

LEONCITA FALSE-FOXGLOVE

(Agalinis calycina)

Status Report

2019



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INTRODUCTION



Leoncita false-foxglove (*Agalinis calycina*) is an annual hemiparasitic herb in the broomrape family (Orobanchaceae). It is an obligate wetland species occurring in perennially moist alkaline/saline/calcareous soils in aridland ciénegas of the southwestern United States and northern Mexico (NMRPTC 1999). It is only known to occur in two locations in the United States and two historic locations in Mexico. In the United States it occurs at Bitter Lake National Wildlife Refuge in Chaves County, NM, and at the Diamond Y Spring Preserve in Pecos County, TX. There are some taxonomic questions about the identity of the specimens from Coahuila in Mexico (Sivinski 2011). In addition, urban and agricultural development surrounding the habitat of the species in Mexico may be jeopardizing the existence of the species in Mexico. NatureServe ranks Leoncita false-foxglove (critically imperiled (G1/S1). Leoncita false-foxglove is a NM Rare Plant Conservation Strategy species, which gives the species an overall conservation status of 'weakly conserved' due to rarity and threats to its habitat (EMNRD-Forestry Division 2017). It is proposed for State listing on the New Mexico State Endangered Species list and is considered a Species of Greatest Conservation Need in the Texas Parks and Wildlife Department's State Conservation Action Plan (2012). Leoncita false-foxglove was petitioned for listing under the federal Endangered Species Act in 2012 by the NM Native Plant Society and is currently evaluated for potential listing by the USFWS, following a positive 90-day finding in 2016 (81 FR 14058 14072).

METHODS

Existing data for the Texas location at the Diamond Spring Preserve in Pecos County was provided by the Texas Natural Diversity Database and the Nature Conservancy of TX. Suitable habitat was surveyed throughout the entire Diamond Y Spring Preserve north of Fort Stockton and the Sandia Springs Preserve near Balmorhea. Both preserves are owned and managed by the Nature Conservancy. Occupied habitat was mapped by walking a polygon around a population and visually estimating the number of plants within a polygon, using the Collector App on a Samsung Galaxy S2 tablet. Small patches of plants were documented with waypoints. The USFWS surveyed the population at the Bitter Lake NWR in Chaves County, New Mexico, in September of 2018, using similar methods. Results of the New Mexico survey were provided by the USFWS and are also presented here.

RESULTS

New Mexico

Surveys performed on September 11, 2018, documented an estimated 307,403 plants to occur in 38 polygons distributed in 4 general areas over a distance of approximately 2 miles (Figure 1). In addition, 15 waypoints documented 16 individuals scattered in the vicinity of the southernmost polygons. Total occupied habitat at the Bitter Lake NWR was estimated at 3.59 acres. Previous surveys in 2009 and 2010 documented plants from 4 mapped polygons, each containing several hundred plants and a number of plants from three individual waypoints (Sivinski 2011). Total occupied habitat was estimated at approximately 5 acres.

