Status Surveys for Seven Federally Listed Vernal Pool Grasses and *Chamaesyce hooveri* in the Sacramento and San Joaquin Valleys (Great Valley), California, USA

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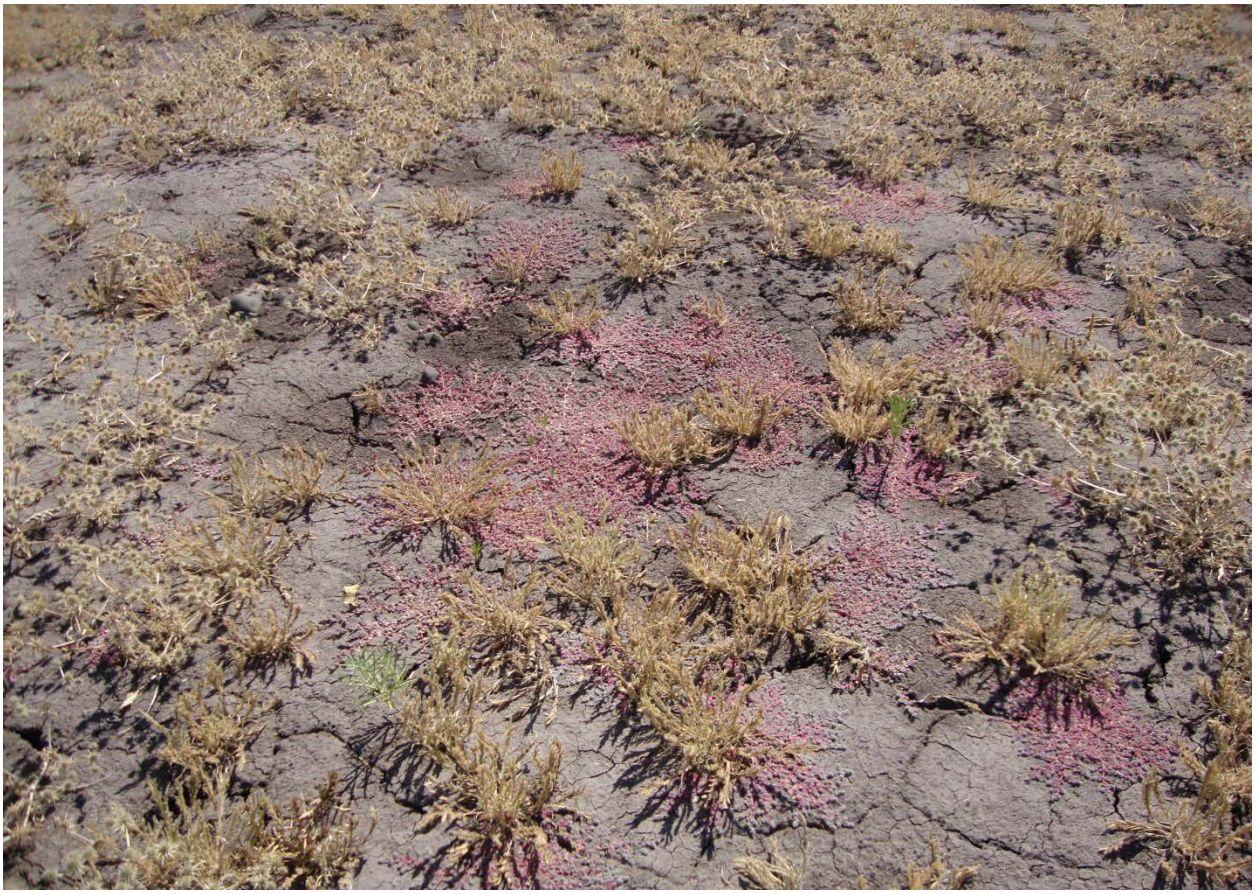

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Status Surveys for Seven Federally Listed Vernal Pool Grasses and *Chamaesyce hooveri* in the Sacramento and San Joaquin Valleys (Great Valley), California, USA

Abstract

The purpose of this project was to determine the current status of California Natural Diversity Database (CNDDB) occurrences within the Sacramento and San Joaquin Valleys for the following plant species: Colusa grass *(Neostapfia colusana)*, San Joaquin Valley orcutt grass *(Orcuttia inaequalis)*, hairy orcutt grass *(Orcuttia pilosa)*, slender orcutt grass *(Orcuttia tenuis)*, Sacramento orcutt grass *(Orcuttia viscida)*, Greene's tuctoria *(Tuctoria greenei)*, Solano Grass *(Tuctoria mucronata)*, and Hoover's spurge *(Chamaesyce hooveri)*. At the time that this project was proposed approximately 75% of the presumed extant occurrences had not been visited in over a decade. Updating information pertaining to the older records was a priority undertaking.

Through a combination of aerial interpretation, field work, and gathering data from others, this report updates information on 273 known occurrences, of which 11 are considered erroneous, duplicate or mis-mapped. Fifteen previously undocumented occurrences are also reported here. Finally, this report includes information on four extirpations and two possible extirpations that took place through potentially unlawful agricultural conversion which occurred during the field studies. In addition to updating each occurrence, observations on losses, threats and protection status are reported along with several recommendations. Summary results are reported on a species-by-species basis and on a regional level within the report. Detailed results are appended to the report for each of the known occurrences.

1 Introduction

The last comprehensive survey for these eight species was conducted in 1986-1987 by Biosystems Analysis (Stone et al. 1988). While some populations are being routinely monitored as part of ongoing research or regulatory mandated monitoring, the vast majority of the populations had not been visited in over a decade and in most cases not since 1986-1987. Additionally, since the Biosystems survey, well over 100,000 acres of vernal pool habitat have been converted to other uses including substantial unregulated agricultural conversion (Holland 2009). During the course of this project, emphasis was placed on determining the status of occurrences that have not been reported on during the past decade or more.

This project was proposed in order to update our knowledge on the Sacramento and San Joaquin Valleys' (Great Valley) distribution and status of the eight species: Colusa grass (*Neostapfia colusana*), San Joaquin Valley orcutt grass (*Orcuttia inaequalis*), hairy orcutt grass (*Orcuttia pilosa*), slender orcutt grass (*Orcuttia tenuis*), Sacramento orcutt grass (*Orcuttia viscida*), Greene's tuctoria (*Tuctoria greenei*), Solano Grass (*Tuctoria mucronata*), and Hoover's spurge (*Chamaesyce hooveri*). For these species, this project specifically fulfills Action 3 of the Stepdown Narrative of the Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon (Recovery Plan) (USFWS 2005).

Table 1: **Species covered in this study** and their status under the federal and California Endangered Species Acts or the California Native Plant Protection Act.

Scientific Name	Common Name	Federal Status	State Status
Chamaesyce hooveri	Hoover's spurge	Threatened	None
Neostapfia colusana	Colusa grass	Threatened	Endangered
Orcuttia inaequalis	San Joaquin Valley orcutt grass	Threatened	Endangered
Orcuttia pilosa	Hairy orcutt grass	Endangered	Endangered
Orcuttia tenuis	Slender orcutt grass	Threatened	Endangered
Orcuttia viscida	Sacramento orcutt grass	Endangered	Endangered
Tuctoria greenei	Greene's tuctoria	Endangered	Rare
Tuctoria mucronata	Solano grass	Endangered	Endangered

2 Description of Study Area

The status surveys for the seven federally listed grasses and Hoover's spurge were conducted throughout the Great Valley. The southern-most populations were at the Department of Fish and Wildlife's Stone Corral Ecological Reserve in Tulare County. The northern-most populations were in the city of Redding in Shasta County. In all, 14 counties were included in the study area: Butte, Colusa, Fresno, Glenn, Madera, Merced, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Tehama, Tulare, and Yolo. No populations of the eight species are known to occur in Placer, Sutter and Yuba Counties. Figure 1 (page 44) is a map showing the distribution of the eight species within the Great Valley with an overlay of the approximate study area.

It should be noted that the study area did not include all populations of all species. Slender orcutt grass is also known from two occurrences in Lake County and 47 occurrences in the Modoc Plateau. These populations were not visited and are not included in this report. Likewise, Greene's tuctoria is known from one occurrence in Murken Bench, in eastern Shasta County, which was not visited or included in this report.

3 Methods and Materials

This project consisted of four proposed tasks: gather existing data, perform GIS review and landowner liaison, conduct field surveys, and prepare interim and final reports. The methods and materials used for each of these tasks are described below.

3.1 *Task 1:* Gather Existing Data

The primary source for existing data was the California Natural Diversity Database (CNDDB) maintained by the Biogeographic Data Branch of the Department of Fish and Wildlife. This database contains information on known populations of rare plants and animals. The CNDDB also maintains Global Information System (GIS) shapefiles for the known occurrences. Additional information and data came from researchers, consultants and other field biologists. Both sets of data were used in identification of survey areas and in some cases constitute the final information being reported here.

3.1.1 California Natural Diversity Database

Prior to commencing the project, the investigator met with CNDDB staff and requested that the files for the eight species be reviewed and any unprocessed records be entered. Roxanne Bittman and her staff graciously agreed to prioritize these species, and the database was updated during the summer of 2008.

A printout of the information available for each occurrence of the eight species was generated using RareFind (CNDDB 2003). The GIS files available from the CNDDB were also queried to produce separate shapefiles for each of the eight species. The dataset used to produce the primary printouts and shapefiles for field survey work was dated August 2, 2008.

The CNDDB releases updated information every two months. Throughout the project period, the updated CNDDB data were reviewed for changes that might be pertinent to this status survey. The tables in this report use CNDDB information through the release dated November 4, 2012. Between the August 2, 2008 and November 4, 2012 datasets, 25 of the 273 species occurrence records were updated. These updates were the result of CNDDB internal record keeping updates or updated occurrence observation data submitted by others. No new occurrences were added for the eight species in the Sacramento and San Joaquin Valleys during that time.

3.1.2 Data from Other Sources

Throughout the project, the investigator communicated with a number of researchers and consultants about specific populations and sites as well as their general knowledge of a given species or area. In some cases, this led to additional specificity in where to find a population or information about ongoing monitoring. Appendix A includes information on which populations are being monitored and by whom. While most people contacted were forthcoming with general information, it was often difficult to obtain field survey data or reports. Nevertheless, the references section contains a list of persons who offered significant contributions to the data presented within this report.

3.2 *Task 2:* GIS Review and Landowner Liaison

The primary purpose of the initial GIS review was to organize a survey plan that maximized effective field time by grouping species and occurrences into appropriate geographic areas. A secondary goal was to identify land ownership for the purposes of obtaining permission to access sites. And a final purpose, not originally anticipated in the project proposal, was to prioritize survey sites based on access, remoteness of the populations, perceived threats and protection status. A variety of data layers was used for the GIS review including:

- California Natural Diversity Database occurrence locations (CNDDB 2008-2012).
- 2005 and 2009 National Agriculture Imagery Program (NAIP) Mosaics by county (1 meter per pixel geo-referenced color aerial images).
- 2010 and 2012 NAIP images were added to the GIS project when they became available.
- Digital Ortho County Mosaics by county (black and white aerials from the 1990s).
- Digital Raster Graphic County Mosaics by county (MrSID format topographic maps).
- Land ownership maps from a variety of sources (Bureau of Land Management (BLM), Department of Fish and Wildlife, Fish and Wildlife Service, State Parks, The Nature Conservancy (TNC), other land trusts, and county tax assessors' parcel maps when available).

3.2.1 GIS Review

All reported occurrences from the CNDDB were remotely reviewed by using the GIS shapefiles overlain on the high resolution NAIP aerial imagery. The purpose of this review was manifold and assisted with:

- Eliminate occurrences found outside the Great Valley study area; this included 49 occurrences for *Orcuttia tenuis* and one occurrence of *Tuctoria greenei*;
- Determining whether habitat was present for occurrences considered extirpated or potentially extirpated in the CNDDB;
- Determining that habitat still exists for occurrence reports within the past 10 years and those for which data was gathered from others in Task 1;
- Determining whether suitable habitat still existed for occurrences not reported upon during the past decade;
- Determining the most suitable search areas for occurrences with vague locality information;
- Determining which species and occurrences occurred in proximity to each other in order to formulate field survey plans; and
- Identifying additional areas to survey if access could be obtained.

GIS review continued throughout the project. In addition to the field packets discussed below, a laptop computer loaded with all of the GIS layers was available in the evenings while in the field.

3.2.2 Develop Field Survey Plans

Upon review of the GIS layers, it became apparent that many of the occurrences were clustered in “hot spots” of vernal pool rare plant diversity. Many of these are well known to the botanical community and include Dales, Vina Plains, Sacramento National Wildlife Refuge, Jepson Prairie, Hickman Vernal Pools, Eastern Merced/Madera Counties, and Cottonwood Creek. Most of these names are familiar to vernal pool biologists and were also used in the Recovery Plan as names for core areas (USFWS 2005).

Field packets were developed for each area of survey interest. These contained the CNDDB printout for each occurrence of each species in the area, the occurrence polygons overlaid on topographic maps, and the occurrence polygons overlaid on aerial photography at various resolutions. When available, land ownership was also included in the field packet. Once general areas were determined through review of the detailed information, each general area was outlined on larger scale maps in a Delorme Atlas & Gazetteer (DeLorme 2008).

This produced a series of field survey plans—occupying three 3” binders—that contained general driving directions and included annotated topographic maps and aerial photography, plus all known data on the target species in that vicinity. The field packets enabled getting to the sites and then navigating on a finer scale within the sites.

3.2.3 Landowner Liaison

When this proposal was first developed, the investigator did not anticipate the obstacles and frustrations that would surround obtaining landowner permission to access sites. Gone are the days of driving down a private road or randomly hopping a fence. Most lands in the Great Valley are now posted as “No Trespassing.” Many have signage that constitutes legal first warning under the California Trespass Law (California Penal Code 602.8(a)) meaning that an offender can be immediately cited or arrested instead of simply being asked to leave.

One unexpected difficulty in landowner liaison was encountered when dealing with public agencies (Bureau of Lands Management, California Department of Transportation (CalTrans), Department of Fish and Wildlife, California Parks, Bureau of Reclamation, USFWS, etc.) and obtaining access to the lands they hold in the public trust. In many cases, an official proposal for use and a formal request for an "appointment" to access the land had to be made weeks or even months in advance of a site visit. Fortunately, using personal contacts within many of the public agencies, I was able to visit numerous sites on relatively short notice by being escorted by accommodating agency staff.

By far, the most perplexing of the landowner liaison issues came about when trying to gain access to proposed preservation and/or mitigation banks. Two bank proponents denied access specifically on the basis of the agencies taking too long to review and approve their applications. Lack of permission to access many sites required modifying my field methodologies as described under *Task 3* below.

3.3 *Task 3:* Field Survey Work

The third and most important task of this status survey was to conduct field surveys to locate and characterize each accessible occurrence with emphasis on those that had not been visited during the past decade. For accessible sites, data collected was to include a GPS perimeter of the population(s), an estimate of plant density using multiple small quadrat census samples, characterization of the vegetation community, documentation of other rare plants or animals observed (see Appendix G), and any additional observations relevant to species vigor, site management, disturbance, invasive species, etc. At sites for which access was denied or in which the species could not be located, a description of whether suitable habitat remains and the most likely location of the population was to be recorded.

For sites that I could not access, a combination of methods were used to determine whether or not suitable habitat was present. These included observing from outside the fence, often with binoculars, and a more thorough review of aerial photography at the end of the day. Best professional judgment was used to identify the most likely vernal pool(s) on the site to contain the target species and the overall contention of the site and habitat.

Field survey work was conducted primarily during the summers of 2010 and 2011. Some reconnaissance-level work took place in the summer of 2009, but the season was deemed to be too dry for many of the target species. Some additional field work was conducted in the spring and summer of 2012, but the southern portion of the study area was again too dry for many of the target species.

3.3.1 Sites with Permission to Access

When permission to access sites was obtained, a thorough data collection was conducted. This included recording population boundaries using a GPS, obtaining transect density data, collecting vegetation community data, and recording any additional observations pertinent to understanding the species and site situation. Most of the results of these data collections are reported here.

3.3.2 Sites without Permission to Access

For sites that I could not access, a combination of methods were used to determine whether or not suitable habitat was present. These included windshield surveys, observing from outside the

fence with binoculars, and a more thorough review of aerial photography at the end of the field day. Best professional judgment and aerial photography interpretation were used to identify the most likely vernal pool(s) on the site to contain the target species.

3.3.3 Windshield Surveys

When access was denied, or sites were clearly posted with “No Trespassing” signs, windshield surveys were used to determine whether suitable habitat appeared to remain at a site. The term windshield survey is used to describe several methods that do not involve entering a property. Sometimes this included standing outside the fence and observing as much as possible through binoculars. Other times, it was literally looking out the window while driving by slowly. This type of reconnaissance was also used to survey many areas that were outside of, or in addition to, known occurrences of the species under consideration.

3.3.4 Remote, Unthreatened and Protected Sites

During the course of GIS review conducted under Task 2 described above, a number of sites were determined to be “too much work” or “too little gain in knowledge” to warrant field work. These included very remote sites, surrounded by natural landscape, and often under conservation easement. Many stock ponds out in the middle of protected ranches were included in this category. While it would have been useful to obtain information on population size and persistence, these occurrences were determined to be low priority for field work.

3.4 *Task 4:* Interim, Annual and Final Reporting

Two levels of reporting were specified as a separate task in the proposal and grant agreement. These included progress reporting and draft and final report preparation.

3.4.1 Progress Reporting

Interim reporting was submitted every four months during the course of this project. A total of 12 progress reports were submitted during this project. This includes five progress reports that were not part of the original grant agreement, task list or budget, but were instead a consequence of extending the grant period from March 31, 2011 to December 31, 2012. All of the progress reports, including associated financial reporting, were submitted in a timely manner.

3.4.2 Draft and Final Reporting

A draft report was transmitted to the USFWS on November 30, 2012. Comments were received from USFWS staff on January 15 and February 4, 2013. All comments were reviewed and incorporated as appropriate. This transmittal constitutes the final report as required by the grant. In addition to transmitting the report and all electronic data to USFWS, the investigator will make the final report and data publically available through electronic dissemination on www.vernalpools.org/StatusSurveys.

4 Results and Discussion

Although not all were visited, each of the 273 occurrences of the eight listed species in the Great Valley was updated during the course of this project. All of the records were reviewed using remote sensing and 158 sites were visited during the course of the 2010-2011 field

seasons. Thousands of additional, but unoccupied, acres were surveyed in a variety of locations. Another several dozen sites were driven by, but access to verify plant presence was not possible. Fifteen new occurrences are reported, while 11 records are believed to be erroneous.

Appendix A contains detailed information on each occurrence by species. These data are summarized below and in the tables and figures that follow. The summary data are presented in two separately organized formats. The first section discusses each individual species and provides summary information on its current status in the Great Valley. The second section discusses regions, organized by the Recovery Plan units and core areas, because in many cases species co-occur and their status may be better understood in the landscape context.

4.1 Species and Occurrence Level Results

The purpose of this project was to determine, to the extent possible through field observations, the current status of known populations of the seven Orcuttieae grasses and *Chamaesyce hooveri*. This report presents those findings and is not an exhaustive literature review on the description, taxonomy, life history or prior research projects related to these species. For more information on those topics, please see the Recovery Plan (USFWS 2005). This report does present information which is new since the publication of the Recovery Plan.

In some cases, changes in the CNDDB make it impossible to precisely cross-reference with the occurrence data presented in the Recovery Plan. The changes are attributed to revised mapping which consolidated multiple occurrences into a single occurrence with multiple parts. The following summary information is presented on occurrences. More information on the multiple parts of some occurrences is provided in Appendix A. Table 2 (page 26) summarizes the results of this status survey by species and the status of their occurrences.

4.1.1 Hoover's Spurge (*Chamaesyce hooveri*)

At the time of the Recovery Plan preparation, a total of 30 occurrences of Hoover's Spurge were known from the Great Valley. Two of those were considered extirpated and an additional two were listed as possibly extirpated. Of the 26 presumed extant occurrences, only three had been visited in the past decade. (USFWS 2005)

Between publication of the Recovery Plan and retrieving data from the CNDDB for this study, two occurrences had been merged for a total of 29 known occurrences. During the course of this project, 16 of the presumed extant occurrences were visited with 10 containing populations and six more presumed extant because habitat remains though plants were not found during the site visits. Through aerial interpretation, two sites were confirmed extirpated and three are considered possibly extirpated. Eight occurrences, primarily on easement or protected lands, were not visited during this project. This report also documents 2 populations not previously known.

Table 3 (page 27) summarizes the status of Hoover's Spurge by occurrence and Figure 2 (page 45) shows its general distribution and status. Appendix A-1 contains detailed information on each occurrence. Hoover's Spurge has a tri-modal distribution; below is a brief discussion of results by general region.

In the north, Hoover's Spurge is known from 21 occurrences in the general vicinities of Vina Plains, central Butte County and the Sacramento National Wildlife Refuge. One of these was

previously known to be extirpated and 2 additional sites are considered possibly extirpated. A previously unreported occurrence discovered in 2003 is also included in this report. The majority of the remaining populations are protected or under conservation easement. The protected sites (owned by TNC or USFWS) are being managed for conservation values. The easement sites are large ranches and protected from adverse changes in land use.

In its central range, Hoover's Spurge is known from two sites in Stanislaus County and one in Merced County. One of the Stanislaus County populations is presumed extant as habitat exists, but access was not possible. The Merced County population is presumed extant even though plants were not observed in 2010 or 2011; this site is protected but considered marginal or declining. The second occurrence in Stanislaus County, one of the largest occurrences from a spatial perspective, is known from Hickman Vernal Pools and is possibly extirpated by agricultural runoff due to the recent encroachment of irrigated orchards surrounding the habitat (see Appendix C); the pools were inundated well into the summer of both 2010 and 2011.

In the south, Hoover's Spurge is known from seven occurrences in Tulare County. One of these was previously known to be extirpated. One is a previously unreported occurrence, which occupies an unusual habitat consisting of the top of a railroad grade and extends into new, irrigated orchards. The five remaining populations are on various Department of Fish and Wildlife parcels in the Stone Corral Ecological Reserve.

In summary, 24 of the 26 known extant or presumed extant occurrences of Hoover's Spurge are afforded some level of protection; this is particularly true in the northern and southern limits of its distribution. When the Recovery Plan was published, two populations were known to be extirpated. No new confirmed extirpations are reported, but one large occurrence in the center of its range, namely the Hickman Vernal Pools, is declining and possibly extirpated due to runoff from agriculture.

4.1.2 Colusa Grass (*Neostapfia colusana*)

At the time of the Recovery Plan preparation, Colusa Grass was known from 60 occurrences. At that time, no more than 42 occurrences remained extant. The type locality in Colusa County had been extirpated, as had 17 other occurrences. The majority of the remaining occurrences were in Solano and Yolo Counties and in Stanislaus and Merced Counties. (USFWS 2005)

Since publication of the Recovery Plan, one occurrence has been combined with another to form a single multi-parted occurrence. Additionally, this report includes six occurrences which were previously unknown: one in Yolo County, four in Solano County, and one in Merced County.

Of the 65 occurrences known today, 17 (26%) are extirpated or possibly extirpated. Besides Colusa County, this includes nine in Stanislaus County, and seven in Merced County. Additionally, the largest spatial occurrence for this species in Hickman Vernal Pools in Stanislaus County is >90% extirpated by summer runoff from adjacent orchards; it is listed as extant only because of 100 plants in a small pool across the road that is part of the same occurrence in the CNDDB.

