Core Map Documentation for Carter's Small-Flowered Flax (*Linum carteri carteri*)

Core map development for species and critical habitat

ArcGIS Pro 3.3 was used to perform all spatial operations.

Version 2

Review Completed: February 2026

Core Map Developer: Tessenderlo Kerley Inc./GESTF

This core map has been reviewed by U.S. Fish and Wildlife (FWS) Species Expert(s)

Review Notes

The developers created this core map using the U.S. Environmental Protection Agency's (EPA) process available at: https://www.epa.gov/endangered-species/process-epa-uses-develop-core-maps-pesticide-use-limitation-areas. EPA reviewed the core map and documentation and evaluated if: (1) the map and documentation are consistent with the agency's process; (2) areas included or excluded from the core map are consistent with the biology, habitat, and/or recovery needs of the species; (3) data sources are documented and appropriate; and (4) the GIS data and mapping process are consistent with the stated intention of the developer. EPA agrees that this map is a reasonable depiction of core areas for this species and was consistent with the agency's mapping process. This documentation was not prepared by EPA, and EPA may have edited this documentation for clarity or other purposes. Some views expressed in this documentation may not necessarily be the viewpoints of EPA or its staff.

The core map developed for this species can be used to develop pesticide use limitation areas (PULAs). This core map incorporates information developed by the U.S. Fish and Wildlife Service (FWS) and made available to the public. The core map has been reviewed by a FWS species expert. This core map may be revised in the future to incorporate new data on this species as it becomes available.

This core map does not replace or revise any range or designated critical habitat developed by FWS.

Basis for Core Map: The core map for this species is based on critical habitat.

Level of Best Professional Judgement (EPA scale): 1-None; the core map is based on critical habitat with no additions or subtractions.

Uncertainties/Needs: No major data needs. FWS species lead review has confirmed that critical habitat is appropriate for this core map.

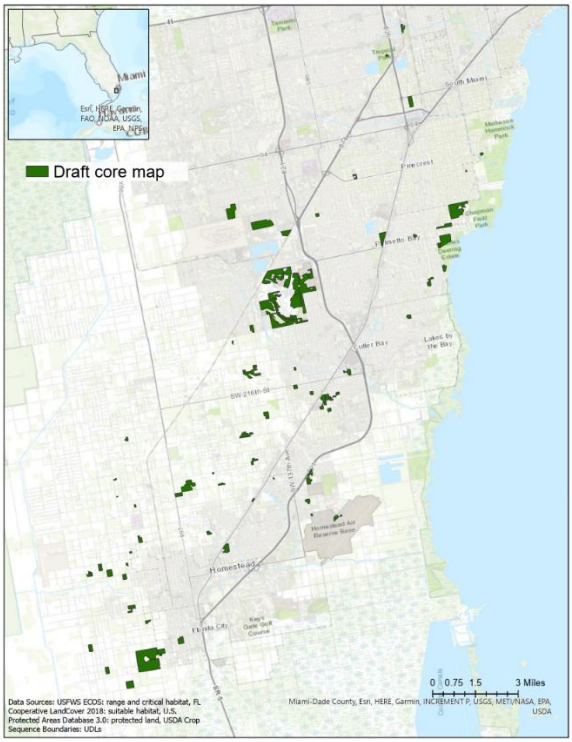

Figure 1. Carter's small-flowered flax core map based on critical habitat.

Percentage of Core Map Represented by NLCD[1] Land Covers and Associated Example Pesticide Use Sites/Types

Example pesticide use sites/types	NLCD Class/Value	% Area
Forestry	Deciduous Forest (41)	0
Forestry	Evergreen Forest (42)	16
Forestry	Mixed Forest (43)	12
Agriculture	Pasture/Hay (81)	1
Agriculture	Cultivated Crops (82)	4
Mosquito adulticide, residential	Open space, developed (21)	7
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)	28
Invasive species control	Emergent Herbaceous Wetlands (95)	17
Invasive species control	Open water (11)	0
Invasive species control	Grassland/herbaceous (71)	0
Invasive species control	Scrub/shrub (52)	12
Invasive species control	Barren land (rock/sand/clay; 31)	0
Total Acres	**Core Map Acres**	**~ 2,666 acres**

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

Key Core Area Inputs

Sourced from most up-to-date documentation available on ECOS.

