

# Interim Core Map Documentation for Texas prairie dawn-flower

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

## Species Summary

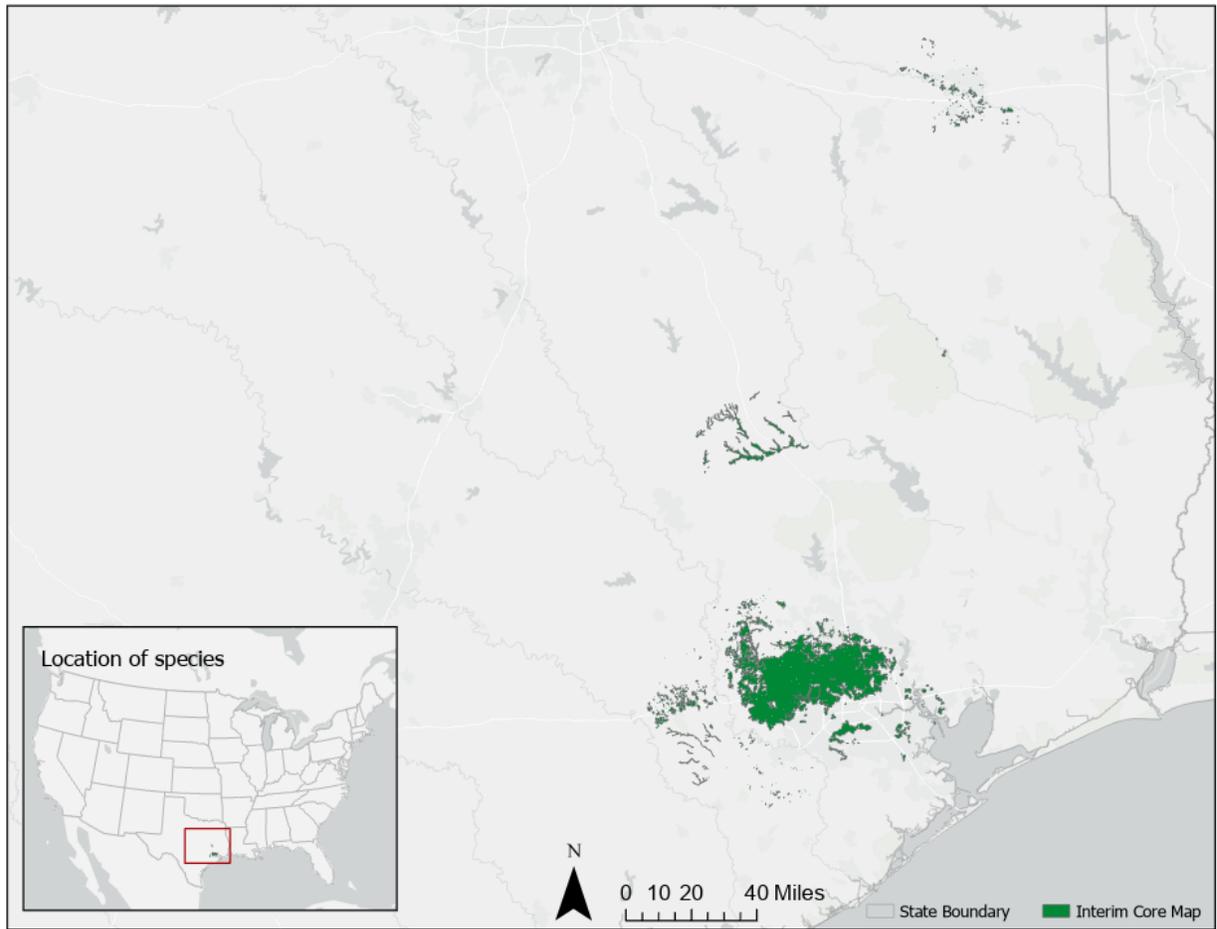
The Texas prairie dawn-flower (*Hymenoxys texana*, Entity ID 1045) is an endangered plant. The U.S. Fish and Wildlife Service (FWS) has not designated a critical habitat for the Texas prairie dawn-flower. This species occurs in the Texas coastal prairie in disturbed, open areas with barren slicks made up of a select few soils, and where specific hydrological requirements can be met. The Texas prairie dawn-flower is an annual plant with unknown pollinators. There are 16 known populations of this species with the most recent population discovered in 2022. FWS revised the species range map in 2022 stating that the new range “provides opportunities for further understanding of where undiscovered populations may still exist on Gulf coastal prairies in southern counties as well as alluvial sediments on stream terraces in more northern counties of east Texas.” (5-year review 2022, p. 18)

## Description of Core Map

The core map for the Texas prairie dawn-flower is based on the species range.

