

2. CARRIZO VERNAL POOL REGION

Only the vernal pool fairy shrimp is known to occur within the Carrizo Vernal Pool Region.

2.1. Vernal Pool Habitat

Holland (2003) mapped the vernal pool complexes of the Central Coast of California based on 1994 aerial imagery. The study area consisted of 9,574,099 acres and encompassed all of San Benito, Monterey, San Luis Obispo, Santa Barbara, and Ventura Counties; this encompasses all of the Carrizo Vernal Pool Region, as well as parts of the Central Coast and Santa Barbara Vernal Pool Regions. The Service does not have a copy of the geodatabase for this study, so we cannot break down the exact acreage of vernal pool complexes in each of the vernal pool regions. In total, 42,488 acres of vernal pool complexes were mapped throughout the study area (see **Figure 2.1**; Holland 2003), though comparison with high-resolution vernal pool mapping at Camp Roberts indicated that Holland's broad scale map is almost certainly an underestimate of both the number and size of vernal pool complexes in the Central Coast. A large amount of vernal pool habitat exists around the Carrizo Plain and Soda Lake, and significant, but smaller, clusters of vernal pool habitat exist around Camp Roberts and Paso Robles.

As in the Central Valley, many vernal pool complexes along the Central Coast, including the Carrizo Vernal Pool Region, are found in older alluvial soils with a claypan/duripan layer (Holland 2003). However, vernal pools are also found in two additional geomorphic settings not well represented in the Central Valley: sag ponds along faults and active Quaternary landslides on structurally incompetent mountain slopes. Holland (2003) also compared the 1994 imagery with satellite imagery from 2000 and found that 4,931 acres had been lost, a loss of 11.6% over the 6-year interval. Subsequent ground truthing in 2001 of 27 of the remaining polygons found that 15 had been converted to other uses, a loss of more than half of the polygons in the ground truthing area in just a year.

Because the Service does not know the exact acreage of vernal pool complexes in this region and because there has not been a comprehensive assessment of all protected lands within this region, we cannot provide a precise estimate of the amount or percentage of vernal pool habitat that has been protected. Lands with some level of protection include Camp Roberts, the Carrizo Plain National Monument, the Los Padres National Forest, and state and private preserves (**Figure 2.2**).

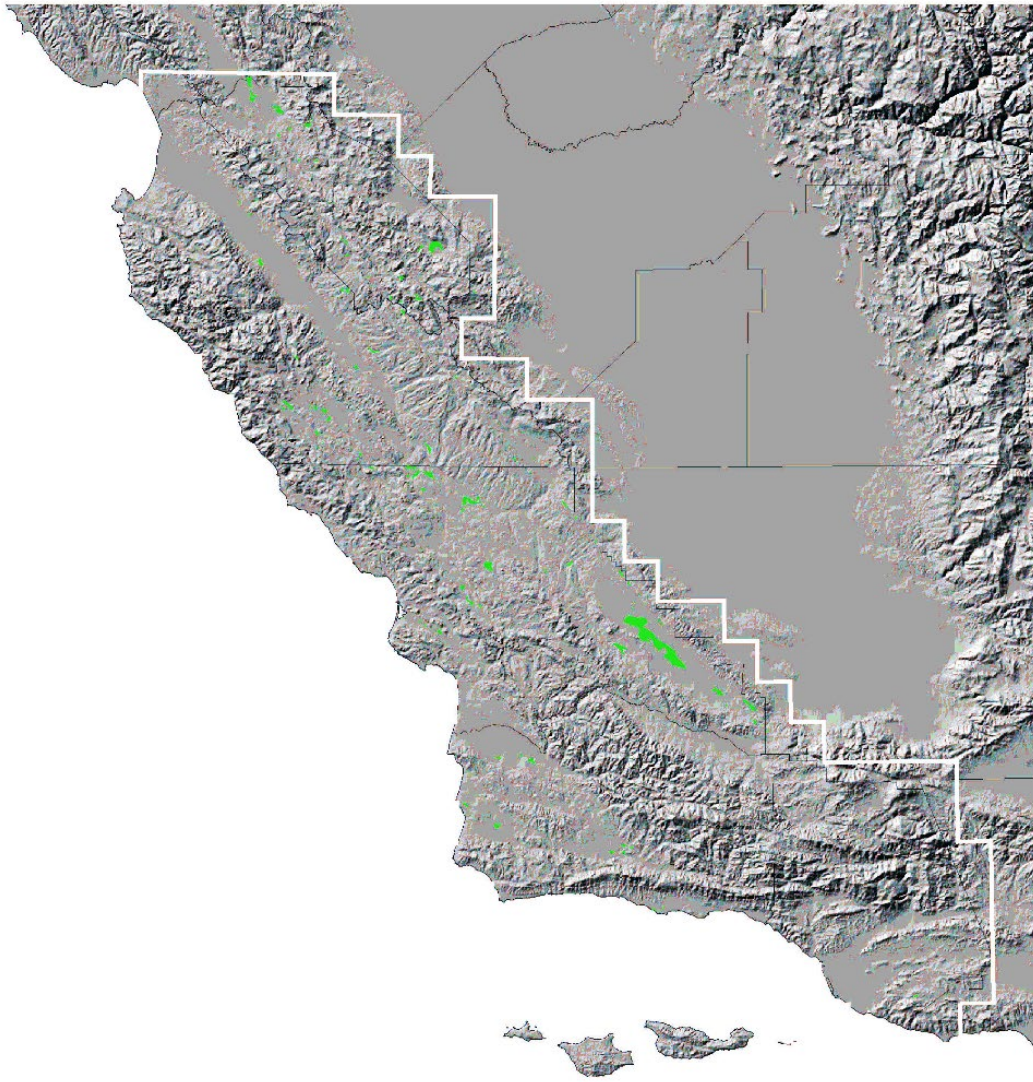


Figure 2.1. Map of vernal pool complexes in green along the Central Coast of California in 1994 mapped by Holland (2003). Taken from Figure 4 of Holland's report submitted to the Service.