Habitat	Descriptions/Datasets
Range	Last updated 2022
Critical habitat	Designated 2015 Consists of pine rockland habitat outside of Everglades National Park
Suitable habitat	Pine rockland and scraped edges adjacent to pine rockland in Miami-Dade County
Current locations	2023 5-yr review: 6 occurrences known, all but one are on protected land: Deering Estate, Old Dixie Pineland, Owaissa Bauer Addition EEL Preserve, R. Hardy Matheson EEL Preserve, Rockdale Pineland EEL Preserve, USDA Subtropical Horticulture Research Station (USDA Chapman Field Station)
Element occurrences	The Global Biodiversity Information Facility (GBIF), iNaturalist, and NatureServe were searched for occurrence data, however the occurrences found did not impact the core map.
Relevant recovery criteria	No relevant recovery criteria found

Datasets Used in Core Map Development

- ECOS Datasets:
  - Most recent species range: https://ecos.fws.gov/docs/species/shapefiles/usfws_Q14I_P01_Linum_carteri_carteri_current_range.zip
  - Most recent species critical habitat downloaded via aggregate feature class, current update status checked on individual species page: https://ecos.fws.gov/docs/crithab/zip/FCH_Linum_carteri_var_carteri_20150817.zip
  - Carter's small-flowered flax (Linum carteri var. carteri) 5-Year Review: 2023 https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/4467.pdf
- Other GIS Datasets:
  - Florida Cooperative Landcover dataset v3.7 https://myfwc.com/research/gis/wildlife/cooperative-land-cover/

Deciding Factors for Core Map Formation

- Six known locations, all occurring in the urban section of the range in Miami-Dade County. All but one of which is protected (Fig 2).
  - All protected (county and federal) populations can be mapped, and correlate with segments of the critical habitat

    - The Old Dixie Pineland location is the only private property location. It occurs on the same property as the South Miami-Dade Busway, so it is in the urban area of the range but location cannot be definitively identified.
- Because one location cannot be definitively identified, the entire critical habitat is used as the core map.
- Critical habitat consists of pine rockland habitat outside of Everglades National Park in Miami-Dade County. Critical habitat correlates well with pine rockland habitat, as seen in the Fig 3.
- Suitable pine rockland habitat was identified using the Florida Cooperative Landcover[2] dataset v3.7 (NAME_STATE = "Pine Rockland")
- FWS species experts recommended using critical habitat alone as the core map.

Core Map Development

- Most recent species range and critical habitat shapefiles were downloaded from ECOS.
- Critical habitat shapefile is used directly as the core map.

Site Name	Ownership	Most Recent Pop. Estimate (Month, Year)	Trend
Deering Estate	County	54 (March 2022)[a]	Undetermined
Old Dixie Pineland	Private	17 (March 2022)[a, b]	Undetermined
Owaissa Bauer Addition	County	65 (March 2022)[a]	Increasing
R. Hardy Matheson Preserve	County	885 (March 2022)[a]	Increasing
Rockdale Pineland Preserve	County	636* (March 2022)[a]	Increasing
USDA Subtropical Horticulture Research Station	Private	8,232 (May 2022)[c]	Increasing

[a]Fairchild unpublished data
[b]iNaturalist (2022)
[c]Possley et al. (2022)
*572 naturally-occurring plus 64 from seed augmentation study

[2] https://myfwc.com/research/gis/wildlife/cooperative-land-cover/

Figure 2. Table 1 from 2023 5-yr review showing current populations. All but one occur on protected land.