Table 4 (page 28) summarizes the status of Colusa Grass by occurrence and Figure 3 (page 46) shows its general distribution and status. Appendix A-2 contains detailed information on each occurrence. Below is a brief discussion of results by general region.

In Yolo and Solano Counties, Colusa Grass has nine occurrences. One is a new occurrence from an inoculated created pool in Yolo County (Gerlach 2009, Gerlach 2011). Four more are very small occurrences near Jepson Prairie on private land. Another in that vicinity was reported from a single plant observed in 1987. Of the three remaining occurrences, the population in Olcott Lake is large and persistent, and one population at the Davis Communications Annex is persistent. The other population at the Davis Communications Annex was partially destroyed in 2009.

In Stanislaus and Merced County, there are 56 occurrences. One is a newly reported occurrence from Merced County in a large natural playa pool under conservation easement. Sixteen of the 56 occurrences are extirpated or possibly extirpated. As stated above, the spatially large Hickman Vernal Pools occurrence is mostly extirpated. Included in these numbers are three potential violations reported from Stanislaus County in 2010 (see Appendix B), where active agriculture conversion was taking place. In Stanislaus County there are 13 remaining occurrences which are either extant or presumed extant; none are protected. In Merced County, there are 26 extant or presumed extant occurrences, with 13 afforded some protection through a conservation easement. However, it should be noted that nine of the Merced County occurrences did not contain plants in 2011 even though habitat remains. This may mean that these southernmost occurrences are marginal and only contain the species in particularly favorable years.

In summary, 16 of the 48 extant and presumed extant occurrences of Colusa Grass are afforded some level of protection. This includes Jepson Prairie and Davis Communications Annex in the north, and easements on the Flying M and Sunrise Ranches in Merced County. However, many of the southern occurrences reported as presumed extant did not contain plants in the year(s) of survey and therefore do not persistently support the species.

4.1.3 San Joaquin Valley Orcutt Grass (*Orcuttia inaequalis*)

At the time of the Recovery Plan preparation, San Joaquin Valley Orcutt Grass was known from 52 occurrences restricted to the Southern Sierra Foothills Vernal Pool Region. Of those 52 occurrences, 17 were already considered extirpated and three others possibly extirpated due to habitat modification. One of the extant occurrences was established artificially. Of the 32 presumed extant occurrences, only 3 had been reported upon within a decade. (USFWS 2005)

Since publication of the Recovery Plan, updating within the CNDDB consolidated the previous 52 occurrences into 46 occurrences, some with multiple parts (more than one pool or polygon included in the occurrence). Additionally, since the Recovery Plan, a new occurrence in Solano County in the Solano-Colusa Vernal Pool Region was discovered and reported. Of the 47 occurrences known at the beginning of this project, four are considered erroneous, duplicates or mis-mapped; all of these occur on the Flying M Ranch in Merced County from which many botanists have submitted information over the years, occasionally with the dot in the wrong place on the map.

Of the remaining 43 occurrences, 16 have been extirpated and one is possibly extirpated. The possibly extirpated occurrence is in Madera County: plants were observed in 2010, but the site was being actively plowed and leveled in 2011. Another occurrence in Madera County was partially destroyed by plowing as well. Thirteen of the remaining 26 occurrences were visited as part of this project, but only 9 of the sites contained plants. No new occurrences were found during this survey.

Table 5 (page 30) summarizes the status of San Joaquin Valley Orcutt Grass by occurrence and Figure 4 (page 47) shows its general distribution and status. Appendix A-3 contains detailed information on each occurrence. Below is a brief discussion of its status by generalized regions.

The population in Solano County was discovered in 2003 but not reported to the CNDDB for several years. This population is on a proposed preservation bank and is being monitored (Foreman personal communication, Doubledee personal communication).

All of the occurrences in Stanislaus County were known to have been extirpated at the time of the Recovery Plan, as were several occurrences each in Merced, Madera and Fresno. Eastern Merced County remains the primary center of extant occurrences of this species and is considered vital to its conservation. Additionally, the number of populations in Merced County, particularly on the Flying M Ranch and vicinity, is understated since many of the occurrences are multi-parted (more than one pool or polygon per occurrence).

In summary, 17 of the 43 (40%) of the known occurrences for San Joaquin Valley Orcutt Grass have been extirpated. However, only the newly reported plowing in Madera County constitutes additional losses since the Recovery Plan. Eleven of the 26 extant or presumed extant occurrences are afforded some level of protection, primarily in the form of conservation easement.

4.1.4 Hairy Orcutt Grass (*Orcuttia pilosa*)

At the time of the Recovery Plan preparation, Hairy Orcutt Grass was known from 39 occurrences, 27 were presumed to be extant. This included an introduced population in a created pool in Madera County. Twelve historical occurrences were reported as extirpated. (USFWS 2005)

Since the Recovery Plan was published, a number of occurrences have been consolidated into a single occurrence with multiple parts. This included populations at Vina Plains, Hickman Vernal Pools and in Madera County. Additionally, one occurrence on a CalTrans mitigation bank was reported in 2010. This results in 35 CNDDB occurrences being reported upon. No new occurrences of Hairy Orcutt Grass were found during this project.

Of the 35 CNDDB occurrences, two are considered to be erroneous. One is from the well-known Pentz Pool in Butte County and is considered a mis-identification. Another is from Vina Plains and was simply a mistake in a 1989 monitoring report; as per personal field observations and many other records over the years this pool contains *Tuctoria greenei*.

Of the remaining 33 occurrences, 15 are considered extirpated or possibly extirpated at this time. Extirpated occurrences include five in Stanislaus County, one in Merced County and two in Madera County. Possibly extirpated occurrences are two in Glenn County, one in Merced County and four in Madera County. Additionally the large occurrence at Hickman Vernal Pools is probably mostly extirpated even though plants were found in one small pool across the road which is considered part of this multi-parted occurrence.

Table 6 (page 31) summarizes the status of Hairy Orcutt Grass by occurrence and Figure 5 (page 48) shows its general distribution and status. Appendix A-4 contains detailed information on each occurrence. Hairy Orcutt Grass has a bimodal distribution; below is a brief discussion of its status by region.

In the north, Hairy Orcutt Grass is known from Vina Plains and the Sacramento National Wildlife Refuge. One of the occurrences on Vina and the occurrence in central Butte County are considered erroneous. Two of the populations on the Sacramento NWR may be extirpated. The remaining 11 extant and presumed extant occurrences are all afforded some level of protection.

In the San Joaquin Valley, Hairy Orcutt Grass has been extirpated from all but one occurrence in Stanislaus County, and that occurrence at the Hickman Vernal Pools has severely declined due to altered hydrology caused by encroachment of irrigated orchards (see Appendix C). The two occurrences in Merced County are extirpated or possibly extirpated. Of the 12 occurrences in Madera County, two are extirpated, four are possibly extirpated, including one reported in 2010 as a potential violation (see Appendix B), two are in created habitats and presumed extant, and four are extant or presumed extant.

In summary, 15 of the 33 (45%) known occurrences of Hairy Orcutt Grass are extirpated or possibly extirpated. An additional occurrence has been highly degraded by agricultural activities and may not persist. Of the remaining 17 occurrences, 11 in the northern distribution are afforded some level of the protection. The remaining six in Madera County may be at least partially threatened by continuing agricultural conversion.

4.1.5 Slender Orcutt Grass (*Orcuttia tenuis*)

It should be noted that this status survey was for Great Valley occurrences of Slender Orcutt Grass. Therefore this report does not cover the 49 occurrences located outside the Great Valley except to note that 44 of them have been visited since 2002, and 45 of them are on public lands (primarily U.S. Forest Service) or are otherwise protected (TNC lands).

At the time of the Recovery Plan preparation, 44 total occurrences of Slender Orcutt Grass were known from the Great Valley. The primary center of concentration was in northern Tehama County in the vicinity of Dales. There were no known extirpated populations of Slender Orcutt Grass in the Great Valley. And it was noted that three occurrences were introduced. (USFWS 2005)

In this report, we document 48 occurrences of Slender Orcutt Grass, including two not yet reported occurrences and two occurrences reported by others since 2005 (CNDDB 2012). However, we note that four occurrences are undoubtedly erroneous, mis-mapped or duplicate. The three introduced populations near Dales have failed to persist and are considered extirpated. And finally, one occurrence in Redding is probably extirpated due to hydro-modification caused by a drainage ditch.

Table 7 (page 32) summarizes the (Great Valley only) status of Slender Orcutt Grass by occurrence and Figure 6 (page 49) shows its general distribution and status. Appendix A-5 contains detailed information on each occurrence. Within the Great Valley, Slender Orcutt Grass occurs in five general locations: Redding, Dales Plain, Vina Plains, central Butte County, and the somewhat disjunct locations in Sacramento County. Below is a brief summary of the status of Slender Orcutt Grass populations by general location.

In Shasta County, Slender Orcutt Grass occurs in and around the City of Redding. Many of the Redding sites were inaccessible, but it was also learned that the Hawes Ranch Mitigation Bank on the Millville Plains just east of Redding has numerous created pools containing Slender Orcutt Grass (Helm Biological Consulting 2012, Helm Biological Consulting 2011). These pools

were not inoculated, and probably received seed from a natural occurrence “upstream” of the created pools (Helm personal communication).

In the Dales area of Tehama County, Slender Orcutt Grass occupies a variety of habitats from large natural vernal lakes to the margins of artificial stock ponds. The vast majority of these are protected by easement or public ownership. However, the investigator is concerned by BLM’s removal of cattle from vast tracts of land in Tehama County; this has resulted in substantial impacts to Slender Orcutt Grass habitat and populations due to an increase in feral pigs which root around in the moist pool bottoms. Three populations in created pools in this area have failed to persist, and one occurrence is simply erroneous.

The Vina Plains occurrences of this species continue to be perplexing. There are clearly two populations on or near TNC’s Vina Plains, there is another occurrence in the Laniger Lakes area, and a new one reported from just north of Laniger Lakes. One occurrence from this area is a mis-identification and another based on a herbarium specimen is probably a duplicate of one of the currently known occurrences.

The two central Butte County occurrences were not known at the time of the Recovery Plan. They were reported in 2007 and occur in one natural and one artificial pool (CNDDB 2012, Gregg personal communication).

There are three occurrences in Sacramento County. These are somewhat disjunct from the remainder of the Slender Orcutt Grass range. One of these occurrences is protected and managed for conservation values. The remaining two are on lands that are intended for eventual protection as mitigation for development projects.

In summary, Slender Orcutt Grass appears to be the most widespread and persistent of the Orcuttieae; it generally occurs even in years of below average rainfall. Combining the 49 occurrences outside the Great Valley with the occurrences in the far north end of the Sacramento Valley, it appears more widespread and stable than was known at the time of listing or publication of the Recovery Plan. However, two factors prevent me from recommending delisting: the Sacramento County populations need to be protected, and BLM’s land management in Tehama County may be imposing previously unknown threats to this species.

4.1.6 Sacramento Orcutt Grass (*Orcuttia viscida*)

The Recovery Plan recognized seven natural and one introduced occurrences of Sacramento Orcutt Grass. One occurrence was known to be extirpated. Portions of another occurrence were also known to be extirpated. Sacramento Orcutt Grass is entirely endemic to Sacramento County. (USFWS 2005)

Since the publication of the Recovery Plan, two additional populations have been found (CNDDB 2012 [EO 21], Finan personal communication [N1]). One population on the Arroyo Seco Conservation Bank was determined to be extirpated through this status survey effort. And, in unrelated research for another grant, the investigator discovered that the southernmost occurrence at Rancho Seco had been introduced to the site in ~1975 (Griggs personal communication, Holland personal communication).

Table 8 (page 33) summarizes the status of Sacramento Orcutt Grass by occurrence and Figure 7 (page 50) shows its general distribution and status. Appendix A-6 contains detailed

information on each occurrence. Below is a brief summary of the status of Sacramento Orcutt Grass populations by general location.

North of the American River, two extant populations occur in the Phoenix Field and Phoenix Parks sites. The former is a natural occurrence, persistently occupying two to several pools owned by the Department of Fish and Wildlife. The latter is an introduced occurrence that has persisted for over 30 years in an open space area managed by the City of Fair Oaks. The population in Orangevale (EO 4) has been known to be extirpated since the 1990s.

Between the American River and Deer Creek, there are seven extant and one extirpated occurrences. The most plants and highest density of occupied pools occurs on the Kiefer Landfill Wetland Preserve which is protected and managed for conservation values. However, it should be noted that part of this occurrence, south of Kiefer Blvd., has been extirpated. Two occurrences on the Anatolia Preserve are protected and persistent. Two occurrences fall within the footprint of the proposed Cordova Hills development and another within the proposed Heritage Falls development. One population on the Arroyo Seco Preservation Area has been extirpated due to unseasonal runoff from a nearby nursery.

South of the Cosumnes River, Sacramento Orcutt Grass is known from one occurrence at Rancho Seco with two pools. It is somewhat persistent in one pool and occasionally observed in the other. This occurrence is under conservation easement and managed for conservation values. This occurrence is now known to be an introduction.

In 2012, the U.S. Fish and Wildlife Service funded a small project to introduce Sacramento Orcutt Grass into several additional protected parcels with suitable habitat. This project has not yet commenced due to low seed production in 2012. However, it is expected to aid recovery of this species by establishing additional protected populations.

4.1.7 Greene's Tuctoria (*Tuctoria greenei*)

At the time of Recovery Plan preparation, Greene's Tuctoria was known from 41 occurrences including one outside the current study area in eastern Shasta County. Approximately 19 occurrences were either extirpated or possibly extirpated. The remaining populations were concentrated in the Northeastern Sacramento Valley Vernal Pool Region and in the Southern Sierra Foothill Region. This species was believed to be extirpated from Fresno, Madera, San Joaquin, Stanislaus and Tulare Counties. (USFSW 2005)

Since the Recovery Plan, three new occurrences in the Great Valley and two on the Modoc Plateau have been entered into the CNDDB. This brings the total known CNDDB occurrences within the Great Valley to 43. One is considered erroneous or mis-mapped. Additionally, three new populations in created pools on the Llano Seco Unit of the Sacramento National Wildlife Refuse are reported here (Gottschalk Fisher 2013). This report does not include the three known occurrences outside the Great Valley.

Table 9 (page 34) summarizes the (Great Valley only) status of Greene's Tuctoria by occurrence and Figure 8 (page 51) shows its general distribution and status. Appendix A-7 contains detailed information on each occurrence. Within the Great Valley, Greene's Tuctoria has a clear bi-modal distribution with clusters of occurrences in the far north end of the Sacramento Valley and scattered occurrences in the Southern Sierra Foothills Vernal Pool Region. Below is a brief summary of the status of Greene's Tuctoria occurrences by general location.

In the northern part of its distribution, Greene's Tuctoria has 22 occurrences. It is found in Tehama, Butte and Glenn Counties. One occurrence in Tehama County is considered erroneous and another is extirpated. Two occurrences in Butte County are considered extirpated or possibly extirpated. One occurrence in Glenn County is possibly extirpated. Three occurrences in Butte County are the result of an introduction study by Erin Gottschalk Fisher at the Llano Seco Unit of the Sacramento National Wildlife Refuse created vernal pools (Gottschalk Fisher 2013). The latter three occurrences along with all but one (OE 48) of the remaining 14 extant or presumed extant populations are afforded some level of protection.

In the southern portion of its distribution, Greene's Tuctoria is known from 24 occurrences in San Joaquin, Stanislaus, Merced, Madera, Fresno and Tulare Counties. All of the seven occurrences in San Joaquin, Madera, Fresno and Tulare Counties are extirpated. While Stone et al. (1998) thought that all of the Stanislaus County occurrences were also extirpated, I believe that one of the five might be extant, but it needs field work as I was unable to gain access. In Merced County, two occurrences are extirpated. Four of the remaining 10 extant or presumed extant occurrences are afforded some level of protection.

In summary, of the 45 occurrences of Greene's Tuctoria, 17 (38%) have been extirpated. In the north end of the Great Valley, most of the remaining occurrences are afforded some level of protection through fee ownership (TNC) or conservation easement. In the southern portion of its range, the last stronghold for Greene's Tuctoria is in southeastern Merced County where it is possibly threatened by ongoing agricultural conversion.

4.1.8 Solano Grass (*Tuctoria mucronata*)

At the time of Recovery Plan publication, Solano Grass was known from two extant populations; one each in Solano and Yolo Counties. Neither of the extant populations is protected and the Yolo County population at the Davis Communications Annex has been subject to a variety of threats. The type locality in Solano County, Olcott Lake, was presumed to be extirpated as it had not been found there since 1993 when only four individuals were observed. (USFWS 2005)

Since the Recovery Plan, very little has changed about the status of this plant. The Olcott Lake occurrence has not been seen although the site is monitored annually. The second Solano County occurrence remains quite small (64 plants in 2010), but is persistent; it is on private property. The Yolo County occurrence is persistent during normal rainfall years in two pools; this occurrence is being monitored by several individuals (Helm personal communication, Gerlach personal communication); their census data should be added to the CNDDB when available.

All of the Solano Grass occurrences were visited by the investigator during the course of this project. The only significant change for this species is that in 2011, plants were found in two created vernal pools immediately adjacent to the Yolo County occurrence. These pools had been inoculated with seed by John Gerlach (Gerlach 2011, Gerlach 2009).

Table 10 (page 35) summarizes the status of Solano Grass by occurrence and Figure 9 (page 52) shows its general distribution and status. Appendix A-8 contains detailed information on each occurrence.

Historic records from the Olcott Lake occurrence of Solano Grass appear to indicate that the plants were abundant when the lake bed was being used during the summer months as an off road vehicle area. In 2008, a small experiment was conducted in Olcott Lake to attempt to determine if lack of disturbance was contributing to the decline at this site. In August 2008,

twelve plots were scarified or otherwise disturbed by various techniques. The plots were monitored in 2009, 2010 and 2011. No plants were found and the effects of the soil disturbance were not even evident in 2009.

4.2 Regional and Landscape Level Results

In an attempt to offer a more holistic and landscape level approach to looking at the status of the seven Orcuttieae grasses and *Chamaesyce hooveri*, this section looks at what is happening with respect to all the species within applicable areas and is generally grouped into the vernal pool regions and core recovery areas identified in the Recovery Plan. The recovery plan units correspond with the vernal pool regions identified in a vernal pool assessment by the Department of Fish and Wildlife (Keeler-Wolf et al. 1998).

The goal in looking at the rare plant occurrences at the landscape level is to better identify areas for concentration of recovery efforts, either in the form of acquisition or restoration, or perhaps enforcement. A map of the recovery units is shown in Figure 10 (page 53) and maps of the core areas and their species occurrences are shown in Figures 11-21. Tables 11-17 provide species occurrence information for each of the recovery units and core areas.

4.2.1 Occurrences Outside of Core Recovery Areas

When the Recovery Plan was prepared, it was acknowledged that numerous populations of several species had already been extirpated. Their already destroyed habitat was not included in any of the core recovery areas. Table 11 (page 35) summarizes a list of 35 occurrences that were known to be extirpated in 2005 and whose habitat was not included in core recovery areas. Other potentially extirpated occurrences within close proximity to core areas are discussed below.

4.2.2 Northwestern Sacramento Valley Vernal Pool Region

The Northwestern Sacramento Valley Recovery Unit runs along the foothills of the Northern Coast Range from Shasta County south into Colusa County. However, occurrences of the target species occur only in two core areas located in Shasta County. Species occurrence status and distribution for the Northwestern Sacramento Valley Recovery Unit are provided in Table 12 (page 36) and Figure 11 (page 54).

The **Redding Core Area** includes eight previously known and one new occurrence of *Orcuttia tenuis*. I was only able to access two of the nine sites. One site west of the Redding Airport may be extirpated due to hydro-modification caused by a drainage ditch. A site along Argyle Road in Redding may be partially extirpated. And finally, the Hawes Ranch Mitigation Bank on the Stillwater Plain to the east of Redding is known to contain numerous occurrences in created vernal pools (Helm Biological Consulting 2012).

The **Milleville Plains Core Area** contains two occurrences of *Orcuttia tenuis* with a total of five pools, ponds or reservoirs between them. All of these occurrences were behind locked gates along posted private roads. They are presumed to be extant because habitat remains in the aerial photography.

In summary, the *Orcuttia tenuis* occurrences within the City of Redding are still threatened by development pressures, particularly in the area near the airport. However, the Hawes Ranch Mitigation Bank has created additional habitat for this species. The Milleville Plains occurrences

are remote and not currently subject to incompatible land uses. No urgent recovery actions are needed in the Northwestern Sacramento Valley Vernal Pool Region.

4.2.3 Northeastern Sacramento Valley Vernal Pool Region

The Northeastern Sacramento Valley Recovery Unit extends along the Sierra Nevada foothills from Shasta to Sutter and Yuba Counties. Four of the target species are known to occur in six core areas within this vernal pool region in Tehama and Butte Counties. Species occurrence status and distribution information for the Northeastern Sacramento Valley Recovery Unit are presented in Table 13 (page 27) and Figures 11-13.

The **Dales Core Area** is shown in Figure 11 (page 54). It includes two erroneous occurrences, three extirpated artificial pool occurrences, one possibly extirpated occurrence, plus 20 extant or presumed extant occurrences, all of *Orcuttia tenuis*. All but six of these occurrences have some level of protection, but there are concerns that some of the BLM sites might be under additional, previously undocumented threat from increased feral pig activity since removal of cattle grazing.

The **Vina Plains Core Area** in is shown in Figure 12 (page 55). This is one of the endangered species “hot spots” of the Sacramento Valley. There are multiple occurrences of *Chamaesyce hooveri*, *Orcuttia pilosa*, *Orcuttia tenuis* and *Tuctoria greenei*. Multiple species often occur in the same vernal pool or vernal pool complex. Of the 44 total records for these four species, four are probably erroneous. Of the remaining 40 occurrences, two are previously unreported, two at the edge of the core area are extirpated, and another is possibly extirpated. All but two of the 37 extant or presumed extant populations are afforded some level of protection from fee ownership (TNC) or easements.

The **Oroville Core Area** is shown in Figure 13 (page 56). There are four records of three species in this core area. One record of *Orcuttia pilosa* at Pentz Pool is considered erroneous. Two of *Tuctoria greenei* and one of *Chamaesyce hooveri* are extant or presumed extant, even though two of sites did not contain plants during the survey year(s). Habitat was still present, so perhaps these pools provide marginal habitat in favorable years. The Pentz Pool is part of a proposed mitigation bank.

The **Richvale Core Area** is shown in Figure 13 (page 56). There is one historic occurrence of *Tuctoria greenei* here which has not been seen in many years and is considered possibly extirpated. The 75 acre parcel has not been grazed or otherwise managed in several decades. However, the parcel is currently for sale. A proposal has been submitted to the Central Valley Project Conservation Program and CVPIA Habitat Restoration Program for acquisition of this parcel.

The **Palermo Core Area** is shown in Figure 13 (page 56). There are two presumed extant occurrences of *Orcuttia tenuis* here. They were originally discovered during a project level survey in 2007. The status of this site is currently unknown.

