

Interim Core Map Documentation for Pecos Sunflower

Date Posted to EPA's GeoPlatform: July 2025

Draft Interim Core Map Developer: Compliance Services International (CSI)

Species Summary

The Pecos sunflower (*Helianthus paradoxus*; Entity ID 558) is a dicotyledonous threatened plant found in New Mexico and Texas. The United States Fish and Wildlife Service (FWS) has assigned designated critical habitat (DCH) for Pecos sunflower. This species inhabits areas with permanently saturated soils in the root zone; these are most commonly desert springs and seeps that form wet meadows called ciénegas. Additional habitat information is provided in **Appendix 1**.

EPA Review Notes

This core map was developed by Compliance Services International (CSI). CSI developed 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 draft interim map and documentation developed by CSI and evaluated if: (1) the map and documentation are consistent with EPA's process; (2) areas added to or excluded from the interim core map are consistent with the species biology and/or recovery needs; (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, consistency, or other purposes.

The core map developed in this document for the Pecos sunflower is considered interim. This core map incorporates information developed by FWS and made available to the public. EPA reviewed the core map; however, the core map has not been formally reviewed by FWS. This interim core map may be revised in the future to incorporate expert feedback from FWS.

Description of Core Map

The core map for the Pecos sunflower is biological information type, based on the designated critical habitat, and supplemented by known location information in two distinct areas. The most recent Recovery Plan from FWS includes a textual description of habitats, and the critical habitat listing document provides details on the known location sites used to develop this core map (see **Appendix 1** for more information). Other available known location information from the Global Biodiversity Information Facility (GBIF), iNaturalist, and NatureServe databases were not used for core map development, as they did not improve on the available datasets used for core map development.

The core map spans 535,760 acres (**Figure 1**). A summary of acreage by National Landcover Database (NLCD) land use type is provided in **Table 1**.

Based on the United States Environmental Protection Agency’s (EPA) “best professional judgment classification” system, CSI has graded this core map as “limited” (2) because the core map is developed from DCH with limited additions from a trusted known location data source (PAD-US, USGS 2023). More information about this classification system and its definitions can be found in the core map process document (EPA, 2024).

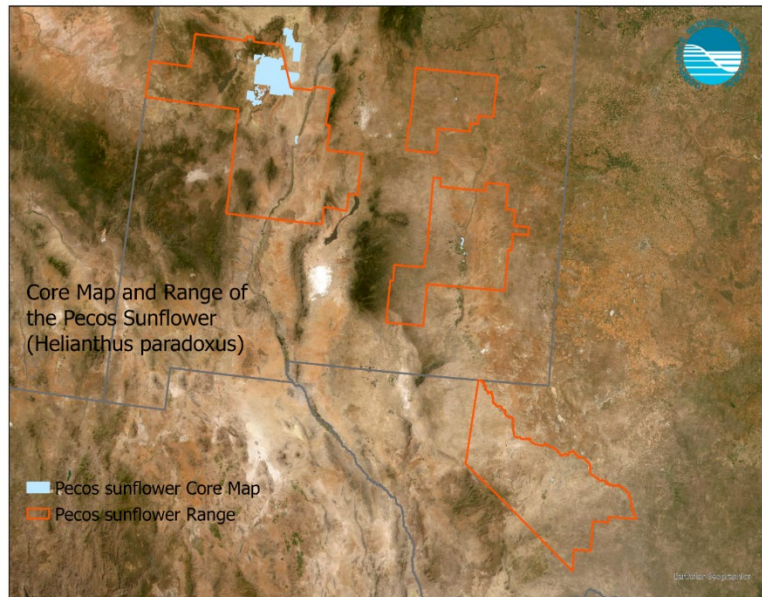


Figure 1. Interim core map for the Pecos sunflower.

Table 1. Percentage of Interim Core Map Represented by NLCD¹ Land Covers and Associated Example Pesticide Use Sites/Types.

Example pesticide use sites/types	NLCD Landcover (Value)	% of core map represented by landcover	% of core map represented by example pesticide
Forestry	Deciduous Forest (41)	0	3
Forestry	Evergreen Forest (42)	3	3
Forestry	Mixed Forest (43)	0	3
Agriculture	Pasture/Hay (81)	0	0
Agriculture	Cultivated Crops (82)	0	0
Mosquito adulticide, residential	Open Space, Developed (21)	0.5	0.8
Mosquito adulticide, residential	Developed, Low intensity (22)	0.2	0.8
Mosquito adulticide, residential	Developed, Medium intensity (23)	0.1	0.8
Mosquito adulticide, residential	Developed, High intensity (24)	0	0.8
Invasive species control	Woody Wetlands (90)	0.4	96.8
Invasive species control	Emergent Herbaceous Wetlands (95)	0.4	96.8

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

Invasive species control	Open Water (11)	0	96.8
Invasive species control	Grassland/herbaceous (71)	3	96.8
Invasive species control	Scrub/shrub (52)	93	96.8
Invasive species control	Barren Land (rock/sand/clay; 31)	0	96.8
Total Acres	Interim Core Map Acres²	535,767	

² This acreage is slightly different from the core map acreage (535,760) due to the pixelation of NLCD land cover. The core map is not developed from raster data.

Evaluation of Known Location Information

There were four evaluated datasets with known location information:

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

Compliance Services International evaluated these four datasets before developing the core map. Overall, there were 52 research-grade observations found in iNaturalist³. The GBIF dataset comprised 40 usable observations. Neither dataset was used for core map development; however, both were considered to be robust enough for validation of other datasets used.

The FWS location information includes textual descriptions of areas of relevant occupancy that extend beyond the critical habitat boundaries; these descriptions were easily identifiable in the Protected Areas Database of the United States (PAD-US) and contributed to the core map development process.

NatureServe public element occurrence (EO) data were also evaluated and are considered by CSI to of good quality for this species; however, these data were not considered for use in core map development because they do not represent more accurate location information than the DCH and known locations that were used.

Approach Used to Create Core Map

The core map was developed using EPA’s process for developing core maps for species listed by the FWS and their DCH (referred to as “the process”). This core map was developed by CSI using the four steps described in the process document:

1. Compile available information for a species;
2. Identify core map type from among the following defined types: DCH, range, and biological information. From EPA, summaries of each core map type are provided below (EPA 2024).
3. Develop the core map for the species; and
4. Document the core map.

