Interim Core Map Documentation for Scrub lupine (*Lupinus aridorum*) Entity ID 1031

Version 1
Review Completed: February 2026
Draft Interim Core Map Developer: Center for Biological Diversity

Species Summary

The scrub lupine (*Lupinus aridorum*;[1] Entity ID 1031) is an endangered short-lived perennial within the pea family.[2] It is endemic to central Florida, and grows primarily in sandy soils where the tree layer is a mix of sand pine (*Pinus clausa*), slash pine (*Pinus elliotii*), and/or turkey oak (*Quercus laevis*).[3] The scrub lupine's historical range coincides with the Orlando metropolitan area—one of the fastest-growing metropolitan areas in the state.[4] The most significant threats to the species are habitat destruction, modification, and degradation, as well as lack of management.[5] No critical habitat has been designated for this species.[6] Additional information is provided in **Appendix 1**.

EPA Review Notes

The developers created this core map using EPA's 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 EPA'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 EPA's mapping process. This documentation was not prepared by EPA, and EPA may have edited this documentation for clarity or other purposes. Some views included in this documentation may not necessarily be the views of EPA or its staff.
The core map developed for this species is considered interim and has not yet been reviewed by FWS species expert(s). EPA intends to use this core map to develop pesticide use limitation areas (PULAs). This core map incorporates information developed by FWS and made available to the public. This core map may be revised in the future after FWS species expert(s) review the map or as additional relevant information becomes available.

This core map does not revise or replace the species range or critical habitat for this species.

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[1] The species was originally listed as *Lupinus aridorum* but, since listing, the species' taxonomy has changes to *Lupinus westianus* var. *aridorum*. *See* J.T. Kartesz, A synonymized checklist of the vascular flora of the United States, Canada, and Greenland (2nd ed., 1994). However, USFWS continues to monitor and reference the species as it was listed (*Lupinus aridorum)*. US Fish and Wildlife Serv., *Scrub Lupine (Lupinus aridorum) Status Review: Summary and Evaluation* (June 2022) ("2022 Status Review").
[2] *See* 52 Fed. Reg. 11172 (April 7, 1987).
[3] *Id.* at 11173.
[4] 2022 Status Review, *supra* n.1, at 5.
[5] *Id.* at 5, 8.
[6] *See* 52 Fed. Reg. at 11174.

Description of Core Map

The core map for the scrub lupine is based on biological information, specifically the species' known locations. All the current known locations (on public lands) with extant members of the scrub lupine have been identified by the U.S. Fish and Wildlife Service (FWS) in its 2022 Status Review of the species.[7] These known locations are mappable, and the Center considers them to be the best available information on which to base a core map for this species. **Figure 1** depicts the interim core map for the scrub lupine. The core map represents approximately 1,216 acres.

This interim core map has a "limited" (2) best professional classification because it consists of known location information taken directly from FWS documents and left unaltered. Little professional judgment was needed to interpret the species' location information. The Center has confidence in the core map because it contains all the species known occurrences, and FWS noted that these locations represent all the known extant populations for the species.

Landcover categories within the core map area are included in **Table 1**. Landcover is predominantly associated with woody wetlands, open space/developed, and pasture/rangeland.

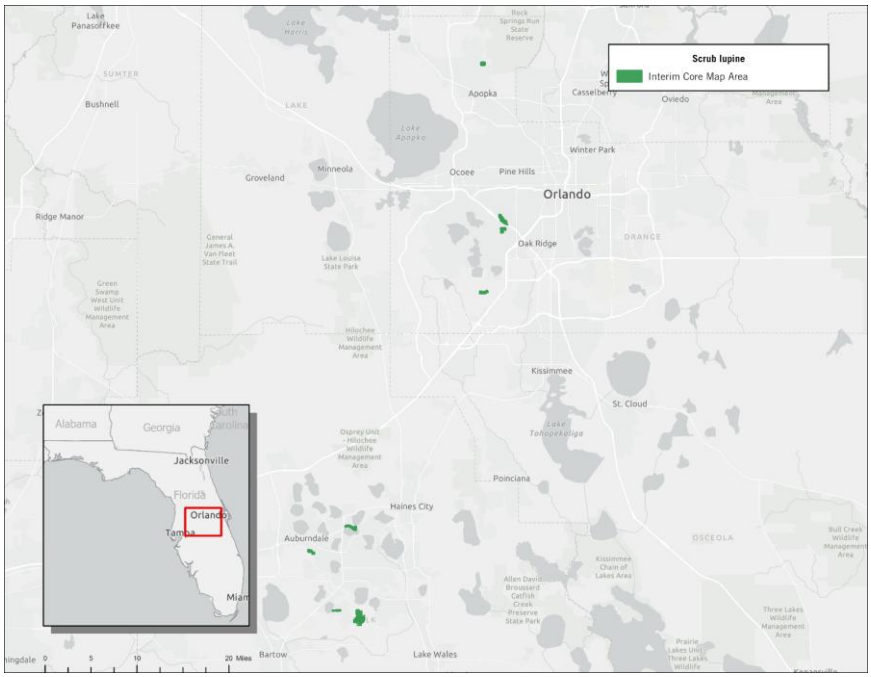

Figure 1: Interim core map for the scrub lupine (approx. total area is ~1,220 acres).