The **Llano Seco Core Area** is shown in Figure 13 (page 56). This includes parts of a the Llano Seco Unit of the Sacramento National Wildlife Refuge. In 2010, *Tuctoria greenei* was planted here in three created vernal pools as part of Erin Gottschalk Fisher’s master’s project (Gottschalk Fisher 2013). Plants occurred in 2011 and reoccurred in 2012 in all three pools without additional seeding.

In summary, occurrences of the target species at Dales, Vina Plains and Llano Seco are mostly protected. The occurrences south of Chico in the Oroville Core Area are proposed as a mitigation bank which will result in protection of the site. The occurrences south of Oroville in the Palermo Core Area may be threatened by a development project. Finally, the *Tuctoria greenei* occurrence on the Richvale vernal pools site may be extirpated. However, this site is for sale and an appropriate recovery action would include acquisition and restoration of this site.

4.2.4 Solano-Colusa Vernal Pool Region

The Solano-Colusa Vernal Pool Region extends from Colusa to Solano County on the valley floor. The vernal pools in this area are considered northern claypan vernal pools. Where pools remain in this region, they are often characterized by having large playas as part of the landscape. Five target species are known to occur in the three core recovery areas. Species occurrence status and distribution for the Solano-Colusa Recovery Unit are presented in Table 14 (page 37) and Figures 14-15.

The **Sacramento National Wildlife Refuge Core Area** is shown in Figure 14 (page 57). There are historic occurrences of *Chamaesyce hooveri*, *Orcuttia pilosa* and *Tuctoria greenei* on the SNWR. Four of the 11 known occurrences are possibly extirpated from the site including the only occurrence of *Tuctoria greenei,* which has not been seen here since 1997. The remaining occurrences are generally small and do not occur every year. These occurrences are being monitored by Joe Silveira of the Sacramento National Wildlife Refuge.

The **Davis Communications Annex Core Area** is depicted in Figure 15 (page 58). It is a small parcel in Yolo County which was previously an antenna farm for McClellan Air Force Base. Both *Neostapfia colusana* and *Tuctoria mucronata* persistently occur here in relatively large numbers. One new occurrence for each species has been recently established in created vernal pools just west of the core populations (Gerlach 2011, Gerlach 2009). Over the years this site has had multiple issues related to lack of natural resource management. The most recent was in 2009 when part of a *Neostapfia colusana* pool was disturbed by removal of a concrete antenna anchor. Long-term management of this site is still an issue. While the Department of Defense has transferred the site to Yolo County, there are no funds to develop a management and monitoring plan.

The **Jepson Prairie Core Area** is depicted in Figure 15 (page 58). This area is known to support *Neostapfia colusana*, *Orcuttia inaequalis* and *Tuctoria mucronata*. The primary occurrence of *Neostapfia colusana* occurs in the eastern portion of Olcott Lake on the Jepson Prairie Preserve. Four additional, small populations were discovered on private lands just west of the preserve during the course of this project. The *Orcuttia inaequalis* was discovered in this area in 2003. This is a disjunct occurrence, but appears to be persistent (Foreman personal communication). *Tuctoria mucronata* is known from two historic occurrences. The Olcott Lake occurrence has not been seen since 1993, when only four plants germinated; prior to that it had not been seen since 1986. This population is considered extirpated. The second population of *Tuctoria mucronata* is on private property; it is small, but persistent.

In summary, while these occurrences are mostly protected from development, several actions are recommended to enhance the potential for long-term survival of several populations. For the Davis Communications Annex and adjacent introduced populations of *Neostapfia colusana* and *Tuctoria mucronata*, a resource management plan needs to be developed and implemented. The implementation entity should be experienced in natural lands management and maintenance and monitoring of conservation value resources. At Jepson Prairie, the extirpated

Olcott Lake population of *Tuctoria mucronata* should be re-established using herbarium materials previously collected from the site.

4.2.5 Southeastern Sacramento Valley Vernal Pool Region

The Southeastern Sacramento Valley Recovery Unit occurs along the Sierra Nevada foothills from Yuba County to San Joaquin County. One species, *Orcuttia viscida*, occurs in three core areas occurring entirely within Sacramento County. Species occurrence status and distribution for the Southeastern Sacramento Valley Recovery Unit are presented in Table 15 (page 40) and Figure 16 (page 59).

The **Phoenix Field and Park Core Area** is located within the City of Fair Oaks and completely surrounded by developed land uses. It contains two occurrences of *Orcuttia viscida*. The northern occurrence persistently occupies two to several vernal pools and is owned by the Department of Fish and Wildlife. Historically, this population was monitored annually by Department of Fish and Wildlife staff, but that was discontinued some years ago (Nosal personal communication). The southern occurrence is in the city-owned Phoenix Park and is the result of seed introduction in 1978. The population has persisted since then. Both of these preserves have had ongoing management issues due to their small size and proximity to residential development. However, most of the issues have been overcome and the plants persist.

The **Mather Core Area** is located in eastern Sacramento County and is entirely within the urban planning areas of both the county and the City of Rancho Cordova. It is the primary subject of a decade-plus conservation planning process called the South Sacramento Habitat Conservation Plan (SSHCP). Eight occurrences of *Orcuttia viscida* are known from this core area including a previously undocumented occurrence being reported here. Of those occurrences, the one on the Arroyo Seco conservation bank is now known to be extirpated due to summer runoff from a nearby nursery operation. A second occurrence, located primarily on the Kiefer Landfill Wetland Preserve has had one plant population, west of the preserve and across Kiefer Boulevard, extirpated. Three occurrences of *Orcuttia tenuis* also occur in the Mather Core Area. One of these is protected in a preserve being managed for conservation values and the two others are on parcels that are planned as future mitigation sites and will eventually be protected. It is the stated intent of the SSHCP to conserve all *Orcuttia* populations in the planning area.

The **Cosumnes/Rancho Seco Core Area** is located in eastern Sacramento County south of the Cosumnes River. It contains one occurrence of *Orcuttia viscida* located in two pools. It is now known that this occurrence was planted from seed collected north of the Cosumnes River in ~1974 (Griggs personal communication, Holland personal communication). The populations are very small, but appear to be persistent in at least one of the pools in favorable rainfall years. The site is remote, protected and not subject to impacts from nearby incompatible land uses.

In summary, the largest *Orcuttia viscida* occurrences in Sacramento County are already protected. One of the three populations of *Orcuttia tenuis* is also protected. Additionally, it is a goal of the SSHCP to protect all known occurrences plus any discovered in the future. To aid the recovery of *Orcuttia viscida*, the USFWS has recently awarded a small grant to establish populations on several protected sites. No additional recovery actions are recommended.

4.2.6 Southern Sierra Foothills Vernal Pool Region

The Southern Sierra Foothills Vernal Pool Recovery Unit extends from San Joaquin County in the north to Tulare County in the south. The recovery unit includes a mixture of southern hardpan, southern claypan and volcanic vernal pools. Five target species are known from eight core areas. Species occurrence status and distribution for the San Joaquin Valley Vernal Pool Recovery Unit are presented in Table 16 (page 41) and Figures 18-20.

The **Farmington Core Area** is depicted in Figure 17 (page 60) and is located in eastern Stanislaus County. One historic occurrence of *Neostapfia colusana,* found in 1986, is known from this core area. This site is presumed extant as habitat is evident on the aerial photography. It is also remote and not threatened by proximity to incompatible land use.

The **Merced Core Area** is depicted in Figure 17 (page 60). Despite its name, it occurs in southeastern Stanislaus County through eastern Merced County north of the Merced River. This core area is known to support 19 recorded occurrences of *Chamaesyce hooveri*, *Neostapfia colusana*, *Orcuttia pilosa* and *Tuctoria greenei*. Eight occurrences are considered extirpated or possibly extirpated and two occurrences were reported as potential violations in 2010 (see Appendix B). The entire area is threatened by agricultural conversion, primarily to orchards. One of the largest vernal pool complexes in the core area is the Hickman Vernal Pools. While the occurrences of *Neostapfia colusana* and *Orcuttia pilosa* are still extant in a very small pool north of Lake Road, all of the large vernal pools south of the road were inundated well into the summers of 2010 and 2011. Orchards encroach on several of the pools and are planted up to the shoreline of others. Appendix C contains a series of aerial photographs showing the extent of this encroachment over the years.

The **Waterford Core Area** is shown in Figure 17 (page 60) and is located in southeastern Stanislaus County. Three occurrences of *Neostapfia colusana* and one of *Tuctoria greenei* have been reported from this core area. Only one population of *Neostapfia* was visited during the field work because the others were clearly posted with “No Trespassing” signs. The three other occurrences are presumed extant because habitat is evident in the aerial photography and from the road.

The **Madera Core Area** is shown in Figure 18 (page 61). It extends from the Merced River in Merced County south to the San Joaquin River in southern Madera County. This 387 square mile core area has 80 records for four of the target species: *Neostapfia colusana*, *Orcuttia inaequalis*, *Orcuttia pilosa* and *Tuctoria greenei*. The 80 records include four which are considered erroneous and another two which may report the same population. One new population of *Neostapfia colusana* was added in this core area during field surveys. Fourteen occurrences are extirpated or possibly extirpated. To facilitate further discussion, the core area has been broken down into segments:

Merced River to Highway 140 (Merced County): This is the largest remaining contiguous vernal pool landscape in the Great Valley (Holland 2009). It contains well surveyed areas such as the parcels known as the Cyril Smith and Virginia Smith Trusts surrounding the University of California Merced (UCM) campus and the Flying M Ranch. A large portion of this area is under conservation easement. Most of the known occurrences of target species are from the Virginia Smith Trust and the Flying M Ranch. Much of this area was surveyed in 2001 (Vollmar 2002), and portions were resurveyed during this project. All four of the erroneous occurrences are from this region. The new occurrence of *Neostapfia* is also from the segment of the Madera Core Area. There are three extirpated occurrence in this

segment. The remaining 38 occurrences of the four species are extant or presumed so. These are also remote from incompatible land uses.

Highway 140 to the Chowchilla River (Merced County): There are four extirpated occurrences in this segment of the Madera Core Area, primarily along the western edge in the vicinity of more intensive agriculture. The remaining 12 occurrences of *Orcuttia inaequalis* and *Tuctoria greenei* are extant or presumed so and are somewhat distant from incompatible land uses.

Chowchilla River to San Joaquin River (Madera County): Most of the occurrences of the target species are in the southern portion of this segment of the Madera Core Area. There are 19 records of *Orcuttia inaequalis*, *Orcuttia pilosa* and *Tuctoria greenei*. Of those nine are extirpated or possibly extirpated. This area is under pressure from both agricultural conversion and development.

The **Table Mountain Core Area** is shown in Figure 19 (page 62). This core area includes Kennedy Table in Madera County and Table Mountain in Fresno County. Each contains an occurrence of *Orcuttia inaequalis*. These are presumed extant as habitat is evident on the aerial photography and they are remote and not subject to proximity of incompatible land uses.

The **Fresno Core Area** is shown in Figure 19 (page 62). This core area is northeast of the City of Fresno in Fresno County. Most of the occurrences of target species in this area were known to be extirpated prior to preparation of the Recovery Plan. There is a single presumed extant occurrence of *Orcuttia inaequalis*. The site was not visited as the road was gated and clearly posted, but habitat is evident on the aerial photography.

The **Cottonwood Creek Core Area** is shown on Figure 20 (page 63) and is located in Tulare County. There are seven occurrences of *Chamaesyce hooveri* recorded from this area including one extirpated occurrence and one new occurrence previously unreported. There is also a single extant occurrence of *Orcuttia inaequalis*. Most of these populations are protected as part of the Department of Fish and Wildlife's Stone Corral Ecological Reserve.

The **Tulare Core Area** is shown in Figure 20 (page 63) and is located in Tulare County. A single occurrence of *Orcuttia inaequalis* was known from this core area. Field work in 2010 verified that this occurrence is extirpated and that no habitat remains in the area.

In summary, this is an extremely large region, but some patterns are apparent. Occurrences in southeastern Stanislaus County are severely threatened by agricultural conversion. The same is true of southeastern Merced County and Madera County. The occurrences in northeastern Merced County are mostly protected, as are those in Tulare County. In Fresno County there is some development pressure on the Fresno Core Area, but the Table Mountain Core Areas are not considered at risk.

Four possible enforcement actions in the Southern Sierra Foothills Recovery Unit were submitted to the regulatory agencies (see Appendix B). These were either deep-ripping or direct fill of wetlands. Three sites were in Stanislaus County and one was in Madera County. Since submitting those reports in 2010, two additional sites in Madera County were plowed. These have not been submitted yet as plowing may not be a violation of the Clean Water Act.

The best possible recovery action in several of these areas would be enforcement. Additionally, efforts to place several large ranches in eastern Merced County under conservation easement

should continue. This will help to prevent future leap-frog development as the UCM campus and surrounding population continue to grow.

4.2.7 San Joaquin Valley Vernal Pool Region

The San Joaquin Valley Vernal Pool Recovery Unit is located on the valley floor and extends from San Joaquin County south to Kern County. The pools within this region are classified as southern claypan vernal pools. Only the Grasslands Ecological Area Core Area in Merced County contains the target Orcuttieae and *Chamaesyce hooveri* species. Species occurrence status and distribution for the San Joaquin Valley Vernal Pool Recovery Unit are presented in Table 17 (page 17) and Figure 21 (page 63).

The **Grasslands Ecological Area Core Area** is located in western Merced County. *Chamaesyce hooveri* is known from one historic occurrence documented in 1987. This site is under conservation easement and habitat remains so it is presumed extant even though no plants were observed in 2010 or 2011. Five occurrences of *Neostapfia colusana* are recorded from this area. Three of these are possibly extirpated. One occurrence under conservation easement is presumed extant even though no plants were observed in 2010 or 2011. The extant occurrence (EO 40) of *Neostapfia colusana* has been partially converted to intensive agriculture and is on private property.

In summary, some of the occurrences in this region are protected through conservation easement. One possible recovery action would be to acquire and manage the one small parcel with the extant occurrence of *Neostapfia colusana*.

5 Summary and Conclusions

This was a long, large project with very complex and cumbersome data. During the data compilation in preparation of this report, it became apparent that it would be difficult to produce any simple summary of results or recommendations. However, several general thoughts and recommendations have coalesced as I considered the full scope of this project and the observations made along the way.

5.1 On the Negative Side

Unregulated and potentially illegal agricultural conversions continue to be a major concern, particularly in Stanislaus and Madera Counties. Both of these counties already boast high extirpation levels compared to historic species occurrences. But the destruction of habitat has not stopped and unregulated and potentially illegal destruction was witnessed during field work conducted under this project (see Appendix B).

The Hickman Vernal Pools in southern Stanislaus County are a prime example of loss due to agricultural conversion issues. The pools themselves have not been converted, but their hydrology has been completely altered by irrigation of encroaching orchards (see Appendix C). During the summers of 2010 and 2011, the primary habitat associated with this area was unseasonably inundated and appeared to have an excessive nutrient load. I believe that three previously large populations of rare plants associated with the Hickman Vernal Pools are essentially lost. The magnitude of the damage here is not likely to be remediable.

5.2 On the Positive Side

Large tracts of vernal pool landscapes are under some form of protection. This is particularly true in the Dales and Vina Plains areas of Tehama County and in eastern Merced County. Other areas also have a significant proportion of their vernal pool resources in a protected status: Sacramento National Wildlife Refuge in Glenn County, Jepson Prairie area in Solano County, and Stone Corral Ecological Area in Tulare County.

5.3 Specific Recommendations

While I understand that it is difficult, enforcement should be a top priority in the more rural counties of the Great Valley. Following a few successful enforcement actions, landowner outreach and education related to the Endangered Species Act may achieve some benefit. Securing additional funding for conservation easements would also help protect these species.

Acquisition and restoration of the Richvale vernal pools population of *Tuctoria greenei* should be considered. This site is at the distal end of the alluvial terrace in Butte County and supports soils that have otherwise been converted to agriculture in that area.

Tuctoria mucronata would benefit from several actions in the Yolo and Solano areas. The Davis Communications Annex needs to be properly protected and managed for conservation resources. The extirpated Olcott Lake population should be re-established using herbarium materials previously collected from the site.

Actions should be taken to continue to protect ranches in eastern Merced County, particularly those in the vicinity of the new UC Merced campus. This would help to prevent future leap-frog development resulting from the inevitable growth of the campus and its surrounding population.

6 Summary of Expenditures

A final financial report using form SF-425 has been prepared and submitted to the USFWS.

7 References

As stated earlier, this project was to determine the status of populations of eight species that occur in vernal pools in the Great Valley. It was not, and this report does not contain, an exhaustive literature review on the description, taxonomy, life history or prior research projects related to these species; for more information on those topics, please see the Recovery Plan (USFWS 2005). The following references and personal communications are those cited in this report and/or the appendices.

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Vollmar, J.E. (Ed.). 2002. Wildlife and Rare Plant Ecology of Eastern Merced County's Vernal Pool Grasslands. Vollmar Consulting, Berkeley, CA.

7.2 Personal Communications

Cypher, Ellen. Department of Fish and Wildlife, Region 4, 1234 E. Shaw Avenue, Fresno, CA 93710. ecypher@dfg.ca.gov. DFG Stone Lakes Ecological Reserve in Tulare County.

Davis, Heather. Department of Biology, Sonoma State University, 1801 East Cotati Avenue, Rohnert Park, California 94928. 717.664.2512. Various species and sites from her 2007-2008 vernal pool grasses genetics studies.

Doubledee, Rebecca. LSA Associates, 157 Park Place, Point Richmond, CA 95801. 510.236.6810. *Orcuttia inaequalis* in Solano County.

Finan, Michael C. U.S. Army Corps of Engineers, Sacramento District. 916.557.5250. *Orcuttia viscida* in Sacramento County

Fisher, Erin Gottschalk. 1118 Salem Street, Chico, CA 95928. (530) 219-5972. egottschalkfisher@mail.csuchico.edu.*Tuctoria greenei* at Llano Seco in Butte County.

Foreman, Steve. LSA Associates, 157 Park Place, Point Richmond, CA 95801. 510.236.6810. *Orcuttia inaequalis* in Solano County.

Gerlach, John. 851 48th Street, Sacramento, CA 95819. 916.844.8108 *Tuctoria mucronata* and *Neostapfia colusana* at the Davis Communications Annex in Yolo County.

Gregg (Alfieri), Elena. Gallaway Consulting. elena@gallawayconsulting.com. *Orcuttia tenuis* south of Oroville, Butte County.

Griggs, F. Thomas. Retired. Formerly of River Partners and The Nature Conservancy. 530.824.4862. *Orcuttia viscida* in Sacramento County, and various other locations and species in the Great Valley.

Helm, Brent. Helm Biological Consulting, LLC. Bhelm69485@aol.com. Hawes Ranch mitigation bank, Stillwater Plains, Shasta County.

Holland, Robert F. Independent consultant. 3371 Ayres Holmes Road, Auburn, CA 95603. 530.888.9180. All things vernal pools, plus *Orcuttia viscida* at Rancho Seco, and access to numerous parcels in Merced County.

Hrusa, G. Fred. Senior Plant Taxonomist, Plant Pest Diagnostic Center, California Department of Food and Agriculture. fhrusa@cdfa.ca.gov. *Orcuttia viscida* on Arroyo Seco, Sacramento County.

Kelly, Heather. Biologist, North State Resources, 530.222.5347 x121. Kelly@nsrnet.com. *Orcuttia tenuis* in the City of Redding, Shasta County.

Lacey, Rodney. Project Manager, Botanical and Wetlands Specialist, Eco-Analysts. 530.342.5991x203. Pentz Pool east of Highway 99 in Butte County.

Nosal, Tim. Department of Fish and Wildlife, Region 2. tnosal@dfg.ca.gov. *Orcuttia viscida* at Phoenix Field in Sacramento County.

O'Leary, Reagen. Associate Environmental Planner/Natural Sciences, California Department of Transportation. 559.243.8215. CalTrans mitigation bank east of Highway 41 in Madera County.

Silveira, Joe. Sacramento National Wildlife Refuge, 752 County Road 99W, Willows, CA 95988. 530.934.2801. Sacramento NWR and a variety of other locations throughout the Great Valley.

Vollmar, John. Vollmar Natural Lands Consulting, 1720 Solano Avenue, Berkeley, CA 94707. 510.559.9603. Various sites in Madera, Merced and Stanislaus Counties.

VonderOhe (Egan), Sarah. ECorp Consulting, 2525 Warren Drive, Rocklin, CA 95677. 916.782.9100. *Orcuttia tenuis* and *O. viscida* sites in Sacramento County.

Whitney, Ken. Foothill Associates, 590 Menlo Drive, Suite 5, Rocklin, CA 95765. 916.435.1202. Various sites in Sacramento and Tehama Counties.

8 Acronyms, Abbreviations and Definitions

CNDDB: California Natural Diversity Database, Biogeographic Data Branch, California Department of Fish and Wildlife.

Differential correction: Using online GPS data from a fixed location, or base station, to refine location data from a GPS mobile device. The process corrects variability in the location information received from the satellites.

Extant: Still in existence as verified by field observations made during this project. See also Presumed Extant.

Extirpated: No longer in existence as verified via aerial interpretation or field observations made during this project. See also Possibly Extirpated.

GIS: Global Information System. Used to describe software that maintains data which is tied to a specific location on the planet. Maps produced by GIS can be used individually or superimposed to see relationships and perform analyses.

GPS: Global Positioning System. GPS uses satellites and a receiver to provide real-time position or location information. This information is often used in conjunction with GIS projects.

Multi-part Occurrence: An occurrence may have more than one discrete polygon or pool if they are within ¼ mile of each other.

Occurrence or Element Occurrence or EO: Mapping unit used by the CNDDB. An occurrence may have more than one discrete polygon or pool if they are within ¼ mile of each other. Occurrences with multiple parts fall into the latter category.

Possibly Extirpated: Populations/Occurrences that may be extirpated. These include two categories: locations where habitat remains, but the plants have not seen in many years and locations where adjacent/surrounding land use has altered the habitat.

Presumed Extant: Populations/Occurrences for which habitat remains. These were either visited and no plants were found. Or they were not visited, but habitat is evident on the aerial photographs.

Rarefind: A database program developed by the CNDDB that allows querying of all of the rare plant and animal records maintained by the CNDDB.

Shapefile: A file used in GIS that provides location information often associated with additional data.

Table 2: **Summary results** of this status survey by species. More detailed information is presented in the Species Level Results section and in Appendix A.

Species Name	CNDDB Occurrences[c]	Erroneous Occurrences[d]	New Occurrences	Total Occurrences	Extirpated[e]	Possibly Extirpated[e]	Extant	Presumed Extant	
								Visited[f]	Not Visited[g]
Chamaesyce hooveri	29	0	2	31	2	3	12	6	8
Neostapfia colusana	59	0	6	65	13	4	17	10	21
Orcuttia inaequalis	47	-4	0	43	16	1	9	4	13
Orcuttia pilosa	35	-2	0	33	8	7	9	5	4
Orcuttia tenuis[a]	46	-4	2	44	3	2	21	1	17
Orcuttia viscida	11	0	1	12	2	0	8	0	2
Tuctoria greenei[b]	43	-1	3	45	15	2	13	5	10
Tuctoria mucronata	3	0	1	4	1	0	3	0	0
TOTALS	273	-11	15	277	60	19	92	31	75

[a] Only reports on the occurrences within the Great Valley; *Orcuttia tenuis* is also known from 49 occurrences outside the valley.

[b]Only reports on the occurrences within the Great Valley; *Tuctoria greenei* is also known from 1 occurrence outside the valley.