**Figure 1** depicts the resulting interim core map for the Texas prairie dawn-flower. The size of this core map is approximately 604,860 acres. Landcover categories within the core map area are included in **Table 1**. Landcover is predominantly pasture/hay and developed low/medium intensity. Since this species occurs in disturbed areas and occurrence is driven by soil type, this represents potential habitat.

The core map developed for the Texas prairie dawn-flower is considered interim. This core map will be used to develop pesticide use limitation areas (PULAs) that include the Texas prairie dawn-flower. 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 a “limited” (2) best professional judgement classification because it consists of the species’ range, which includes refinements of suitable soil type and is supported by occurrences throughout its range. 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 Texas prairie dawn-flower. The total acreage of the interim core map is approximately 604,860 acres.**

**Table 1. Percentage of Interim Core Map Represented by NLCD 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)	1%	8%
Forestry	Evergreen Forest (42)	5%	8%
Forestry	Mixed Forest (43)	2%	8%
Agriculture	Pasture/Hay (81)	32%	36%
Agriculture	Cultivated Crops (82)	4%	36%
Mosquito adulticide, residential	Developed Open Space (21)	8%	43%
Mosquito adulticide, residential	Developed Low Intensity (22)	12%	43%
Mosquito adulticide, residential	Developed Medium Intensity (23)	16%	43%
Mosquito adulticide, residential	Developed High Intensity (24)	7%	43%
Invasive species control	Woody Wetlands (90)	7%	13%
Invasive species control	Emergent Herbaceous Wetlands (95)	2%	13%
Invasive species control	Open Water (11)	0%	13%
Invasive species control	Grassland/Herbaceous (71)	1%	13%
Invasive species control	Shrub/Scrub (52)	2%	13%
Invasive species control	Barren Land (31)	1%	13%
Total Acres	Interim Core Map Acres	604,860	

## Evaluation of Known Location Information

There are five datasets with known location information for this species:

- Descriptions of locations provided by FWS
- Occurrence locations included in iNaturalist
- Occurrence locations included in the Global Biodiversity Information Facility (GBIF)
- Occurrence locations included in NatureServe
- Occurrence locations included in Texas Natural Diversity Database (TXNDD)

## 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<sup>3</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
4. Document the core map

For step 1, EPA compiled available information for the Texas prairie dawn-flower from FWS, as well as observation information available from various publicly available sources (including iNaturalist, GBIF, NatureServe, and Texas Natural Diversity Database (TXNDD)). The information compiled for the Texas prairie dawn-flower is included in **Appendix 1**. Influential information that impacted the development of the core map included:

- FWS discovered new populations in 2021 and 2022 in new soil types that the species was not previously found in (i.e., Wockley fine sandy loam, Tomball loam, and Gowker soils; 5-year review 2022, p. 16-17).
- FWS created a new refined range map incorporating the known populations and known soil types the species lives in and buffering for the potential for additional new populations to exist in the new soil types as surveys continue (these soil types were previously not assessed for the species).

For step 2, EPA used the compiled information to identify the core map type. EPA compared known location data to the range and found that these known locations are consistent with the species range. The entire range of the species was used as the core map because new populations of the species are still being discovered, the range is refined to include relevant soil types for this species, and occurrences are documented throughout its range. Thus, EPA used the FWS range as the species core map.

For step 3, EPA used the ECOS species range for the Texas prairie dawn-flower.

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

Alternative approaches and data not already described in this document were not explored in the development of this interim core map.

## Appendix 1. Information Compiled for Species

### 1. Recent FWS Documents

[2022 5-year review](#)

[2015 5-year review](#)

[1990 Recovery plan](#)