[7] 2022 Status Review, *supra* n.1, at 5–7.

Table 1. Percentage of Interim Core Map Represented by NLCD[8] Land Covers and Associated Example Pesticide Use Sites/Types.

Example pesticide use sites/types	NLCD Land Cover (Value)	% of core map represented by landcover	% of core map represented by example pesticide use
Forestry	Deciduous Forest (41)	0%	8.7%
Forestry	Evergreen Forest (42)	8.7%	8.7%
Forestry	Mixed Forest (43)	0%	8.7%
Agriculture	Pasture/Hay (81)	18.8%	18.8%
Agriculture	Cultivated Crops (82)	0%	18.8%
Mosquito adulticide, residential	Open space, developed (21)	25.7%	47.8%
Mosquito adulticide, residential	Developed, Low intensity (22)	16%	47.8%
Mosquito adulticide, residential	Developed, Medium intensity (23)	6%	47.8%
Mosquito adulticide, residential	Developed, High intensity (24)	.1%	47.8%
Invasive species control	Woody Wetlands (90)	20.7%	24.7%
Invasive species control	Emergent Herbaceous Wetlands (95)	.8%	24.7%
Invasive species control	Open water (11)	2.8%	24.7%
Invasive species control	Grassland/herbaceous (71)	.2%	24.7%
Invasive species control	Scrub/shrub (52)	.2%	24.7%
Invasive species control	Barren land (rock/sand/clay; 31)	0%	24.7%
Total Acres	Interim Core Map Acres	~1,220 acres	

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

Evaluation of Known Location Information

The dataset with known location information used:

- Descriptions of locations and maps provided by FWS documentation
- FWS shapefiles for the scrub lupine

The Center evaluated the sets of data before selecting the type of core map and developing the core map. FWS' 2022 Status Review detailed the known locations of this species. There are 8 known occurrences identified by FWS with at least one extant member of this species. Four locations occur on the Mount Dora Ridge (Orange County) and four on the Winter Haven Ridge (Polk County). Location data included in the 2022 Status Review is visualized in **Appendix 1**, **Figure A1-2**. **Appendix 1** includes additional details on the available known location information.

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"(referred to as "the process"). This core map was developed by the Center using the four steps described in the process document:(referred to as "the process"). This core map was developed by the Center using the four 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, the Center compiled available information for the scrub lupine from FWS, see **Appendix 1**. Influential information that impacted the development of the core map included:

- FWS documentation available on ECOS that provides the range and occurrences of the species.

For step 2, the Center used the compiled information to identify the core map type, including species range and known location information. Based on this information, the Center selected the biological information core map type, which consists of these known locations identified by FWS. The locations described in the 2022 Status Review of the species were used to visualize species occurrence. The full range of the species was not selected as the core map because it contains areas where the species no longer occurs (based on landcover information that represents areas that are not likely habitat).

For step 3, the Center used the best available data sources to generate the core map. Data sources are discussed in the process document. For this core map, the Center used the 2022 FWS Status Review for the scrub lupine. **Appendix 2** provides more details on the GIS analysis and data used to generate the core map.

This core map has not been formally reviewed by FWS but may be reviewed by FWS species experts in the future. This core map may be revised after FWS species expert review or as influential data becomes available to inform the core map.

Appendix 1. Information Compiled for the Scrub Lupine

Relevant FWS documents/links

- Environmental Conservation Online System (ECOS) Page for Scrub lupine (Last Accessed Dec. 18, 2025), available at https://ecos.fws.gov/ecp/species/736.
- Scrub Lupine (Lupinus aridorum) Status Review (June 2022), available at https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/3760.pdf.
- Scrub Lupine (Lupinus aridorum) 5-Year Review: Summary and Evaluation (Nov. 2016), available at https://ecosphere-documents-production-public.s3.amazonaws.com/sams/public_docs/species_nonpublish/2370.pdf.
- Recovery Plan for Nineteen Florida Scrub and High Pineland Plant Species (June 1996) (includes most current recovery plan for Scrub Lupine), available at https://ecos.fws.gov/docs/recovery_plan/960622.pdf.
- Federal Register document establishing Endangered status for Scrub Lupine (52 Fed. Reg 11172 (April 7, 1987)), available at https://www.govinfo.gov/link/fr/52/11172?link-type=pdf.

Background information

Status: Federally listed as Endangered[9]

Resiliency, redundancy, and representation (the 3Rs)*:*

- Resiliency – The 2022 Status Report notes that the genus is known to have 10 years seed bank resiliency, rather than 10,000 years. (FWS 2022 Status Report, p. 5)

- Redundancy – Stressors that impact both redundancy and resiliency for the species include charcoal root rot (*Macrophomina phaseolina*), black leaf spot (*Diplocarpon rosae*), an unknown black fungus, and moth (*Uresiphita reversalis*) predation (FWS 2022 Status Report, p. 8).

- Representation – The FWS' evaluation of representation for the scrub lupine comprises eight known locations where there is at least one plant in existence for the 2022 review. (FWS 2022 Status Report, p. 5).