For step 1, CSI compiled available information for Pecos sunflower from FWS, as well as observation information available from various publicly available sources including iNaturalist, GBIF, and NatureServe. The information compiled for Pecos sunflower is included in **Appendix 1**. Influential information that impacted the development of the core map includes a description of the species habitat from the FWS Recovery Plan:

³ According to iNaturalist, an observation is designated as “research grade” if it 1) is verifiable with date, coordinates, photos/sounds, and not captive; 2) achieves community agreement defined as “more than 2/3 of identifiers needs to agree on the species level ID or lower;” and 3) “must pass a data quality assessment, which includes checks for accurate date and location, evidence of a wild organism, and clear evidence of the organism itself”

(<https://help.inaturalist.org/en/support/solutions/articles/151000169936-what-is-the-data-quality-assessment-and-how-do-observations-qualify-to-become-research-grade->).

- “Pecos sunflower is a wetland plant that grows in areas with permanently saturated soils in the root zone. These are most commonly desert springs and seeps that form wet meadows called ciénegas. This sunflower also can occur around the margins of lakes, impoundments and creeks. When Pecos sunflowers grow around lakes or ponds, these are usually impoundments or subsidence areas within natural ciénega habitats” (Recovery Plan 2005, 6).

For step 2, CSI used the compiled information including the species range, known locations, and habitat location information to determine the core map type. The known location data were compared to the range and critical habitat and found that known locations from larger databases (iNaturalist and GBIF) were too limited in extent compared to the critical habitat and supplementary sites to be used for core map development. Known location information from FWS was specific enough to easily identify supplementary sites from a trusted data source, the PAD-US dataset from USGS (2023).

Although the Pecos sunflower would not be expected to be found on agricultural land (*i.e.*, it is an “off-field” species), there is no agriculture in the area; therefore, no refinement was necessary to exclude cultivated land. When weighing this information together, CSI selected a DCH core map type, supplemented by known location information. The DCH and PAD-US datasets described above were used to derive this core map.

For step 3, CSI used the best-available data sources to generate the core map. Data sources are discussed in the EPA’s core map process document. For this interim core map, CSI followed EPA’s decision framework to arrive at a core map type of DCH. Designated critical habitat was identified as a core map type because the Pecos sunflower has DCH that more accurately identifies critical areas for core map development than its more widespread range, which is neither refined nor endemic. **Appendix 2** provides more details on the GIS analysis and data used to generate the core map.

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

Known Observation Datasets

Datasets such as iNaturalist, GBIF, and NatureServe were considered but not used. NatureServe public EOs are viewable in their mapper as hexagons corresponding to locations where the species may have been observed. The current range of the species encompasses all of the occurrences from these datasets based on visual inspection.

NLCD, LANDFIRE, and other land cover datasets

Typically, it would be reasonable to refine a core map for a species with a large and/or unrefined range based on descriptions of its habitat, which can be mapped to land cover datasets such as NLCD, LANDFIRE, and others. For the Pecos sunflower, the core map extent was small enough and based on precise location information such that a refinement based on national land cover datasets was not necessary. Therefore, no attempt was made to refine the core map using land cover datasets.

Appendix 1. Information Compiled for Pecos sunflower

1. Recent FWS documents

- [Recovery Plan \(2005\)](#)
- [5-Year Review \(2015\)](#)
- [5-Year Review \(2023\)](#)
- [Critical Habitat \(2008\)](#)
- [ECOS Profile Page \(2025a\)](#)
- [FWS Focus \(2025b\)](#)

2. Background information

- **Status:** Federally listed as threatened in 1999.
- **Resiliency, redundancy, and representation (the 3Rs)**
 - The 3 Rs were not specifically described in the species Recovery Plan or most recent 5-Year Review for this species. There is no Species Status Assessment.
- **Habitat, Life History, and Ecology**
 - Habitat: “Pecos sunflower is a wetland plant that grows in areas with permanently saturated soils in the root zone. These are most commonly desert springs and seeps that form wet meadows called ciénegas. The word ‘ciénega’ or ‘ciénaga’ is derived from the Spanish ‘cien aguas’ meaning hundred waters, which indicates a large area where water is seeping from the ground in numerous places. These are rare wetland habitats in the arid southwest region (Hendrickson and Minckley 1984). This sunflower also can occur around the margins of lakes, impoundments and creeks. When Pecos sunflowers grow around lakes or ponds, these are usually impoundments or subsidence areas within natural cienega habitats” (Recovery Plan, 6)
 - “The soils of these desert wetlands are typically saline or alkaline because the waters are high in dissolved solids and high rates of evaporation leave deposits of salts, including carbonates, at the soils surface. Soils in these habitats are predominantly silty clays or fine sands with high organic matter content. Studies by Van Auken and Bush (1995) and Van Auken (2001) showed that Pecos sunflower grows in saline soils, but seeds germinate and establish best when precipitation and high water tables reduce salinity near the soil’s surface. Like all sunflowers, this species requires open areas that are not shaded by taller vegetation” (Recovery Plan, 6).
 - “Pecos sunflower populations occur on spring seeps or ciénega habitats with saline, calcareous, heavy-textured soils and are usually most abundant on perennially wet soils of sub irrigated terraces just above the wettest sites. Woody plants are scarce and often occur as riparian tree species around the drier margins. Germination occurs in late winter, from February into early March, and appears to be best when precipitation or high-water tables reduce salinity near the soil surface (Van Auken and Bush 1995); flowering occurs August-November (Texas Natural Diversity Database 2023). In the Santa Rosa area, seedling germination has been documented in early March, after the potential for killing frosts is low, the water table is at or near the surface, and longer daylight hours and temperatures promote favorable conditions. Seedling germination and establishment monitoring is optimal in mid-April, flowering occurs in early- to mid-September, and seed dispersal occurs through October (Roth 2020).” (5-Year Review 2023, 2-3)
 - Pollinators: “Pollination vectors for the Pecos sunflower have not been studied. However, most radiate-headed plants in the aster family are generalists in attracting a variety of

insect pollinators. Seed production is greatly enhanced in Pecos sunflower by cross-pollination between individual plants.” (Recovery Plan, 7)

- **Taxonomy**

- FWS CONUS-11. Species has biotic pollination vectors, other reproductive mechanisms are unknown.
- Wetland plant – “Dr. John Torrey, botanist at the New York Botanical Garden, identified this specimen as *Helianthus petiolaris* (prairie sunflower) (Sitgreaves 1853). It was not until a century later that Dr. Charles Heiser recognized this specimen as a new species and named it *Helianthus paradoxus* (Heiser 1958). Heiser’s description of this species cited two known specimens, the type specimen collected September 11, 1947 by H.R. Reed from an extant population near Fort Stockton in Pecos County, Texas, and the 1851 Woodhouse specimen collected in New Mexico.” (Recovery Plan, 2).