### 2. Background information on Species

- **Status:** Federally listed as endangered in 1986
- **Taxonomy:** Dicot; FWS Plant Group CONUS-11
- **Resiliency**
  - “Important factors in this species’ short life cycle requires natural disturbances, in open areas with barren slicks made up of specific and sometimes rare soils, where specific hydrological requirements can be met. Although the exact role of natural disturbance (droughts, fires, and floods) has on these populations is unclear, these disturbances appear necessary to the continued recruitment and recovery of these populations.” (5-year review 2022, p. 23)
- **Redundancy**
  - There are at least 16 populations of Texas prairie dawn-flower, with the 16<sup>th</sup> discovered in 2022. (5-year review 2022, p. 13)
- **Representation**
  - No genetic information of the 16 existing populations is available but FWS is providing section 6 funding to study the reproductive biology, genetics, and seed dispersal mechanisms for the Texas prairie dawn-flower. (5-year review 2022, p. 14)
- **Habitat Description**
  - Texas prairie dawn-flowers are often found in “sparsely vegetated areas of fine, sandy to loamy, compact saline soils at the base of mima mounds. This saline barren habitat contains cryptogamic soils that are often covered with the bluegreen algae *Nostoc sp.*, which appears as a “slick” surface during wet winters and early spring, or crusty dry patches during summer (5-year review 2022, p. 6)
  - Soil is important to where this species can grow. **Table A1-1** contains more information on soil type and ecoregion of known populations of the Texas prairie dawn-flower (5-year review 2022, p. 9)
    - Six self-sustaining populations in western Harris County are conserved on private lands managed by Coastal Prairie Conservancy (former Katy Prairie Conservancy). Although previous reports of the primary soils associated with these six populations were thought to be Gessner Series, the soils have been reclassified as Clodine-Warrenlake complex and Snakecreek fine sandy loam. (5-year review 2022, p. 7)
    - Recently, two isolated populations in Trinity and Gregg Counties were discovered on a different type of saline barren habitat in frequently flooded sandy-loamy alluvial soils (Sawlit, Kullit, Wrightsville-Raino, and Udorthents Series) in the Piney Woods Ecoregion. Another new population was observed to span multiple saline barrens associated with a rare soil type (Gowker Series, a fine-loamy siliceous thermic Cumulic Hapludolls), which is only found on frequently flooded stream terraces in east Texas (5-year review 2022, p. 6-7)
    - “The discovery of the new populations thriving in other ecoregions also indicates this species may have biological mechanisms that allow it to adapt or recruit to

prairie habitats outside of its known range. Future recovery efforts will be focused on working with local private landowners to gain access to areas with this same soil and habitat type to determine if other populations may occur in the Post Oak and Savannah Ecoregions.” (5-year review 2022, p. 7)

- “*H. texana* thrives in disturbed, open areas with barren slicks made up of a select few soils, and where specific hydrological requirements can be met. These requirements are specific to the Texas coastal prairie.” (5-year review 2015, p. 19)

**Table A1-1. Soil Types and Ecoregion associations identified with Texas prairie dawn-flower populations surveyed during the 2022 flowering season (5-year review 2022, p. 9).**

County	Soil Code	Soil Type	Ecoregion
Ft Bend	CduA	Clodine-Urban land complex	Gulf Prairies and Marshes
Ft Bend	Wb	Waller slightly saline, occasionally ponded-Katy complex	Gulf Prairies and Marshes
Gregg	KtB	Kullit very fine sandy loam	Piney Woods
Gregg	Ud	Udorthents, Loamy and Clayey	Piney Woods
Gregg	WrA	Wrightsville-Raino complex	Piney Woods
Harris	Ad	Addicks loam	Gulf Prairies and Marshes
Harris	Ak	Addicks-Urban land complex	Gulf Prairies and Marshes
Harris	Be	Bernard-Edna complex	Gulf Prairies and Marshes
Harris	Cd	Clodine fine sandy loam	Gulf Prairies and Marshes
Harris	Gs	Clodine-Warrenlake complex	Gulf Prairies and Marshes
Harris	Ap/Cd/Ca	Cyfair fine sandy loam	Gulf Prairies and Marshes
Harris	GesA/Wa	Gessner loam	Gulf Prairies and Marshes
Harris	Kat/Kf	Katy fine sandy loam	Gulf Prairies and Marshes
Harris	ModA	Mocarey-Urban land complex	Gulf Prairies and Marshes
Harris	SnIA	Snakecreek fine sandy loam	Gulf Prairies and Marshes
Madison	Go	Gowker clay loam	Post Oak Savannah
Trinity	SsA	Sawlit-Sawtown complex	Piney Woods
Waller	WoA	Wockley fine sandy loam	Gulf Prairies and Marshes
Waller	Wa	Tomball loam	Gulf Prairies and Marshes