- Habitat: The scrub lupine is found only in Orange County and Polk County in Central Florida.[10] It is a sand pine scrub species, and it grows primarily in well-drained, sandy soils where the tree layer is a mixture of sand pine (*Pinus clausa*), slash pine (*Pinus elliotii*), and/or turkey oak (*Quercus laevis*).[11] Today, the scrub lupine occurs exclusively in the Orlando metropolitan area—a region with a very large population and high level of human activity.[12] When the species was listed as endangered, FWS elected not to designate critical habitat for the species, because "the identification of the precise sites where the populations occur, through the publication of critical habitat descriptions and maps in the Federal Register, might increase the threats to the species" because of increased human interest in and interaction with the species.[13]

[9] 52 Fed. Reg. 11172 (April 7, 1987).
[10] *Id.*
[11] *Id.* at 11173 (*Citing* R.P. Wunderlin, *Guide to the vascular plants of central Florida* (1982).
[12] 2022 Status Review, *supra* n.1, at 5.
[13] 52 Fed. Reg at 11174.

- Life history: According to FWS, "*Lupinus aridorum* is a short-lived perennial most likely with an average life span of 2 to 4 years. Many perish after the first year, but most survive 2 to 3 years with 1 to 3 reproductive cycles. Plants have been recorded to flower at 6 to 7 years… The genus is known to have seed bank resiliency (Zazula 2009, 10 yrs. not 10,000 yrs.). This species may have a resilient seed bank based on empirical data of known locations where the habitat degraded to a closed canopy condition and no plants were detected for many years during survey events. After clearing of the vegetation years after no detection and much longer than a typical life span for an individual plant, the species reappeared within the habitat prior to conversion to another land use."[14]
- Pollinators: The pollination biology for scrub lupine is still relatively unknown.[15] Both generalist bumblebees and honeybees have been recorded visiting scrub lupine, but some researchers believe the plant is capable of self-pollinating.[16]
- Taxonomy: The scrub lupine was first recognized and named in 1982.[17] Since then, the taxonomy of the species has changed from *Lupinus aridorum* (McFarlin ex Beckner) to *Lupinus westianus* var. *aridorum* (McFarlin ex Beckner) Isely.[18] However, FWS has elected to continue referencing the taxonomy of the species as *Lupinus aridorum*, as it was originally listed under the Endangered Species Act.[19] FWS's justification for this decision can be found on page 3 of the 2022 Status Review.[20]

Relevant Pesticide Use Site

- No specific pesticide use sites were noted in FWS documentation, overlap of the core map and NLCD landcover include forestry (8.7%), pasture/hay (18.8%), mosquito adulticide use in residential areas (47.8%), and invasive species control (24.7%).[21]

Relevant Recovery Criteria and Actions

- Recovery Objective: Prevent extinction[22]
- Recovery Criteria: In the current recovery plan, the recovery criteria are listed as follows: "Protect sites in Polk and Highlands counties, and establish a disturbance regime to create bare, sunny openings. Conduct demographic monitoring for the foreseeable future. Manage and rehabilitate publicly-owned habitats in Orange county."[23] However, FWS has noted that "Lupinus aridorum is not known to occur in Highlands County; criterion # 1 erroneously lists Highlands County instead of Orange County."[24]
- Downlisting/Delisting Criteria: According to the most recent recovery plan, "the recovery plan will be

[14] 2022 Status Review, *supra* n.1, at 4–5 (citing G.D. Zazula et al*., Radiocarbon dates reveal that Lupinus arcticus plants were grown from modern not Pleistocene seeds,* 182 NEW PHYTOLOGIST 788 (2009)).
[15] NatureServe, *Lupinus westianus var. aridorum: Scrub Lupine* (last accessed Dec. 22, 2025), accessible at https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.133225/Lupinus_westianus_var_aridorum ("NatureServe")
[16] *See* NatureServe, *supra* n. 17 (citing personal communication with I.J. Stout).
[17] 52 Fed. Reg at 11172.
[18] 2022 Status Review, *supra* n.1, at 3.
[19] *Id.*
[20] *Id.*
[21] J. Dewitz, National Land Cover Database (NLCD) 2021 Products: U.S. Geological Survey data release (July 2023) , *available at* https://doi.org/10.5066/P9JZ7AO3.
[22] US Fish and Wildlife Serv., *Recovery Plan: Nineteen Florida Scrub and High Pineland Plant Species* (June 1996) ("Recovery Plan") at 60.
[23] *Id.*
[24] 2022 Status Review, *supra* n.1, at 4.

successful in the short term if habitat is protected and extinction averted. Reclassification to threatened status cannot be predicted at the present time."[25]

- Recovery Actions: In the most recent recovery plan, FWS noted five "broad" recovery actions, but failed to assign metrics for their completion.[26] These recovery actions are:

  "1. Protect[ing]habitat through purchase and other means (including the Habitat Conservation Plan process for threatened animals in the Florida scrub habitat)."

  2. Manag[ing] protected habitats.

  3./4. Conserv[ing] germplasm and establish[ing] new populations… (if possible) [of] *Lupinus aridorum*.

