers approximately 202,401 acres.

Table 1. Percentage of Interim Core Map Represented by National Land Cover Database (NLCD)[1] Land Covers and Associated Example Pesticide Use Sites/Types.

Example pesticide use sites/types	NLCD Landcover (Value)	% of core map represented by landcover
Forestry	Deciduous Forest (41)	0%
Forestry	Evergreen Forest (42)	7%
Forestry	Mixed Forest (43)	2%
Agriculture	Pasture/Hay (81)	2%
Agriculture	Cultivated Crops (82)	2%
Mosquito adulticide, residential	Open space, developed (21)	4%
Mosquito adulticide, residential	Developed, Low intensity (22)	2%
Mosquito adulticide, residential	Developed, Medium intensity (23)	1%
Mosquito adulticide, residential	Developed, High intensity (24)	0%
Invasive species control	Woody Wetlands (90)	59%
Invasive species control	Emergent Herbaceous Wetlands (95)	17%
Invasive species control	Open water (11)	1%
Invasive species control	Grassland/herbaceous (71)	1%
Invasive species control	Scrub/shrub (52)	2%
Invasive species control	Barren land (rock/sand/clay; 31)	0%
Total Acres	**Interim Core Map Acres**	**~ 202,401**

Evaluation of Known Location Information

There are four datasets with known location information:

- Descriptions of locations provided by FWS
- Occurrence locations in iNaturalist
- Occurrence locations in NatureServe
- Occurrence locations in the Global Biodiversity Information Facility (GBIF)

EPA evaluated these sets of data before selecting the type of and developing the core map. FWS appeared to have the finest resolution of the location information, providing a map that depicted the species range to a county level (**Figure A1-2 in Appendix 1**). Occurrences in iNaturalist, GBIF, and NatureServe did not support expanding the core map outside of these counties. **Appendix 1** includes more information on the available known location information.

[1] Dewitz, J., 2023, National Land Cover Database (NLCD) 2021 Products: U.S. Geological Survey data release, https://doi.org/10.5066/P9JZ7AO3

Approach Used to Create 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"[2] (referred to as "the process"). EPA developed the core map 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
4. Document the core map

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

- Occurrences and known locations of the tiny polygala are in six counties in Florida (Broward, Martin, Miami-Dade, Monroe, Palm Beach, St. Lucie);
- The species is found in scrub-like and pine rockland habitats.

For step 2, EPA used the compiled information to identify the core map type including species range and known location information. The extant populations are in six counties identified by FWS in Florida. Therefore, EPA based the core map on the known locations identified by FWS. EPA further refined this area by removing areas with unsuitable habitat to the species requirements. The entire range of the species was not used as the core map because the range contains areas where the species does not occur.

For step 3, EPA used the best available data sources to generate the core map. Data sources are discussed in the process document. For this core map, EPA used the counties identified by FWS (Broward, Martin, Miami-Dade, Monroe, Palm Beach, St. Lucie). EPA used the 2024 Florida Cooperative Land Cover data to remove areas that do not meet species requirements. A full list of included and removed areas, along with more details on Geographic Information System (GIS) analysis, are provided in **Appendix 2**.

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

EPA explored using GIS datasets that describe the species' dependency on fire to further refine the core map. However, this approach was not used because further removal of area would result in increased core map uncertainty.

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

Appendix 1. Information Compiled for the Tiny Polygala

1. **Recent FWS documents/links and other data sources**
   - Five Year Review (2021) https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/3234.pdf
   - Five Year Review (2011) (https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/1839.pdf)
   - Recovery Plan (1999) (https://ecos.fws.gov/docs/recovery_plan/140903.pdf)

2. **Background information**
   - **Status**: Federally listed as endangered in 1985
   - **Resiliency, redundancy, and representation** (the 3Rs)

     Resiliency: Lack of fire is a significant threat and this threat has increased while trends in other threats have continued at the same level. Accordingly, the overall species status is declining. (Five Year Review 2010)

     Redundancy: "Extant populations in Miami-Dade, Palm Beach, Martin, and St. Lucie Counties are fragmented, seed dispersal is unlikely, and sites are genetically isolated" (Five Year Review 2021)

     Representation: "The populations of this species are increasingly fragmented with three recently extirpated, though extirpated sites may reappear with appropriate management (Woodmansee et al. 2007), like at Savannas Preserve State Park (Rogers 2020). However, there have been no new sites or populations discovered since 2008 (FNAI 2019)." (Five Year Review 2021)

   - **Habitat**
     - Pine rocklands and scrub habitat (Five Year Review, 2010)
     - Seeds likely remain dormant until fire disturbs a site (Five Year review, 2021)
   - **Pollinator/reproduction**
     Plants typically appear, flower, and then disappear until the next fire or other suitable disturbance. (Five year review, 2021)
   - **Taxonomy**
     Terrestrial Plant
   - **Relevant Pesticide Use Sites**
     No information specific to pesticides.
   - **Recovery Criteria/Objectives (2006 recovery plan)**
     - [1] existing natural populations achieve and maintain a stable or increasing trend, evidenced by natural recruitment and multiple age classes. Each must be protected by a permanent conservation easement with a management agreement.
     - [2] a network of at least six new populations are either discovered or reintroduced that exhibit a stable or increasing trend, evidenced by natural recruitment and multiple age classes.
     - [3] all populations (criteria 1 and 2) are protected by a conservation mechanism.

- [4] threats have been reduced or eliminated to the degree that the species will remain viable for the foreseeable future.

3. Description of Species Range

- Figure A1-1 depicts the FWS range. The range was last updated on 2/15/2022 Total acreage of range is around 4,847,355 acres.