- **Relevant Potential Pesticide Use Sites**

- Management activities at the Blue Hole Cienega Natural Preserve in New Mexico includes herbicide treatments to control tamarisk, Russian olive, and Siberian elm invasive woody plants (5-Year Review 2023, 9).
- “The New Mexico Roswell/Dexter Recovery Region includes ongoing control of species such as cattail (*Typha* spp) and common reed (*Phragmites* spp) with tools such as prescribed fire and mechanical and chemical treatments (New Mexico Meluso Productions 2019), as well as noxious and invasive weed control (Service 2015) and prescribed burning (BLM 2021) at the BLM Overflow Wetland.” (5-Year Review 2023, 9)
- “NMDOT is conducting field verification surveys to characterize potential habitat and rare plant species locations within the 15,000 miles and 488 square miles of its right of ways, and potential roadway management actions should avoid the known rare plant occurrences. At least 3 Pecos sunflower locales have been identified in two of the Recovery Regions (Sanderson and Hummel 2023). Other roadways such as county and those managed by cities do not receive these considerations.” (5-Year Review 2023, 13)

- **Threats**

- “The primary threat to Pecos sunflower is destruction or modification of wetland habitats from filling, groundwater pumping, aquifer depletion, and surface water diversion. Other threats include competition from non-native plant species, excessive livestock grazing, mowing, and highway maintenance (Service 1999).” (5-Year Review 2023, 6)

- **Relevant Recovery Criteria**

- Recovery criteria:
 - “Identify and establish at least one core conservation area for Pecos sunflower in each of four distinct recovery regions that would collectively, if protected, ensure the long-term survival of the species. Each core habitat must occur on wetlands that are not threatened by depletion of the contributing aquifer and have demonstrated a self-perpetuating stand of Pecos sunflower of greater than 5000 individuals for a minimum of seven out of ten years. In addition to the core conservation area, each region should have at minimum one additional isolated stand of protected Pecos sunflowers with greater than 1600 individuals for at least seven out of ten years to protect against catastrophic loss of the regional population.
- “Ensure long-term protection of designated core conservation areas and designated isolated stands in perpetuity through the implementation of appropriate management

plans, conservation easements, or land acquisition.” (Recovery Plan 2005, iii) Recovery Criteria

- “The recovery criteria from the Pecos sunflower Recovery Plan (2005) have been partially attained. At least one core Pecos sunflower population is protected within all four of the designated recovery regions. All of these core populations are at least 50 to 100 times, or even higher multiples in some years of, the minimum size recommended in the recovery plan” (FWS 2015).
- The four core conservation areas are as follows:
 - West Texas Recovery Region: Diamond Y Spring Preserve near Fort Stockton, Pecos County.
 - New Mexico – Dexter/Roswell Recovery Region: Bitter Lake National Wildlife Refuge, Roswell, Chaves County Dexter Cienega, 3 miles north of Dexter, Chaves County.
 - New Mexico – Santa Rosa Recovery Region: Blue Hole Cienega, Guadalupe County Agua Negra Spring, Guadalupe County.
 - West-Central New Mexico Recovery Region: La Joya State Waterfowl Management Area, Socorro County.
- The 2015 5-Year Review indicated that the Recovery Plan recovery criteria “should be collectively re-evaluated to determine if they constitute the most effective strategy for conservation and recovery of the species. Of most significance, the actual size of existing core populations is between 50 and 100 times, or even higher multiples in some years of, the minimum number required in the recovery plan. The current recovery criteria may not have considered this much higher number of plants extant throughout the range of the species.” (5-Year Review 2015, 3-4)
- **Recovery Actions**
 - Identify and establish core conservation areas and isolated stands.
 - Identify and address information gaps, compatible uses, and management actions regarding Pecos sunflower distribution, biology and aquifer stability.
 - Protect core conservation areas and isolated stands through landowner education, implementation of management plans, conservation easements, and land acquisition.
 - Monitor Pecos sunflower conservation areas and management actions as needed to satisfy delisting criteria. (Recovery Plan, iv)

3. Description of Species Range

- **Spatial Distribution:** “The historic distribution of Pecos sunflower is not well documented, there is evidence that their associated desert ciénega habitats have been reduced or eliminated by aquifer depletion, or severely impacted by agricultural activities and invasive plant encroachment. Current known established populations of Pecos sunflower are distributed in Cibola, Valencia, Guadalupe, Socorro, and Chaves counties in New Mexico; and Pecos and Reeves counties in Texas” (FWS Focus).