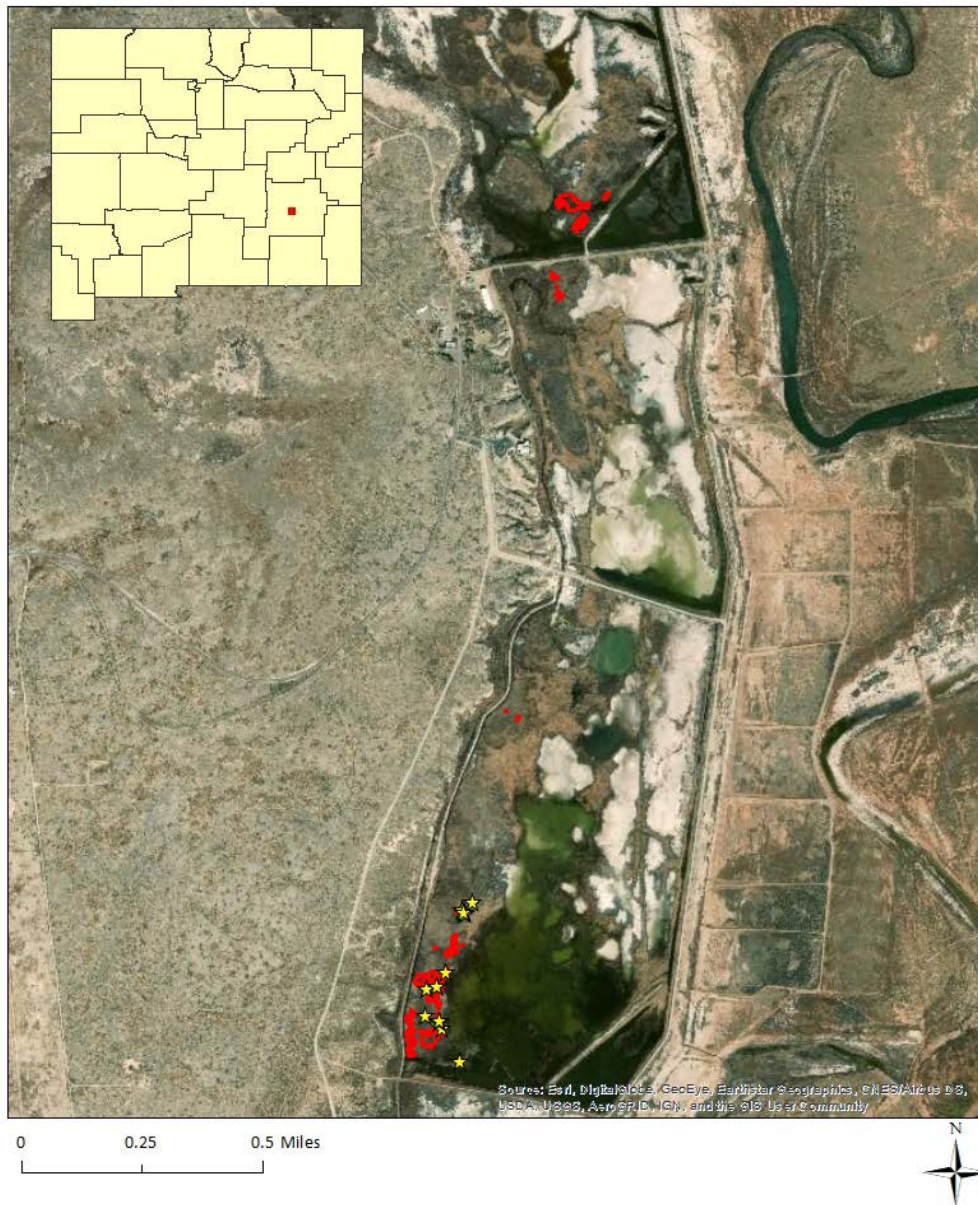


Figure 1. Distribution of *Leoncita* false-foxglove at the Bitter Lake NWR in Chaves County, NM.

Texas

No plants were found at the Sandia Springs Preserve near Balmorhea. Therefore, the only known Texas population of *Leoncita false-foxglove* is located at the Diamond Y Springs Preserve, ca. 8 miles north of Fort Stockton (Figure 2). Previous documentation on the distribution of the species on the Preserve was limited and previous population estimates were only available for one general area (Figure 3). In 2019 surveys were performed on September 18, 19, and 20, when plants were in full flower.