Carrizo - Protected Lands

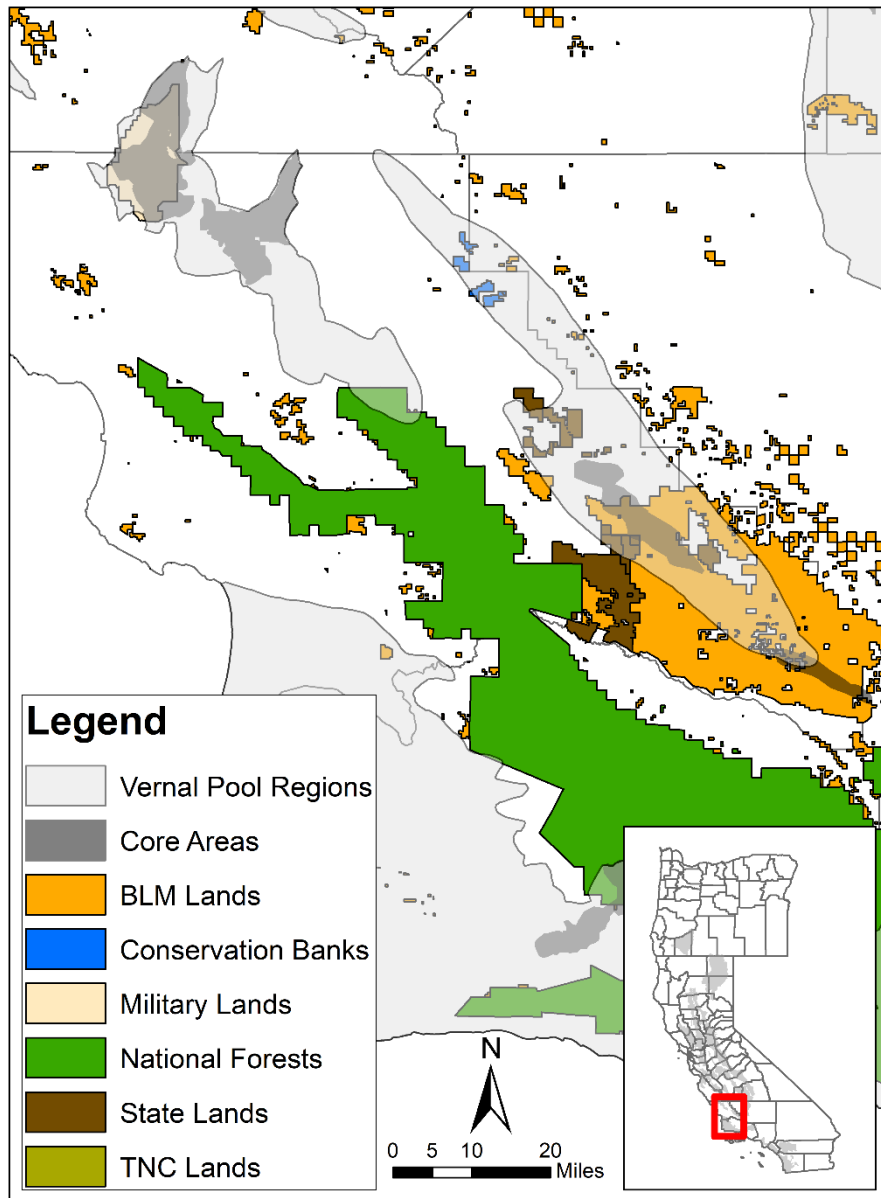


Figure 2.2. Map of protected areas that contain vernal pool grassland habitat and/or vernal pool fairy shrimp within the Carrizo Vernal Pool Region. BLM = Bureau of Land Management, TNC = The Nature Conservancy.

Carrizo - Vernal Pool Fairy Shrimp

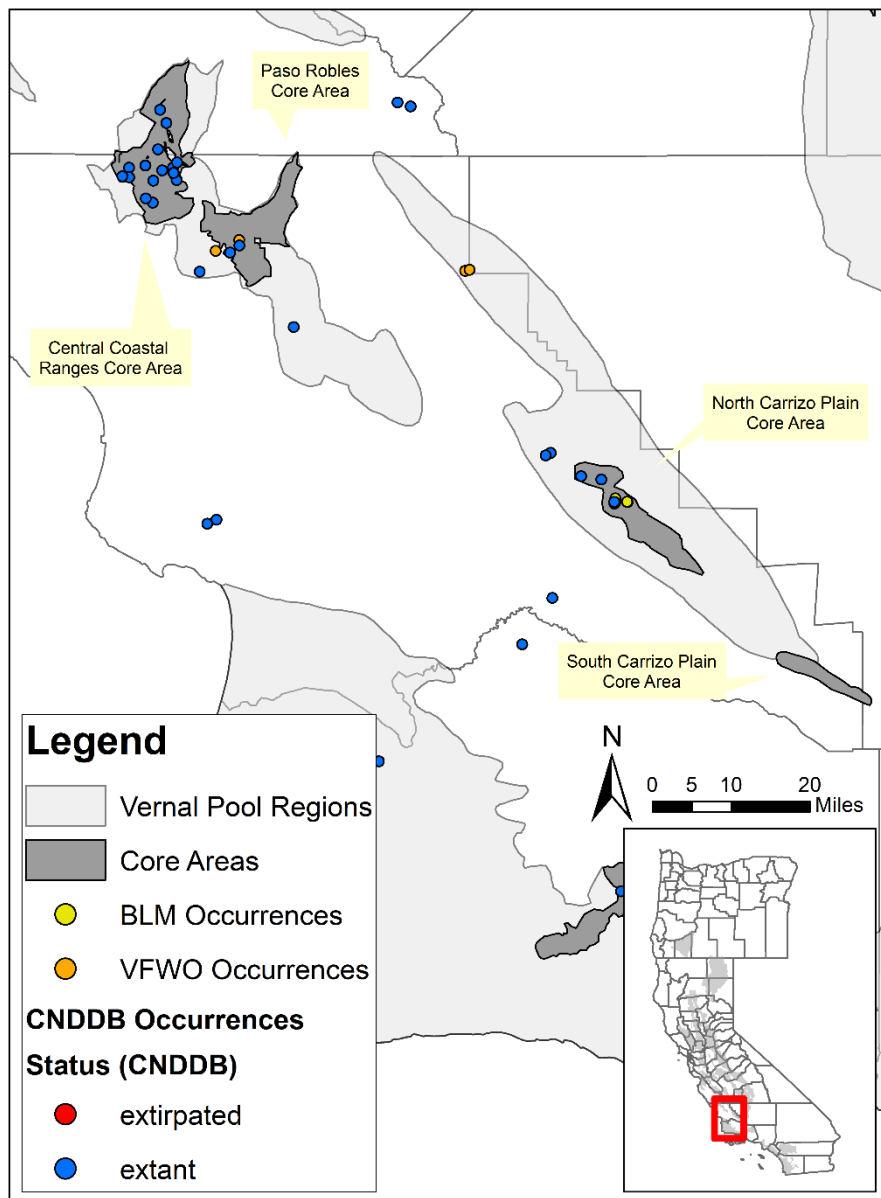


Figure 2.3. Map of known occurrences of vernal pool fairy shrimp recorded in the Diversity Database (2022), provided by the Service’s Ventura Fish and Wildlife Office (VFWO) (Ogonowski, *in litt.* 2023a), or documented during Bureau of Land Management (BLM) surveys in the Carrizo Vernal Pool Region. Points may represent individual pools, multiple pools, whole properties, or entire vernal pool grassland complexes.

2.2. Species Occurrences

2.2.1. Vernal Pool Fairy Shrimp

There are 28 occurrence records of the vernal pool fairy shrimp documented within, or immediately adjacent to, the Carrizo Vernal Pool Region in the Diversity Database (see **Figure 2.3**; Diversity Database 2022). Of these 28 occurrences, 16 are located on the Camp Roberts military installation, 1 is located on the Los Padres National Forest, and 11 are on private land (Diversity Database 2022). All are presumed extant by the Diversity Database, although it is possible that some of the 28 occurrences are no longer extant, but have not been surveyed recently. Several of the occurrence records on private land are described as being threatened by agricultural or solar development (Diversity Database 2022). In addition, surveys by the Bureau of Land Management (BLM) have identified the vernal pool fairy shrimp in two nearby clusters of pools within the region: one cluster of pools corresponds to Diversity Database record #259 and the other cluster does not correspond with any Diversity Database records and represent an additional occurrence record (**Figure 2.3**).

There are four additional occurrence records provided by the Ventura Fish and Wildlife Office that were not in the Diversity Database, all of which were first documented within the last 5 years (Ogonowski, *in litt.* 2023a). Two occurrences are located in Paso Robles and two are located within or adjacent to the Palo Prieto Conservation Bank.

Of the 28 Diversity Database occurrence records, 17 (61%) receive some level of protection by virtue of being located on federal land: 16 within Camp Roberts and 1 within Los Padres National Forest (**Figure 2.2**). Two additional occurrences not recorded in the Diversity Database are also protected: one within BLM's Carrizo Plain National Monument and one on the Palo Prieto Conservation Bank.