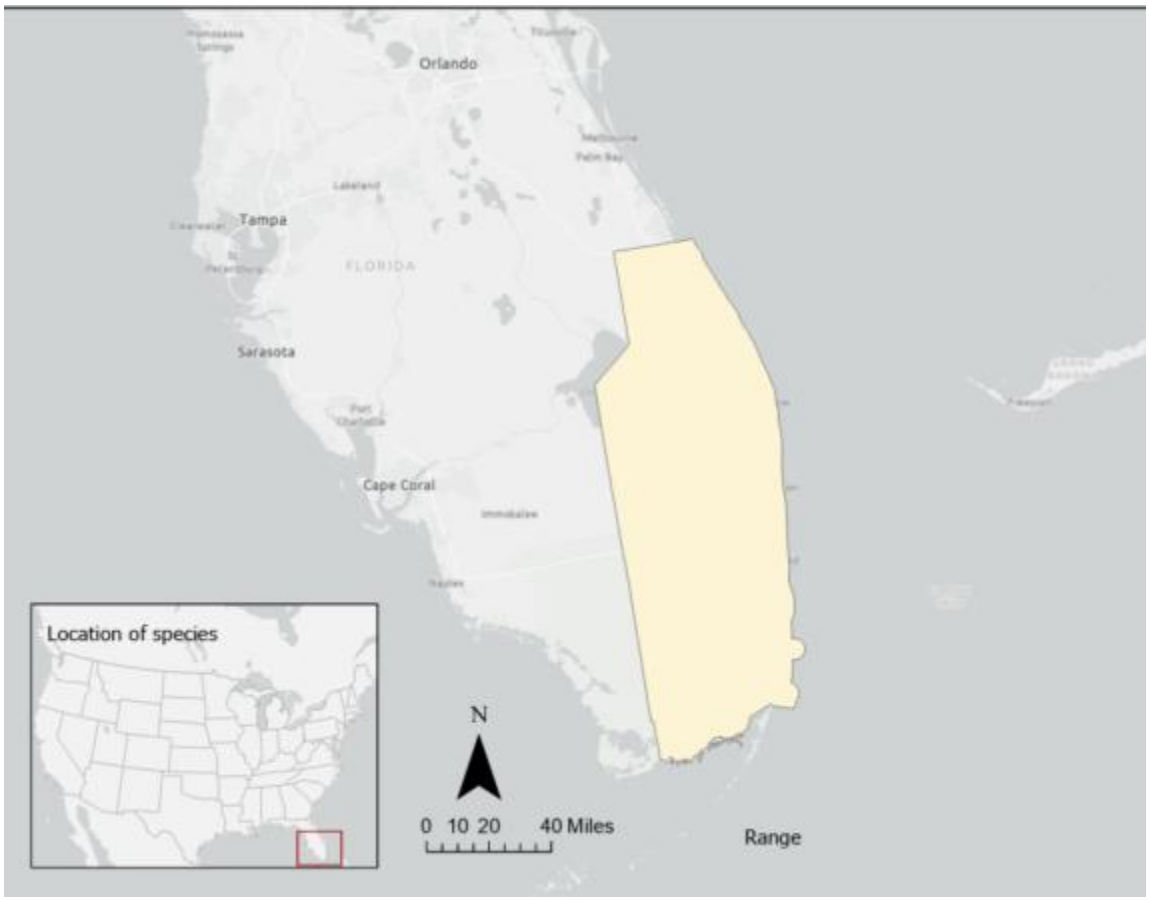

Figure A1-1. FWS range for the tiny polygala. The total acreage of the range is around 4,847,355 acres.

4. Critical Habitat

FWS has not designated a critical habitat for this species.

5. Known Locations

Known Locations Described in 2021 5 Year Plan

- Figure A1-2 depicts the currently known locations from FWS.

6. Occurrences Included in Public Databases

EPA queried iNaturalist, GBIF, and NatureServe. Collectively, the occurrence information is sparse and did not support expanding the core map beyond the species current range.

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

This core map was created based on biological information, including occupied location and species habitat. EPA used the range provided by FWS as a starting point for developing this core map. The initial range consists of six counties in southern Florida. These counties were refined to remove areas with unsuitable habitat.

1. **Dataset References and Software**

- Florida Cooperate Land Cover[3]
  - 10 m raster dataset that contains statewide land cover data
- Software used: ArcGIS Pro 3.5
- FWS Species Range – last updated on 2/15/2022

2. **Core Map Development**

- EPA started with the range provided by FWS during to set the outer extent of the core map. This map contains the counties in southern Florida which contain the FWS known locations for the species.
- This species has specific habitat requirements of Pine rockland and scrub-like habitat; therefore, non-suitable habitat was removed from the map.
  - Select by attributes, to include all landcover features which could be considered "Pine Rockland" or "Scrub-like" habitat. Cropland and other unsuitable landcover types were removed as part of this attribute selection. The "Select by attributes" expression in ArcGIS Pro included the following: Where NAME_STATE is equal to Coast Scrub OR Costal Strand OR Coastal Uplands OR Dry Prairie OR Hydric Hammock OR Keys Tidal Rock Barren OR Maritime Hammock OR Mesic Flatwoods OR Mesic Hammock OR Palmetto Prairie OR Pine Rockland OR Rockland Hammock OR Sand Pine Scrub OR Scrub OR Scrubby Flatwoods OR Scrub and Brushland OR Wet Flatwoods OR Xeric Hammock.
  - Create new layer from selection and use this as the interim core map (989_Tiny_Polygala_Interim_Core_Map.gdb), featured in Figure 1 of the main document.

[3] Florida Fish and Wildlife Conservation Commission. 2024. Cooperative Land Cover, Version 3.8- Published December 2024. https://myfwc.com/research/gis/wildlife/cooperative-land-cover/