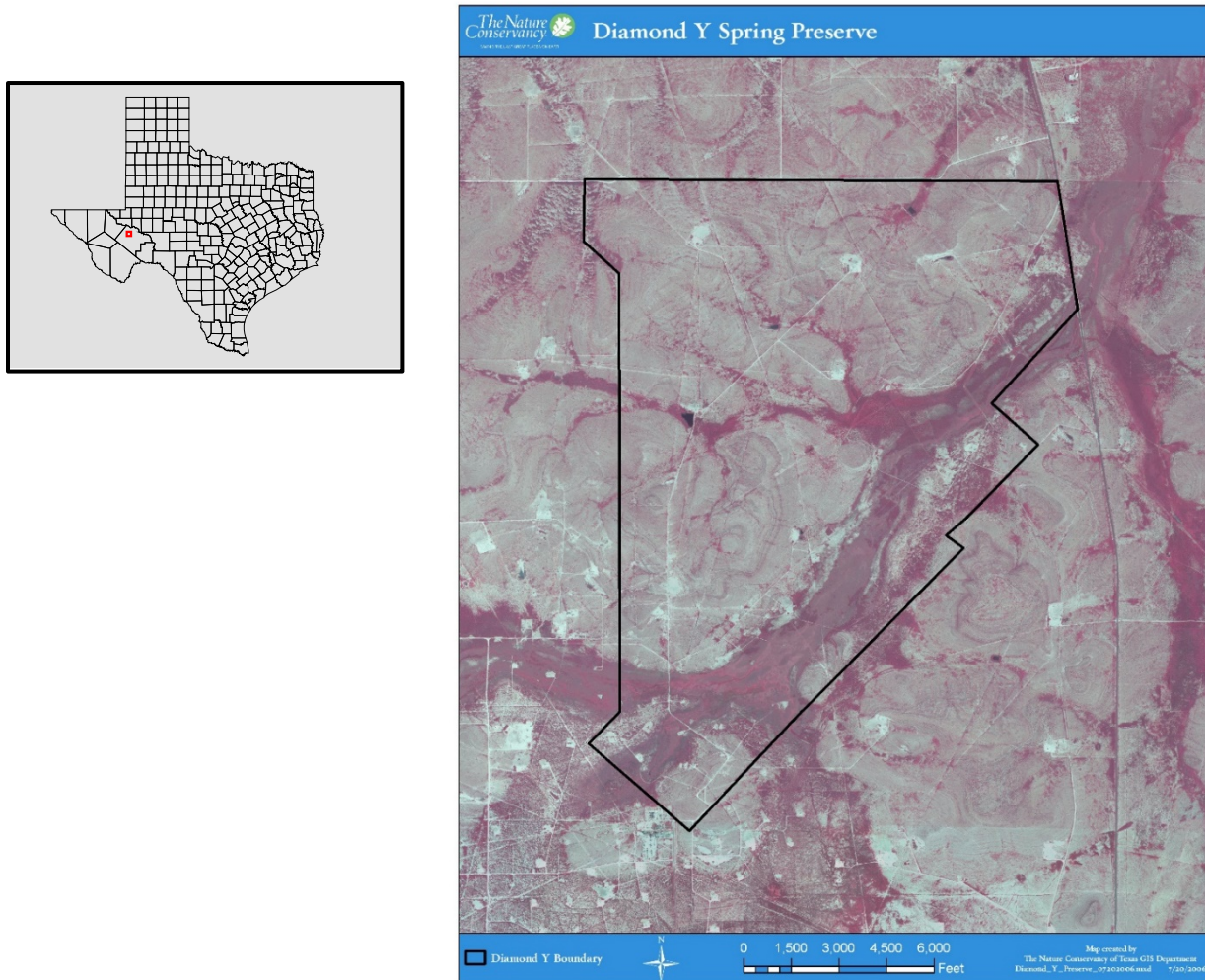


Figure 2. Location of the Diamond Y Spring Preserve in Pecos County, TX (map courtesy of the Nature Conservancy).