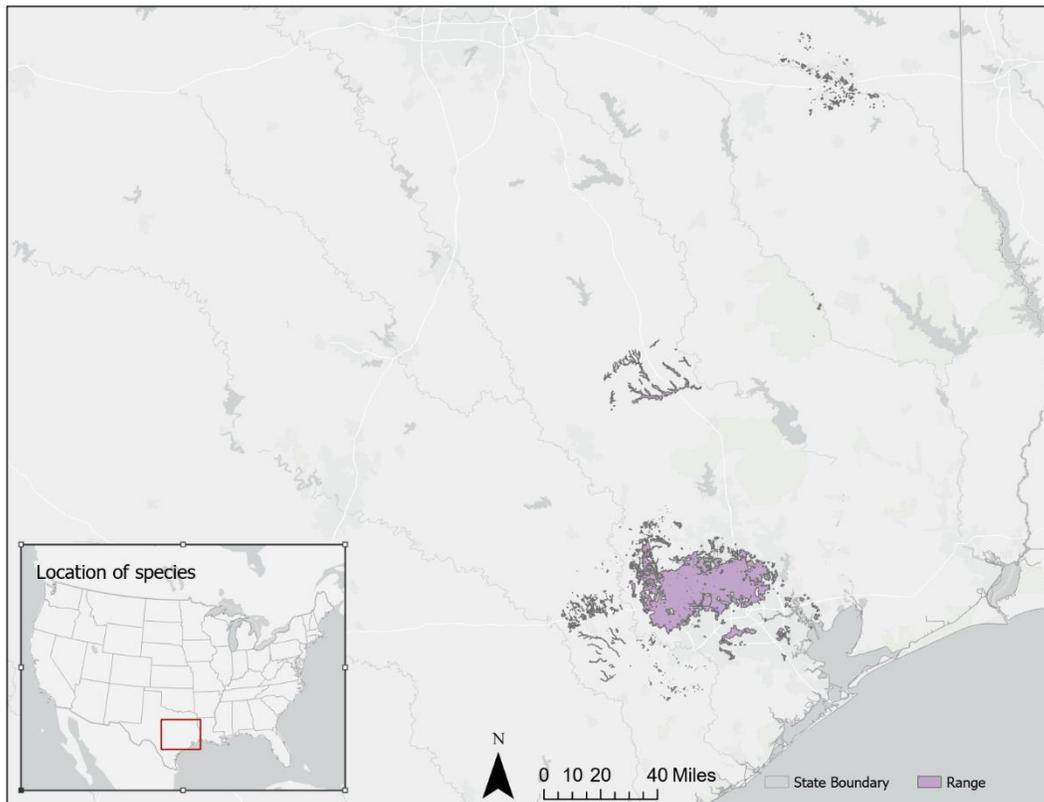
- **Relevant Life History Information**

- “Most plants are dead by May with the principal period of flowering and seed maturation being from mid—March to mid—April.” (Recovery Plan 1990, p. 7)
- “The early flowering period is a result of specific wet conditions available on the bare and saline slick spots where the plant is found. These spots tend to dry out to almost desert like conditions during the hot summer months. Cool and wet winters tend to produce conditions favorable for increased and more robust flowers. However, drought conditions (as seen during the winters from 2009 to 2011) may impede growth of the plant resulting in fewer individuals.” (5-year review 2015, p. 6)
- “Individual *Hymenoxys texana* plants are small, and hundreds of plants may be found within a few square meters. Therefore, no effort has been expended counting plants at any of the sites. If counts were made, the total number of plants would be quite high, but such figures have little meaning for small annual plants like *Hymenoxys texana*. Instead, range, number of occupied sites, and area of occupied habitat are all considered better parameters for estimating the abundance of *Hymenoxys texana*.” (Recovery Plan 1990, p. 13)

- Pollinators are unknown but are thought to be Harvester ants (*Pogonomyrmex barbatus*), composite thrips (*Microcephalothrips abdominalis*), bees (genus *Andrena* and *Lasioglossum*). (5-year review 2015, p. 6)
- **Ecology**
  - “Although the distribution of Texas prairie dawn flower is naturally restricted to specific habitat and soil requirements, there appear to be biological, chemical, and physical factors that influence population size and health. The exact role natural disturbance (droughts, fires, and floods) has on these populations is unclear, but these natural types of disturbances appear necessary to the continued recruitment and recovery of these populations.” (5-year review 2022, p. 28)
  - “*Hymenoxys texana* grows in small colonies on bare spots and individual colonies are often patchily dispersed among other types of vegetation.” (Recovery Plan 1990, p. 12)
- **Taxonomy**
  - It is a member of the Helenieae, tribe of the sunflower family (Asteraceae), originally described under the name *Actinella texana* in 1891 and later changed to *Hymenoxys texana* (5-year review 2022, p. 15)
- **Relevant Pesticide Use Sites**
  - None are mentioned
- **Threats**
  - “Loss of the saline barren habitat from urban development and agricultural use in the Gulf Prairies and Marshes Ecoregion continues to be a high threat to this species.” (5-year review 2022, p. 7)
- **Relevant Recovery Criteria and Actions (Source: 1990 Recovery Plan)**
  - Downlisting criteria include:
    - At least 50 separate populations, each occupying at least one hectare (2.47 acres) of suitable habitat, are discovered or established.
    - At least 50 populations are protected from land use practices or land use changes that could destroy the populations.
  - De-listing criteria include:
    - Management practices are developed and implemented which ensure the numbers of plants at protected populations remain stable.
  - Recovery actions include (p. 18-20):
    - Protect the species and its habitat from existing and future threats
    - Gather information on the natural history for use in management
    - Update management plans as new data accumulates
    - Search for new sites and populations
    - Establish a botanical garden population and, if needed, attempt to establish populations in suitable natural habitat
    - Develop public awareness, appreciation and support for the preservation and study of the species

### 3. Description of Species Range

- The current geographic range encompasses 604,860 acres.
- **Figure A1-1** depicts the current FWS species range map (last updated 08/23/2022).