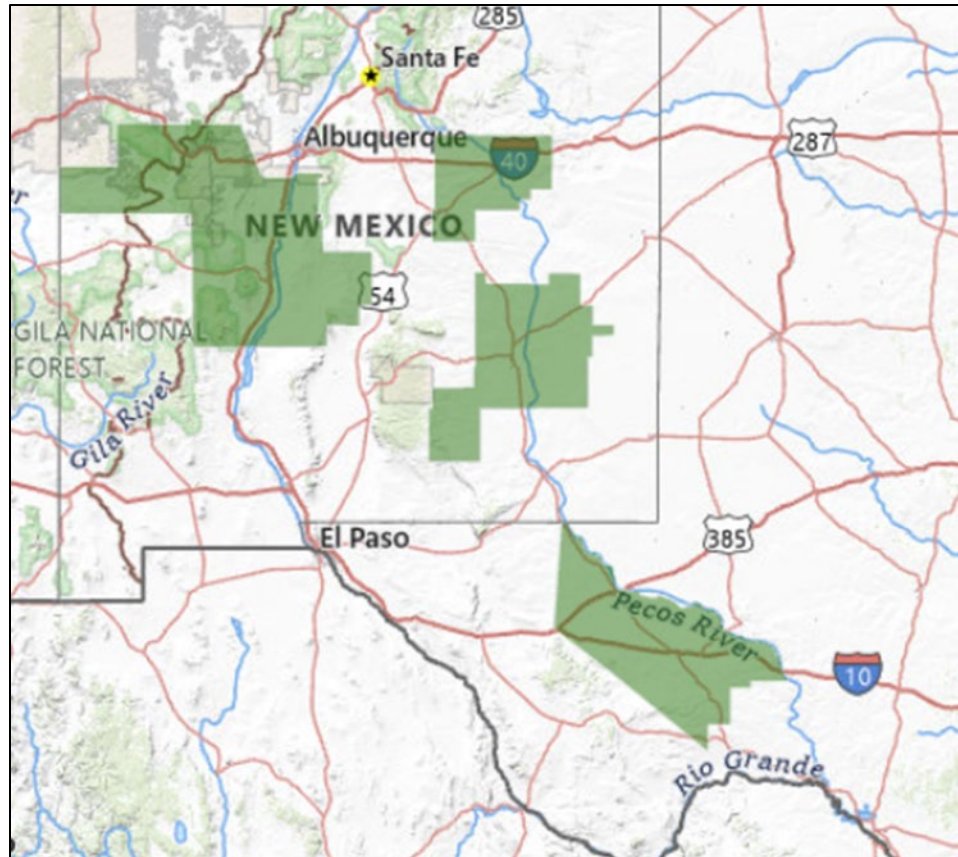


Figure A1-1. Current range map for Pecos sunflower (FWS 2025a).

4. Critical Habitat

- Critical habitat designated in 2008.
- Approximately 1,305 acres (ac) or 528 hectares (ha) in Chaves, Cibola, and Guadalupe counties, New Mexico, and in Pecos County, Texas, fall within the boundaries of the final critical habitat designation.

It should also be noted that extant populations at both the La Joya Unit of the *Ladd S Gordon Wildlife Management Area* and the Pueblo of Laguna were both excluded from Critical Habitat designation because it was determined that both areas are committed to greater conservation measures than would result from the designation of critical habitat for this species (Critical Habitat, 17778).

- Physical and Biological Features (equivalent to “Primary Constituent Elements”) for the species: “The primary constituent elements of critical habitat for *Helianthus paradoxus* are the desert wetland or riparian habitat components that provide:
 - Silty clay or fine sand soils that contain high organic content, are saline or alkaline, are permanently saturated within the root zone (top 50 cm (19.7 in) of the soil profile), and have salinity levels ranging from 10 to 40 parts per thousand; and
 - A low proportion (less than 10 percent) of woody shrub or canopy cover directly around the plant” (Critical Habitat, 17768).

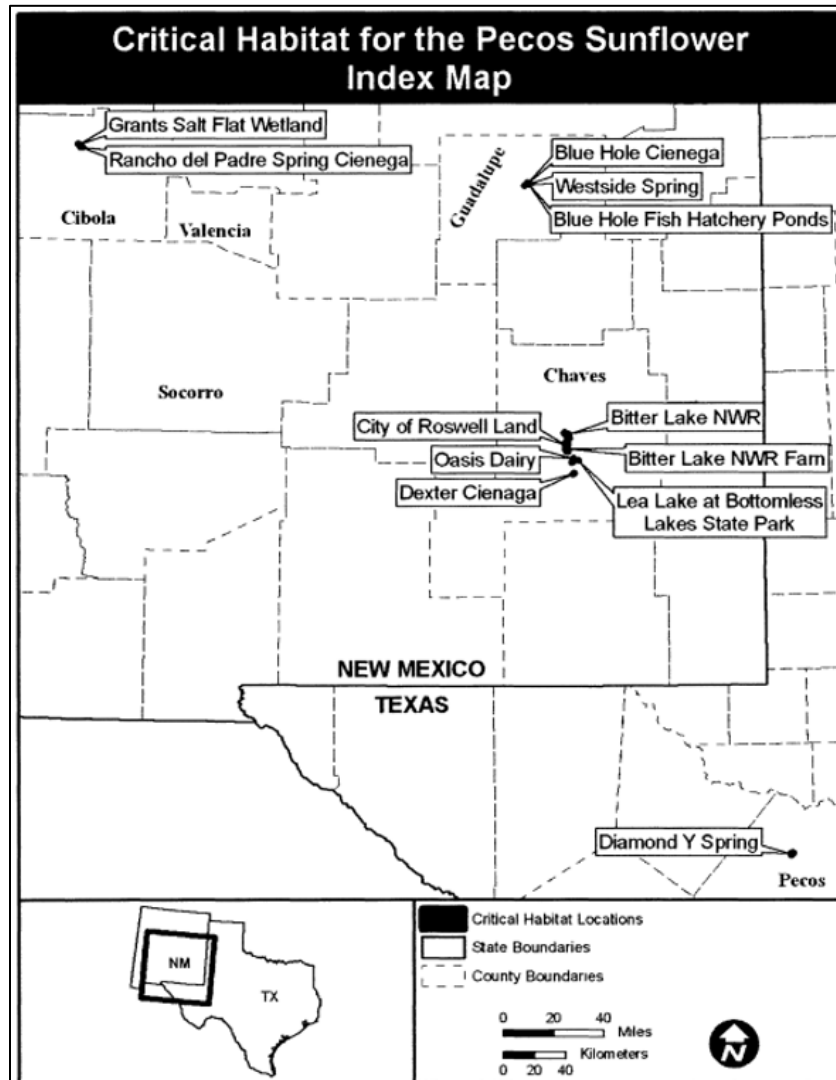


Figure A1-2. Critical Habitat Map for Pecos sunflower. Copied from Figure 1 of the Final Rule document (Critical Habitat 2008, 17787).