[c]CNDDB Occurrences assessed from California Natural Diversity Database RareFind 3.0, data set dated November 4, 2012.

[d]Erroneous Occurrences are more fully explained in the species by occurrence data presented in Appendix A.

[e]Approximately 37 of the Extirpated or Possibly Extirpated sites were visited; see additional information in Apppendix A.

[f]Sites where habitat was present, but no plants were found on the date of the field survey; possibly represents marginal habitat for the species.

[g]Sites were not visited for a variety of reasons including inability to access; this is more fully explained in the detailed data in Appendix A.

Table 3: Status of **Hoover's Spurge (*Chamaesyce hooveri*)** occurrences in the Great Valley. Populations are listed from north to south and correspond with Figure 2 (page 45).

EO	PTS	County	Date Observed	2010-2011 Status	Habitat Condition	Estimated Vigor	Protection Status
26	1	Tehama	1987	Presumed extant	Present and Natural	Unknown	Easement
29	1	Tehama	1987	Possibly Extirpated*	Present but Modified	Likely Declining	
N1	1	Tehama	2003*	Presumed Extant	Present and Natural	Unknown	Proposed Bank
27	1	Tehama	1987	Presumed Extant	Present and Natural	Unknown	Easement
7	1	Tehama	1987	Presumed Extant	Present and Natural	Unknown	Easement
8	1	Tehama	1986	Presumed extant	Present and Natural	Unknown	Easement
2	1	Tehama	1986	Presumed Extant	Present and Natural	Unknown	Easement
3	1	Tehama	1980	Presumed Extant	Present and Natural	Unknown	Easement
1	1	Tehama	Unknown	Extirpated	Eliminated		
5	1	Tehama	8/15/2010	>4,000 Plants in 2010	Present and Natural	Persistent	Protected
16	6	Tehama	8/16/2011	300 Plants in 2011	Present and Natural	Persistent	Protected
28	5	Tehama	8/17/2011	>1,000 Plants in 2011	Present and Natural	Persistent	Protected
24	1	Tehama	8/15/2011	2 Plants in 2011	Present and Natural	Declining	Protected
30	1	Butte	8/15/2011	Presumed Extant**	Present but Modified	Marginal	Protected
14	1	Butte	8/11/2011	Presumed Extant**	Present and Natural	Marginal	Protected
23	2	Butte	8/11/2011	5 Plants in 2011	Present and Natural	Declining	
4	1	Butte	9/9/2010	Presumed Extant	Present and Natural	Marginal	Proposed Bank
34	1	Glenn	2007	Presumed Extant	Present but Modified	Unknown	Protected
19	5	Glenn	7/12/2011	50 Plants in 2011	Present but Modified	Persistent	Protected
21	1	Glenn	7/12/2011	Presumed Extant**	Present but Modified	Declining	Protected
35	1	Glenn	7/12/2011	Possibly Extirpated	Present but Modified	Declining	Protected
11	1	Stanislaus	1986	Presumed Extant	Present and Natural	Unknown	
9	6	Stanislaus	10/16/2011	Possibly Extirpated*	Modified by Ag Runoff	Declining	
22	1	Merced	9/22/2011	Presumed Extant**	Present and Natural	Declining	Easement
N2	1	Tulare	8/5/2010*	100s Plants in 2010	Totally Modified	Unknown	
13	1	Tulare	8/6/2010	2,000 Plants in 2010	Present and Natural	Persistent	Protected
33	1	Tulare	6/6/2011	6 Plants in 2010	Present and Natural	Declining	Protected
32	1	Tulare	8/5/2010	>1,500 Plants in 2010	Present and Natural	Persistent	Protected
12	1	Tulare	1941	Extirpated	Eliminated		
31	2	Tulare	6/6/2011	50 Plants in 2011	Present and Natural	Persistent	Protected
25	1	Tulare	6/6/2011	Presumed Extant**	Present and Natural	Declining	Protected

EO: Element Occurrence number from CNDDB; PTS: Number of parts associated with the EO.

*New or a change from 11/4/12 California Natural Diversity Database information.

**Presumed extant even though no plants were found on the date of the survey.

Table 4: Status of **Colusa Grass (*Neostapfia colusana*)** occurrences in the Great Valley. Populations are listed from north to south and correspond with Figure 3 (page 46).

EO	PTS	County	Date Observed	2010-2011 Status	Habitat Condition	Estimated Vigor	Protection Status
13	1	Colusa	1898	Extirpated	Eliminated		
58	1	Yolo	10/15/2011	100 Plants in 2011	Present but Modified	Persistent	DOD/Yolo
N6	2	Yolo	10/15/2011*	~50 Plants in 2011	Artificial	New	Yolo Co
49	2	Yolo	10/15/2011	1,000s Plants in 2011	Present but Modified	Persistent	DOD/Yolo
19	1	Solano	8/25/2012	1,000s in 2012	Present and Natural	Persistent	Protected
N1	1	Solano	8/29/2010*	2 Plants in 2010	Present and Natural	Persistent	
N2	2	Solano	8/29/2010*	109 Plants in 2010	Present and Natural	Persistent	
N3	1	Solano	8/29/2010*	51 Plants in 2010	Present and Natural	Unknown	
N4	2	Solano	8/29/2010*	>100 Plants in 2010	Present and Natural	Unknown	
48	1	Solano	9/5/2010	Presumed Extant**	Present and Natural	Marginal	
47	1	Stanislaus	1986	Presumed Extant	Present and Natural	Unknown	
55	1	Stanislaus	1988	Presumed Extant	Stockpond	Unknown	
57	1	Stanislaus	1987	Possibly Extirpated*	Unknown	Unknown	Reported
22	1	Stanislaus	1937	Extirpated	Eliminated		
56	1	Stanislaus	2001	Presumed Extant	Present and Natural	Unknown	
64	1	Stanislaus	2001	Presumed Extant	Present and Natural	Unknown	
7	1	Stanislaus	1969	Presumed Extant*	Potentially Mis-mapped	Unknown	
41	5	Stanislaus	1973	Extirpated	Eliminated		
65	1	Stanislaus	9/3/2010	300 Plants in 2010	Present and Natural	Persistent	
62	1	Stanislaus	2001	Presumed extant	Present and Natural	Unknown	
4	3	Stanislaus	2009	Presumed Extant	Present and Natural	Unknown	
8	1	Stanislaus	1986	Presumed Extant	Present and Natural	Unknown	
71	1	Stanislaus	9/3/2010	1,000 Plants in 2010	Present and Natural	Persistent	
9	1	Stanislaus	1938	Extirpated	Eliminated		
5	2	Stanislaus	2001	Presumed Extant	Present and Natural	Unknown	
63	1	Stanislaus	Unknown	Extirpated	Eliminated		
11	3	Stanislaus	9/4/2010	Extirpated*	Eliminated		Reported
6	1	Stanislaus	1962	Extirpated*	Eliminated		
20	1	Stanislaus	9/2/2010	Extirpated*	Eliminated		Reported
23	1	Stanislaus	1958	Extirpated	Eliminated		
2	6	Stanislaus	9/2/2010	100 Plants in 2010	Present but Modified	Declining	
24	1	Stanislaus	1981	Presumed Extant	Present but Modified	Unknown	
61	1	Merced	1987	Extirpated	Eliminated		
54	1	Merced	1987	Extirpated	Eliminated		
67	1	Merced	9/21/2011	29 Plants in 2011	Stockpond	Marginal	Easement
15	1	Merced	9/21/2011	Presumed Extant**	Stockpond	Marginal	Easement
46	1	Merced	1986	Presumed Extant	Stockpond	Unknown	
70	1	Merced	9/22/2011	Presumed Extant**	Stockpond	Marginal	Easement
17	1	Merced	9/26/2010	Presumed Extant**	Present and Natural	Marginal	
14	1	Merced	9/21/2011	Presumed Extant**	Present and Natural	Marginal	Easement
32	3	Merced	9/26/2010	Presumed Extant**	Present and Natural	Declining	
18	1	Merced	1992	Presumed Extant	Stockpond	Unknown	
27	1	Merced	1981	Presumed Extant	Potentially Mis-mapped	Unknown	
45	1	Merced	1986	Presumed Extant	Stockpond	Unknown	
68	1	Merced	9/21/2011	Presumed Extant**	Stockpond	Marginal	Easement
36	1	Merced	2001	Presumed Extant	Potentially Mis-mapped	Unknown	
69	1	Merced	9/21/2011	400 Plants in 2011	Stockpond	Persistent	Easement
26	1	Merced	1986	Presumed Extant	Stockpond	Unknown	

Continued

Table 4 *(cont)***:** Status **of Colusa Grass (*Neostapfia colusana*)** occurrences in the Great Valley. Populations are listed from north to south and correspond with Figure 3 (page 46).

EO	PTS	County	Date Observed	2010-2011 Status	Habitat Condition	Estimated Vigor	Protection Status
34	1	Merced	9/26/2010	Presumed Extant**	Potentially Mis-mapped	Marginal	
38	1	Merced	1986	Presumed Extant	Present and Natural	Unknown	Easement
29	1	Merced	1986	Presumed Extant	Present and Natural	Unknown	
66	1	Merced	9/22/2011	12 Plants in 2011	Present and Natural	Marginal	Easement
59	2	Merced	9/22/2011	33 Plants in 2011	Present and Natural	Marginal	Easement
37	1	Merced	1981	Presumed Extant	Present and Natural	Unknown	
N5	1	Merced	9/22/2011*	100,000s Plants in 2011	Present and Natural	Persistent	Easement
1	1	Merced	9/26/2010	Presumed Extant**	Present and Natural	Declining	Easement
12	1	Merced	1943	Extirpated*	Eliminated		
60	1	Merced	2001	Presumed Extant	Present and Natural	Unknown	Easement
43	2	Merced	1986	Presumed Extant	Present and Natural	Unknown	
42	1	Merced	2001	Extirpated	Eliminated		
51	1	Merced	9/25/2010	Possibly Extirpated	Present but Degraded	Marginal	
52	1	Merced	1990	Possibly Extirpated	Present but Modified	Unknown	
40	1	Merced	10/15/2011	~600 Plants in 2011	Present but Modified	Declining	
50	1	Merced	9/22/2011	Presumed Extant**	Present and Natural	Marginal	Easement
39	1	Merced	9/22/2011	Possibly Extirpated	Present but Degraded	Declining	

EO: Element Occurrence number from CNDDB; PTS: Number of parts associated with the EO.

*New or a change from 11/4/12 California Natural Diversity Database information.

**Presumed extant even though no plants were found on the date of the survey.

Table 5: Status of **San Joaquin Valley Orcutt Grass** (*Orcuttia inaequalis*) occurrences in the Great Valley. Populations are listed from north to south and correspond with Figure 4 (page 47).

EO	PTS	County	Date Observed	2010-2011 Status	Habitat Condition	Estimated Vigor	Protection Status
63	1	Solano	2011	1,000s in 2011	Present and Natural	Persistent	Proposed Bank
18	1	Stanislaus	1937	Extirpated	Eliminated		
16	1	Stanislaus	1973	Extirpated	Eliminated		
11	1	Stanislaus	7/20/2010	Extirpated	Eliminated		
14	1	Stanislaus	1937	Extirpated	Eliminated		
12	1	Stanislaus	1937	Extirpated	Eliminated		
9	1	Merced	1959	Extirpated	Eliminated		
64	1	Merced	9/23/2010	Erroneous*	Present but Not Suitable		Easement
8	1	Merced	1962	Extirpated	Eliminated		
5	1	Merced	9/21/2011	Presumed Extant**	Stockpond	Marginal	Easement
6	1	Merced	9/26/2010	Presumed Extant**	Present and Natural	Marginal	Easement
33	1	Merced	9/26/2010	1,000s in 2010	Present and Natural	Persistent	
4	1	Merced	9/21/2011	Presumed Extant**	Present and Natural	Marginal	Easement
26	1	Merced	4/14/2012	1,000s in 2010	Present and Natural	Persistent	Easement
34	2	Merced	9/26/2010	Erroneous*	Present but Not Suitable		Easement
59	1	Merced	9/23/2010	Erroneous*			
49	2	Merced	9/22/2011	41 Plants in 2011	Present and Natural	Persistent	Easement
46	1	Merced	1891	Erroneous*	Probably EO#35	Unknown	
35	1	Merced	1981	Presumed Extant	Present and Natural	Unknown	
28	6	Merced	4/14/2012	>million in 2010	Present and Natural	Persistent	Easement
60	1	Merced	2001	Presumed Extant	Present and Natural	Unknown	Easement
61	1	Merced	2001	Presumed Extant	Present and Natural	Unknown	Easement
57	3	Merced	2001	Presumed Extant	Present and Natural	Unknown	Easement
50	1	Merced	1987	Presumed Extant	Present and Natural	Unknown	
58	1	Merced	9/22/2011	>5,000 Plants in 2011	Present and Natural	Persistent	
2	1	Merced	9/22/2011	Extirpated*	Eliminated		Easement
39	1	Merced	1986	Presumed Extant	Present and Natural	Unknown	
51	1	Merced	1987	Presumed Extant	Present and Natural	Unknown	
38	1	Merced	1981	Presumed extant	Present and Natural	Unknown	
10	1	Merced	9/22/2011	Extirpated*	Eliminated		
62	1	Merced	9/23/2010	Presumed Extant**	Present but Degraded	Declining	
55	1	Madera	1995	Presumed Extant	Present and Natural	Unknown	
54	1	Madera	1995	Presumed Extant	Created	Unknown	
44	1	Madera	1973	Extirpated	Eliminated		
31	1	Madera	8/8/2010	Extirpated	Eliminated		
47	1	Fresno	2002	Presumed Extant	Present and Natural	Unknown	Half BLM
41	1	Madera	8/8/2010	65 Plants in 2010	Present and Natural	Persistent	
43	7	Madera	10/16/2011	3,000 in 2010	Present but Degraded***	Declining	
48	1	Madera	1992	Presumed extant	Present and Natural	Unknown	
45	1	Madera	10/16/2011	Possibly Extirpated	Probably Elminiated	Declining	
53	1	Fresno	1996	Presumed Extant	Present and Natural	Unknown	
23	1	Madera	8/9/2010	Extirpated	Eliminated		
22	1	Fresno	1976	Extirpated	Eliminated		
21	1	Fresno	1927	Extirpated	Eliminated		
20	1	Fresno	1936	Extirpated	Eliminated		
19	1	Tulare	8/6/2010	Extirpated*	Eliminated		
56	1	Tulare	6/6/2011	1,000 Plants in 2011	Present and Natural	Persistent	Protected

EO: Element Occurrence number from CNDDB; PTS: Number of parts associated with the EO.

*New or a change from 11/4/12 California Natural Diversity Database information.

**Presumed extant even though no plants were found on the date of the survey.

Table 6: Status of **Hairy Orcutt Grass (*Orcuttia pilosa*)** occurrences in the Great Valley. Populations are listed from north to south and correspond with Figure 5 (page 48).

EO	PTS	County	Date Observed	2010-2011 Status	Habitat Condition	Estimated Vigor	Protection Status
42	1	Tehama	1987	Presumed Extant	Present and Natural	Unknown	Easement
12	1	Tehama	1988	Presumed Extant	Present and Natural	Unknown	Easement
32	1	Tehama	8/13/2011	Erroneous*	Present and Natural	Marginal	Protected
13	1	Tehama	8/15/2011	150,000 Plants 2011	Present and Natural	Persistent	Protected
23	1	Tehama	8/16/2011	Presumed Extant**	Present and Natural	Marginal	Protected
24	5	Tehama	8/16/2011	>10,000 Plants in 2011	Present and Natural	Persistent	Protected
41	5	Tehama	8/17/2011	>260,000 Plants in 2001	Present and Natural	Persistent	Protected
33	1	Tehama	8/15/2011	Presumed Extant**	Present and Natural	Declining	Protected
30	1	Butte	9/9/2010	Erroneous*	Present and Natural	Marginal	Proposed Bank
35	1	Glenn	7/12/2011	1,100 Plants in 2011	Present and Natural	Persistent	Protected
36	1	Glenn	7/12/2011	Presumed Extant**	Present and Natural	Declining	Protected
37	1	Glenn	7/12/2011	Possibly Extirpated	Present and Natural	Marginal	Protected
38	1	Glenn	7/12/2011	1,000 Plants in 2011	Present and Natural	Persistent	Protected
40	1	Glenn	7/12/2011	Possibly Extirpated*	No Habitat	Marginal	Protected
39	2	Glenn	7/12/2011	90 Plants in 2011	Present and Natural	Declining	Protected
20	5	Stanislaus	1973	Extirpated	Eliminated		
7	1	Stanislaus	1938	Extirpated	Eliminated		
21	1	Stanislaus	Unknown	Extirpated	Eliminated		
1	2	Stanislaus	9/4/2010	Extirpated	Eliminated		
34	1	Stanislaus	7/20/2010	Extirpated	Eliminated		
2	6	Stanislaus	9/2/2010	500 Plants in 2010	Present but Modified	Declining	
10	1	Merced	9/26/2011	Possibly Extirpated	Stockpond	Declining	
16	1	Merced	1938	Extirpated	Eliminated		
44	1	Madera	1995	Presumed Extant	Created	Unknown	
43	1	Madera	1995	Presumed Extant	Present and Natural	Unknown	
9	1	Madera	1973	Extirpated	Eliminated		
18	1	Madera	8/8/2010	300 Plants in 2010	Present but Degraded	Declining	
11	2	Madera	10/15/2011	1,500 Plants in 2011	Present but Degraded	Persistent	
15	1	Madera	1941	Extirpated	Eliminated		
19	2	Madera	8/8/2010	Possibly Extirpated*	Present but Degraded	Declining	Reported
29	1	Madera	8/9/2010	Probably Extirpated*	Present but Degraded	Marginal	
48	1	Madera	2010	Presumed Extant	Created	Marginal	CalTrans Bank
45	1	Madera	8/9/2010	Presumed Extant**	Present but Mis-mapped	Marginal	CalTrans Bank
22	1	Madera	8/7/2010	Probably Extirpated*	Present but Degraded	Declining	
28	1	Madera	1986	Possibly Extirpated*	Possibly Eliminated	Unknown	

EO: Element Occurrence number from CNDDB; PTS: Number of parts associated with the EO.

*New or a change from 11/4/12 California Natural Diversity Database information.

**Presumed extant even though no plants were found on the date of the survey.

Table 7: Status of **Slender Orcutt Grass (*Orcuttia tenuis*)** occurrences in the Great Valley. Populations are listed from north to south and correspond with Figure 6 (page 49).

EO	PTS	County	Date Observed	2010-2011 Status	Habitat Condition	Estimated Vigor	Protection Status
2	2	Shasta	8/10/2011	1,500 Plants in 2011	Present and Natural	Declining	
N2	1	Shasta	2009*	Presumed Extant	Pond	Unknown	
96	1	Shasta	2006	Presumed Extant	Present and Natural	Unknown	
45	1	Shasta	1988	Presumed Extant	Natural and Created	Unknown	Bank
4	1	Shasta	8/10/2011	Probably Extirpated*	Present but Degraded	Declining	City of Redding
31	3	Shasta	1986	Presumed Extant	Present	Unknown	
1	1	Shasta	1988	Presumed Extant	Natural and Created	Unknown	Bank
47	1	Shasta	1986	Presumed Extant	Natural and Created	Unknown	Bank
3	2	Shasta	2003	Presumed extant	Present and Natural	Unknown	
32	2	Shasta	1991	Presumed Extant	Present	Unknown	
22	2	Shasta	1995	Presumed Extant	Natural and Created	Unknown	Bank
21	2	Tehama	8/9/2011	~1m Plants in 2011	Present and Natural	Persistent	Protected
24	1	Shasta	8/9/2011	Probably Erroneous*	No Habitat Present		
40	2	Tehama	8/9/2011	Presumed Extant	Present and Natural	Unknown	
11	2	Tehama	8/9/2011	Presumed Extant	Present and Natural	Unknown	
62	1	Tehama	1986	Presumed Extant	Stockpond	Unknown	Easement
50	1	Tehama	6/8/1905	Presumed Extant	Stockpond	Unknown	Easement
63	1	Tehama	8/12/2011	>10,000 Plants in 2011	Stockpond	Persistent	Easement
52	1	Tehama	8/9/2011	Unknown# in 2011	Present and Natural	Unknown	
39	4	Tehama	8/12/2011	Presumed Extant**	Present and Natural	Marginal	Easement
73	1	Tehama	8/9/2011	Extirpated Artficial*	Created and Not Suitable		Protected
61	1	Tehama	8/9/2012	>10,000 Plants in 2011	Borrow Pit	Persistent	Protected
66	1	Tehama	8/12/2011	150 Plants in 2011	Stockpond	Persistent	Easement
37	1	Tehama	8/12/2011	60,000 Plants in 2011	Stockpond	Persistent	Easement
74	1	Tehama	8/9/2011	Extirpated Artificial*	Created and Not Suitable		Protected
12	5	Tehama	8/12/2011	~1 million in 2011	Present and Natural	Persistent	Part Protected
95	1	Tehama	9/13/2011	Erroneous*	No Habitat Present		Easement
72	1	Tehama	8/9/2011	Extirpated Artificial*	Created and Not Suitable		Protected
28	1	Tehama	8/12/2011	150,000 Plants in 2011	Present and Natural	Persistent	Easement
60	1	Tehama	1987	Presumed Extant	Present and Natural	Unknown	
38	1	Tehama	8/12/2011	20,000 Plants in 2011	Present and Natural	Persistent	Easement
67	1	Tehama	8/12/2011	~5,000 Plants in 2011	Present but Degraded	Declining	Protected
15	2	Tehama	1986	Presumed Extant	Present and Natural	Unknown	
13	2	Tehama	8/12/2011	~1m Plants in 2011	Present and Natural	Persistent	Protected
14	1	Tehama	8/10/2011	Possibly Extirpated*	Present and Natural	Declining	Protected
20	1	Tehama	8/12/2011	90,000 Plants in 2011	Present and Natural	Persistent	Protected
30	2	Tehama	8/12/2011	>10,000 Plants in 2011	Stockpond	Persistent	Easement
N1	1	Tehama	2003*	Presumed Extant	Present and Natural	Unknown	Proposed Bank
43	1	Tehama	2003	Presumed Extant	Present and Natural	Unknown	Proposed Bank
26	1	Tehama	8/13/2011	2,500 Plants in 2011	Present and Natural	Persistent	Protected
23	1	Tehama	8/16/2011	Probably Erroneous*	Likely Mis-mapped		Protected
57	1	Tehama	8/13/2011	~1,000 Plants in 2011	Present and Natural	Persistent	
94	1	Tehama	8/16/2011	Erroneous*	Mis-id		Protected
80	1	Butte	2007	Presumed Extant	Natural and Created	Unknown	
81	1	Butte	2008	Presumed Extant	Natural and Created	Unknown	
71	1	Sacramento	10/9/2012	300 Plants in 2012	Present and Natural	Persistent	Protected
16	2	Sacramento	8/13/2010	1,500 Plants in 2010	Present and Natural	Persistent	
90	1	Sacramento	8/30/2010	>5,000 Plants in 2010	Present and Natural	Persistent	

EO: Element Occurrence number from CNDDB; PTS: Number of parts associated with the EO.

*New or a change from 11/4/12 California Natural Diversity Database information.