**Figure A1-1. Map of FWS Texas prairie dawn-flower range (604,860 acres).**

### 4. Critical Habitat

- There is no critical habitat for this species.

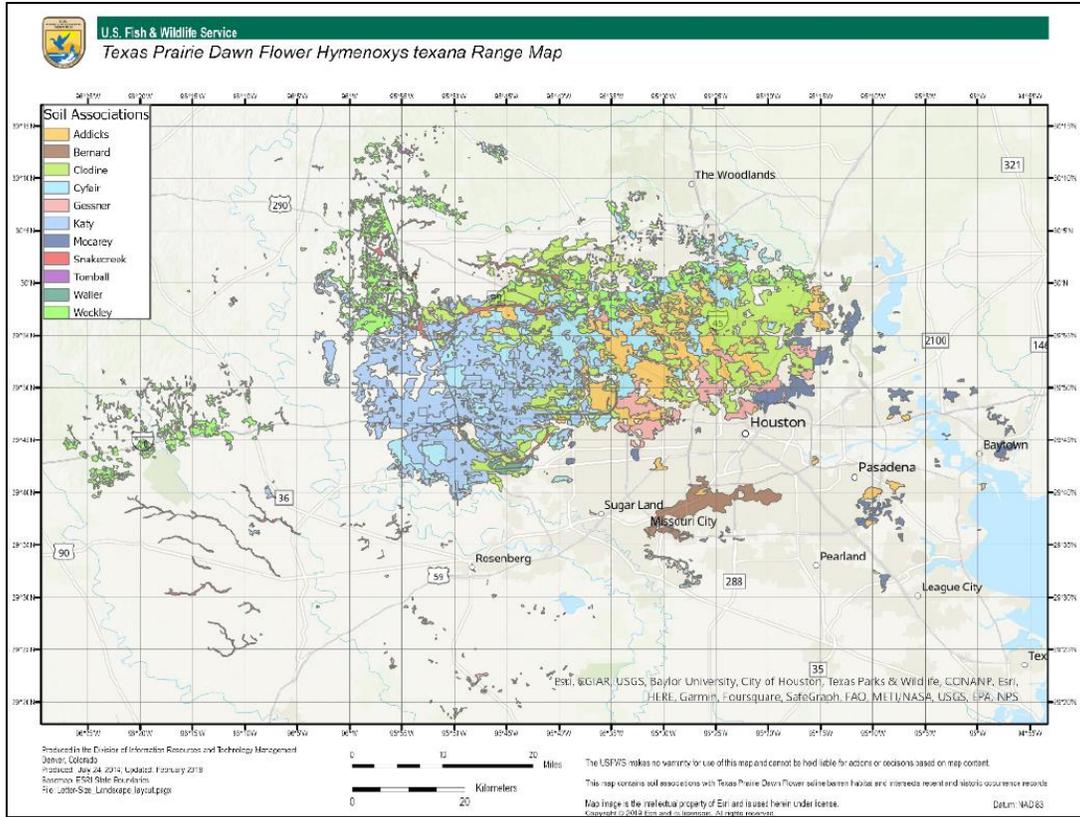
### 5. Known Locations

- **Occurrences Described in FWS Documents**
  - Researchers initially believed *H. texana* occurred in only two Texas counties. However recent surveys revealed populations in three additional counties...Due to recent findings, it appears that *H. texana* is more widespread than originally thought and the range of this plant warrants further investigation. (5-year review 2015, p. 10)
  - There are 16 populations described in the 2022 5-year review (p. 13-14), and they are detailed in **Table A1-2**.
  - A new refined core map was developed in 2022 by FWS which incorporates suitable soil for the Texas prairie dawn-flower (**Figures A1-2 to A1-5**).