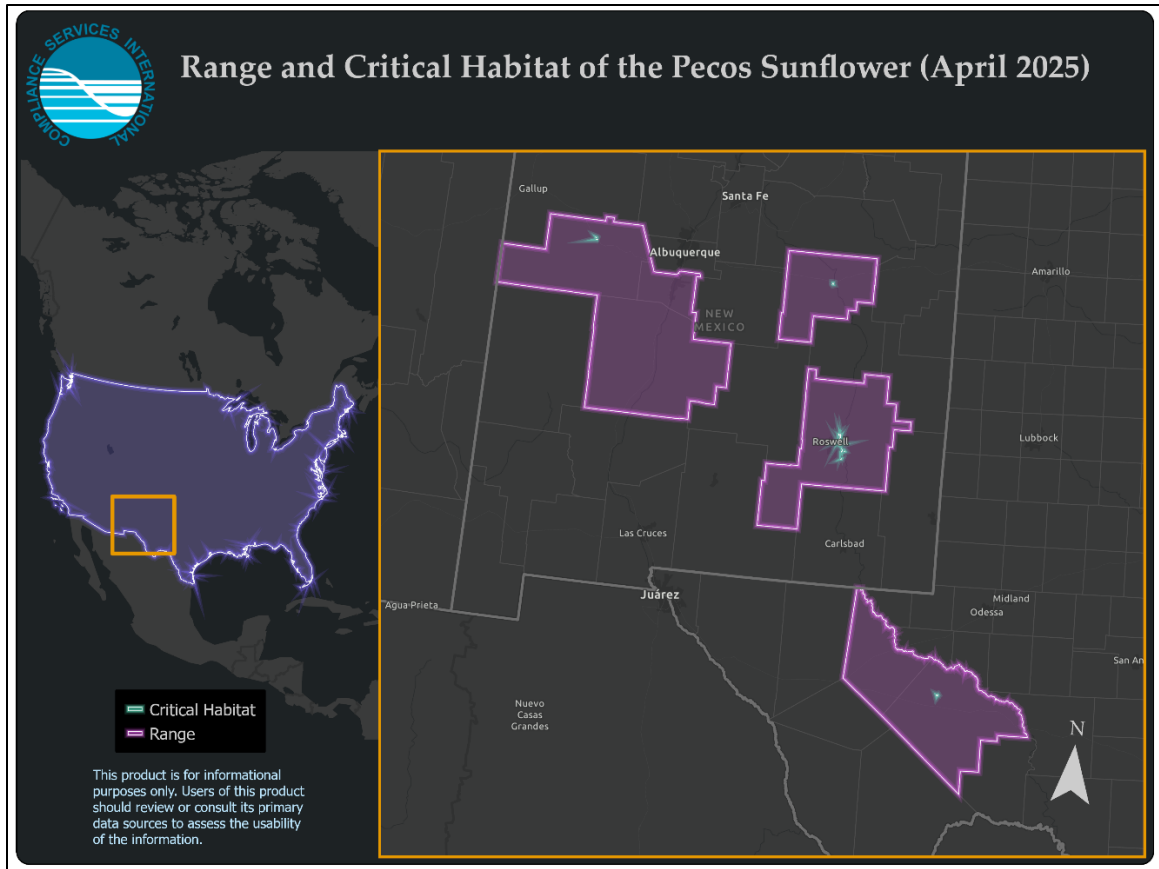


Figure A1-3. Range and critical habitat of the Pecos sunflower (ECOS Profile Page).

5. Known Locations

- FWS 5-Year Review (2023, 2)
 - “The Pecos sunflower is a wetland plant that was known from only a single population near Fort Stockton, Pecos County, Texas, when it was proposed as a candidate for listing as endangered under the Act on December 15, 1980 (45 FR 82480). Subsequent field surveys for this species found additional populations in New Mexico and Texas. At the time of listing, Pecos sunflower was known from 25 sites that occurred in five general areas. These areas were Pecos and Reeves counties, Texas, in the vicinity of Fort Stockton and Balmorhea; Chaves County, New Mexico, from Dexter to just north of Roswell; Guadalupe County, New Mexico, in the vicinity of Santa Rosa; Valencia County, New Mexico, along the lower part of the Rio San Jose; and Cibola County, New Mexico, in the vicinity of Grants. There were three sites in the Fort Stockton to Balmorhea area, eleven in the Dexter/Roswell area, eight in the Santa Rosa area, one along the lower Rio San Jose, and two in the Grants area (Service 1999). In addition, since listing, two new sites on the middle Rio Grande have been added, additional sites at the Ladd S. Gordon Waterfowl Complex, population expansion on BLM land in the Dexter/Roswell area, several new sites in the Santa Rosa area, and expansion of a site in Texas.”
- iNaturalist:
 - https://www.inaturalist.org/observations?quality_grade=research&subview=map&taxon_id=163624

- Sixty-eight verifiable observations, 52 of which are research-grade with public coordinate data (**Figure A1-4**).
- These locations align well with species range. All four parts to the range (three in New Mexico and one in Texas) are represented by research-grade observations. The core map was not developed primarily from known occurrences; iNaturalist occurrences were considered for supplemental areas but ultimately decided against in favor of more precise location data.

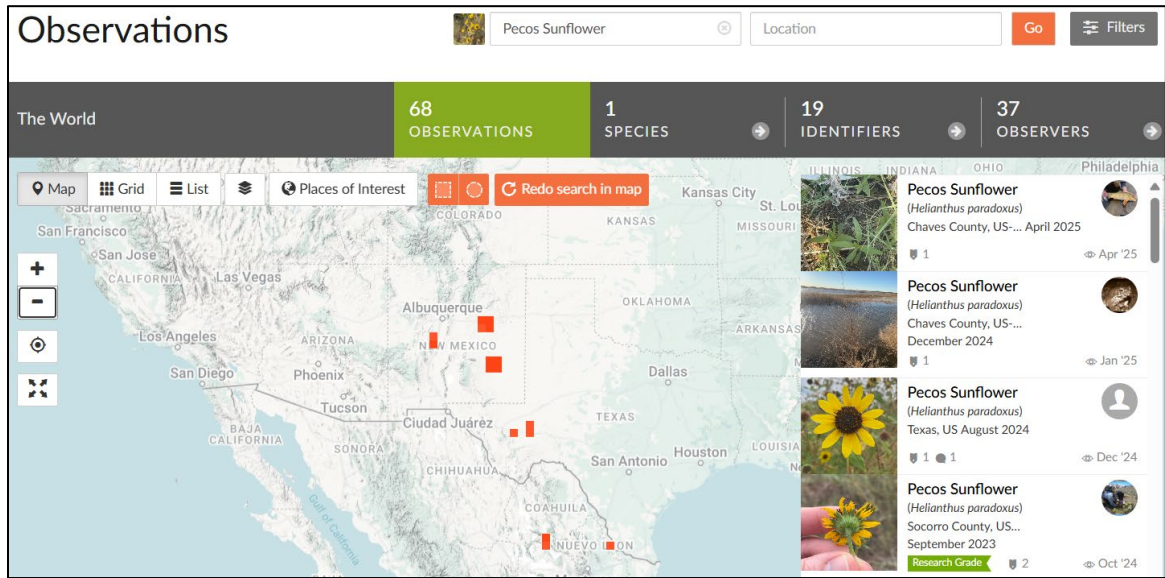


Figure A1-4. iNaturalist occurrences for the Pecos sunflower.