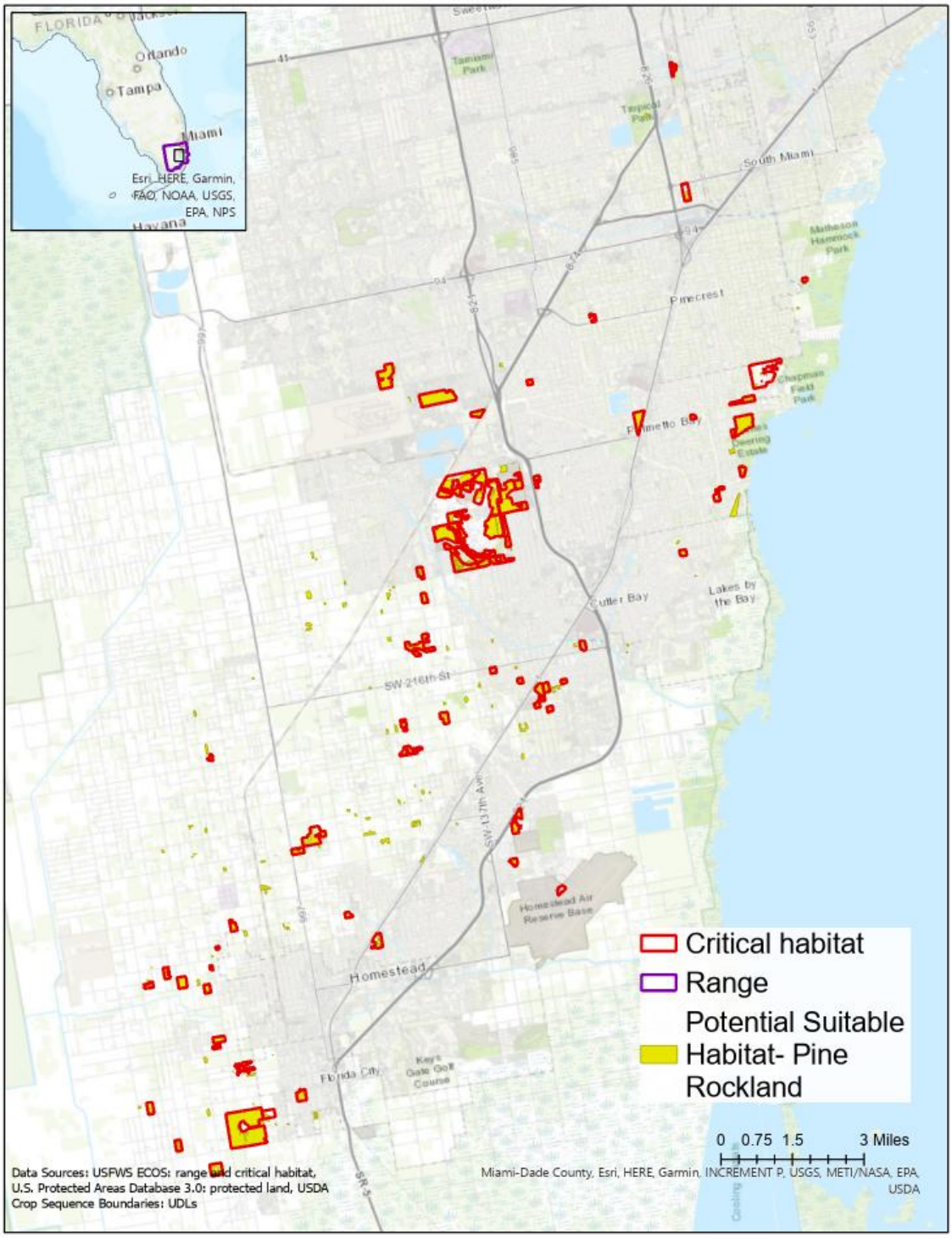

Figure 3. Critical habitat in relation to suitable habitat (pine rockland landcover type).