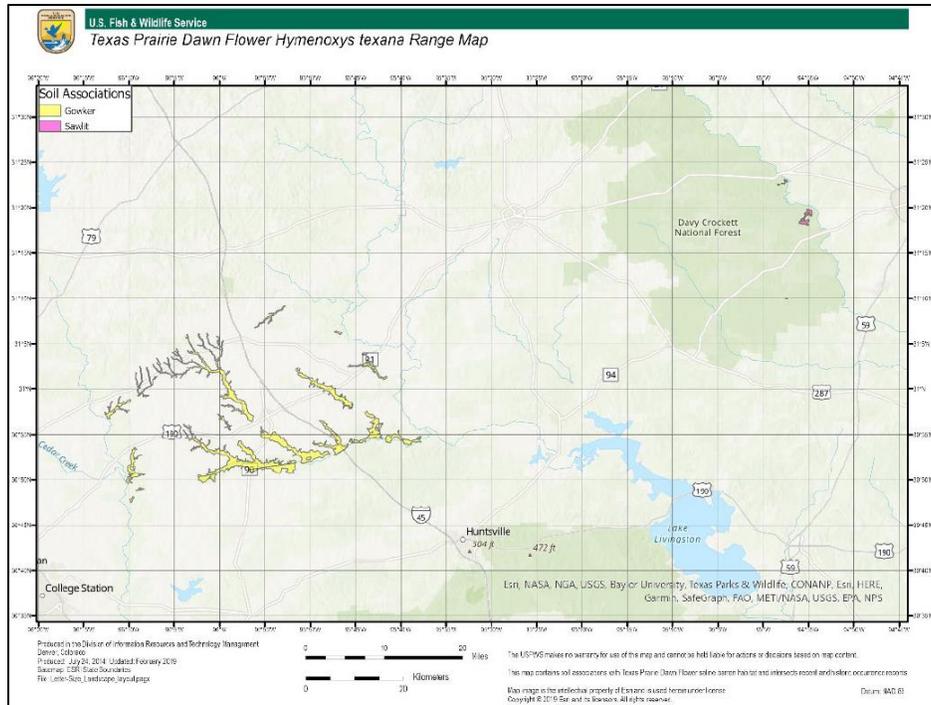
**Table A1-2.** Populations Surveyed during 2022 Spring Flowering Season in each Ecoregion.

Populations	Texas Prairie Dawn Populations Name	2022 Population Estimate	County	Ecoregions
1	Addicks Reservoir – Bear Creek Park on Federal Lands	6,579	Harris	Western Gulf Prairies and Marshes
2	Addicks Reservoir – North Clay Road & Groescke Road on Federal Lands	51	Harris	Western Gulf Prairies and Marshes
3	Private lands held in conservation by Coastal Prairie Conservancy – North Warren Prairie	7,000	Harris	Western Gulf Prairies and Marshes
4	Private lands held in conservation by Coastal Prairie Conservancy – Mid-Warren Prairie near Stream	33,074	Harris	Western Gulf Prairies and Marshes
5	Private lands held in conservation by Coastal Prairie Conservancy – South-Warren Prairie near Stream	35,763	Harris	Western Gulf Prairies and Marshes
6	Private lands held in conservation by Coastal Prairie Conservancy – adjacent to Warren Prairie	77	Waller	Western Gulf Prairies and Marshes
7	Private lands held in conservation by Coastal Prairie Conservancy – North-Jack Roads Prairie	5,355	Harris	Western Gulf Prairies and Marshes
8	Private lands held in conservation by Coastal Prairie Conservancy – Mid-Jack Roads Prairie	7,433	Harris	Western Gulf Prairies and Marshes
9	Private lands held in conservation by Coastal Prairie Conservancy- South-Jack Roads Prairie	5,813	Harris	Western Gulf Prairies and Marshes
10	Private Lands proposed for future conservation	5,274	Waller	Western Gulf Prairies and Marshes
11	Mercer Prairie Dawn Preserve on Harris County Lands	2,583	Harris	Western Gulf Prairies and Marshes
12	Willow Waterhole Prairie Dawn Preserve on Harris County Flood Control Lands	0	Harris	Western Gulf Prairies and Marshes
13	Space Center Prairie Dawn Preserve on Harris County Lands	153	Harris	Western Gulf Prairies and Marshes
14	Private Lands	>30,000*	Madison	Post Oak Savannah
15	Private Lands	7,622	Trinity	Piney Woods
16	Private Lands	50,422	Gregg	Piney Woods