Table 8: Status of **Sacramento Orcutt Grass (*Orcuttia viscida*)** occurrences in the Great Valley. Populations are listed from north to south and correspond with Figure 7 (page 50).

EO	PTS	County	Date Observed	2010-2011 Status	Habitat Condition	Estimated Vigor	Protection Status
4	1	Sacramento	1958	Extirpated	Eliminated		
5	1	Sacramento	9/8/2010	>5,000 Plants in 2010	Present and Natural	Persistent	Protected
15	1	Sacramento	9/8/2010	1,500 Plants in 2010	Present and Natural	Persistent	Open space
N1	1	Sacramento	2008*	Presumed extant	Present and Natural	Unknown	
21	1	Sacramento	2007	Presumed extant	Present and Natural	Unknown	
19	3	Sacramento	8/30/2010	>5,000 Plants in 2010	Present and Natural	Declining	
18	1	Sacramento	8/18/2010	400 Plants in 2010	Present and Natural	Persistent	Easement
1	1	Sacramento	10/12/2012	1.2 million in 2011	Present and Natural	Persistent	Protected
17	1	Sacramento	8/18/2010	1,200 Plants in 2011	Present and Natural	Persistent	Easement
6	10	Sacramento	10/17/2012	184,000 in 2011	Present and Natural	Presistent	Protected
20	1	Sacramento	7/26/2011	Extirpated*	Eliminated		
16	2	Sacramento	7/26/2011	41 Plants in 2011	Present and Natural	Marginal	Protected

EO: Element Occurrence number from CNDDB; PTS: Number of parts associated with the EO.

*New or a change from 11/4/12 California Natural Diversity Database information.

Table 9: Status of **Greene's Tuctoria (*Tuctoria greenei*)** occurrences in the Great Valley. Populations are listed from north to south and correspond with Figure 8 (page 51).

EO	PTS	County	Date Observed	2010-2011 Status	Habitat Condition	Estimated Vigor	Protection Status
43	1	Tehama	1987	Presumed Extant	Present and Natural	Unknown	Proposed Bank
27	1	Tehama	1980	Presumed Extant	Present and Natural	Unknown	Easement
47	1	Tehama	1980	Presumed Extant	Present and Natural	Unknown	Easement
1	1	Tehama	1986	Presumed Extant	Present and Natural	Unknown	Easement
4	1	Tehama	8/17/2011	Presumed Extant	Present and Natural	Unknown	Easement
2	1	Tehama	8/15/2011	Probably Erroneous*	Present but Unsuitable	Marginal	Easement
36	1	Tehama	8/13/2011	>5,000 Plants in 2011	Present and Natural	Persistent	Protected
24	1	Tehama	Unknown	Extirpated	Eliminated		
37	2	Tehama	8/16/2011	53,000 Plants in 2011	Present and Natural	Persistent	Protected
34	1	Tehama	8/16/2011	5 Plants in 2011	Present and Natural	Persistent	Protected
35	3	Tehama	8/16/2011	15,000 Plants in 2011	Present and Natural	Persistent	Protected
3	2	Tehama	8/17/2011	>100,000 Plants in 2011	Present and Natural	Persistent	Protected
31	1	Tehama	8/15/2011	1,000 Plants 2011	Present and Natural	Persistent	Protected
40	1	Butte	8/11/2011	Presumed Extant**	Present and Natural	Marginal	Protected
51	1	Butte	9/9/2010	Extirpated*	Eliminated		
18	1	Butte	9/9/2010	156,000 Plants in 2011	Present and Natural	Persistent	Proposed Bank
N1	1	Butte	7/12/2011	2,009 Plants in 2012	Created*	Persistent	Protected
N2	1	Butte	7/12/2011	51 Plants in 2012	Created*	Persistent	Protected
N3	1	Butte	7/12/2011	110 Plants in 2012	Created*	Persistent	Protected
48	1	Butte	8/11/2011	Presumed Extant**	Present but Marginal	Marginal	
19	1	Butte	8/11/2011	Possibly Extirpated*	Present but Degraded	Marginal	For Sale
49	1	Glenn	7/12/2011	Possibly Extirpated	Present but Marginal	Marginal	Protected
8	1	San Joaquin	1936	Extirpated	Eliminated		
15	1	San Joaquin	1936	Extirpated	Eliminated		
5	1	Stanislaus	1980	Extirpated	Eliminated		
6	1	Stanislaus	1937	Extirpated	Eliminated		
39	1	Stanislaus	9/4/2010	Presumed Extant	Present and Natural	Unknown	
21	2	Stanislaus	9/3/2010	Extirpated*	Eliminated		
14	1	Stanislaus	7/20/2010	Extirpated	Eliminated		
45	1	Merced	4/14/2012	200 Plants in 2010	Present and Natural	Persistent	Easement
32	1	Merced	9/22/2011	Presumed Extant**	Present but Unsuitable	Marginal	
29	1	Merced	9/22/2011	Extirpated*	Eliminated		Easement
10	1	Merced	9/23/2011	Extirpated*	Present but Unsuitable		
23	1	Merced	9/23/2011	Presumed Extant	Present and Natural	Marginal	
11	1	Merced	9/23/2011	>10,000 Plants in 2011	Present and Natural	Persistent	
42	1	Merced	9/23/2011	150 Plants in 2011	Present but Marginal	Persistent	
44	1	Merced	1987	Presumed Extant	Present and Natural	Unknown	
28	1	Merced	9/23/2011	Presumed Extant	Present and Natural	Unknown	Bank
54	1	Merced	2010	Presumed Extant	Present and Natural	Unknown	Bank
13	1	Merced	9/23/2011	Presumed Extant	Present and Natural	Unknown	Bank
46	1	Merced	9/23/2010	Presumed Extant**	Present but Degraded	Marginal	
9	1	Madera	1936	Extirpated	Eliminated		
22	1	Fresno	1937	Extirpated	Eliminated		
16	1	Fresno	1936	Extirpated	Eliminated		
17	1	Fresno	1956	Extirpated	Eliminated		
20	1	Tulare	8/6/2010	Extirpated	Eliminated		

EO: Element Occurrence number from CNDDB; PTS: Number of parts associated with the EO.

*New or a change from 11/4/12 California Natural Diversity Database information.

**Presumed extant even though no plants were found on the date of the survey.

Table 10: Status of **Solano Grass (*Tuctoria mucronata*)** occurrences in the Great Valley. Populations are listed from north to south and correspond with Figure 9 (page 52).

EO	PTS	County	Date Observed	2010-2011 Status	Habitat Condition	Estimated Vigor	Protection Status
N1	2	Yolo	10/15/2011*	~50 Plants in 2011	Created	New	Yolo Co
3	2	Yolo	10/15/2011	1,000s Plants in 2011	Present but Modified	Persistent	DOD/Yolo
1	1	Solano	8/22/2012	Extirpated	Present and Natural		Protected
2	1	Solano	9/5/2010	64 Plants in 2010	Present and Natural	Declining	
EO: Element Occurrence number from CNDDB; PTS: Number of parts associated with the EO.							
*New or a change from 11/4/12 California Natural Diversity Database information.							

Table 11: Status of Orcuttieae and *Chamaesyce hooveri* CNDDB occurrences in the Great Valley which occur **outside a core recovery area**. (Note that these populations were known to be extirpated prior to publication of the Recovery Plan)

Species	EO	PTS	County	Date Observed	2010-2011 Status	Habitat Condition	Recovery Unit
Chamaesyce hooveri	1	1	Tehama	Unknown	Extirpated	Eliminated	
Neostapfia colusana	13	1	Colusa	1898	Extirpated	Eliminated	Solano-Colusa
Orcuttia viscida	4	1	Sacramento	1958	Extirpated	Eliminated	Southeastern Sacramento Valley
Tuctoria greenei	8	1	San Joaquin	1936	Extirpated	Eliminated	Southern Sierra Foothills
Tuctoria greenei	15	1	San Joaquin	1936	Extirpated	Eliminated	Southern Sierra Foothills
Tuctoria greenei	5	1	Stanislaus	1980	Extirpated	Eliminated	Southern Sierra Foothills
Neostapfia colusana	22	1	Stanislaus	1937	Extirpated	Eliminated	Southern Sierra Foothills
Orcuttia inaequalis	18	1	Stanislaus	1937	Extirpated	Eliminated	Southern Sierra Foothills
Tuctoria greenei	6	1	Stanislaus	1937	Extirpated	Eliminated	Southern Sierra Foothills
Neostapfia colusana	41	5	Stanislaus	1973	Extirpated	Eliminated	Southern Sierra Foothills
Orcuttia pilosa	20	5	Stanislaus	1973	Extirpated	Eliminated	Southern Sierra Foothills
Orcuttia inaequalis	16	1	Stanislaus	1973	Extirpated	Eliminated	Southern Sierra Foothills
Neostapfia colusana	63	1	Stanislaus	Unknown	Extirpated	Eliminated	Southern Sierra Foothills
Orcuttia pilosa	21	1	Stanislaus	Unknown	Extirpated	Eliminated	Southern Sierra Foothills
Orcuttia pilosa	1	2	Stanislaus	9/4/2010	Extirpated	Eliminated	Southern Sierra Foothills
Neostapfia colusana	11	3	Stanislaus	9/4/2010	Extirpated	Eliminated	Southern Sierra Foothills
Neostapfia colusana	23	1	Stanislaus	1958	Extirpated	Eliminated	Southern Sierra Foothills
Orcuttia inaequalis	11	1	Stanislaus	7/20/2010	Extirpated	Eliminated	Southern Sierra Foothills
Tuctoria greenei	14	1	Stanislaus	7/20/2010	Extirpated	Eliminated	Southern Sierra Foothills
Orcuttia pilosa	34	1	Stanislaus	7/20/2010	Extirpated	Eliminated	Southern Sierra Foothills
Orcuttia inaequalis	14	1	Stanislaus	1937	Extirpated	Eliminated	Southern Sierra Foothills
Neostapfia colusana	54	1	Merced	1987	Extirpated	Eliminated	Southern Sierra Foothills
Orcuttia inaequalis	12	1	Stanislaus	1937	Extirpated	Eliminated	Southern Sierra Foothills
Orcuttia inaequalis	9	1	Merced	1959	Extirpated	Eliminated	Southern Sierra Foothills
Orcuttia inaequalis	8	1	Merced	1962	Extirpated	Eliminated	Southern Sierra Foothills
Orcuttia pilosa	16	1	Merced	1938	Extirpated	Eliminated	Southern Sierra Foothills
Orcuttia inaequalis	10	1	Merced	9/22/2011	Extirpated	Eliminated	Southern Sierra Foothills
Orcuttia pilosa	15	1	Madera	1941	Extirpated	Eliminated	Southern Sierra Foothills
Orcuttia pilosa	19	2	Madera	8/8/2010	Extirpated	Degraded	Southern Sierra Foothills
Orcuttia inaequalis	22	1	Fresno	1976	Extirpated	Eliminated	Southern Sierra Foothills
Orcuttia inaequalis	21	1	Fresno	1927	Extirpated	Eliminated	Southern Sierra Foothills
Tuctoria greenei	16	1	Fresno	1936	Extirpated	Eliminated	Southern Sierra Foothills
Tuctoria greenei	17	1	Fresno	1956	Extirpated	Eliminated	Southern Sierra Foothills
Orcuttia inaequalis	20	1	Fresno	1936	Extirpated	Eliminated	Southern Sierra Foothills
Tuctoria greenei	20	1	Tulare	8/6/2010	Extirpated	Eliminated	Southern Sierra Foothills
EO: Element Occurrence number from CNDDB; PTS: Number of parts associated with the EO.							

Table 12: Species status in the **Northwestern Sacramento Valley Recovery Unit** (Shasta County) by core area. Species are listed from north to south within each core area and correspond with Figure 11 (page 54).

Species	EO	PTS	Date Observed	2010-2011 Status	Habitat Condition	Estimated Vigor	Protection Status
Redding Core Area							
Orcuttia tenuis	2	2	8/10/2011	1,500 Plants in 2011	Present and Natural	Declining	
Orcuttia tenuis	N2	1	2009*	Presumed Extant	Pond	Unknown	
Orcuttia tenuis	96	1	2006	Presumed Extant	Present and Natural	Unknown	
Orcuttia tenuis	45	1	1988	Presumed Extant	Natural and Created	Unknown	Bank
Orcuttia tenuis	4	1	8/10/2011	Probably Extirpated*	Present but Degraded	Declining	City of Redding
Orcuttia tenuis	1	1	1988	Presumed Extant	Natural and Created	Unknown	Bank
Orcuttia tenuis	47	1	1986	Presumed Extant	Natural and Created	Unknown	Bank
Orcuttia tenuis	3	2	2003	Presumed extant	Present and Natural	Unknown	
Orcuttia tenuis	22	2	1995	Presumed Extant	Natural and Created	Unknown	Bank
Milleville Plains Core Area							
Orcuttia tenuis	31	3	1986	Presumed Extant	Present	Unknown	
Orcuttia tenuis	32	2	1991	Presumed Extant	Present	Unknown	

EO: Element Occurrence number from CNDDB; PTS: Number of parts associated with the EO.

*New or a change from 11/4/12 California Natural Diversity Database information.

Table 13: Species status in the **Northeastern Sacramento Valley Recovery Unit** (Tehama and Butte Counties) by core area. Species are listed from north to south within each core area and correspond with Figure 11 (page 54: Dales Core Area) and Figure 13 (page 56: Oroville, Richvale, Palermo and Llano Seco Core Areas).

Species Name	EO	PTS	Date Observes	2010-2011 Status	Habitat Condition	Estimated Vigor	Protection Status
Dales Core Area							
Orcuttia tenuis	21	2	8/9/2011	~1m Plants in 2011	Present and Natural	Persistent	Protected
Orcuttia tenuis	24	1	8/9/2011	Probably Erroneous*	No Habitat Present		
Orcuttia tenuis	40	2	8/9/2011	Presumed Extant	Present and Natural	Unknown	
Orcuttia tenuis	11	2	8/9/2011	Presumed Extant	Present and Natural	Unknown	
Orcuttia tenuis	62	1	1986	Presumed Extant	Stockpond	Unknown	Easement
Orcuttia tenuis	50	1	6/8/1905	Presumed Extant	Stockpond	Unknown	Easement
Orcuttia tenuis	63	1	8/12/2011	>10,000 Plants in 2011	Stockpond	Persistent	Easement
Orcuttia tenuis	52	1	8/9/2011	Unknown# in 2011	Present and Natural	Unknown	
Orcuttia tenuis	39	4	8/12/2011	Presumed Extant**	Present and Natural	Marginal	Easement
Orcuttia tenuis	73	1	8/9/2011	Extirpated Artficial*	Created and Not Suitable		Protected
Orcuttia tenuis	61	1	8/9/2012	>10,000 Plants in 2011	Borrow Pit	Persistent	Protected
Orcuttia tenuis	66	1	8/12/2011	150 Plants in 2011	Stockpond	Persistent	Easement
Orcuttia tenuis	37	1	8/12/2011	60,000 Plants in 2011	Stockpond	Persistent	Easement
Orcuttia tenuis	74	1	8/9/2011	Extirpated Artificial*	Created and Not Suitable		Protected
Orcuttia tenuis	12	5	8/12/2011	~1m Plants in 2011	Present and Natural	Persistent	Part Protected
Orcuttia tenuis	95	1	9/13/2011	Erroneous*	No Habitat Present		Easement
Orcuttia tenuis	72	1	8/9/2011	Extirpated Artificial*	Created and Not Suitable		Protected
Orcuttia tenuis	28	1	8/12/2011	150,000 Plants in 2011	Present and Natural	Persistent	Easement
Orcuttia tenuis	60	1	1987	Presumed Extant	Present and Natural	Unknown	
Orcuttia tenuis	38	1	8/12/2011	20,000 Plants in 2011	Present and Natural	Persistent	Easement
Orcuttia tenuis	67	1	8/12/2011	~5,000 Plants in 2011	Present but Degraded	Declining	Protected
Orcuttia tenuis	15	2	1986	Presumed Extant	Present and Natural	Unknown	
Orcuttia tenuis	13	2	8/12/2011	~1m Plants in 2011	Present and Natural	Persistent	Protected
Orcuttia tenuis	14	1	8/10/2011	Possibly Extirpated*	Present and Natural	Declining	Protected
Orcuttia tenuis	20	1	8/12/2011	90,000 Plants in 2011	Present and Natural	Persistent	Protected
Orcuttia tenuis	30	2	8/12/2011	>10,000 Plants in 2011	Stockpond	Persistent	Easement
Oroville Core Area							
Chamaesyce hooveri	4	1	9/9/2010	Presumed Extant	Present and Natural	Marginal	Proposed Bank
Orcuttia pilosa	30	1	9/9/2010	Erroneous*	Present and Natural	Marginal	Proposed Bank
Tuctoria greenei	18	1	9/9/2010	156,000 Plants in 2011	Present and Natural	Persistent	Proposed Bank
Tuctoria greenei	48	1	8/11/2011	Presumed Extant**	Present but Marginal	Marginal	
Richvale Core Area							
Tuctoria greenei	19	1	8/11/2011	Possibly Extirpated*	Present but Degraded	Marginal	For Sale
Palermo Core Area							
Orcuttia tenuis	80	1	2007	Presumed Extant	Natural and Created	Unknown	
Orcuttia tenuis	81	1	2008	Presumed Extant	Natural and Created	Unknown	
Llano Seco Core Area							
Tuctoria greenei	N1	1	7/12/2011*	2,009 Plants in 2012	Created	Persistent	Protected
Tuctoria greenei	N2	1	7/12/2011*	51 Plants in 2012	Created	Persistent	Protected
Tuctoria greenei	N3	1	7/12/2011*	110 Plants in 2012	Created	Persistent	Protected

EO: Element Occurrence number from CNDDB; PTS: Number of parts associated with the EO.

*New or a change from 11/4/12 California Natural Diversity Database information.

**Presumed extant even though no plants were found on the date of the survey.

Continued.

Table 13 *(cont)***:** Species status in the **Northeastern Sacramento Valley Recovery Unit** (Tehama and Butte Counties) by core area. Species are listed from north to south within each core area and correspond with Figure 12 (page 55: Vina Plains Core Area).

Species Name	EO	PTS	Date Observes	2010-2011 Status	Habitat Condition	Estimated Vigor	Protection Status
Vina Plains Core Area							
Chamaesyce hooveri	26	1	1987	Presumed extant	Present and Natural	Unknown	Easement
Chamaesyce hooveri	29	1	1987	Possibly Extirpated*	Present but Modified	Likely Declining	
Orcuttia tenuis	N1	1	2003*	Presumed Extant	Present and Natural	Unknown	Proposed Bank
Chamaesyce hooveri	N1	1	2003*	Presumed Extant	Present and Natural	Unknown	Proposed Bank
Orcuttia pilosa	42	1	1987	Presumed Extant	Present and Natural	Unknown	Easement
Orcuttia tenuis	43	1	2003	Presumed Extant	Present and Natural	Unknown	Proposed Bank
Tuctoria greenei	43	1	1987	Presumed Extant	Present and Natural	Unknown	Proposed Bank
Chamaesyce hooveri	27	1	1987	Presumed Extant	Present and Natural	Unknown	Easement
Chamaesyce hooveri	7	1	1987	Presumed Extant	Present and Natural	Unknown	Easement
Tuctoria greenei	27	1	1980	Presumed Extant	Present and Natural	Unknown	Easement
Chamaesyce hooveri	8	1	1986	Presumed extant	Present and Natural	Unknown	Easement
Orcuttia pilosa	12	1	1988	Presumed Extant	Present and Natural	Unknown	Easement
Tuctoria greenei	47	1	1980	Presumed Extant	Present and Natural	Unknown	Easement
Chamaesyce hooveri	2	1	1986	Presumed Extant	Present and Natural	Unknown	Easement
Tuctoria greenei	1	1	1986	Presumed Extant	Present and Natural	Unknown	Easement
Chamaesyce hooveri	3	1	1980	Presumed Extant	Present and Natural	Unknown	Easement
Tuctoria greenei	4	1	8/17/2011	Presumed Extant	Present and Natural	Unknown	Easement
Tuctoria greenei	2	1	8/15/2011	Probably Erroneous*	Present but Unsuitable	Marginal	Easement
Orcuttia pilosa	32	1	8/13/2011	Erroneous*	Present and Natural	Marginal	Protected
Tuctoria greenei	36	1	8/13/2011	>5,000 Plants in 2011	Present and Natural	Persistent	Protected
Orcuttia tenuis	26	1	8/13/2011	2,500 Plants in 2011	Present and Natural	Persistent	Protected
Tuctoria greenei	24	1	Unknown	Extirpated	Eliminated		
Chamaesyce hooveri	5	1	8/15/2010	>4,000 Plants in 2010	Present and Natural	Persistent	Protected
Orcuttia pilosa	13	1	8/15/2011	150,000 Plants 2011	Present and Natural	Persistent	Protected
Orcuttia tenuis	23	1	8/16/2011	Probably Erroneous*	Likely Mis-mapped		Protected
Orcuttia tenuis	57	1	8/13/2011	~1,000 Plants in 2011	Present and Natural	Persistent	
Tuctoria greenei	37	2	8/16/2011	53,000 Plants in 2011	Present and Natural	Persistent	Protected
Orcuttia pilosa	23	1	8/16/2011	Presumed Extant**	Present and Natural	Marginal	Protected
Tuctoria greenei	34	1	8/16/2011	5 Plants in 2011	Present and Natural	Persistent	Protected
Orcuttia pilosa	24	5	8/16/2011	>10,000 Plants in 2011	Present and Natural	Persistent	Protected
Orcuttia tenuis	94	1	8/16/2011	Erroneous*	Mis-id		Protected
Chamaesyce hooveri	16	6	8/16/2011	300 Plants in 2011	Present and Natural	Persistent	Protected
Tuctoria greenei	35	3	8/16/2011	15,000 Plants in 2011	Present and Natural	Persistent	Protected
Chamaesyce hooveri	28	5	8/17/2011	>1,000 Plants in 2011	Present and Natural	Persistent	Protected
Orcuttia pilosa	41	5	8/17/2011	>260,000 Plants in 2001	Present and Natural	Persistent	Protected
Tuctoria greenei	3	2	8/17/2011	>100,000 Plants in 2011	Present and Natural	Persistent	Protected
Chamaesyce hooveri	24	1	8/15/2011	2 Plants in 2011	Present and Natural	Declining	Protected
Orcuttia pilosa	33	1	8/15/2011	Presumed Extant**	Present and Natural	Declining	Protected
Tuctoria greenei	31	1	8/15/2011	1,000 Plants 2011	Present and Natural	Persistent	Protected
Tuctoria greenei	40	1	8/11/2011	Presumed Extant**	Present and Natural	Marginal	Protected
Chamaesyce hooveri	30	1	8/15/2011	Presumed Extant**	Present but Modified	Marginal	Protected
Chamaesyce hooveri	14	1	8/11/2011	Presumed Extant**	Present and Natural	Marginal	Protected
Chamaesyce hooveri	23	2	8/11/2011	5 Plants in 2011	Present and Natural	Declining	
Tuctoria greenei	51	1	9/9/2010	Extirpated*	Eliminated		

EO: Element Occurrence number from CNDDB; PTS: Number of parts associated with the EO.

*New or a change from 11/4/12 California Natural Diversity Database information.