2.3. Federal Lands

2.3.1. National Wildlife Refuges

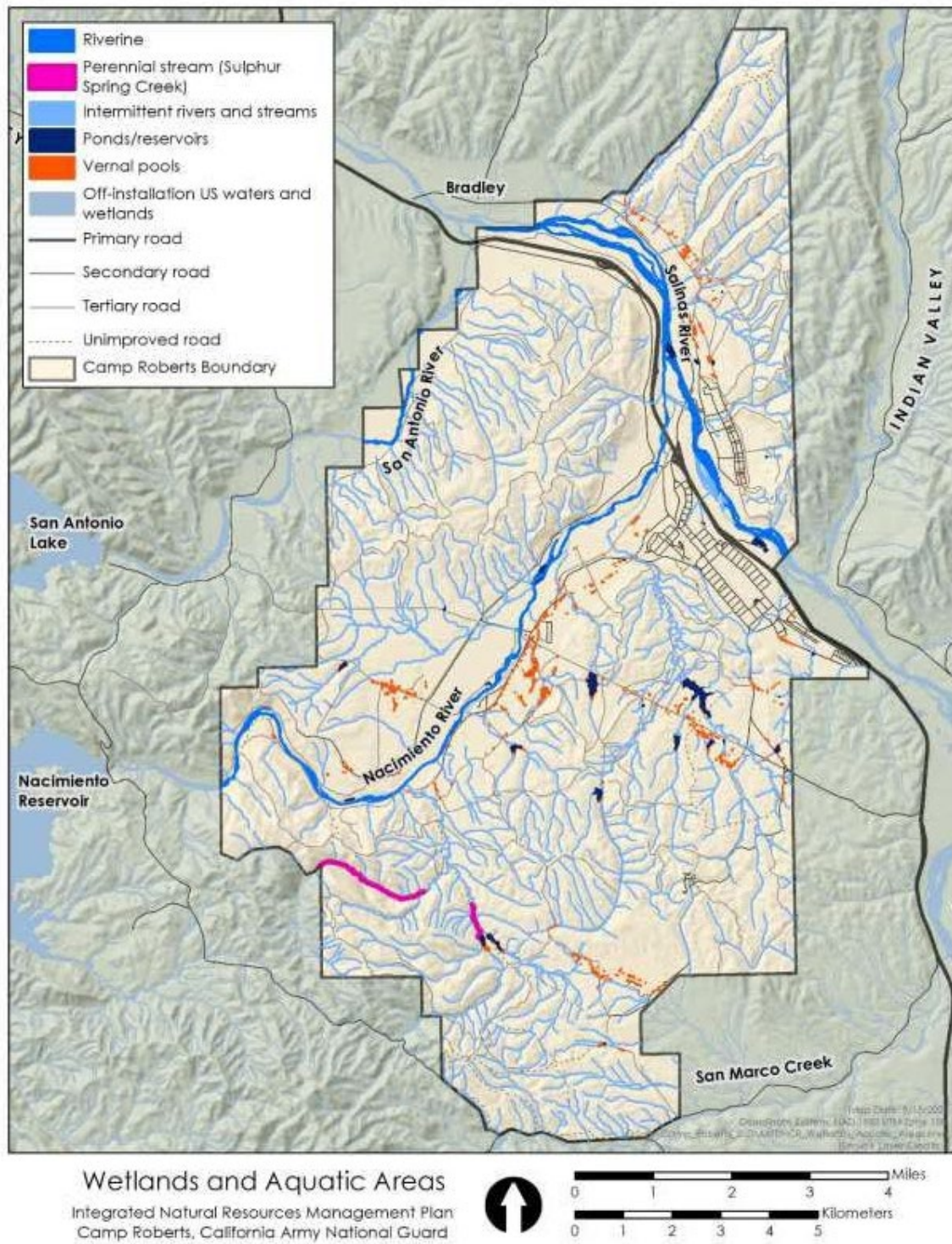
There are no National Wildlife Refuges with known occurrences of the vernal pool fairy shrimp in the Carrizo Vernal Pool Region.

2.3.2. Military Lands

Camp Roberts is a 42,784-acre military training site owned by the U.S. Army Corps of Engineers (Corps) and leased to the California Army National Guard (CA ARNG) located in the southern Salinas River Valley in Monterey and San Luis Obispo Counties. Most of Camp Roberts is within the Central Coastal Ranges Core Area. An Integrated Natural Resources Management Plan (INRMP) was finalized for Camp Roberts in August 2022 (CA ARNG 2022). There are 25,039 acres of annual or perennial grasslands throughout Camp Roberts, a portion of which include vernal pools. The vernal pools themselves cover 47 wetted acres and range in size from a few square feet to more than an acre in size (**Figure 2.4**). They occur in grasslands in gently sloping terrain such as river terraces, benches, valleys, or swales. There are natural and artificial vernal pools at Camp Roberts; natural pools occur on stream terraces, alluvial fans, and alluvial

terraces, while artificial pools consist of borrow pits, shell craters, and tire ruts (CA ARNG 2022).

The vernal pool fairy shrimp was first documented on Camp Roberts in 1995; it was definitively identified in 61 pools and immature fairy shrimp which could not be identified to the species level were identified in 119 additional pools (Jones and Stokes Associates 1997). Annual surveys ceased in 2008 due to funding shortfalls but resumed in 2017; the 2017 surveys identified the vernal pool fairy shrimp in 40 pools, some of which were ponds/reservoirs, with a total area of 38.3 acres (CA ARNG 2022). A programmatic biological opinion was written for training activities at Camp Roberts in 2009 that includes measures to avoid and minimize effects of activities on the vernal pool fairy shrimp (Service 2009a). As of 2021, approximately 22 acres of vernal pools had been protected to mitigate for impacts to vernal pool fairy shrimp (CA ARNG 2022). Management priorities identified in the INRMP include developing a vernal pool habitat management plan, conducting routine shrimp surveys to monitor population levels, controlling excessive vegetation using grazing and prescribed burning, and installing informational signage at vernal pool fairy shrimp mitigation areas (CA ARNG 2022).



Map 3-7. Camp Roberts wetlands and aquatic areas.

Figure 2.4. Map of vernal pools and other aquatic features at Camp Roberts. In addition to vernal pools, the vernal pool fairy shrimp has also been found in several of the ponds/reservoirs. Taken from Map 3-7 of the INRMP (CA ARNG 2022).

2.3.3. Bureau of Land Management

There is a large amount of land owned by the BLM throughout the Carrizo Vernal Pool Region, most of which is within the Carrizo Plain National Monument. A Resource Management Plan was approved for the Carrizo Plain National Monument in April 2010 (BLM 2010). The National Monument is 246,817 acres in total, including 206,635 acres of BLM land, 8,702 acres of CDFW land, 607 acres of other state-owned lands, 75 acres of land owned by The Nature Conservancy (TNC), and 30,798 acres of privately owned lands. The Resource Management Plan states that approximately 20 acres of small vernal pools occur within the National Monument, though the acreage of vernal pools and other aquatic features which provide habitat for vernal pool species is likely higher, particularly if more saline and alkaline features near Soda Lake are included. Vernal pools are found both on the valley floor (Carrizo Plain and Soda Lake) and in the foothills of the Caliente Range; many more vernal pools also occur just north of the National Monument's boundary. The Resource Management Plan contains various objectives and management actions related to protecting, restoring, monitoring, and studying vernal pool habitat, including actions related to livestock grazing, invasive plant management, native plant restoration, monitoring fairy shrimp populations, and ensuring BLM actions and authorization are designed to avoid impacts to vernal pools (BLM 2010).

The vernal pool fairy shrimp was not known to occur within the National Monument when the Resource Management Plan was published in 2010, but the species was included in the Resource Management Plan as a species that may be found in the future and would benefit from the protection and management of vernal pools within the National Monument. The vernal pool fairy shrimp does occur in several locations just north of the National Monument's boundary, and the species was identified within the National Monument for the first time in 2015 (BLM 2015). The endangered longhorn fairy shrimp (*Branchinecta longiantenna*) is known from pools throughout the National Monument as well.