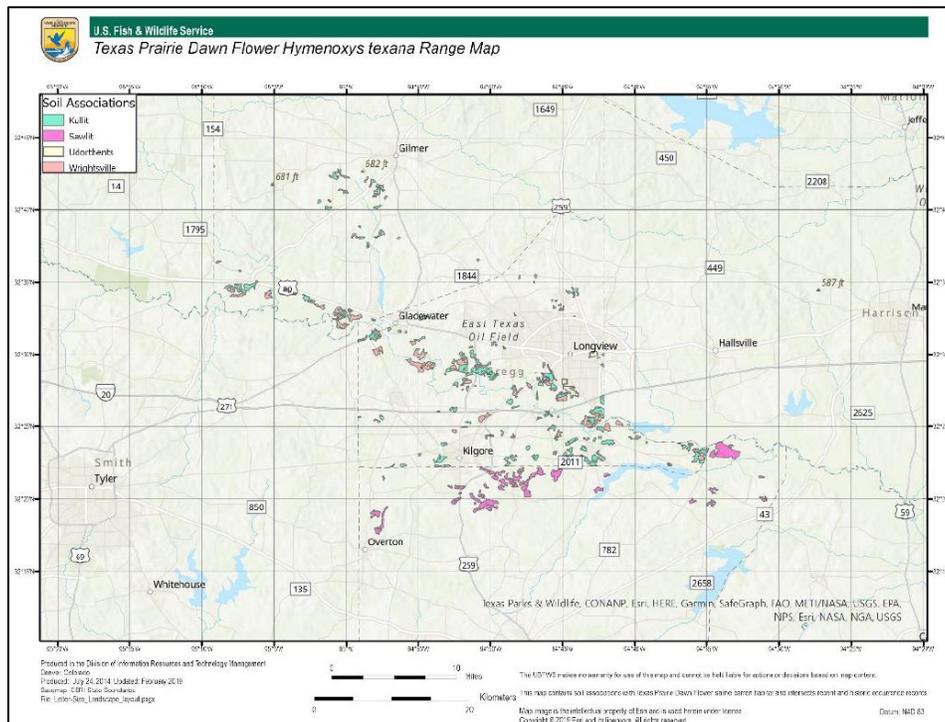
\*Note estimates of populations where data could not be collected using actual counts or counts within quadrants interpolated over aerial coverage.



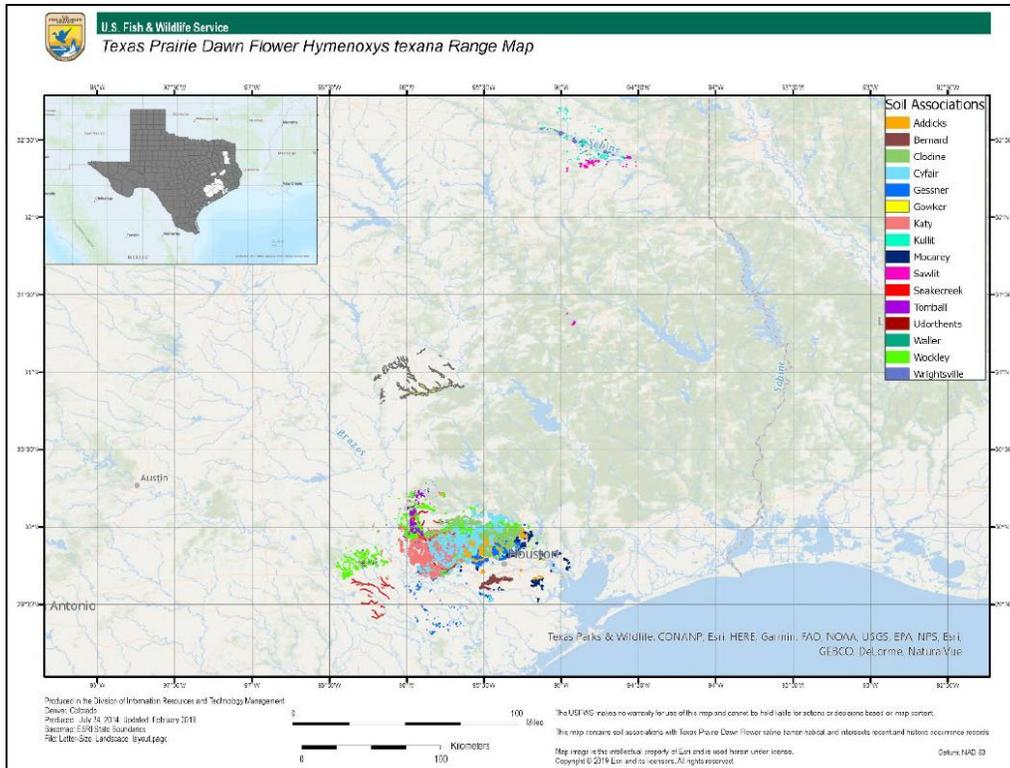
**Figure A1-2. Saline barren habitat associated with specific soils found in the Gulf coastal prairies are color coded to show where potential suitable habitat for the Texas prairie dawn-flower may occur (SSURGO 2022). Many of these soils are no longer available due to urban and agricultural development. Only the western soils in Harris and Waller County have been preserved or protected from development. Specific soils in Fort Bend, Colorado, and Austin Counties have not been explored for potential Texas prairie dawn populations. (5-year review 2022, p. 19)**