**Presumed extant even though no plants were found on the date of the survey.

Table 14: Species status in the **Solano-Colusa Recovery Unit** (Glenn, Yolo and Solano Counties) by core area. Species are listed from north to south within each core area and correspond with Figure 14 (page 57: Sacramento NWR Core Area) and Figure 15 (page 58: Davis Comm. Annex and Jepson Prairie Core Areas).

Scientific Name	EO	PTS	Date Observed	2010-2011 Status	Habitat Condition	Estimated Vigor	Protection Status
Sacramento National Wildlife Refuge Core Area							
Chamaesyce hooveri	34	1	2007	Presumed Extant	Present but Modified	Unknown	Protected
Orcuttia pilosa	35	1	7/12/2011	1,100 Plants in 2011	Present and Natural	Persistent	Protected
Chamaesyce hooveri	19	5	7/12/2011	50 Plants in 2011	Present but Modified	Persistent	Protected
Orcuttia pilosa	36	1	7/12/2011	Presumed Extant**	Present and Natural	Declining	Protected
Orcuttia pilosa	37	1	7/12/2011	Possibly Extirpated	Present and Natural	Marginal	Protected
Chamaesyce hooveri	21	1	7/12/2011	Presumed Extant**	Present but Modified	Declining	Protected
Orcuttia pilosa	38	1	7/12/2011	1,000 Plants in 2011	Present and Natural	Persistent	Protected
Tuctoria greenei	49	1	7/12/2011	Possibly Extirpated	Present but Marginal	Marginal	Protected
Orcuttia pilosa	40	1	7/12/2011	Possibly Extirpated*	No Habitat	Marginal	Protected
Chamaesyce hooveri	35	1	7/12/2011	Possibly Extirpated	Present but Modified	Declining	Protected
Orcuttia pilosa	39	2	7/12/2011	90 Plants in 2011	Present and Natural	Declining	Protected
Davis Comm. Annex Core Area							
Neostapfia colusana	58	1	10/15/2011	100 Plants in 2011	Present but Modified	Persistent	DOD/Yolo
Neostapfia colusana	N6	2	10/15/2011*	~50 Plants in 2011	Artificial	New	Yolo Co
Tuctoria mucronata	N1	2	10/15/2011*	~50 Plants in 2011	Created	New	Yolo Co
Neostapfia colusana	49	2	10/15/2011	1,000s Plants in 2011	Present but Modified	Persistent	DOD/Yolo
Tuctoria mucronata	3	2	10/15/2011	1,000s Plants in 2011	Present but Modified	Persistent	DOD/Yolo
Jepson Prairie Core Area							
Neostapfia colusana	19	1	8/25/2012	1,000s in 2012	Present and Natural	Persistent	Protected
Tuctoria mucronata	1	1	8/22/2012	Extirpated	Present and Natural		Protected
Neostapfia colusana	N1	1	8/29/2010*	2 Plants in 2010	Present and Natural	Persistent	
Orcuttia inaequalis	63	1	2011	1,000s in 2011	Present and Natural	Persistent	Proposed Bank
Neostapfia colusana	N2	2	8/29/2010*	71 Plants in 2010	Present and Natural	Persistent	
Neostapfia colusana	N3	1	8/29/2010*	27 Plants in 2010	Present and Natural	Unknown	
Neostapfia colusana	N4	2	8/29/2010*	>100 Plants in 2010	Present and Natural	Unknown	
Tuctoria mucronata	2	1	9/5/2010	64 Plants in 2010	Present and Natural	Declining	
Neostapfia colusana	48	1	9/5/2010	Presumed Extant**	Present and Natural	Marginal	

EO: Element Occurrence number from CNDDB; PTS: Number of parts associated with the EO.

*New or a change from 11/4/12 California Natural Diversity Database information.

**Presumed extant even though no plants were found on the date of the survey.

Table 15: Species status in the **Southeastern Sacramento Valley Recovery Unit** (Sacramento County) by core area. Species are listed from north to south within each core area and correspond with Figure 16 (page 59).

Scientific Name	EO	PTS	Date Observed	2010-2011 Status	Habitat Condition	Estimated Vigor	Protection Status
Phoenix Field and Park Core Area							
Orcuttia viscida	5	1	9/8/2010	>5,000 Plants in 2010	Present and Natural	Persistent	Protected
Orcuttia viscida	15	1	9/8/2010	1,500 Plants in 2010	Present and Natural	Persistent	Open space
Mather Core Area							
Orcuttia viscida	N1	1	2008*	Presumed extant	Present and Natural	Unknown	
Orcuttia viscida	21	1	2007	Presumed extant	Present and Natural	Unknown	
Orcuttia tenuis	71	1	10/9/2012	300 Plants in 2012	Present and Natural	Persistent	Protected
Orcuttia viscida	19	3	8/30/2010	>5,000 Plants in 2010	Present and Natural	Declining	
Orcuttia viscida	18	1	8/18/2010	400 Plants in 2010	Present and Natural	Persistent	Easement
Orcuttia viscida	1	1	10/12/2012	1.2 million in 2011	Present and Natural	Persistent	Protected
Orcuttia viscida	17	1	8/18/2010	1,200 Plants in 2011	Present and Natural	Persistent	Easement
Orcuttia viscida	6	10	10/17/2012	184,000 in 2011	Present and Natural	Presistent	Protected
Orcuttia viscida	20	1	7/26/2011	Extirpated*	Eliminated		
Orcuttia tenuis	16	2	8/13/2010	1,500 Plants in 2010	Present and Natural	Persistent	
Orcuttia tenuis	90	1	8/30/2010	>5,000 Plants in 2010	Present and Natural	Persistent	
Cosumnes/Rancho Seco Core Area							
Orcuttia viscida	16	2	7/26/2011	41 Plants in 2011	Present and Natural	Marginal	Protected

EO: Element Occurrence number from CNDDB; PTS: Number of parts associated with the EO.

*New or a change from 11/4/12 California Natural Diversity Database information.

Table 16: Species status in the **Southern Sierra Foothills Recovery Unit** (Stanislaus, Merced, Madera Fresno and Tulare Counties) by core area. Species are listed from north to south within each core area and correspond with Figure 17 (page 60: Farmington, Merced and Waterford Core Areas) and Figure 18 (page 61: Madera Core Area).

Species Name	EO	PTS	Date Observed	2010-2011 Status	Habitat Condition	Estimated Vigor	Protection Status
Framington Core area							
Neostapfia colusana	47	1	1986	Presumed Extant	Present and Natural	Unknown	
Merced Core Area							
Neostapfia colusana	55	1	1988	Presumed Extant	Stockpond	Unknown	
Neostapfia colusana	57	1	1987	Possibly Extirpated*	Unknown	Unknown	Reported
Neostapfia colusana	7	1	1969	Presumed Extant*	Potentially Mis-mapped	Unknown	
Tuctoria greenei	21	2	9/3/2010	Extirpated*	Eliminated		
Neostapfia colusana	62	1	2001	Presumed extant	Present and Natural	Unknown	
Neostapfia colusana	4	3	2009	Presumed Extant	Present and Natural	Unknown	
Chamaesyce hooveri	11	1	1986	Presumed Extant	Present and Natural	Unknown	
Neostapfia colusana	8	1	1986	Presumed Extant	Present and Natural	Unknown	
Neostapfia colusana	71	1	9/3/2010	1,000 Plants in 2010	Present and Natural	Persistent	
Neostapfia colusana	9	1	1938	Extirpated	Eliminated		
Orcuttia pilosa	7	1	1938	Extirpated	Eliminated		
Neostapfia colusana	5	2	2001	Presumed Extant	Present and Natural	Unknown	
Neostapfia colusana	6	1	1962	Extirpated*	Eliminated		
Neostapfia colusana	20	1	9/2/2010	Extirpated*	Eliminated		Reported
Chamaesyce hooveri	9	6	10/16/2011	Possibly Extirpated	Modified by Ag Runoff	Declining	
Neostapfia colusana	2	6	9/2/2010	100 Plants in 2010	Present but Modified	Declining	
Orcuttia pilosa	2	6	9/2/2010	500 Plants in 2010	Present but Modified	Declining	
Neostapfia colusana	24	1	1981	Presumed Extant	Present but Modified	Unknown	
Neostapfia colusana	61	1	1987	Extirpated	Eliminated		
Waterford Core Area							
Neostapfia colusana	56	1	2001	Presumed Extant	Present and Natural	Unknown	
Neostapfia colusana	64	1	2001	Presumed Extant	Present and Natural	Unknown	
Tuctoria greenei	39	1	9/4/2010	Presumed Extant**	Present and Natural	Unknown	
Neostapfia colusana	65	1	9/3/2010	300 Plants in 2010	Present and Natural	Persistent	
Madera Core Area							
Orcuttia pilosa	10	1	9/26/2011	Possibly Extirpated	Stockpond	Declining	
Orcuttia inaequalis	64	1	9/23/2010	Erroneous*	Present but Not Suitable		Easement
Neostapfia colusana	67	1	9/21/2011	29 Plants in 2011	Stockpond	Marginal	Easement
Neostapfia colusana	15	1	9/21/2011	Presumed Extant**	Stockpond	Marginal	Easement
Orcuttia inaequalis	5	1	9/21/2011	Presumed Extant**	Stockpond	Marginal	Easement
Neostapfia colusana	46	1	1986	Presumed Extant	Stockpond	Unknown	
Neostapfia colusana	70	1	9/22/2011	Presumed Extant**	Stockpond	Marginal	Easement
Neostapfia colusana	17	1	9/26/2010	Presumed Extant**	Present and Natural	Marginal	
Orcuttia inaequalis	6	1	9/26/2010	Presumed Extant**	Present and Natural	Marginal	Easement
Orcuttia inaequalis	33	1	9/26/2010	1,000s in 2010	Present and Natural	Persistent	
Neostapfia colusana	14	1	9/21/2011	Presumed Extant**	Present and Natural	Marginal	Easement
Orcuttia inaequalis	4	1	9/21/2011	Presumed Extant**	Present and Natural	Marginal	Easement
Neostapfia colusana	32	3	9/26/2010	Presumed Extant**	Present and Natural	Declining	
Neostapfia colusana	18	1	1992	Presumed Extant	Stockpond	Unknown	
Orcuttia inaequalis	26	1	4/14/2012	1,000s in 2010	Present and Natural	Persistent	Easement
Neostapfia colusana	27	1	1981	Presumed Extant	Potentially Mis-mapped	Unknown	
Neostapfia colusana	45	1	1986	Presumed Extant	Stockpond	Unknown	
Neostapfia colusana	68	1	9/21/2011	Presumed Extant**	Stockpond	Marginal	Easement
Neostapfia colusana	36	1	2001	Presumed Extant	Potentially Mis-mapped	Unknown	
Tuctoria greenei	45	1	41013	200 Plants in 2010	Present and Natural	Persistent	Easement

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*New or a change from 11/4/12 California Natural Diversity Database information.

**Presumed extant even though no plants were found on the date of the survey.

Continued.

Table 16 *(cont)***:** Species status in the **Southern Sierra Foothills Recovery Unit** (Stanislaus, Merced, Madera Fresno and Tulare Counties) by core area. Species are listed from north to south within each core area and correspond with Figure 18 (page 61: Madera Core Area).

Species Name	EO	PTS	Date Observed	2010-2011 Status	Habitat Condition	Estimated Vigor	Protection Status
Madera Core Area (continued)							
Orcuttia inaequalis	34	2	9/26/2010	Erroneous*	Present but Not Suitable		Easement
Neostapfia colusana	69	1	9/21/2011	400 Plants in 2011	Stockpond	Persistent	Easement
Neostapfia colusana	26	1	1986	Presumed Extant	Stockpond	Unknown	
Orcuttia inaequalis	59	1	9/23/2010	Erroneous*			
Neostapfia colusana	34	1	9/26/2010	Presumed Extant**	Potentially Mis-mapped	Marginal	
Neostapfia colusana	38	1	1986	Presumed Extant	Present and Natural	Unknown	Easement
Neostapfia colusana	29	1	1986	Presumed Extant	Present and Natural	Unknown	
Neostapfia colusana	66	1	9/22/2011	12 Plants in 2011	Present and Natural	Marginal	Easement
Neostapfia colusana	59	2	9/22/2011	33 Plants in 2011	Present and Natural	Marginal	Easement
Orcuttia inaequalis	49	2	9/22/2011	41 Plants in 2011	Present and Natural	Persistent	Easement
Orcuttia inaequalis	46	1	1891	Erroneous*	Probably EO#35	Unknown	
Neostapfia colusana	37	1	1981	Presumed Extant	Present and Natural	Unknown	
Orcuttia inaequalis	35	1	1981	Presumed Extant	Present and Natural	Unknown	
Neostapfia colusana	N5	1	9/22/2011*	100,000s Plants in 2011	Present and Natural	Persistent	Easement
Neostapfia colusana	1	1	9/26/2010	Presumed Extant**	Present and Natural	Declining	Easement
Orcuttia inaequalis	28	6	4/14/2012	>million in 2010	Present and Natural	Persistent	Easement
Neostapfia colusana	12	1	1943	Extirpated*	Eliminated		
Orcuttia inaequalis	60	1	2001	Presumed Extant	Present and Natural	Unknown	Easement
Neostapfia colusana	60	1	2001	Presumed Extant	Present and Natural	Unknown	Easement
Neostapfia colusana	43	2	1986	Presumed Extant	Present and Natural	Unknown	
Orcuttia inaequalis	61	1	2001	Presumed Extant	Present and Natural	Unknown	Easement
Orcuttia inaequalis	57	3	2001	Presumed Extant	Present and Natural	Unknown	Easement
Orcuttia inaequalis	50	1	1987	Presumed Extant	Present and Natural	Unknown	
Orcuttia inaequalis	58	1	9/22/2011	>5,000 Plants in 2011	Present and Natural	Persistent	
Tuctoria greenei	32	1	9/22/2011	Presumed Extant**	Present but Unsuitable	Marginal	
Neostapfia colusana	42	1	2001	Extirpated	Eliminated		
Orcuttia inaequalis	2	1	9/22/2011	Extirpated*	Eliminated		Easement
Tuctoria greenei	29	1	9/22/2011	Extirpated*	Eliminated		Easement
Tuctoria greenei	10	1	9/23/2011	Extirpated*	Present but Unsuitable		
Tuctoria greenei	23	1	9/23/2011	Presumed Extant	Present and Natural	Marginal	
Tuctoria greenei	11	1	9/23/2011	>10,000 Plants in 2011	Present and Natural	Persistent	
Orcuttia inaequalis	39	1	1986	Presumed Extant	Present and Natural	Unknown	
Tuctoria greenei	42	1	9/23/2011	150 Plants in 2011	Present but Marginal	Persistent	
Orcuttia inaequalis	51	1	1987	Presumed Extant	Present and Natural	Unknown	
Tuctoria greenei	44	1	1987	Presumed Extant	Present and Natural	Unknown	
Orcuttia inaequalis	38	1	1981	Presumed extant	Present and Natural	Unknown	
Tuctoria greenei	28	1	9/23/2011	Presumed Extant	Present and Natural	Unknown	Bank
Tuctoria greenei	54	1	2010	Presumed Extant	Present and Natural	Unknown	Bank
Tuctoria greenei	13	1	9/23/2011	Presumed Extant	Present and Natural	Unknown	Bank
Orcuttia inaequalis	62	1	9/23/2010	Presumed Extant**	Present but Degraded	Declining	
Tuctoria greenei	46	1	9/23/2010	Presumed Extant**	Present but Degraded	Marginal	
Orcuttia pilosa	44	1	1995	Presumed Extant	Created	Unknown	
Orcuttia pilosa	43	1	1995	Presumed Extant	Present and Natural	Unknown	
Orcuttia inaequalis	54	1	1995	Presumed Extant	Created	Unknown	
Orcuttia inaequalis	44	1	1973	Extirpated	Eliminated		
Tuctoria greenei	9	1	1936	Extirpated	Eliminated		
Orcuttia inaequalis	31	1	8/8/2010	Extirpated	Eliminated		

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*New or a change from 11/4/12 California Natural Diversity Database information.

**Presumed extant even though no plants were found on the date of the survey.

Continued.

Table 16 *(cont)***:** Species status in the **Southern Sierra Foothills Recovery Unit** (Stanislaus, Merced, Madera Fresno and Tulare Counties) by core area. Species are listed from north to south within each core area and correspond with Figure 18 (page 61: Madera Core Area), Figure 19 (page 62: Table Mountain and Fresno Core Area) and Figure 20 (page 63: Cottonwood Creek and Tulare Core Area).

Species Name	EO	PTS	Date Observed	2010-2011 Status	Habitat Condition	Estimated Vigor	Protection Status
Madera Core Area (continued)							
Orcuttia pilosa	9	1	1973	Extirpated	Eliminated		
Orcuttia pilosa	18	1	8/8/2010	300 Plants in 2010	Present but Degraded	Declining	
Orcuttia pilosa	11	2	10/15/2011	1,500 Plants in 2011	Present but Degraded	Persistent	
Orcuttia inaequalis	41	1	8/8/2010	65 Plants in 2010	Present and Natural	Persistent	
Orcuttia pilosa	29	1	8/9/2010	Probably Extirpated*	Present but Degraded	Marginal	
Orcuttia pilosa	48	1	2010	Presumed Extant	Created	Marginal	CalTrans Bank
Orcuttia inaequalis	43	7	10/16/2011	3,000 in 2010	Present but Degraded***	Declining	
Orcuttia pilosa	45	1	8/9/2010	Presumed Extant**	Present but Mis-mapped	Marginal	CalTrans Bank
Orcuttia inaequalis	48	1	1992	Presumed extant	Present and Natural	Unknown	
Orcuttia inaequalis	45	1	10/16/2011	Possibly Extirpated	Probably Elminiated	Declining	
Orcuttia inaequalis	23	1	8/9/2010	Extirpated	Eliminated		
Orcuttia pilosa	22	1	8/7/2010	Probably Extirpated*	Present but Degraded	Declining	
Orcuttia pilosa	28	1	1986	Possibly Extirpated*	Possibly Eliminated	Unknown	
Table Mountain Core Area							
Orcuttia inaequalis	55	1	1995	Presumed Extant	Present and Natural	Unknown	
Orcuttia inaequalis	47	1	2002	Presumed Extant	Present and Natural	Unknown	Half BLM
Fresno Core Area							
Orcuttia inaequalis	53	1	1996	Presumed Extant	Present and Natural	Unknown	
Tuctoria greenei	22	1	1937	Extirpated	Eliminated		
Cottonwood Creek Core Area							
Chamaesyce hooveri	N2	1	8/5/2010	100s Plants in 2010	Totally Modified	Unknown	
Chamaesyce hooveri	13	1	8/6/2010	2,000 Plants in 2010	Present and Natural	Persistent	Protected
Chamaesyce hooveri	33	1	6/6/2011	6 Plants in 2010	Present and Natural	Declining	Protected
Chamaesyce hooveri	32	1	8/5/2010	>1,500 Plants in 2010	Present and Natural	Persistent	Protected
Chamaesyce hooveri	12	1	1941	Extirpated	Eliminated		
Orcuttia inaequalis	56	1	6/6/2011	1,000 Plants in 2011	Present and Natural	Persistent	Protected
Chamaesyce hooveri	31	2	6/6/2011	50 Plants in 2011	Present and Natural	Persistent	Protected
Chamaesyce hooveri	25	1	6/6/2011	Presumed Extant**	Present and Natural	Declining	Protected
Tulare Core Area							
Orcuttia inaequalis	19	1	8/6/2010	Extirpated*	Eliminated		
EO: Element Occurrence number from CNDDB; PTS: Number of parts associated with the EO.							
*New or a change from 11/4/12 California Natural Diversity Database information.							
**Presumed extant even though no plants were found on the date of the survey.							

Table 17: Species status in the **San Joaquin Valley Recovery Unit** (Merced County) by core area. Species are listed from north to south within each core area and correspond with Figure 21 (page 64).

Species name	EO	PTS	Date Observed	2010-2011 Status	Habitat Condition	Estimated Vigor	Conservation Status
Grassland Ecological Area Core Area							
Neostapfia colusana	51	1	9/25/2010	Possibly Extirpated	Present but Degraded	Marginal	
Neostapfia colusana	52	1	1990	Possibly Extirpated	Present but Modified	Unknown	
Neostapfia colusana	40	1	10/15/2011	~600 Plants in 2011	Present but Modified	Declining	
Chamaesyce hooveri	22	1	9/22/2011	Presumed Extant**	Present and Natural	Declining	Easement
Neostapfia colusana	50	1	9/22/2011	Presumed Extant**	Present and Natural	Marginal	Easement
Neostapfia colusana	39	1	9/22/2011	Possibly Extirpated	Present but Degraded	Declining	
EO: Element Occurrence number from CNDDB; PTS: Number of parts associated with the EO.							
**Presumed extant even though no plants were found on the date of the survey.							

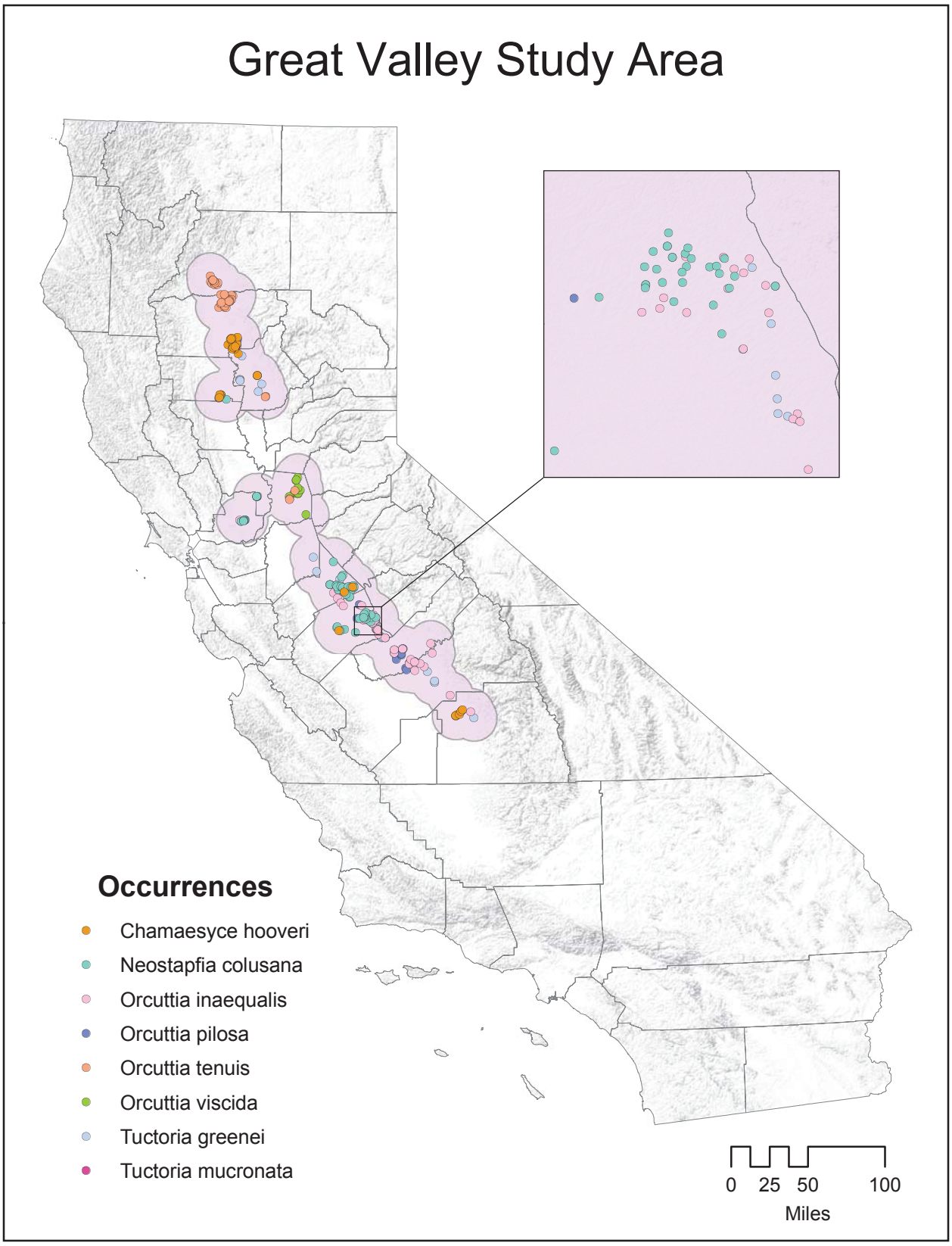

Figure 1: Great Valley Study Area.