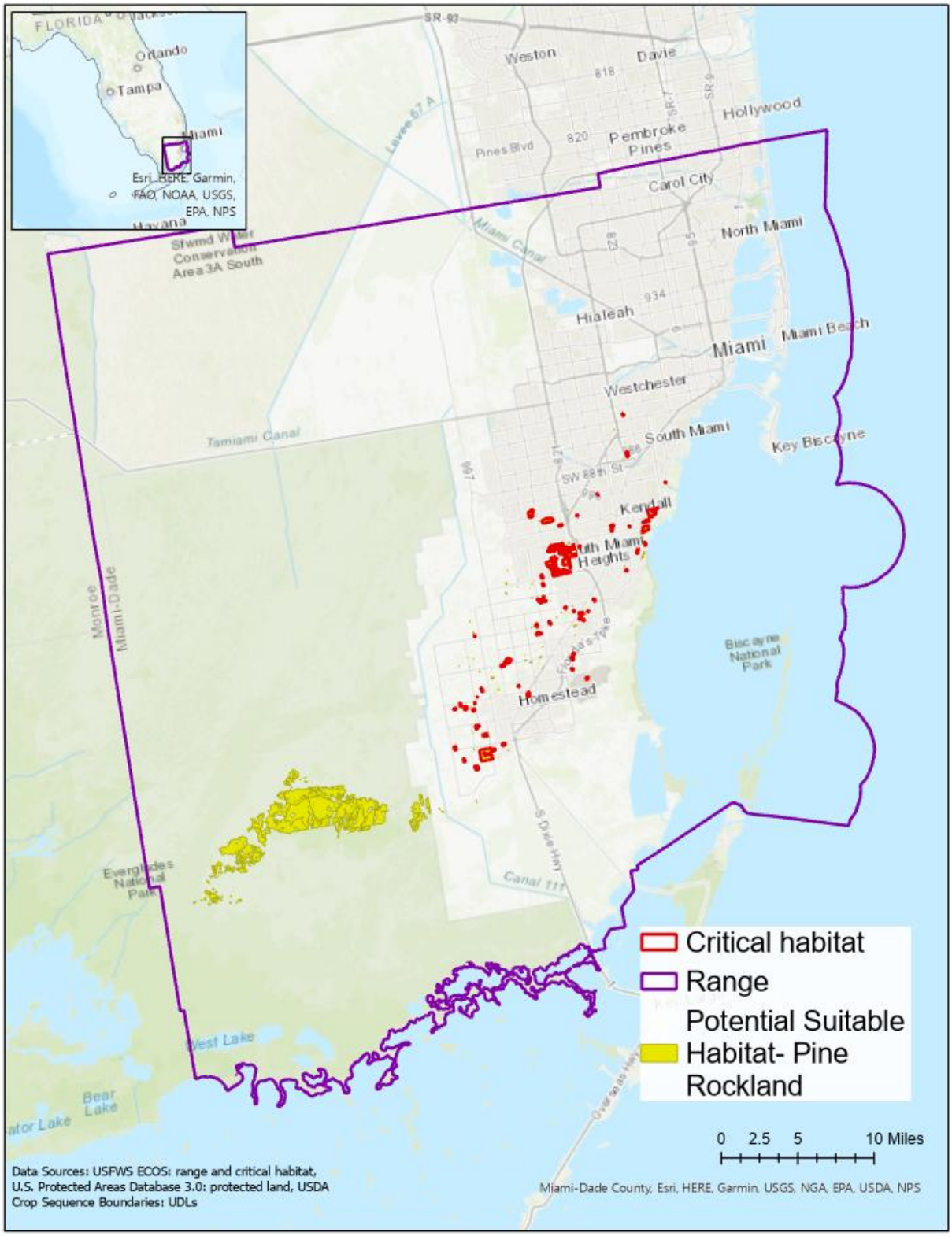

Figure 4. Carter's small-flowered flax range and critical habitat in relation to suitable habitat. Core map based on critical habitat.