The BLM surveyed vernal pools and similar features across the Carrizo Plain in and around the Carrizo Plain National Monument from 2015-2019 (BLM 2015; BLM 2016; BLM 2017a; BLM 2019a). Pools were surveyed once or twice each year for 1-4 years. The vernal pool fairy shrimp was observed at least once in seven pools, all located in North Carrizo Plain. One cluster of 14 pools, including four occupied by the vernal pool fairy shrimp, is located on the north side of Seven Mile Road on private land just outside of the BLM's Carrizo Plain National Monument; these pools are roughly synonymous with vernal pool fairy shrimp occurrence #259 in the Diversity Database. Another cluster of nine pools, including three occupied by the vernal pool fairy shrimp, is located along Borega Road on BLM land that is inside the northern boundary of the Carrizo Plain National Monument; these pools are not synonymous with any Diversity Database records and represent an additional occurrence record (**Figure 2.3**). Other areas that were surveyed but that had no pools occupied by the vernal pool fairy shrimp include Garcia Rocks in the north, Selby Rocks in the western Carrizo Plain National Monument, and the Jennifer Mata Spadefoot Pond and South Carrizo Plain sites in the southeastern portion of the Carrizo Plain National Monument.

2.3.4. Other Federal Lands

The Los Padres National Forest is owned and managed by the Forest Service. This National Forest is 1,781,364 acres in size and is spread across Kern, Los Angeles, Monterey, San Luis Obispo, Santa Barbara, and Ventura Counties (USDA 2005a). Most of the National Forest is within or adjacent to the Santa Barbara Vernal Pool Region, but the northernmost extent is located between the Carrizo and Santa Barbara Vernal Pool Regions. Within this northernmost extent there are two Diversity Database records of the vernal pool fairy shrimp, one in San Luis Obispo County which is closer to the Carrizo region and one in Santa Barbara County which is closer to the Santa Barbara region. The San Luis Obispo occurrence was found in 2005 approximately 0.5 mile north of Gifford Springs; the habitat consisted of a small swale on a south-facing slope, 700 meters below the ridgeline, that was surrounded by oak woodland and grassland (Diversity Database 2022). For more general information about the Los Padres National Forest, see Section 10 on the Santa Barbara Vernal Pool Region.

2.4. **Conservation Banks**

There are no conservation or mitigation banks that provide credits for the vernal pool fairy shrimp in the Carrizo Vernal Pool Region. The species was recently identified in one pool within the Palo Prieto Conservation Bank in the Buckley Parcel and in another pool immediately adjacent to the Buckley Parcel (Ogonowski, *in litt.* 2023a).

2.5. **Habitat Conservation Plans**

There is one regional Habitat Conservation Plan (HCP) within the Carrizo Vernal Pool Region that includes the three shrimp species as Covered Species. Although only the vernal pool fairy shrimp is found in the Carrizo Vernal Pool Region, this HCP spans multiple regions and therefore covers all three shrimp species.

2.5.1. PG&E Multiple Region Operations and Maintenance HCP

The Pacific Gas & Electric Company's (PG&E) Multiple Region Operations and Maintenance HCP covers PG&E activities within the Sacramento Valley, Sierra Nevada Foothills, North Coast, and Central Coast of California, spanning multiple vernal pool regions (ICF 2020). PG&E's Sacramento Valley and Foothills region includes the Northeastern and Northwestern Sacramento Valley Vernal Pool Regions, most of the Southeastern Sacramento Valley Vernal Pool Region, and parts of the Solano-Colusa and Southern Sierra Foothills Vernal Pool Regions. PG&E's Central Coast region includes most of the Central Coast and Carrizo Vernal Pool Regions, and part of the Santa Barbara Vernal Pool Region. This HCP was permitted in 2020 and has a 30-year permit term. The purpose of the HCP is to enable PG&E to continue to conduct current and future operations and maintenance activities within 34 California counties while avoiding, minimizing, and mitigating temporary and permanent impacts on threatened and endangered species habitat. The HCP's conservation strategy includes mitigation for permanent and temporary impacts to species habitat, which may be in the form of purchasing and/or placing easements on high quality habitat, purchase of conservation bank credits, contributions to existing conservation planning and recovery efforts, or habitat enhancement or restoration.

The HCP's Habitat Models estimated that 11,233 acres of vernal pool fairy shrimp and vernal pool tadpole shrimp habitat, as well as 2,260 acres of Conservancy fairy shrimp habitat, exist in PG&E's Sacramento Valley and Foothills region (ICF 2020). The HCP estimated permanent and temporary losses of vernal pool fairy shrimp and vernal pool tadpole shrimp habitat in the Sacramento Valley and Foothills region at 30.00 acres and 285.17 acres, respectively. The HCP estimated permanent and temporary losses of Conservancy fairy shrimp habitat in the Sacramento Valley and Foothills region at 7.50 acres and 57.92 acres, respectively. Permanent loss of habitat for the three shrimp species will be mitigated at a 3:1 ratio and temporary habitat loss at a 0.5:1 ratio. Therefore, a total of 232.6 acres of vernal pool fairy shrimp and vernal pool tadpole shrimp habitat, as well as 51.5 acres of Conservancy fairy shrimp habitat, will be preserved in perpetuity throughout PG&E's Sacramento Valley and Foothills region.

The HCP's Habitat Models estimated that 2,076 acres of vernal pool fairy shrimp and vernal pool tadpole shrimp habitat exists in PG&E's Central Coast region (ICF 2020). The HCP estimated permanent and temporary losses of vernal pool fairy shrimp and vernal pool tadpole shrimp habitat in the Central Coast region at 11.90 acres and 53.32 acres, respectively. Permanent loss of this habitat will be mitigated at a 3:1 ratio and temporary habitat loss at a 0.5:1 ratio. Therefore, a total of 62.4 acres of vernal pool fairy shrimp and vernal pool tadpole shrimp habitat will be preserved in perpetuity in PG&E's Central Coast region.

During HCP development, PG&E acquired several conservation lands to begin meeting the requirements of the conservation strategy; however, these properties had not yet been fully preserved in perpetuity as of the finalization of the HCP (ICF 2020). Lands acquired for the vernal pool fairy shrimp and vernal pool tadpole shrimp include the Sheridan property in Placer County (526 acres). The HCP says that the habitat may support the Conservancy fairy shrimp, but the species is not known to occur on this site.

2.6. Other Preserves

The Carrizo Plains Ecological Reserve is owned by CDFW and is located partly within and partly to the west of the Carrizo Plain National Monument. A Land Management Plan for the Ecological Reserve was written in 2019 (Jodi McGraw Consulting 2019). Vegetation mapping identified 16 acres of the California Mixed Annual/Perennial Freshwater Vernal Pool/Swale Bottomland Group habitat type within the Ecological Reserve. Of this, 11 acres were along an unnamed stream near Soda Lake in the American Unit, which is within the Carrizo Plain National Monument, and 5 acres were within the North and South Chimineas Units of the Ecological Reserve, west of the National Monument. The vernal pool fairy shrimp has never been identified within the Ecological Reserve, though it has been found within the Los Padres National Forest 0.5 miles north of CDFW's Gifford parcel, part of the South Chimineas Unit of the Ecological Reserve.

The North Carrizo Ecological Reserve is owned by CDFW and is located northwest of the North Carrizo Plain Core Area. CDFW acquired the Ecological Reserve in 2011 as mitigation for the Topaz Solar Farm project (Wildlands Conservation Science 2017). Vernal pools are found on the eastern portion of the 1,100-acre Parcel D, a.k.a. Cooper Unit, with 2.1 wetted acres present; vernal pool fairy shrimp were found throughout these pools (Althouse and Meade 2011). Management of the vernal pools includes cattle grazing, but excluding cattle from the pools with

fencing while water is present, avoiding use of pesticides, and invasive aquatic species eradication if necessary (Althouse and Meade 2011). The vernal pools did not fill from 2011-2016 due to drought. The vernal pool fairy shrimp was detected in 6 of 10 pools that filled within the Cooper Unit of the Ecological Reserve surveyed in 2017 and 2019 (Wildlands Conservation Science 2017; C. Fiehler, CDFW, *in litt.* 2022). These pools correspond to vernal pool fairy shrimp occurrence #863 in the Diversity Database.