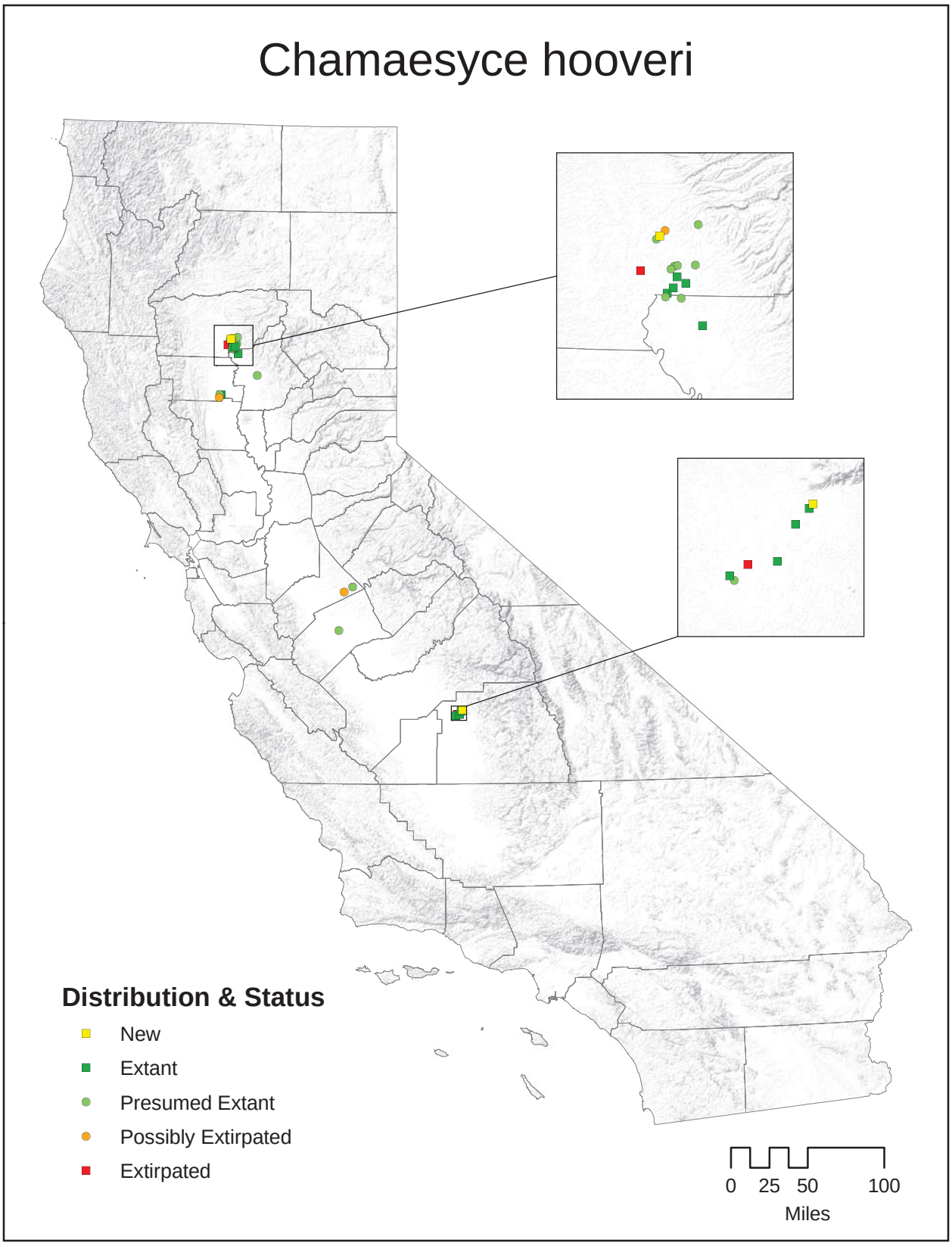

Figure 2: Hoover's Spurge (*Chamaesyce hooveri*) Distribution and Status.

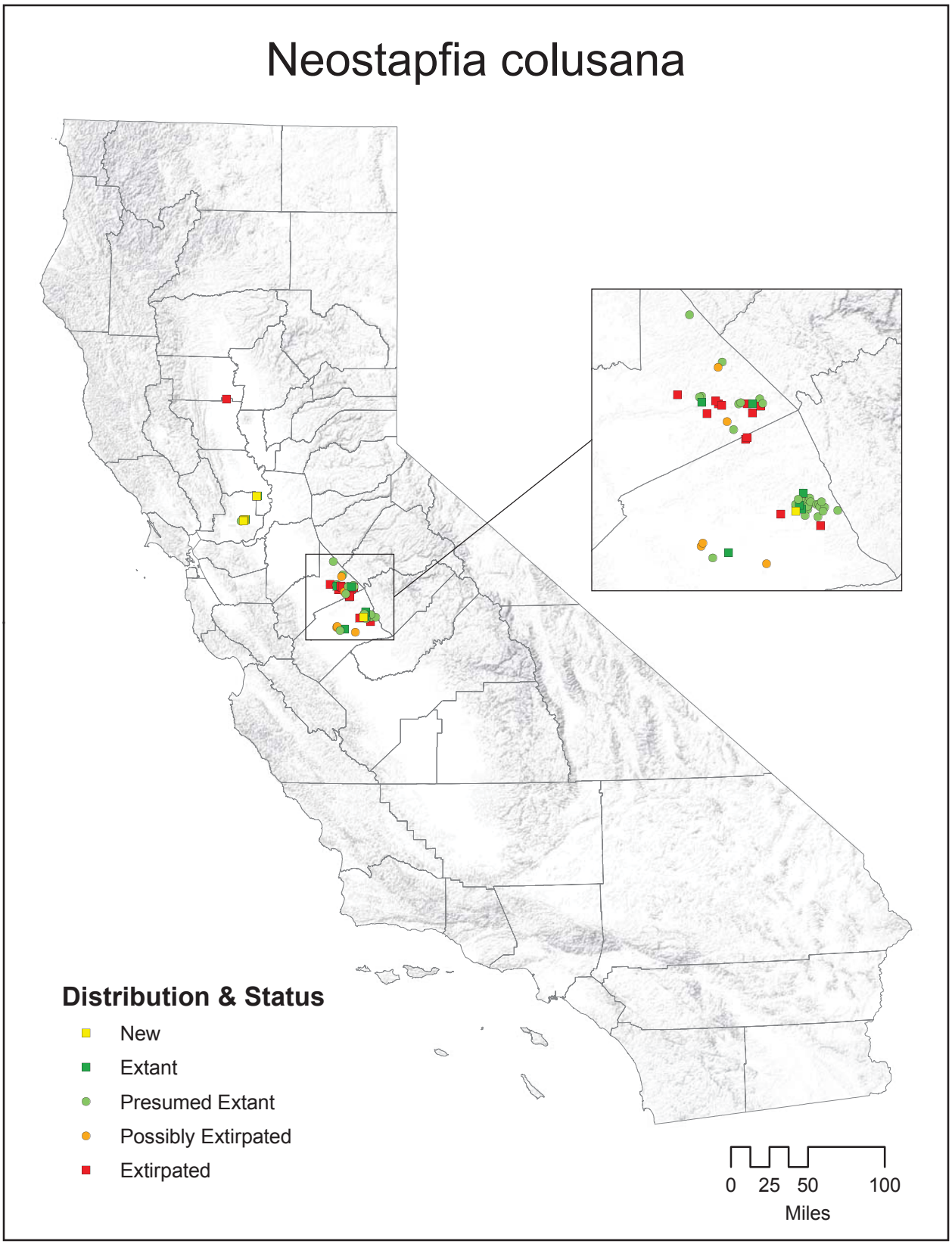

Figure 3: Colusa Grass (*Neostapfia colusana*) Distribution and Status.

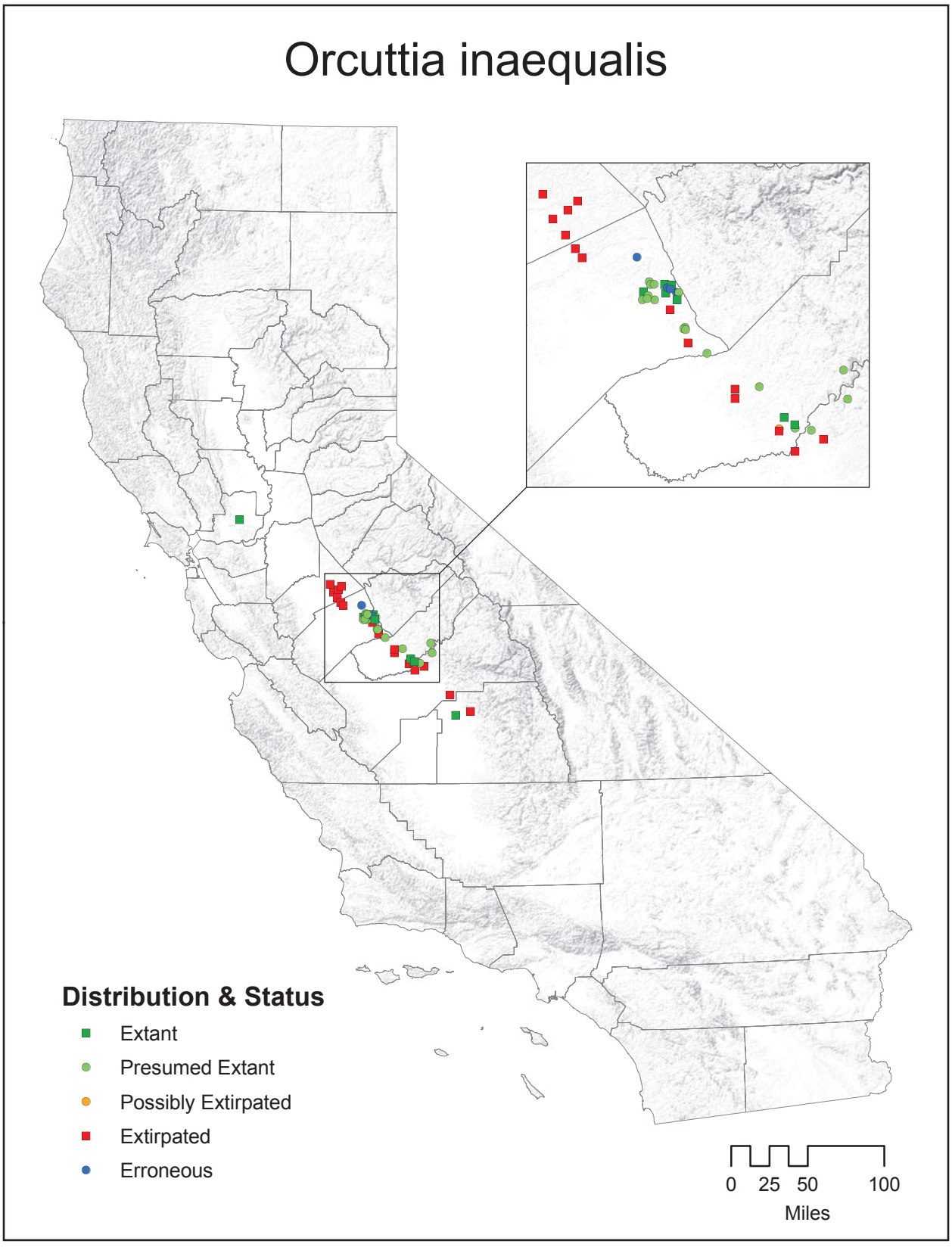

Figure 4: San Joaquin Valley Oructt Grass (*Orcuttia inaequalis*) Distribution and Status.

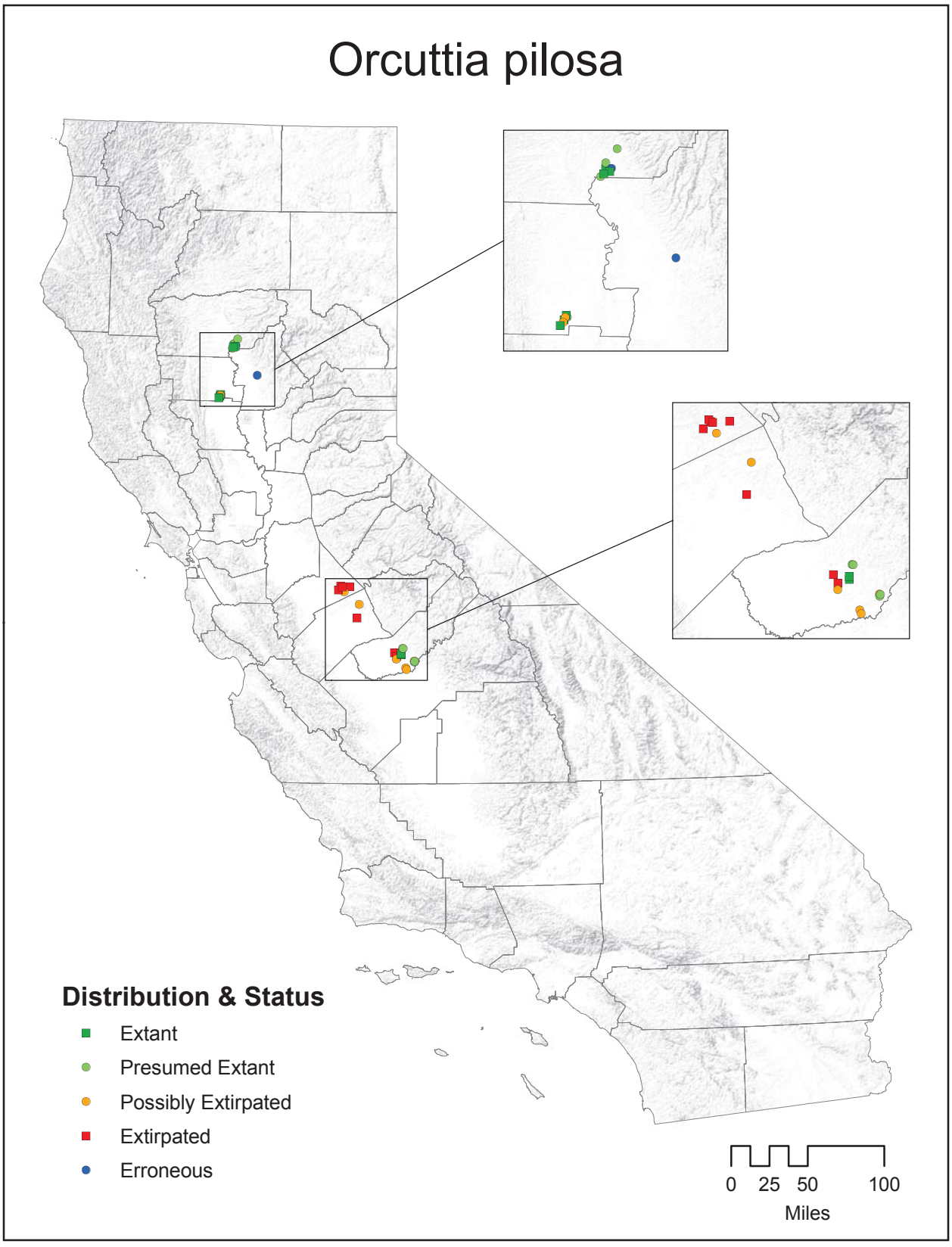

Figure 5: Hairy Orcutt Grass (*Orcuttia pilosa*) Distribution and Status.

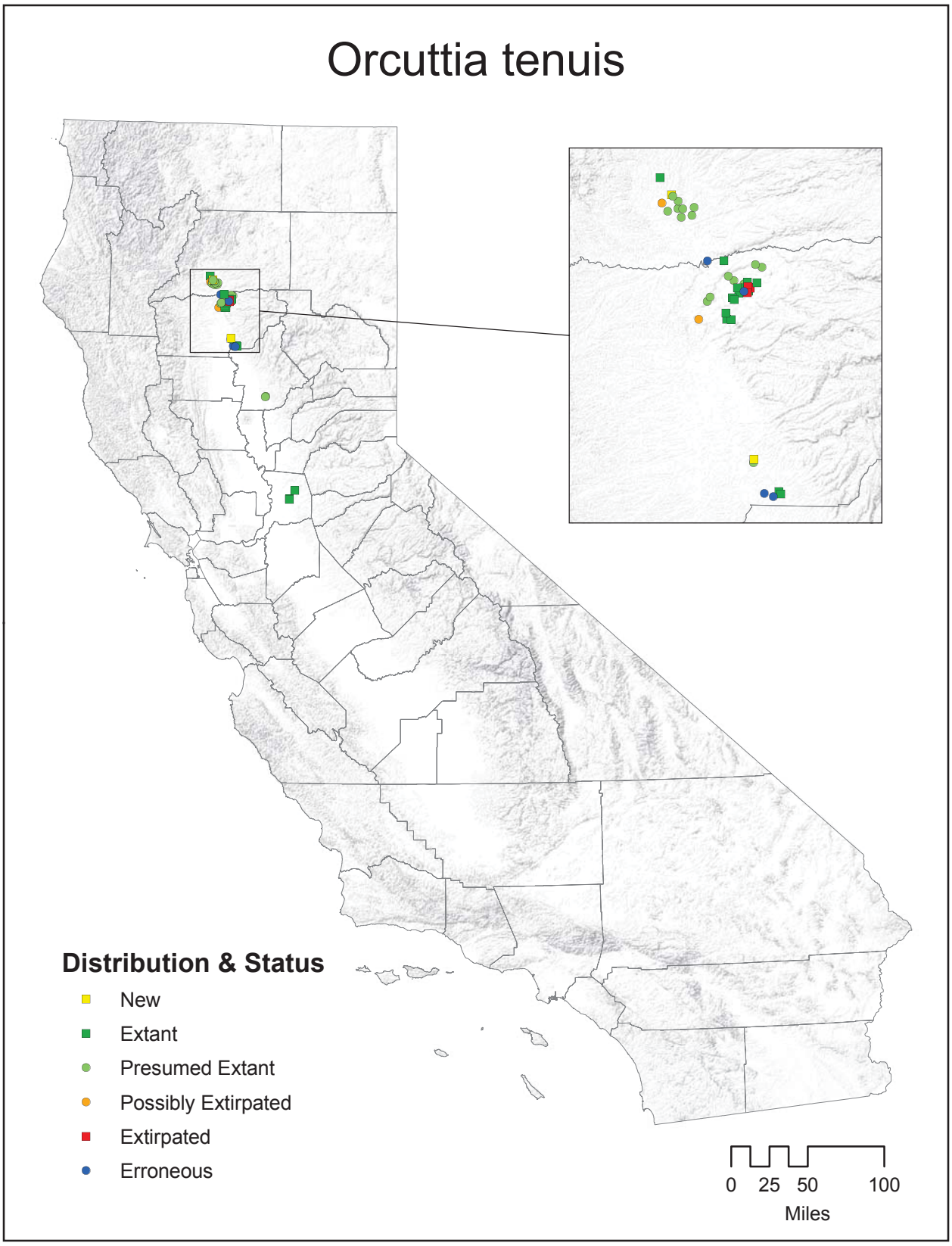

Figure 6: Slender Orcutt Grass (*Orcuttia tenuis*) Distribution and Status.

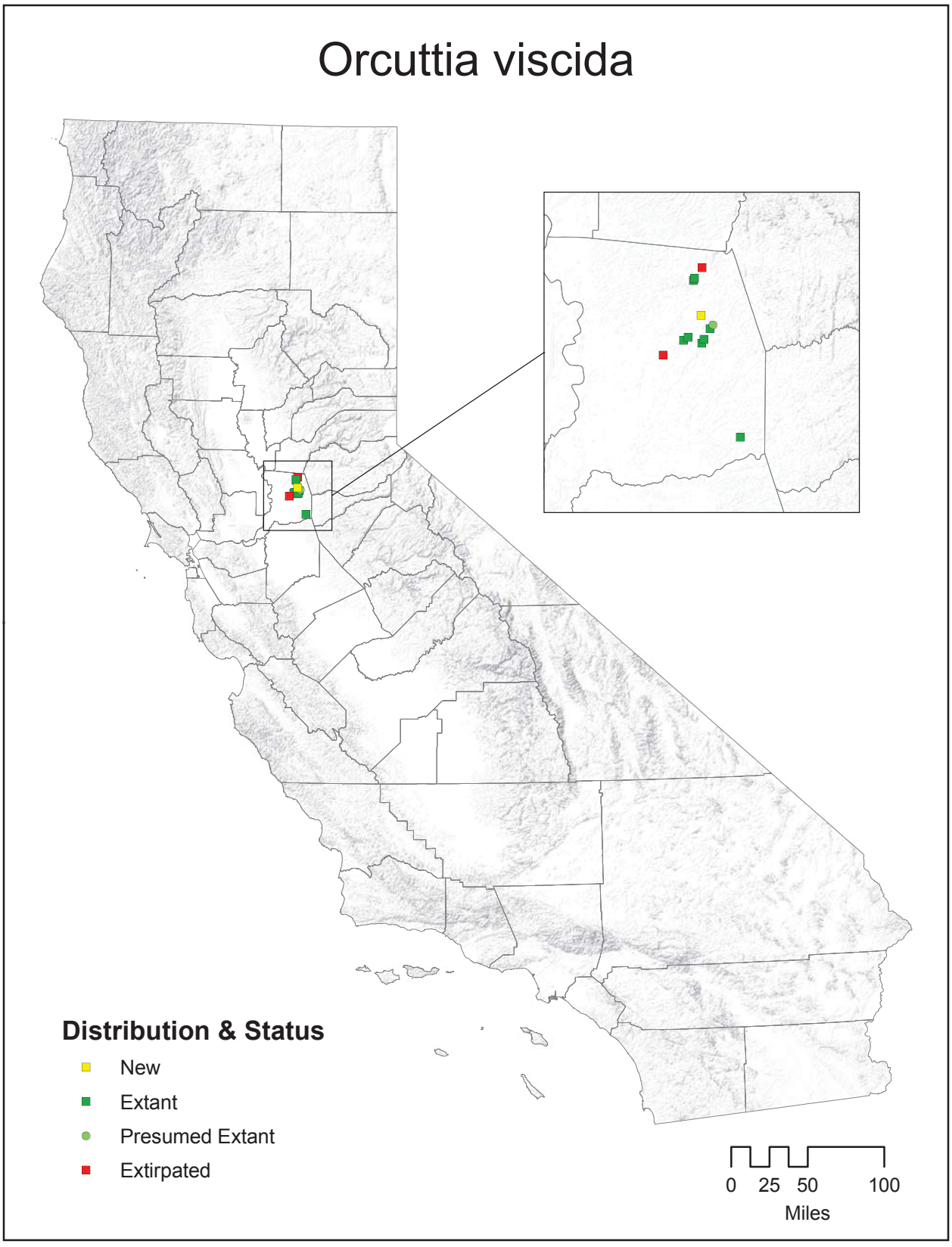

Figure 7: Sacramento Orcutt Grass (*Orcuttia viscida*) Distribution and Status.