**Figure A1-3. Saline barren habitat associated with specific alluvial soils (Gowker and Sawlit Series) found on stream terraces in the Post Oak Savannah and Piney Woods grasslands that provide suitable habitat for the Texas prairie dawn-flower. (5-year review 2022, p. 20)**

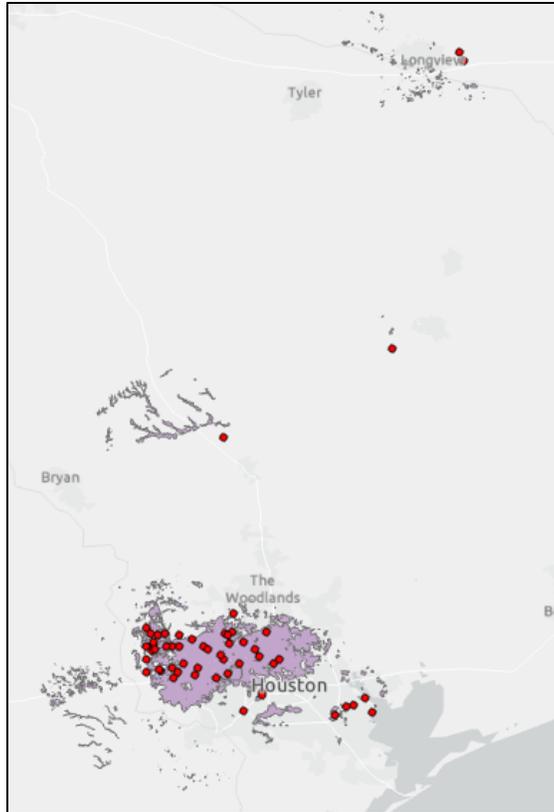


**Figure A1-4. Saline barren habitat associated with specific alluvial soils (Kullit, Sawlit, Udothents, and Wrightsville Series) found on stream terraces in the Piney Woods grasslands in the northern extent of the range that provide suitable habitat for the Texas prairie dawn-flower. (5-year review 2022, p. 21)**



**Figure A1-5. FWS Range Map for the Texas prairie dawn-flower showing the full extent of saline barrens and the specific soils that provide suitable habitat for this species. (5-year review 2022, p. 22)**

- **Occurrences in iNaturalist**
  - Searched on 7/24/2025
  - [https://www.inaturalist.org/observations?quality\\_grade=research&subview=table&axon\\_id=163947&verifiable=any](https://www.inaturalist.org/observations?quality_grade=research&subview=table&axon_id=163947&verifiable=any)
  - There are 56 research grade observations available from 2014 to 2025.
  - Coordinates were downloaded from iNaturalist and imported into ArcGIS with the coordinate system GCS\_North\_American\_1983.
  - **Figure A1-6** depicts the locations of these observations, all of which are obscured by 29 km. When accounting for the obscuring, these observations could be considered as within the FWS range.



**Figure A1-6. Occurrences available in iNaturalist (56 research-grade observations).**

- **Occurrences in GBIF**
  - Searched on 7/14/2025
  - [https://www.gbif.org/occurrence/search?has\\_coordinate=true&has\\_geospatial\\_issue=false&taxon\\_key=3150190](https://www.gbif.org/occurrence/search?has_coordinate=true&has_geospatial_issue=false&taxon_key=3150190)
  - There were 187 observations available for this species, 62 of which had coordinates, and 15 which were not included in iNaturalist and are “preserved specimens” from 1890 to 2014. Of these, six observations are from 1989 to 2014 and are consistent with the FWS species range.
  
- **Occurrences in NatureServe**
  - NatureServe was searched on 7/24/2025
  - <https://explorer.natureserve.org/pro/Welcome>
  - NatureServe did not have any additional locations and showed a range consistent with that of the current FWS range.
  
- **Occurrences in Texas Natural Diversity Database (TXNDD)**
  - Contacted on 7/24/2025
  - Due to data guidelines, EPA cannot present a figure showing the locations of the Texas prairie dawn-flower from TXNDD. Unmasked occurrence data from the TXNDD was received and overlaid with the FWS range. These observations did not support expanding the core map and the locations were consistent with the FWS range.

Collectively, the occurrence data are consistent with the core map being the FWS species range. Two new populations were discovered in 2021 and 2022 on soil types previously not known to host the species. The FWS refined the species range in 2022 to account for these new soil types and the high potential for undiscovered populations to exist within the specified soil types (see **Table A1-1** above). The FWS range encompasses the documented locations of the populations described in **Table A1-2** and the documented occurrences are found throughout the range.