  5. Assess[ing] progress and plan[ning] post-recovery monitoring."[27]

Description of the Species' Range

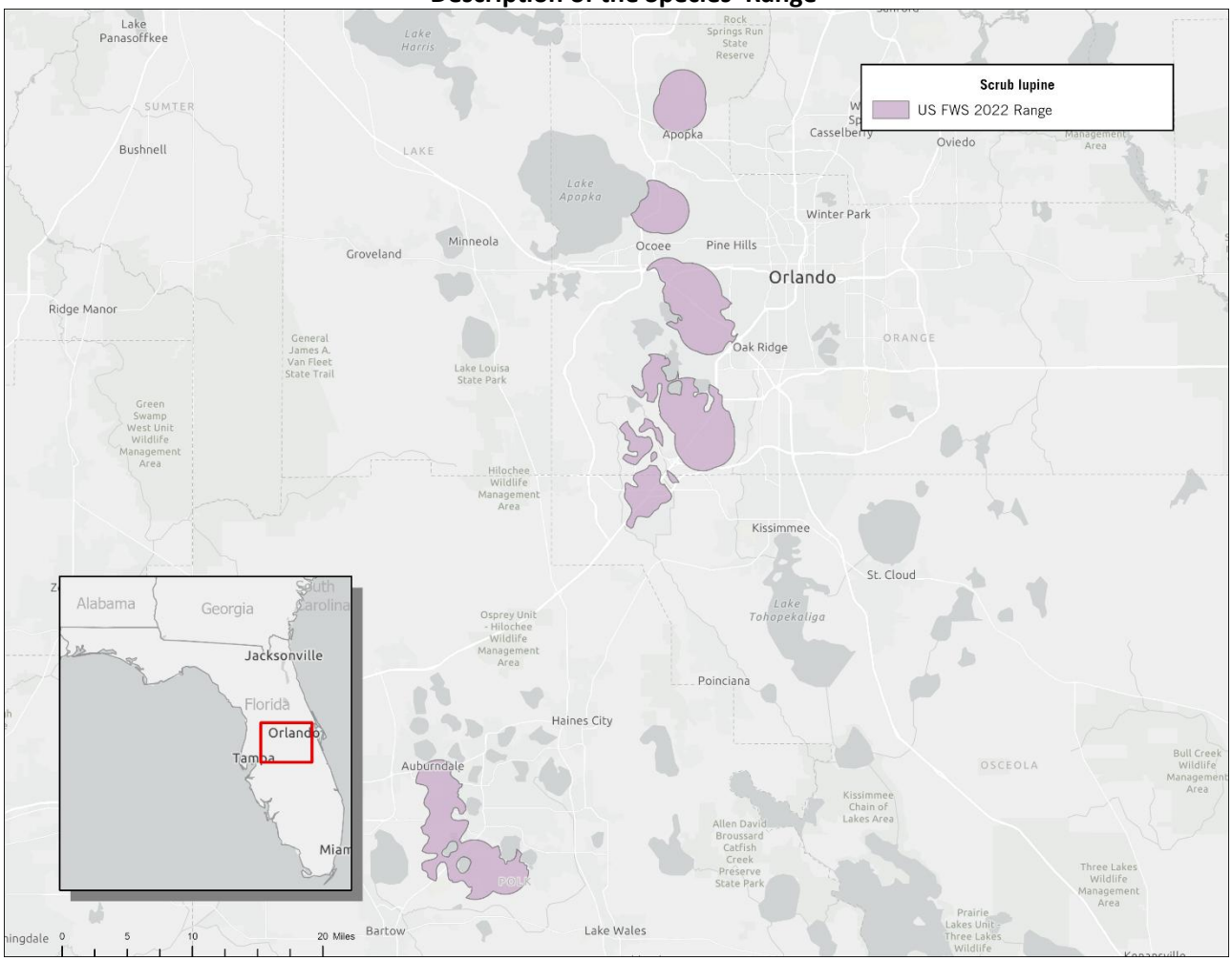

Figure A1-2: ECOS Range Map for the scrub lupine. The total acreage of range is approximately 70,336 acres.

[25] Recovery Plan, *supra* n.22, at 60. at v.

[26] *See* US Fish and Wildlife Serv., *Scrub Lupine (Lupinus aridorum) 5-Year Review: Summary and Evaluation* (Nov. 2016) at 3.

[27] Recovery Plan, *supra* n.22, at v.

Known Locations/Occurrence Data

- Occurrences Described in FWS Documents: In the 2022 Status Review, FWS documented scrub lupine populations at the following sites in Orange and Polk Counties in Florida: the Fenton Street Conservation Area, Shadow Bay Park, Bill Fredrick Park, and Springs Community (Rock Springs Elementary School) in Orange County (Mount Dora Ridge); and Lake McLeod National Wildlife Refuge, CSX, Lake Blue Scrub, and McKay Gardens and Lakeside Preserve in Polk County (Winter Haven Ridge). *See* Table A1-1. Specific descriptions of each site are provided below:

  Mount Dora Ridge – Orange County

  - *Fenton Street Conservation Area (EOR #40)* is located on the Mount Dora Ridge, and spans a conservation easement under the control of the Kerina Corp. Homeowners' Association.[28] As of 2022, it contained the largest remaining population of Scrub lupine on Mt. Dora Ridge, but a lack of management has caused the scrub lupine population to decline at this site in recent years.[29]
  - *Shadow Bay Park (EOR #23)* is a park in Orange County[30] that includes a habitat management area funded by the Service's Partners for Fish and Wildlife in 2015.[31] While this management area was initially intended to include a "restoration area" that would be the site of vegetation management and prescribed burns, the prescribed fire was never applied—and so the habitat conditions in this area of the park continue to degrade.[32] In 2022, after FWS's survey of the site, 14 plants were introduced to the restoration area "south of the natural area under a powerline easement."[33]
  - *Bill Fredrick Park (EOR #39)* is a public park located along the shore of Turkey Lake in Orlando.[34] While no plants were detected in the natural areas of this park in the 2022 surveys, there were still 7 plants located at a former introduction location in a restoration area within the park (this figure has decreased from 144 plants in the restoration area in 2015).[35]
  - *Springs Community – Rock Springs Elementary School (EOR # 50)* is a site that includes Rock Springs Elementary School (a public elementary school in Apopka, Orange County[36]) and the Springs Community residential development.[37] As of 2022, one seedling was observed in an overgrown area on the boarder of the two properties.[38] Previously, the main population of scrub lupine occurred on the Springs Community side of the site, but that community (which included 62 plants in 2014) was completely eliminated with the expansion of a parking lot and water retention area within the community.[39]

[40]

[28] 2022 Status Review, *supra* n.1, at 5.
[29] *Id.*at 5–6.
[30] https://www.orangecountyfl.net/cultureparks/parks.aspx?m=dtlvw&d=36
[31] 2022 Status Review, *supra* n.1, at 6.
[32] *Id.*
[33] *Id.*
[34] *See* https://www.orlando.gov/Parks-the-Environment/Directory/Bill-Frederick-Park-At-Turkey-Lake.
[35] 2022 Status Review, *supra* n.1, at 6.
[36] *See* https://rockspringses.ocps.net/.
[37] 2022 Status Review, *supra* n.1, at 6.
[38] *Id.*
[39] *Id.*

Winter Haven Ridge – Polk County

- *Lake McLeod National Wildlife Refuge (EOR #37)* is the largest and possibly only stable long-term population remaining in the species' range. Lake McLeod is one of four tracts within the Lake Wales Ridge NWR that was established in the 1990's for protection of endangered and threatened plants. This is a managed and secure site, and the average number of plants is approximately 515 based on census data from 2002 to 2022.[41]
- *CSX (EOR # 55)* is a population located on three different properties referenced as east, central, and south. The east portion is privately owned land that is used as pastureland for grazing livestock. The central portion is where the active CSX rail operates and contains swale and shoulder habitat. The west portion is a property owned by the City of Winter Haven Water Resources and is an overgrown tract of habitat. The 2022 survey found 11 plants in the east property, 6 plants in the west property along the entry road accessing the parcel, and 3 plants within the central property rail line area.[42]
- *Lake Blue Scrub (EOR # 56)* is an urban site managed by the Florida Fish and Wildlife Conservation Commission. There are management challenges associated with the location which have resulted in the site becoming overgrown. There was an introduction effort from 2008 through 2010 and over 1,000 plants were planted. At the time of the last survey in 2022, only 44 plants were reported.[43]
- *McKay Gardens and Lakeside Preserve (no EOR # provided)* is an experimental population that was planted in 2011 through 2014. Over 600 plants were introduced during this timeframe but the last time it was surveyed only one plant remained. The location is a sandhill restoration area and may not be appropriate for *Lupinus aridorum* persistence.[44]

Table A1-1. Known Sites of Scrub lupine with the number of extant populations, from the 2022 Status Review for Scrub Lupine, pg. 8.

Site	County	2014	2022	Difference
Fenton Street	Orange	11	46	+35
Shadow Bay Park (Natural)	Orange	360	41	-319
Shadow Bay Park (Introduced)	Orange		14	
Bill Fredrick Park (Natural)	Orange	257 (2015)	0	-257
Bill Frederick Park (Introduced)	Orange	144 (2015)	7	-137
Springs Community	Orange	62	1	-61
Lake McLeod	Polk	599 (2015)	681 (2021)	+82
CSX	Polk	4 (2015)	20	+16
Lake Blue Scrub (Natural)	Polk	9	0	-9
Lake Blue Scrub (Introduced)	Polk	1,217	44	-1173
MacKay Gardens	Polk	196	1	-195

[41] *Id*.
[42] 2022 Status Review, *supra* n.1, at 6-7.
[43] 2022 Status Review, *supra* n.1, at 7.
[44] *Id.*

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

The core map type for this species is based on biological information, including known locations listed in the FWS 2022 Scrub Lupine Status Review in Orange and Polk Counties Florida.

Below is a table showing the eight areas described in the US FWS 2022 Scrub Lupine Status Review, the county each is in, and the GIS source used. County parcel data based on geographic location and in relationship to a landmark, owner name, and zoning information is used to select the parcels that have known locations. USGS PAD-US version 4.0, unit name is used for Shadow Bay Park, Bill Frederick Park at Turkey Lake, and Mackay Gardens and Lakeside Preserve known locations. The Mackay Gardens and Lakeside Preserve is located outside of the scrub lupine range. However, since it is listed as a known location in US FWS 2022 Scrub Lupine Status Review, it is included. The Florida Natural Areas Inventory (FNAI), Florida Forever Board of Trustees Project (2025) feature class is used for the Lake McLeod and Lake Blue Scrub populations.