The Nature Conservancy owns two parcels within the Carrizo Plain National Monument that total 75 acres. These two parcels are near Soda Lake, and the vernal pool fairy shrimp has not been documented within them.

There are no other private preserves or mitigation sites for vernal pool habitat or the vernal pool fairy shrimp that the Service is aware of in this vernal pool region.

2.7. Vernal Pool Core Areas

There are four Core Areas within the Carrizo Vernal Pool Region that are designated in the Recovery Plan for the vernal pool fairy shrimp: Central Coastal Ranges, North Carrizo Plain, Paso Robles, and South Carrizo Plain. Because the Service does not know how much vernal pool habitat existed in this region in 2005, how much still exists today, and how much has been protected, we do not know if any of the core areas have met the target of 85% of vernal pool habitat protected.

2.7.1. Central Coastal Ranges

This is a zone 2 core area with a goal of protecting 85% of vernal pool habitat for the vernal pool fairy shrimp. The core area is located in southern Monterey County and northern San Luis Obispo County.

There is no estimate of how many acres of vernal pool complex existed in this core area in 2005 or today, and so the Service cannot assess what percentage of vernal pool habitat has been protected. Still, we can attempt to approximate the percentage of protected vernal pool habitat based on other available information. Approximately 68% of this core area is within Camp Roberts. Although we do not have access to Holland's (2003) geodatabase of vernal pool habitat mapped along the Central Coast from 1994, visual examination of his map (**Figure 2.1**) suggests that most or all of the vernal pool habitat within this core area is within Camp Roberts. However, comparison with high-resolution vernal pool mapping at Camp Roberts indicated that Holland's (2003) broad scale map is almost certainly an underestimate of both the number and size of vernal pool complexes in the Central Coast, meaning that there may be vernal pool complexes in this core area outside of Camp Roberts that were missed by Holland's mapping effort. It is therefore possible that 85% of vernal pool habitat in this core area has been protected within Camp Roberts, but further analysis is needed to confirm if this is correct. However, these areas are not protected in perpetuity under a conservation easement or deed restriction, and could conceivably be subject to changes in management if Federal priorities shift or if Camp Roberts is ever closed and the land is transferred to a different landowner.

2.7.1.1. Vernal Pool Fairy Shrimp Occurrences

There are 16 occurrence records from the Diversity Database for the vernal pool fairy shrimp within this core area, all of which are within the Camp Roberts military installation (see **Figure 2.5**; Diversity Database 2022). The vernal pool fairy shrimp was first detected at Camp Roberts in 1995 after the species was listed (Jones and Stokes Associates 1997), and 14 of the 16 occurrences were known prior to 2005 when the Recovery Plan was published (Diversity Database 2022). The two newer occurrences are near other known occurrences, and the vernal pool fairy shrimp was detected most recently at the base in 2017 (CA ARNG 2022). The vernal pool fairy shrimp has been found throughout Camp Roberts, and in 2017 they were found to occupy 38.3 acres (81.5%) of the 47 wetted acres of vernal pool complexes and similar features throughout the site (CA ARNG 2022).

Central Coastal Ranges Core Area - Protected Lands

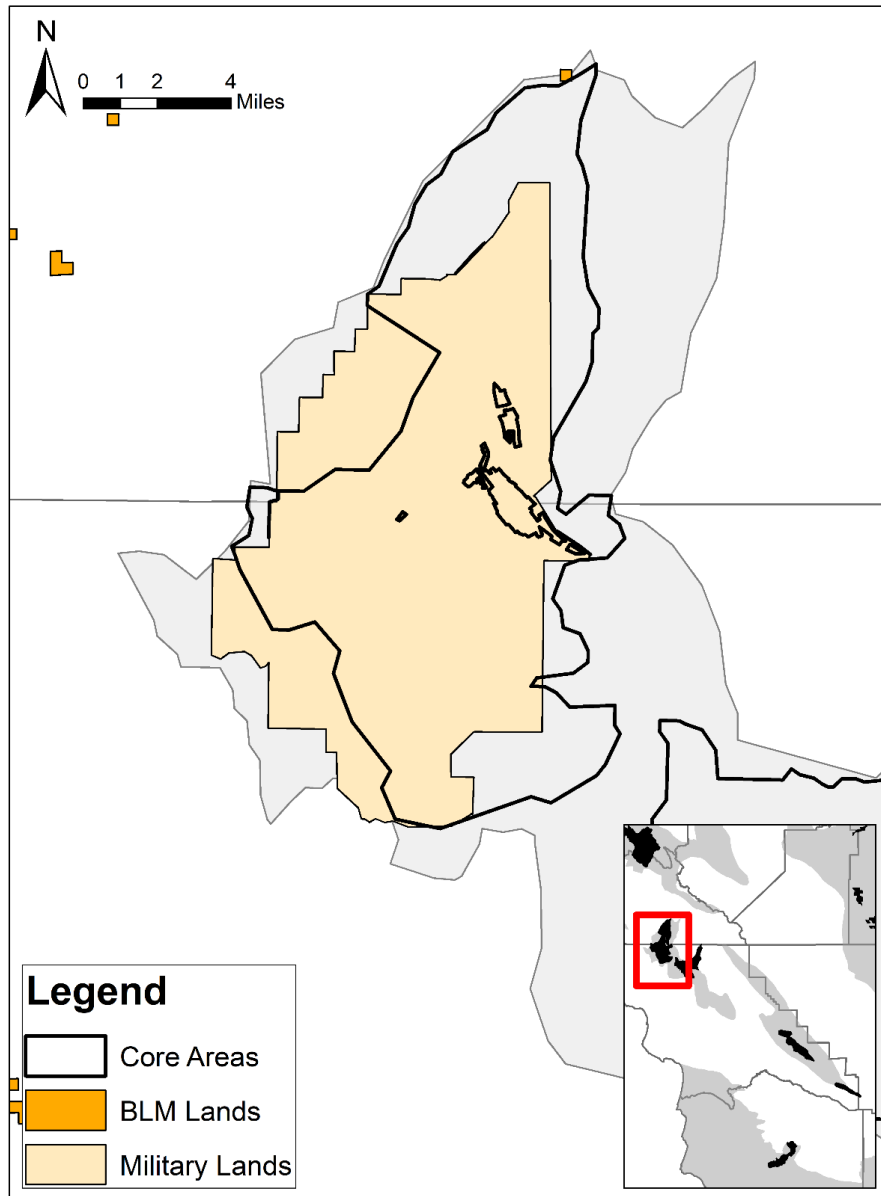


Figure 2.5. Map of all protected lands within the Central Coastal Ranges Core Area. Diversity Database (2022) records have been redacted from the map to comply with CDFW's Diversity Database Data Use Guidelines. BLM = Bureau of Land Management.

2.7.2. North Carrizo Plain

This is a zone 2 core area with a goal of protecting 85% of vernal pool habitat for the vernal pool fairy shrimp. The core area is located in southeastern San Luis Obispo County.

There is no estimate of how many acres of vernal pool complex existed in this core area in 2005 or today, and so the Service cannot assess what percentage of vernal pool habitat has been protected. The 2010 Resource Management Plan states that there are approximately 20 wetted acres of vernal pools throughout the Carrizo Plain National Monument (BLM 2010). Although it does not say where within the National Monument the pools are located, the maps of vernal pool plants and the longhorn fairy shrimp in the plan suggest that they are mainly around Soda Lake (within this core area) or in the southeastern part of the Carrizo Plain (within the South Carrizo Plain Core Area). In addition, vegetation mapping within CDFW's Carrizo Plains Ecological Reserve showed 11 acres of the California Mixed Annual/Perennial Freshwater Vernal Pool/Swale Bottomland Group habitat type on an unnamed stream near Soda Lake, which is within this core area (Jodi McGraw Consulting 2019). All of these vernal pools are protected on federal or state land (**Figure 2.6**). There is no comprehensive assessment of how many acres of vernal pool complexes occur within this core area on the private lands north of the National Monument.