- GBIF: <https://www.gbif.org/species/3119149>
 - GBIF includes 196 occurrence records, 84 of which are georeferenced; 40 of these include usable coordinate data based on latitude/longitude precision (3+ decimal places) and relative recency (2010-present) in New Mexico and Texas. As with iNaturalist, this dataset was considered as a supplementary dataset for core map development, but ultimately not used in favor of more precise location information.

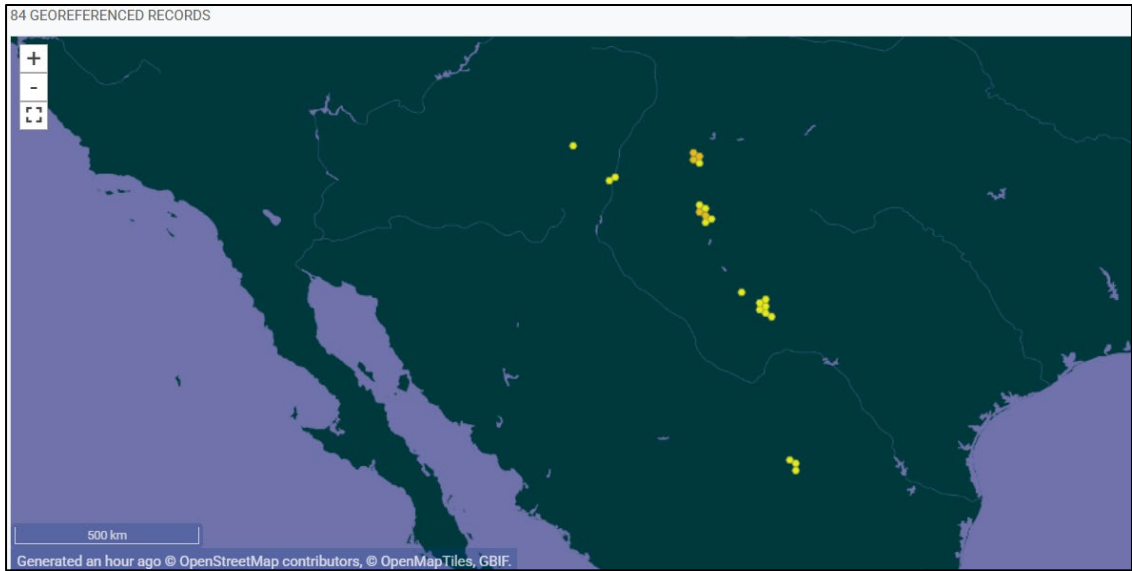


Figure A1-5. GBIF occurrences of the Pecos sunflower.

- NatureServe Explorer: <https://explorer.natureserve.org/>
 - Available public EO information from NatureServe Explorer is generally consistent with FWS range and captures all range areas of the species in New Mexico and Texas; however, other more precise location data sources were used to supplement DCH in developing the Pecos sunflower core map.

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

The core map for this species is based on DCH, expanded to include two additional areas not represented by critical habitat. In particular, the locations associated with Pueblo of Laguna (Tribal lands) and The La Joya Unit of the *Ladd S. Gordon Wildlife Management Area*. Although the species is considered to be “off-field,” the core map extent does not include a significant amount of agricultural area (7 acres); therefore, the removal of cultivated areas > 25 acres was not necessary.

1. References and Software

- PAD-US: <https://catalog.data.gov/dataset/protected-areas-database-of-the-united-states-pad-us-3-0-ver-2-0-march-2023>.
- Software used: ArcGIS Pro version 3.2.
- FWS Species Critical Habitat: <https://ecos.fws.gov/ecp/species/7211>.

2. Datasets Used in Core Map Development

2.1. Critical Habitat

The critical habitat for this species was designated on April 1, 2008 (**Figure A2-1**). A shapefile including species critical habitat for all DCH species was downloaded from the FWS ECOS website on January 24, 2025. The shapefile was converted to a feature class stored in a file geodatabase and reprojected to WKID #4269 (“North America Albers Equal Area Conic”).

1. Using an ArcGIS Web Map the species was queried based on the ECOS listed “Entity ID” of 558 and exported as a feature class to a temporary file geodatabase as a standalone Entity ID-specific layer.
2. The area of the critical habitat was calculated automatically by loading it into the software (ArcGIS Pro version 3.2) and reading its area from the attribute table (“Shape_Area”), then converting its units (square meters) into acres with a conversion rate of 0.000247105.
3. This shapefile was added to an ArcGIS Pro map and compared against the available known locations described in the most recent 5-Year Review (2023), and the available occurrence information from the GBIF, iNaturalist, and NatureServe databases.

Compliance Services International has determined that the shapefile for DCH functions well as the basis for the core map, noting that two additional sites were supplemented to create the core map as described below.