Site Name / FNAI Element Occurrence Records	County	GIS Source
Fenton Street (EOR #40)	Orange	Florida Department of Revenue, 2025 Orange County parcels
Shadow Bay Park (EOR #23)	Orange	USGS PAD-US V4.0
Bill Fredrick Park (EOR #39)	Orange	USGS PAD-US V4.0
Springs Community (EOR #50)	Orange	Florida Department of Revenue, 2025 Orange County parcels
Lake McLeod (EOR #37)	Polk	Florida Natural Areas Inventory. Florida Forever Board of Trustees Projects, October 2025
CSX (EOR #55)	Polk	Florida Department of Revenue, 2025 Polk County parcels
Lake Blue Scrub (EOR #56)	Polk	Florida Natural Areas Inventory. Florida Forever Board of Trustees Projects, October 2025
MacKay Gardens and Lakeside Preserve	Polk	USGS PAD-US V4.0

This section details the data and steps used to create the core map ("EPA_Scrub_lupine.gdb") for the Scrub lupine based on this biological information.

1. **References and Software**
   - World UTM Grid: https://services.arcgis.com/P3ePLMYs2RVChkJx/arcgis/rest/services/World_UTM_Grid/FeatureServer
   - EPA's modified cultivated land layer larger than 25 acres (Downloaded 01/27/2025) https://cdn.arcgis.com/home/item.html?id=159e70ce4c284f5b972c687037f8a668
   - USFWS Species range: https://ecos.fws.gov/docs/species/shapefiles/usfws_Q2PR_P01_Lupinus_aridorum_current_range.zip

- 2024 annual Land Cover (CONUS) (downloaded on July 8, 2025) https://www.mrlc.gov/data?f%5B0%5D=category%3ALand%20Cover&f%5B1%5D=project_tax_term_term_parents_tax_term_name%3AAnnual%20NLCD&f%5B2%5D=year%3A2024
- USA Census Bureau 2024 Tiger/Line Shapefile: Counties (and equivalent) https://www.census.gov/cgi-bin/geo/shapefiles/index.php
- USGS (Protected Areas Database US) PAD-US file Version 4.0 https://www.usgs.gov/programs/gap-analysis-project/science/pad-us-data-download
- Florida Department of Revenue, County Level 2025 GIS parcel data (Polk and Orange Counties) https://floridarevenue.com/property/dataportal/Pages/default.aspx?path=/property/dataportal/Documents/PTO%20Data%20Portal/Map%20Data/2025F/2025F%20PAR
- Florida Natural Areas Inventory. Florida Forever Board of Trustees Projects, October 2025 https://www.fnai.org/publications/gis-data
- Florida Department of Transportation Open Data Portal, Rail_System_Layers_2025, https://gis-fdot.opendata.arcgis.com/
- Palmer, T. (2008, January 29). Rare, Endangered, and Probably Doomed. The Ledger. https://www.theledger.com/story/news/2008/01/29/rare-endangered-and-probably-doomed/25923714007/
- Software used: ArcGIS Pro version 3.5.3

2. Datasets and Procedures Used in Core Map Development

2.1. Create copy of template EPA polygon

1. In ArcPro, create a copy of the template EPA polygon feature class for the scrub lupine, named "EPA_scurb_lupine_Poly ".

2.2. Create "Definition Queries" in Feature Classes

1. Please note that not all the definition queries will refine the feature to specific records that will be copied and pasted. Some when used in tandem with the google coordinates can be independently selected, then copied and pasted.
2. In the USGS PAD-US V4.0 feature class, use: Unit_Nm IN ('Shadow Bay Park', 'Bill Frederick Park at Turkey Lake', 'Mackay Gardens and Lakeside Preserve')
3. In the "ffbot_2025" feature class, use: SITENAME IN ('Lake Wales Ridge Ecosystem Florida Forever BOT Project - Lake Mcleod', 'Lake Wales Ridge Ecosystem Florida Forever BOT Project - Lake Blue')
4. To focus attention on just the "CSX" railroad lines in the "Railroad Name" feature class, use: "RRCO (Railroad Company) = 'CSX'".
5. In the "orange_2025par" feature class, use: OWN_NAME LIKE '%KERINA%' Or OWN_NAME = 'SCHOOL BOARD OF ORANGE COUNTY'
6. In the "polk_2025par" feature class, use: OWN_NAME = 'WINTER HAVEN CITY OF'

2.3. Use Google Maps to find the coordinates for known locations

1. The coordinates are used to zoom to the general area. Then turn on layers to find records from other feature classes.
2. Rock Springs Elementary School, Orange County (28.720180936715764, -81.51115150424465)
3. CSX Winter Haven (27.938683419290616, -81.69528645030093)

2.4. Copy and paste records from USGS PAD-US V4.0 and ffbot_2025 feature classes

1. Select records from USGS PAD-US V4.0, copy and paste them to "EPA_scurb_lupine_Poly ".
2. Select records from ffbot_2025, copy and paste them to "EPA_scurb_lupine_Poly "

2.5. Create polygon for Fenton Street (EOR #40)

1. Select parcels from "orange_2025par" that "contains" "Kerina" and zoom to the selected. Set the background the Imagery Hybrid. **(Figure A2-1, EPA removed figure during review due to high resolution and specificity of image showing location**). Per the description, the conservation easement is under control of Kerina Corp HOA. This is why the owner's name is like "%Kerina%" is used. Visual review shows that Fenton St borders the parcels. The imagery shows vacant land for all three parcels. All three parcels are copied and pasted and merged into one multi-part polygon.