2.7.2.1. Vernal Pool Fairy Shrimp Occurrences

There are four occurrence records for the vernal pool fairy shrimp within this core area: three records from the Diversity Database and two occurrence records from BLM surveys in 2015-2019, one of which is synonymous with Diversity Database record #259 (see **Figure 2.7**; BLM 2015; BLM 2016; BLM 2017a; BLM 2019a; Diversity Database 2022). The vernal pool fairy shrimp was first observed in this core area in 1985 on private land at two locations just north of the Carrizo Plain National Monument (Diversity Database 2022). The third Diversity Database occurrence was recorded in 1995, and thus all three Diversity Database occurrences were known prior to 2005 when the Recovery Plan was published. Surveys conducted by BLM in 2015-2019 confirm that the vernal pool fairy shrimp still occurs in at least some of these pools on private land, and they also documented the species at one new location on BLM land within the Carrizo Plain National Monument for the first time (BLM 2015). Thus, just one (25%) of the four known occurrences of the vernal pool fairy shrimp within this core area is currently protected. For the two Diversity Database occurrences that do not overlap with BLM's surveys, one had vernal pool fairy shrimp during surveys in 2011 and 2017 and the other has not been surveyed since 1985 (Diversity Database 2022).

North Carrizo Plain Core Area - Protected Lands

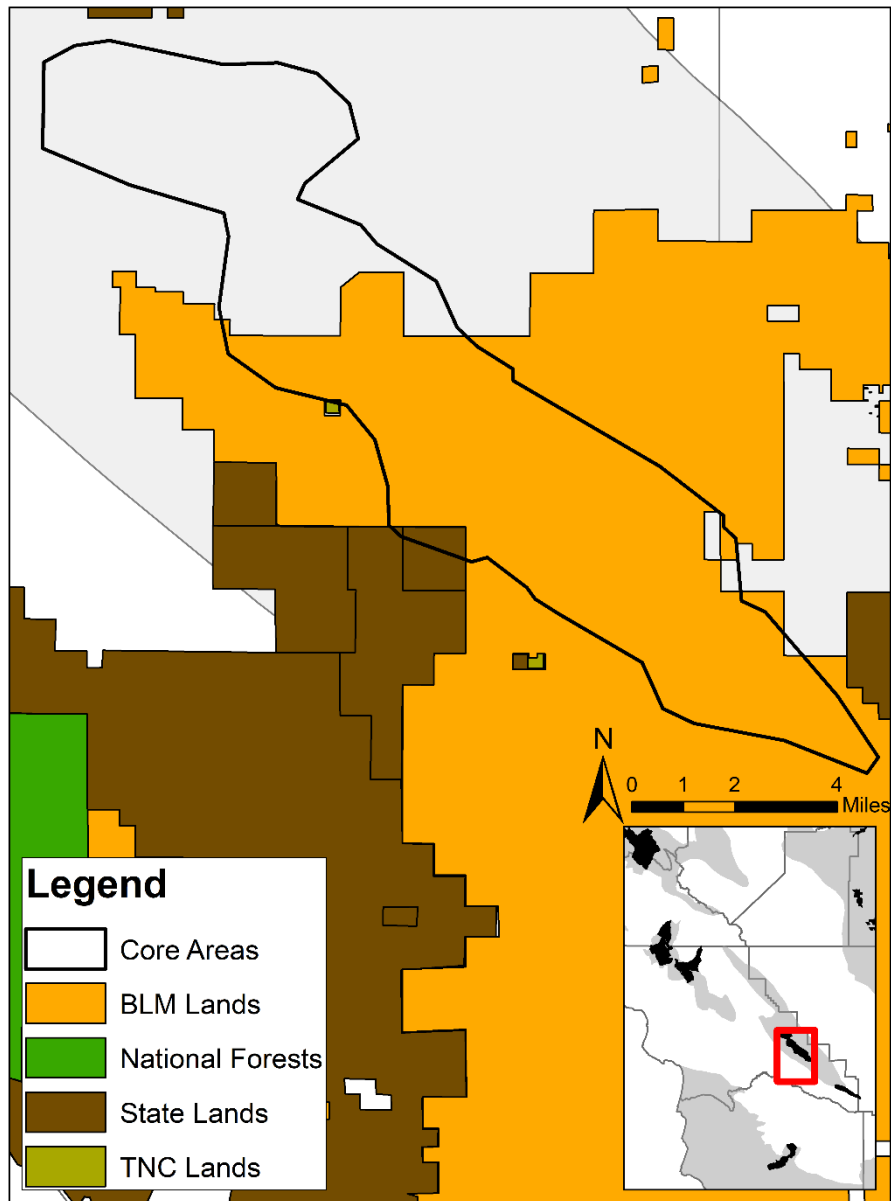


Figure 2.6. Map of protected areas within the North Carrizo Plain Core Area. BLM = Bureau of Land Management, TNC = The Nature Conservancy.

North Carrizo Plain Core Area - Vernal Pool Fairy Shrimp

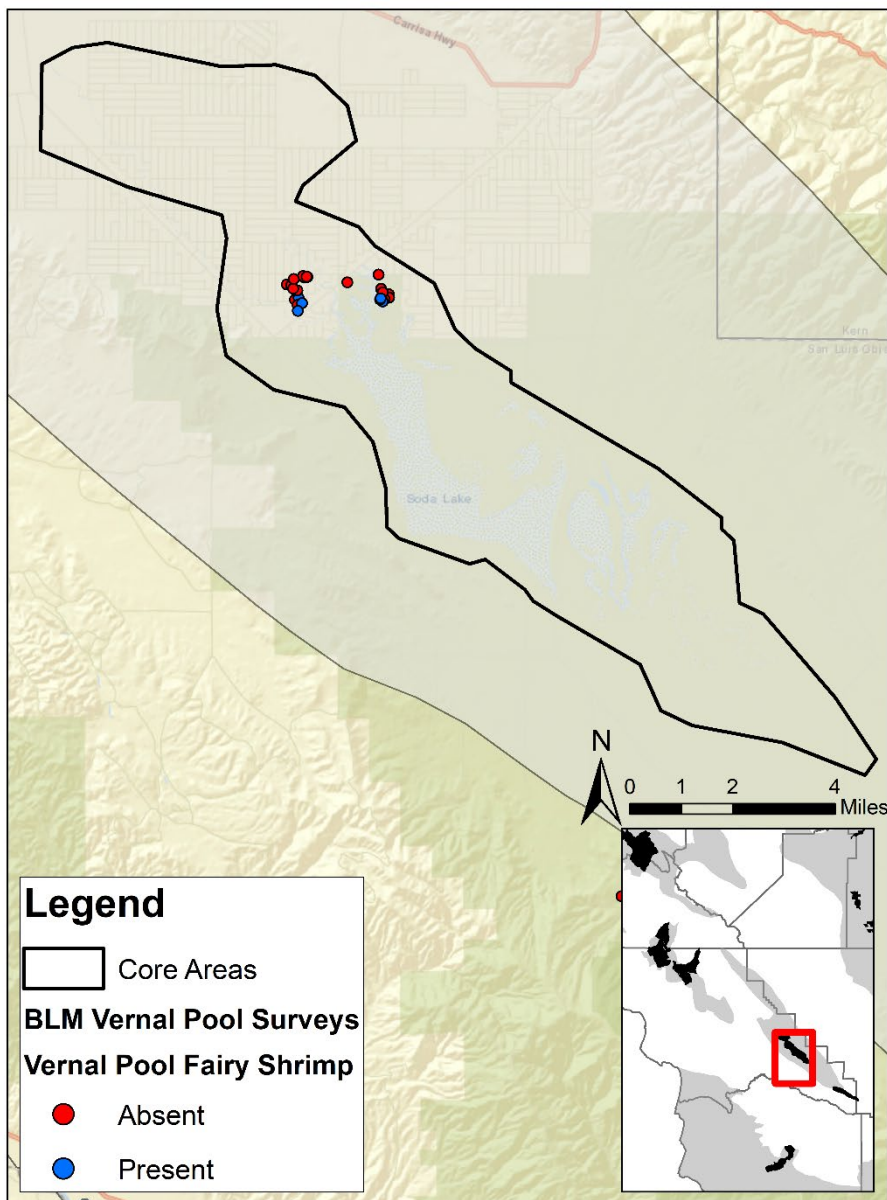


Figure 2.7. Map of known occurrences of vernal pool fairy shrimp recorded during Bureau of Land Management (BLM) surveys from 2015-2019 (BLM 2015; BLM 2016; BLM 2017a; BLM 2019a) within the North Carrizo Plain Core Area. BLM points represent individual vernal pools. Diversity Database (2022) records have been redacted from the map to comply with CDFW’s Diversity Database Data Use Guidelines.