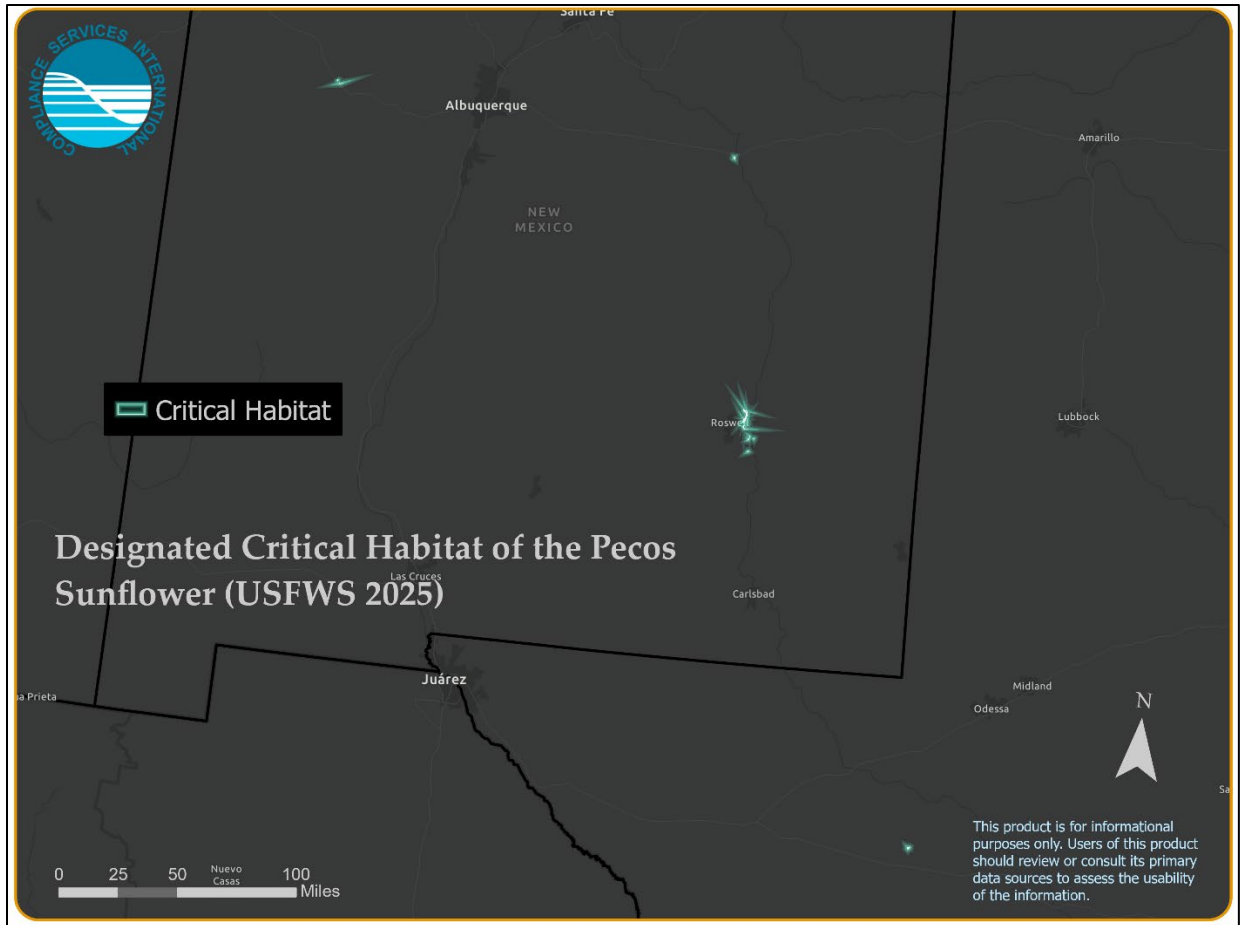


Figure A2-1. DCH of the Pecos sunflower (ECOS Profile Page).

2.2. PAD-US

According to USGS, PAD-US is “America’s official national inventory of U.S. terrestrial and marine protected areas that are dedicated to the preservation of biological diversity and to other natural, recreation and cultural uses, managed for these purposes through legal or other effective means. PAD-US also includes the best available aggregation of federal land and marine areas provided directly by managing agencies, coordinated through the Federal Geographic Data Committee Federal Lands Working Group.”⁴

In the case of the Pecos sunflower, where known occurrences include well-defined areas such as tribal lands and wildlife management areas, the PAD-US dataset was useful in extracting areas meant to conservatively capture extant populations of the species. These were used to supplement critical habitat spatial data. Specifically, the locations of Pueblo of Laguna (Tribal land) and the La Joya Unit of the *Ladd S. Gordon Wildlife Management Area* were extracted from the PAD-US dataset and added to DCH to form the core

⁴ <https://www.usgs.gov/programs/gap-analysis-project/science/pad-us-data-overview>

map (Figure A2-2 and Figure A2-3).

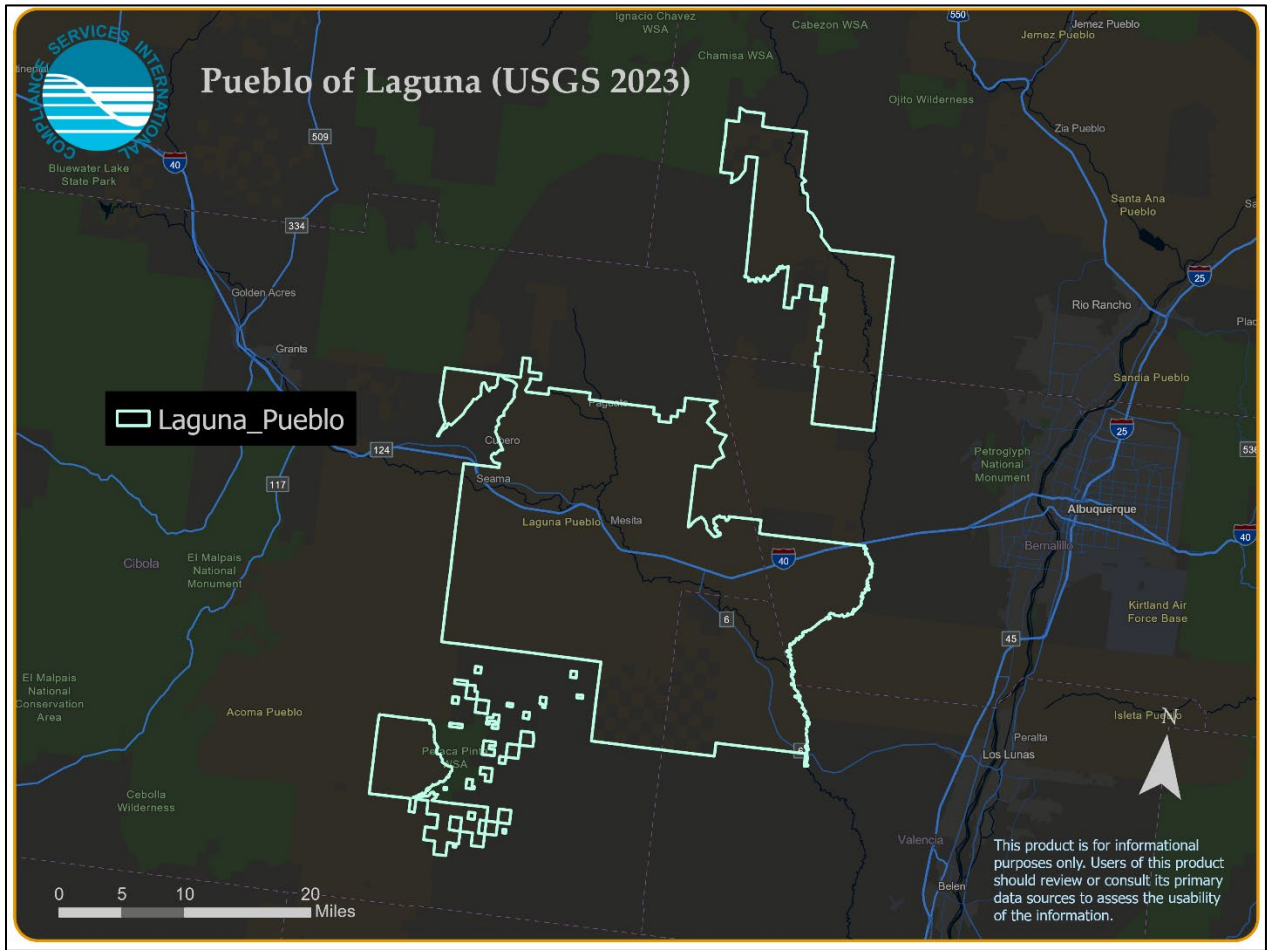


Figure A2-2. Pueblo of Laguna (USGS 2023).