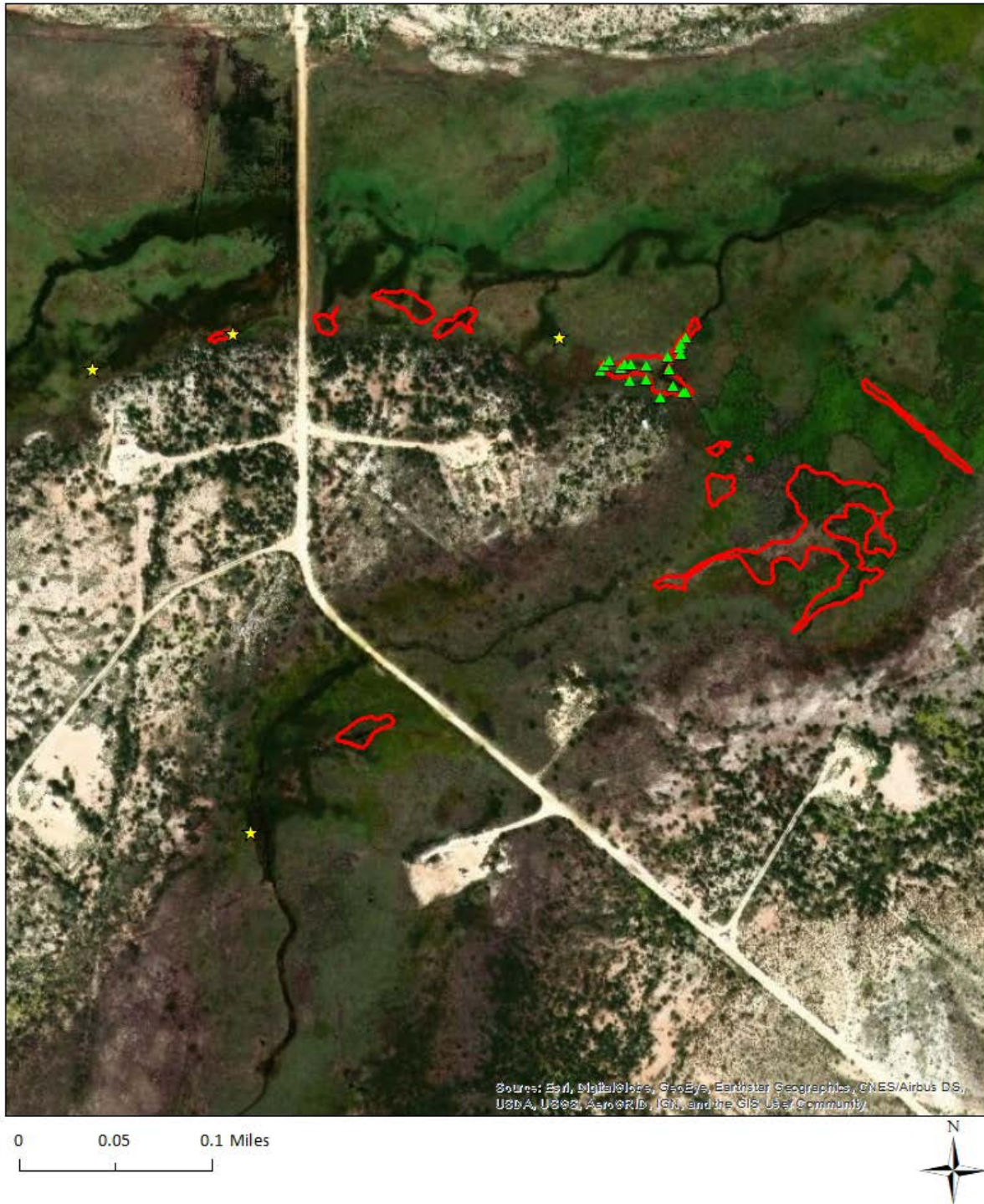


Figure 3. 2019 distribution of *Leoncita* false-foxglove (red polygons, yellow stars) and previously documented location (green triangles; TNDD 2019) at the Diamond Y Spring Preserve in Pecos County, TX.