2.7.3. Paso Robles

This is a zone 2 core area with a goal of protecting 85% of vernal pool habitat for the vernal pool fairy shrimp. The core area is located in northern San Luis Obispo County.

There is no estimate of how many acres of vernal pool complex existed in this core area in 2005 or today, and so the Service cannot assess what percentage of vernal pool habitat has been protected. However, the Service is not aware of any protected lands that exist within this core area, so it is possible that none of the existing vernal pool habitat has been protected.

2.7.3.1. Vernal Pool Fairy Shrimp Occurrences

There are two occurrence records from the Diversity Database for the vernal pool fairy shrimp within this core area, both on private land (see **Figure 2.8**; Diversity Database 2022). One is on the north side of Highway 46 and is described as two pools on “Blacks Hatchery and Turkey Farm.” The other is on the south side of Highway 46 and is described as the “Agriglobe” vernal pools and as being threatened by agricultural development (Diversity Database 2022). Both were recorded in 2001, after the species was listed but prior to 2005 when the Recovery Plan was published, and no additional information has been provided since. Although the exact coordinates in the Diversity Database may not be precise, aerial imagery of the location of the second record suggests that it may have been converted to a vineyard (Google Maps 2023a).

There are two additional occurrence records provided by the Ventura Fish and Wildlife Office (Ogonowski, *in litt.* 2023a). One is within the core area along Dry Creek Road near the southeastern corner of the Paso Robles Municipal Airport. The naturally occurring pool along the road was recently disturbed during reconstruction of Dry Creek Road and an adjacent mitigation pool was created to compensate for this impact. In August 2022, the mitigation area was impacted by the installation of a new sewer line, so additional mitigation may occur to compensate for this additional impact. The vernal pool fairy shrimp was identified in the natural pool in 2021 prior to construction and in both the natural and created pools in 2023 after construction. The second occurrence is outside of the core area within a more urbanized area that has been proposed for the construction of a hotel. The vernal pool fairy shrimp was identified in two pools onsite in 2019.

Paso Robles Core Area - Vernal Pool Fairy Shrimp

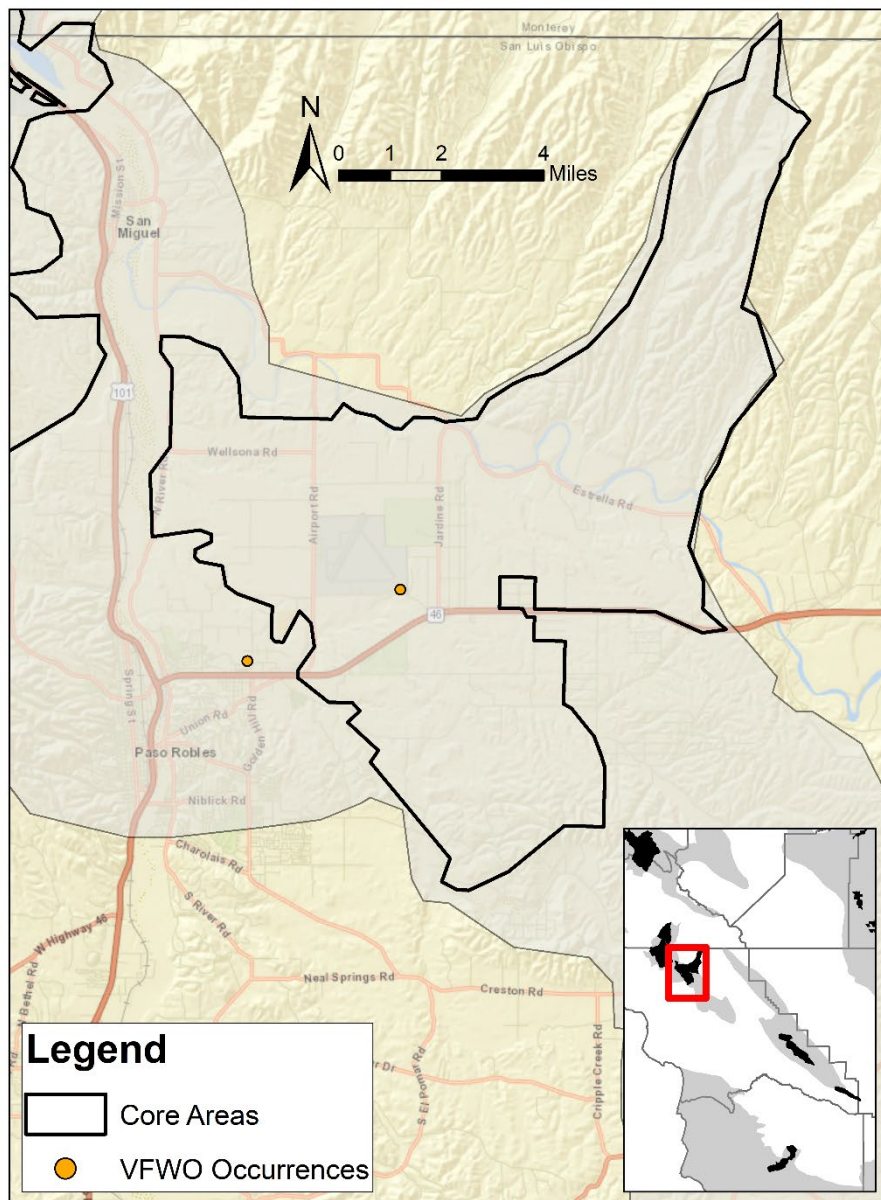


Figure 2.8. Map of known occurrences of vernal pool fairy shrimp provided by the Service’s Ventura Fish and Wildlife Office (VFWO) (Ogonowski, *in litt.* 2023a) within the Paso Robles Core Area. Diversity Database (2022) records have been redacted from the map to comply with CDFW’s Diversity Database Data Use Guidelines.

2.7.4. South Carrizo Plain

This is a zone 2 core area with a goal of protecting 85% of vernal pool habitat for the vernal pool fairy shrimp. The core area is located in southeastern San Luis Obispo County and southwestern Kern County.

There is no estimate of how many acres of vernal pool complex existed in this core area in 2005 or today, and so the Service cannot assess what percentage of vernal pool habitat has been protected. The 2010 Resource Management Plan states that there are approximately 20 wetted acres of vernal pools throughout the Carrizo Plain National Monument (BLM 2010). Although it does not say where within the National Monument the pools are located, the maps of vernal pool plants and the longhorn fairy shrimp in the plan suggest that they are mainly around Soda Lake (within the North Carrizo Plain Core Area) or in the southeastern part of the Carrizo Plain (within this core area). The entirety of the core area is within the Carrizo Plain National Monument, though there are several parcels of private land within the core area (**Figure 2.9**), so we cannot say that 100% of the core area is protected within federal land.