2.6. Create a polygon for Springs Community (EOR #50)

1. Use coordinates from Google search for Rock Springs Elementary School, Orange County with the "Locate" tool to zoom to the area. Make sure that the "orange_2025par" feature class is turned on. Select the parcel that represents the Rock Springs Elementary School. This site's description says, *"One seedling was observed in an overgrown area boarding the two properties."* Use the "Buffer" tool to create a buffer of 500 feet around the parcel to account for the ambiguity of the language and ensure there is adequate coverage. Copy and paste into "EPA_scurb_lupine_Poly "

2.7. Create a polygon for CSX (EOR #55)

1. Use the coordinates from Google search for CSX Winter Haven with the "Locate" tool to zoom to the area. Make sure that the "polk_2025par" feature class is turned on. Visual review shows that parcels based on the definition query where parcels owned by the City of Winter Haven are to the west of the CSX rail line and north of the terminal. Additional context to confirm the location of CSX (EOR #55) is from this online Lakeland Ledger article. https://www.theledger.com/story/news/2008/01/29/rare-endangered-and-probably-doomed/25923714007/ that mentions the CSX terminal and Pollard Rd, which can also be seen. **(Figure A2-2, EPA removed figure during review due to high resolution and specificity of image showing location**).

2. Select the parcels that are on the west side of the track and copy and paste them into "EPA_scurb_lupine_Poly ". Merge them into one polygon. Use the reshape tool and trace the adjacent parcels to the east of the CSX train tracks. **(Figure A2-3**) **(Figure A2-4**). **EPA removed these figures during review due to high resolution and specificity of image showing location**)

2.8. Remove EPA's "CultivatedAreas_Over25acres" areas from "EPA_scurb_lupine_Poly"

1. Use "Pairwise Erase" tool to remove cultivated areas from "EPA_scurb_lupine_Poly. The output feature class is "EPA_scurb_lupine_Poly_Final". **(Figure A2-5**)