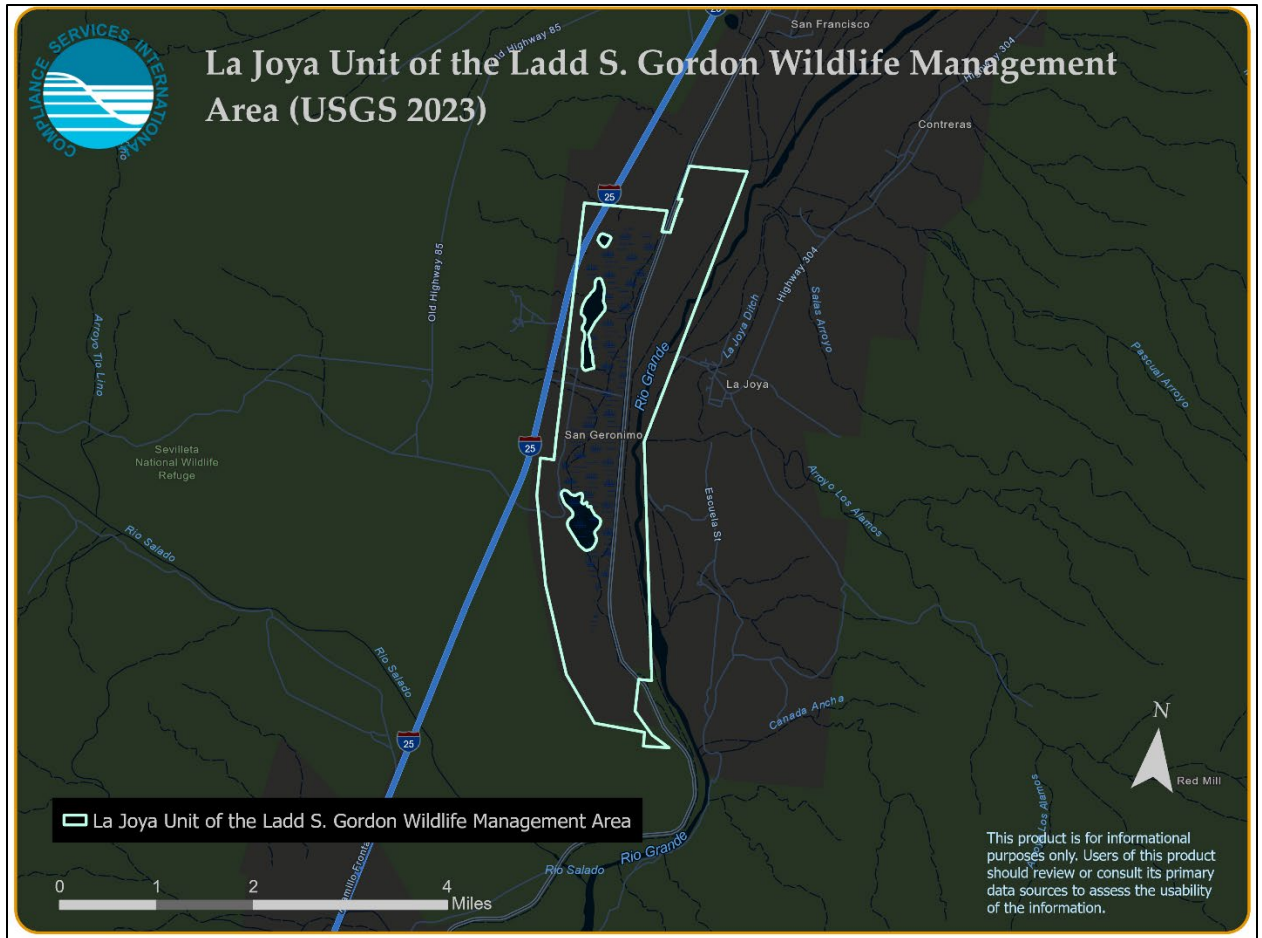


Figure A2-3. La Joya Unit of the Ladd S. Gordon Wildlife Management Area (USGS 2023).

3. Creating the Core Map

3.1. Core Map Layer Development

The Pecos sunflower core map is developed from DCH data, supplemented by known location data. The layers comprising the Pecos sunflower core map were processed as follows:

1. Import the species critical habitat as a feature class named “PS_CH.”
2. Import the PAD-US dataset. Use the combined “Proclamation, Marine, Fee, Designation, Easement” layer to query for the Pueblo of Laguna (Unit_Nm LIKE '%Pueblo%' AND Unit_Nm LIKE '%Laguna%') and La Joya (Unit_Nm LIKE '%La Joya%') areas. Export each as separate layers named “Laguna_Pueblo” and “LJWMA” respectively.
3. Use the Merge tool to merge the species DCH (“PS_CH”) and added known locations (“Laguna_Pueblo” and “LJWMA”) and save as a new feature class (“PS_extent_merge”).
4. Use the Pairwise Dissolve tool to dissolve the previous layer (“PS_extent_merge”) into a single feature. Save as a new layer, “PS_extent_merge_pd”.
5. (Optional) Export the previous layer “PS_extent_merge_pd” as a new layer identifiable as the species core map (“PS_CoreMap”).

References

Documents

- U.S. Environmental Protection Agency. 2024. Process EPA Uses to Develop Core Maps for Pesticide Use Limitation Areas. Accessed May 12, 2025. <https://www.epa.gov/endangered-species/process-epa-uses-develop-core-maps-pesticide-use-limitation-areas>.
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Spatial Data & Software

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