2.7.4.1. Vernal Pool Fairy Shrimp Occurrences

There are no Diversity Database records of the vernal pool fairy shrimp in this core area, and the nearest known occurrence of the species is 28 miles away in the North Carrizo Plain Core Area. There are 10 vernal pools in this core area that were surveyed for 1-4 years by BLM from 2015 through 2019, and the vernal pool fairy shrimp was never found (see **Figure 2.10**; BLM 2015; BLM 2016; BLM 2017a; BLM 2019a). The longhorn fairy shrimp is known to occur in this core area, so the Recovery Plan likely included the vernal pool fairy shrimp due to uncertainty as to whether it occurred here as well.

South Carrizo Plain Core Area - Protected Lands

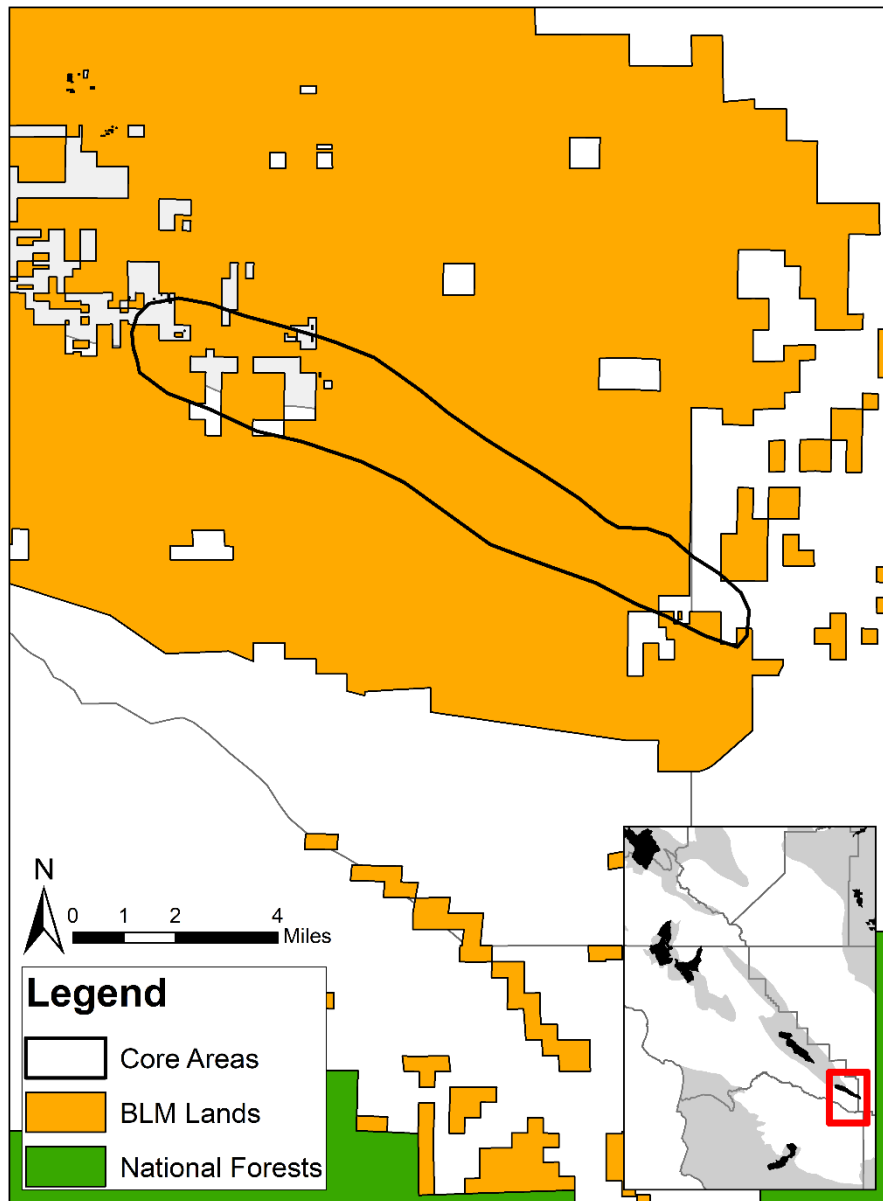


Figure 2.9. Map of protected areas within the South Carrizo Plain Core Area. BLM = Bureau of Land Management.

South Carrizo Plain Core Area - Vernal Pool Fairy Shrimp

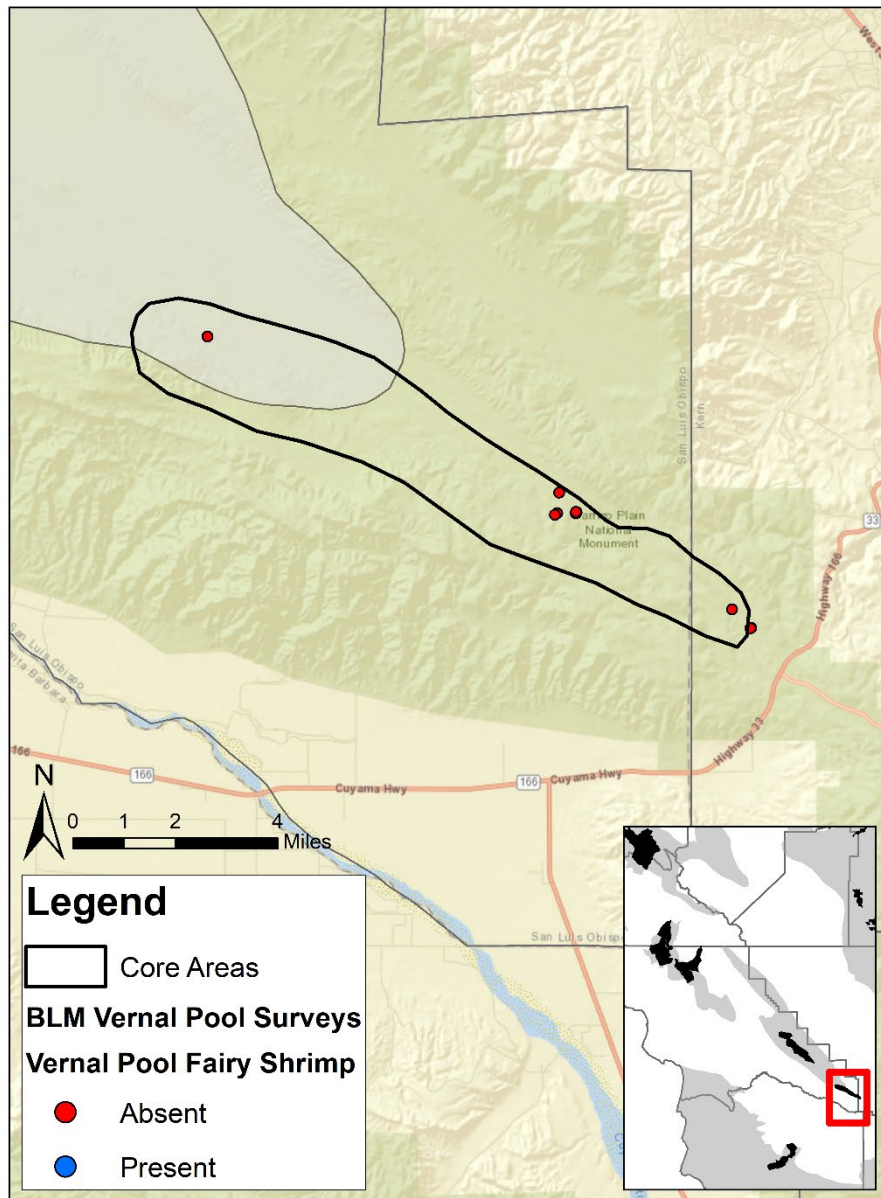


Figure 2.10. Map of vernal pools surveyed for vernal pool shrimp species during Bureau of Land Management (BLM) surveys from 2015-2019 (BLM 2015; BLM 2016; BLM 2017a; BLM 2019a) within the South Carrizo Plain Core Area. The vernal pool fairy shrimp has never been documented within the South Carrizo Plain Core Area.