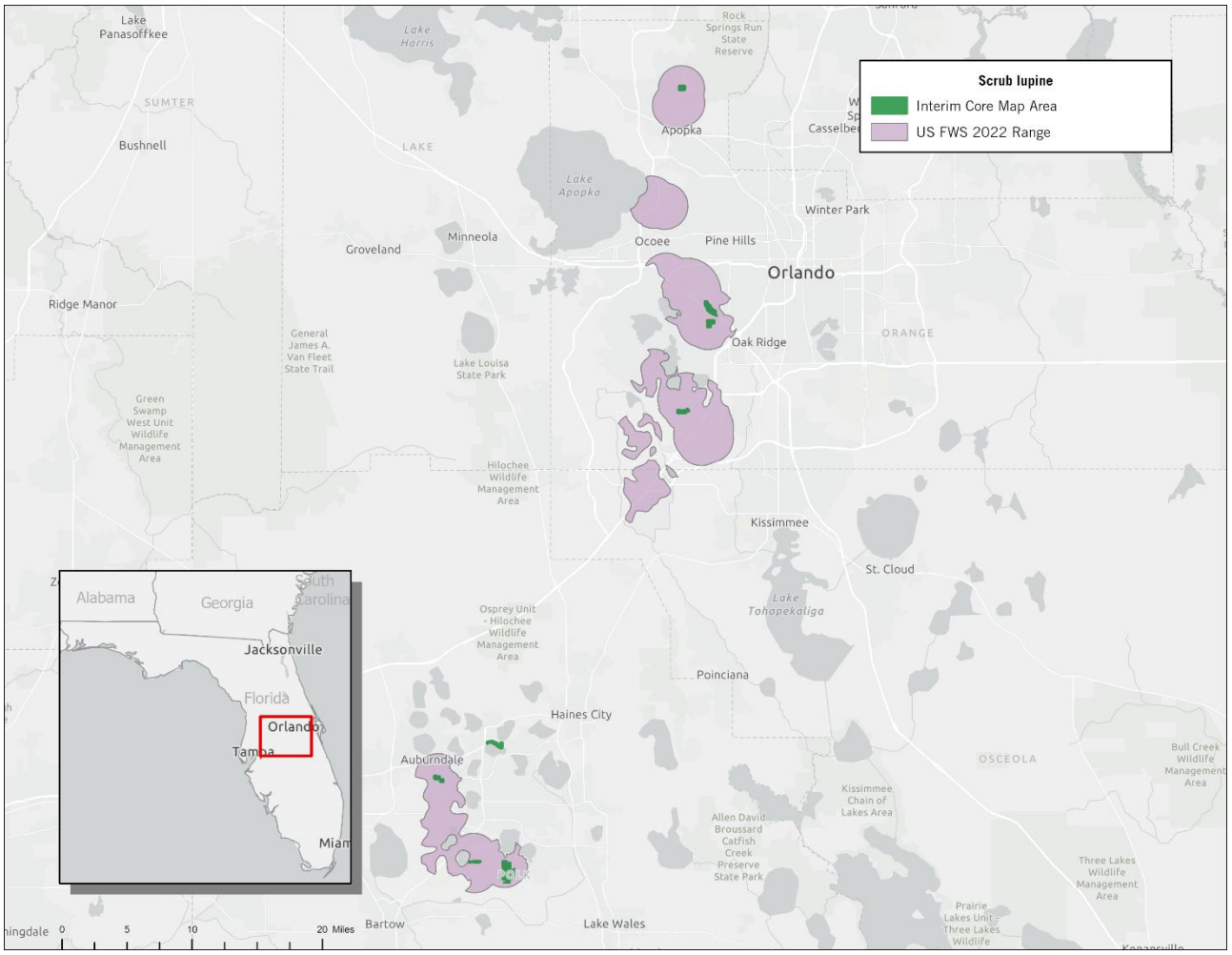

Figure A2-5 Screenshot of interim core map area overlayed on range

2.9. Update attributes and "Calculate Geometry"

1. Update the following fields with the "Calculate Fields "tool with the following:
   a. CommName = "Scrub lupine"
   b. SciName = "Lupinus aridorum"
   c. Category = "Area of occupancy"
   d. EPA_Code = "1031"
   e. FWS_Code = "Q2PR"
   f. ECOS_WebPg = "https://ecos.fws.gov/ecp/species/736"
2. Turned on the "World UTM Grid" layer and identified the UTM zone as "17". Right-clicked on the "Acres" fieldàleft-clicked on "CalculateGeometry". "Calculate Geometry" dialog box appears. Selected "Area" under "Property", "US Survey Acres" in "Area Unit" and "NAD_1983_UTM_Zone_17N" in the Coordinate System" box. Click Apply. Click OK.

2.10. Use downloaded 2024 NLCD Land Cover Layer for raster process to determine percentage of interim core map represented by NLCD Land Cover.

1. The 2024 annual Land Cover (CONUS) was downloaded on January 1, 2025, from the following URL: (https://www.mrlc.gov/data?f%5B0%5D=category%3ALand%20Cover&f%5B1%5D=project_tax_term_term_parents_tax_term_name%3AAnnual%20NLCD&f%5B2%5D=year%3A2024)

2. The “Extract by Mask” tool is used with “Annual_NLCD_LndCov_2024_CU_C1V0.tif” filtered by the same area within “EPA_scurb_lupine_Poly_Final” as the extent. In the “Environments” tab, change the output coordinate system to match “EPA_scurb_lupine_Poly_Final,” which in this case is “USA_Contiguous_Albers_Equals_Area_Conic_USGS_version.’ The output is named, “NLCD_MaskArea1”.
3. Use the “Tabulate Area” tool to determine the count of area for each NLCD code. **(Figure A2-6**)

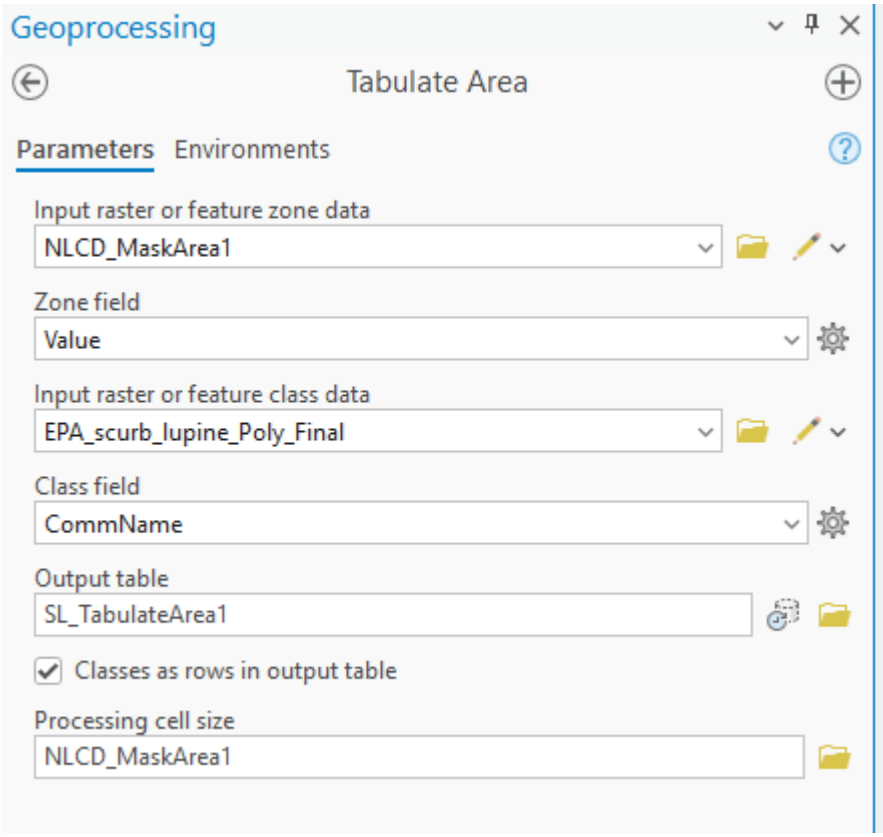

Figure A2-6. Screenshot of “Tabulate Area” tool

4. Add a double field named, “Per” to the “SL_TabulateArea1” table. Right click on field and select “Calculate Field”. Enter the formula “(!Count!/ 5474)*100”. This calculates the percentage of NLCD within the core map area. Review results and input into Table 1, (Percentage of Interim Core Map Represented by NLCD Land Covers and Associated Example Pesticide Use Sites/Types.)