The number of plants at the Diamond Y Spring Preserve was estimated to be between 4,416 and 7,416 individuals in 2019, distributed in 11 distinct habitat polygons (Figure 3). An additional 19 plants were documented from 4 scattered waypoints. Occupied habitat covered 2.58 acres of the Preserve and

plants were only found along the wettest areas, usually along shallow drainages and seeps. All *Leoncita* false-foxglove populations were associated with extensive stands of the federally listed threatened Pecos sunflower (*Helianthus paradoxus*), which appeared to grow in somewhat drier areas. More than 90% of plants were flowering during the survey period. Observed disturbances included oil & gas development and associated infrastructure, including access roads and oil wells, and habitat destruction caused by feral pigs (Figures 3, 4 and 5). Some tamarisk (*Tamarix* sp.) was observed growing in the vicinity of plant populations.



Figure 4. Feral pig wallow in the habitat of *Leoncita* false-foxglove



Figure 5. Oil pump jack at the Diamond Y Spring Preserve, in the immediate vicinity of Pecos sunflowers (*Helianthus paradoxus*).

DISCUSSION

Spring ciénega habitats are regionally rare and limited in extent and many species that rely exclusively upon them are also rare (Sivinski 2011). Extensive botanical surveys of ciénega habitats in southeastern New Mexico failed to locate additional populations (Sivinski and Tonne 2011). Many wetland habitats in arid regions are severely impacted by human use, climate change and exotic species. Therefore, some obligate wetland plant species are threatened or endangered.

The New Mexico population of *Leoncita* false-foxglove is significantly larger than the Texas population, although occupied habitat only differed in size by approximately 1 acre. While large numbers of these annual plants were documented in 2018 and 2019, the total worldwide distribution of the species covered approximately 6.17 acres of occupied habitat in New Mexico and Texas. Like most rare plant species, only a fraction of suitable habitat was occupied. *Leoncita* false-foxglove is an annual herb and

therefore abundance and local distribution may differ significantly from one year to the next, depending on rainfall amounts during the active growing season. However, differences in estimated plant numbers at Bitter Lake NWR between 2009/2010 and 2018 may also be attributed to survey effort and surveyor error.

The two populations occur in seemingly protected areas, one on National Wildlife Refuge lands and the other on a Nature Conservancy preserve. However, neither hold water or subsurface rights, therefore limiting the amount of protection that can be provided. Management at the Bitter Lake NWR is complicated by the presence of several other rare and endangered plants and animals as well as water management for the benefit of waterfowl (Sivinski 2011). Habitat requirements are still poorly understood and it is unclear whether current water management practices benefit the species.

Little active management or monitoring of *Leoncita* false-foxglove have occurred on the Diamond Y Spring Preserve. Previous and current management include some tamarisk control projects, the exclusion of livestock, and the permitting of feral pig hunting within the Preserve. No comprehensive surveys throughout the habitat have been conducted on the Preserve prior to the 2019 surveys. Casual observational counts since 2001 have estimated plants in the thousands (Carr 2001 a & b). One area previously surveyed had actual plant counts, estimating the population at 2,123 individuals in 2013 (TNDD 2019; Figure 3). This site was estimated to have 1000 to 2000 plants in 2019.

Direct and indirect impacts of oil & gas development may be the largest threats to the Texas population. Several oil wells and associated access roads are located within a few hundred feet of all existing populations. Oil spills are not uncommon, and while most oil spills are generally small and quickly cleaned up, occupied habitat of *Leoncita* false-foxglove is less than 3 acres and therefore may be significantly impacted by oil & gas development activities, potential oil spills and associated clean-up activities, or other accidents.

Feral pigs are considered among the most destructive invasive species in the United States (Morthland 2011). In 2011 it was estimated that two to six million feral pigs roam in 39 states, half of them in Texas. Feral pigs are known to wallow in mud pits during the hot months, the active growing season of *Leoncita* false-foxglove, which germinates and establishes during that time. Pig wallows occur in the primary habitat of the species. Several feral pigs were chased off during the 2-day surveys and pig wallows were observed throughout the Preserve. Although observed pig wallows were relatively small in size, considering the small area of occupied habitat at the Preserve, feral pigs have the potential to significantly impact populations.

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