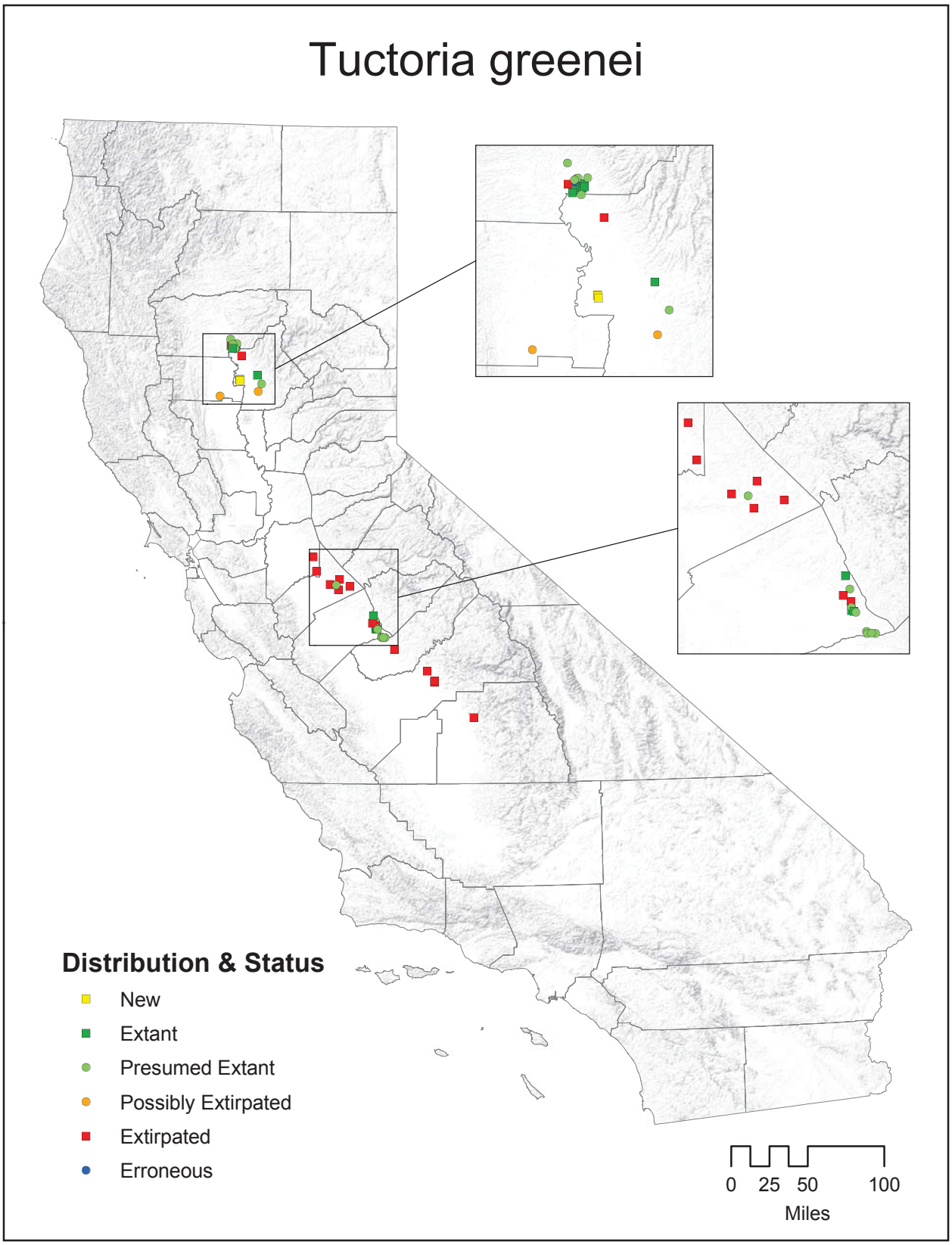

Figure 8: Greene's Tuctoria (*Tuctoria greenei*) Distribution and Status.

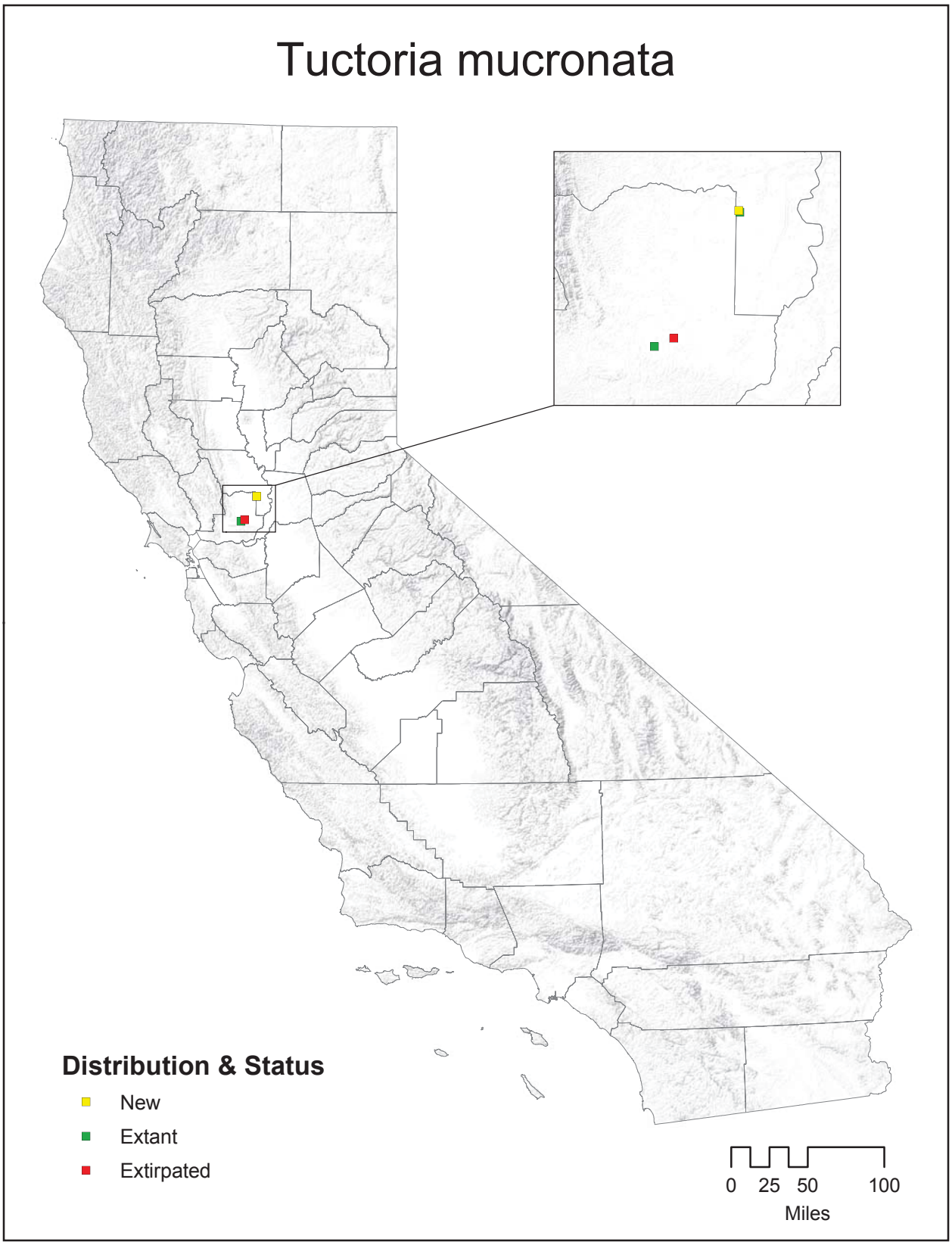

Figure 9: Solano Grass (*Tuctoria mucronata*) Distribution and Status.

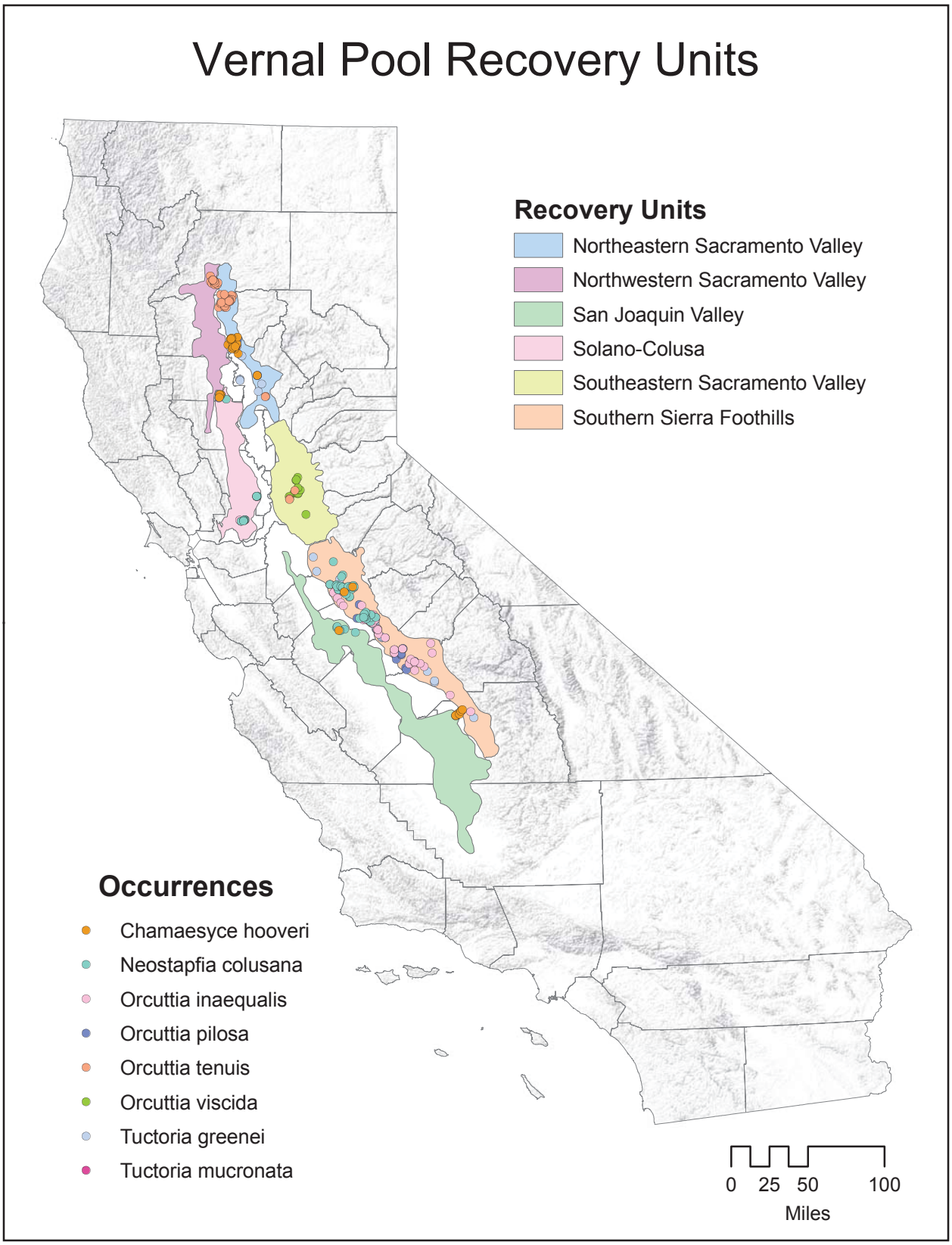

Figure 10: Vernal Pool Recovery Units.

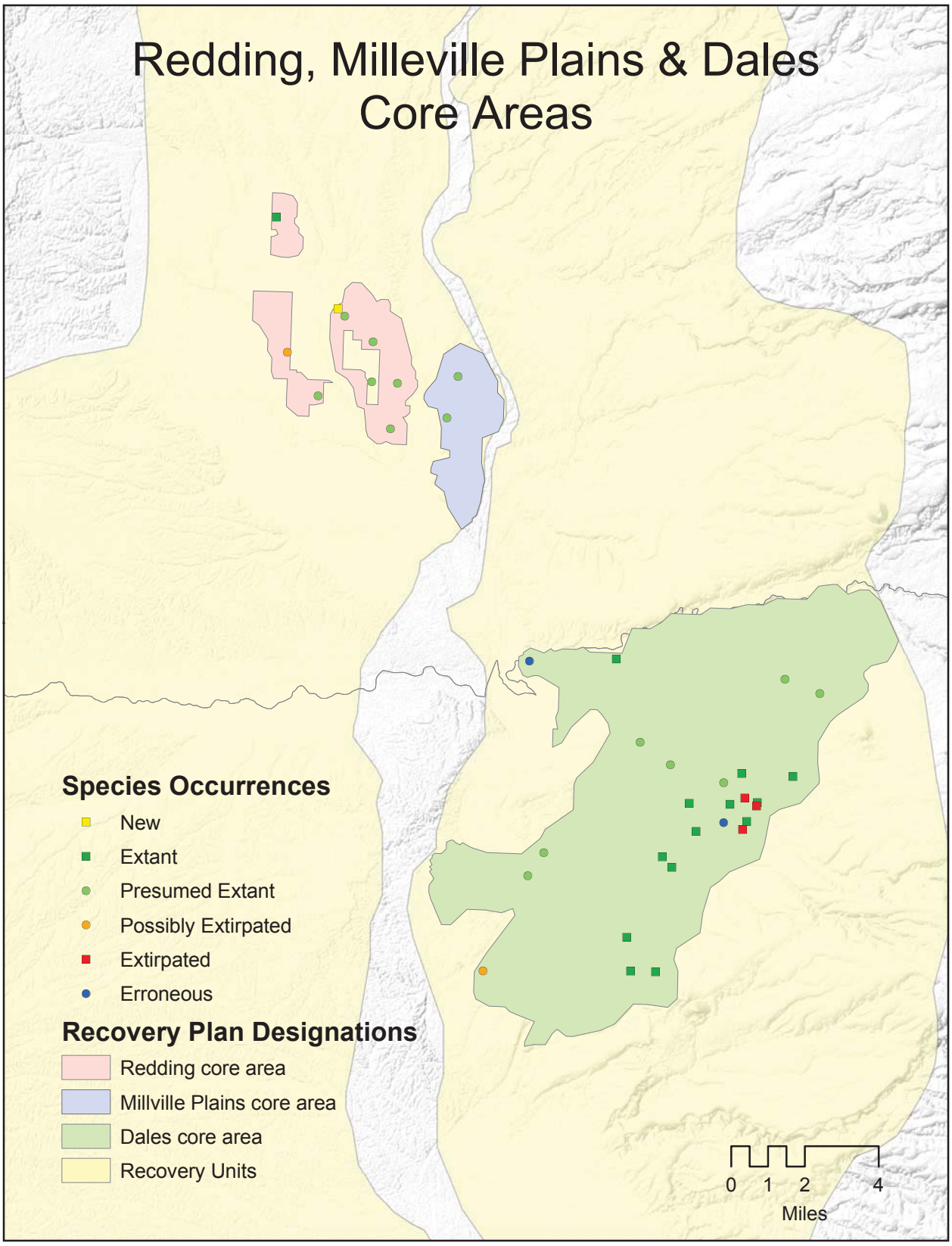

Figure 11: Redding, Millville Plains and Dales Core Areas.

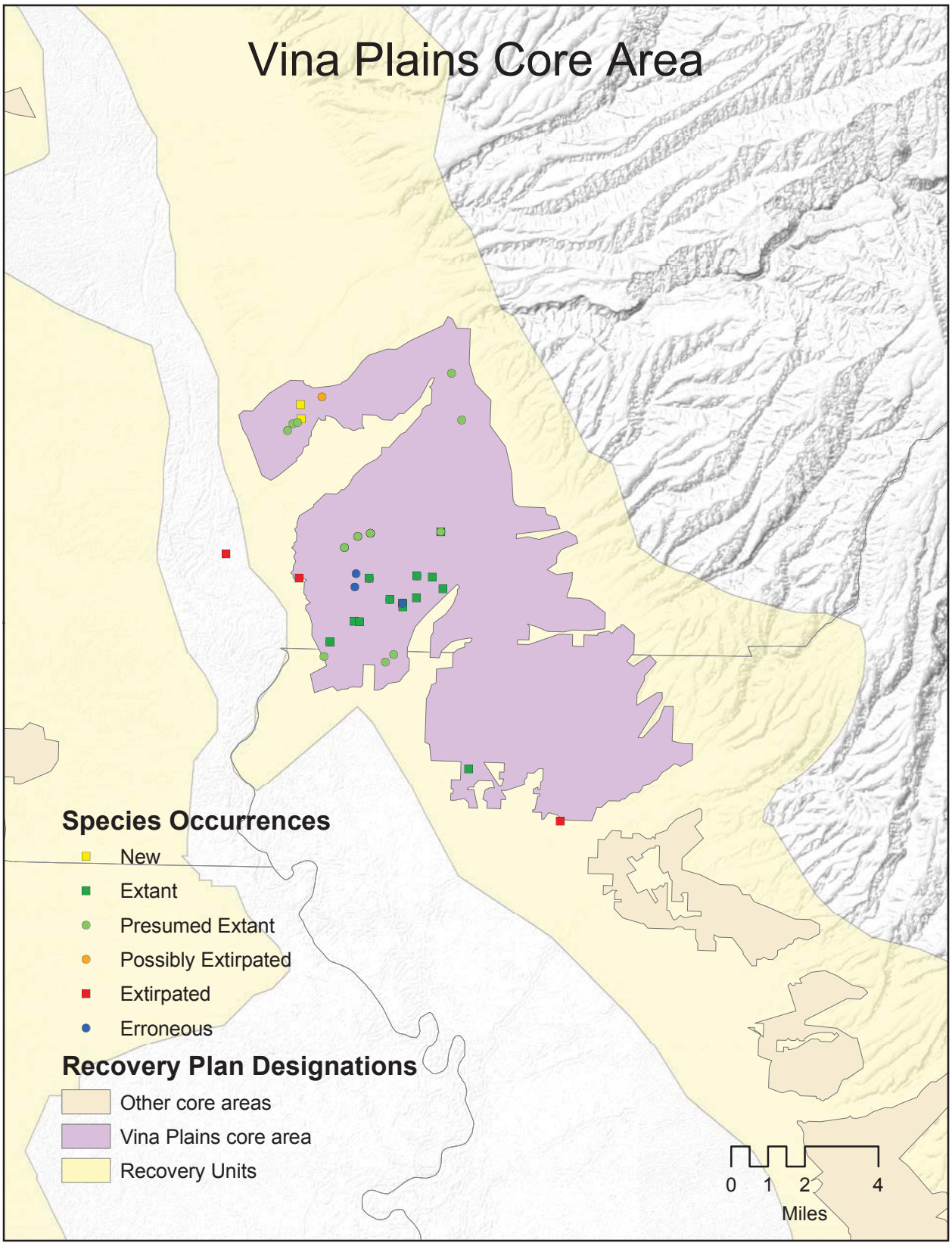

Figure 12: Vina Plains Core Area.

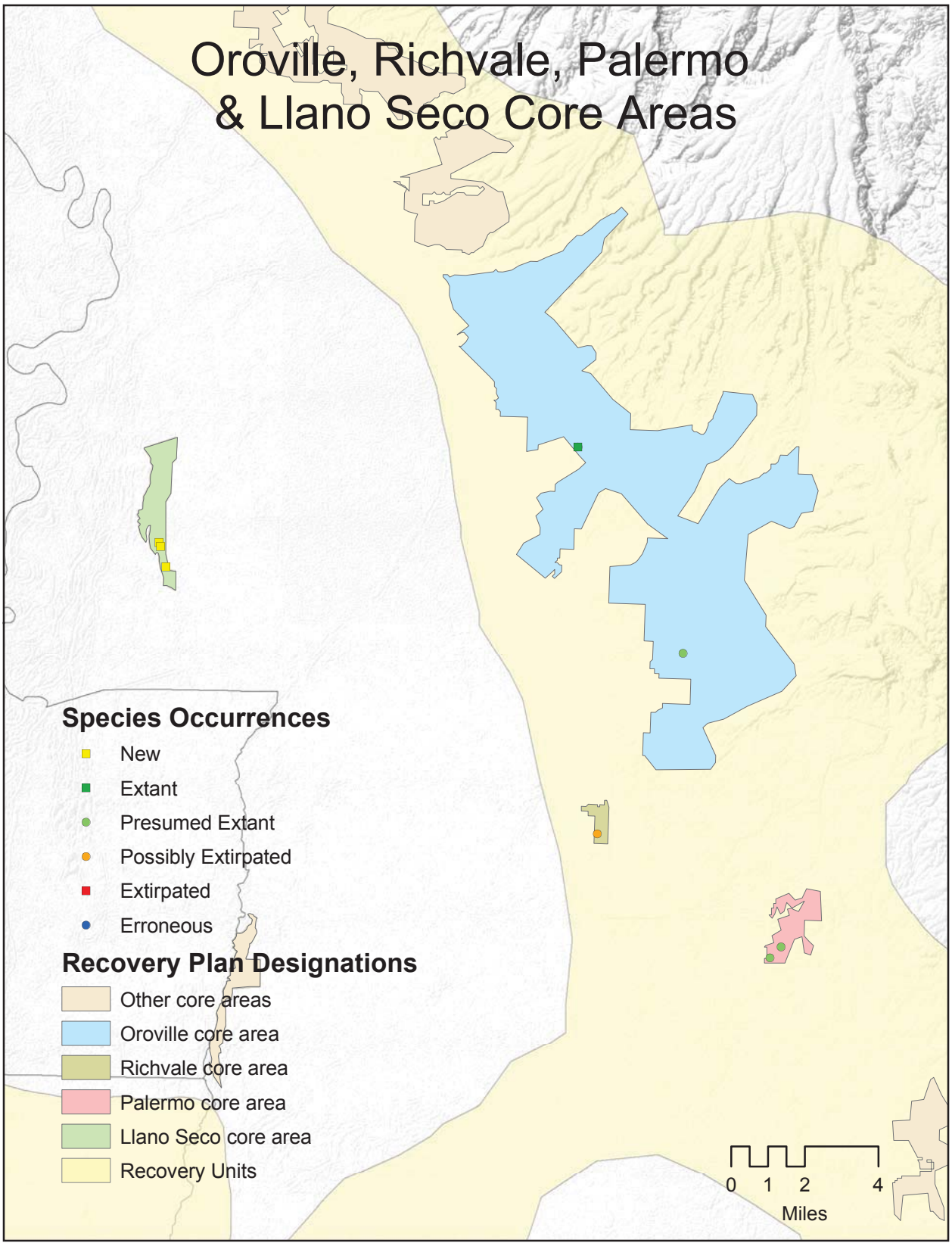

Figure 13: Oroville, Richvale, Palermo and Llano Seco Core Areas.

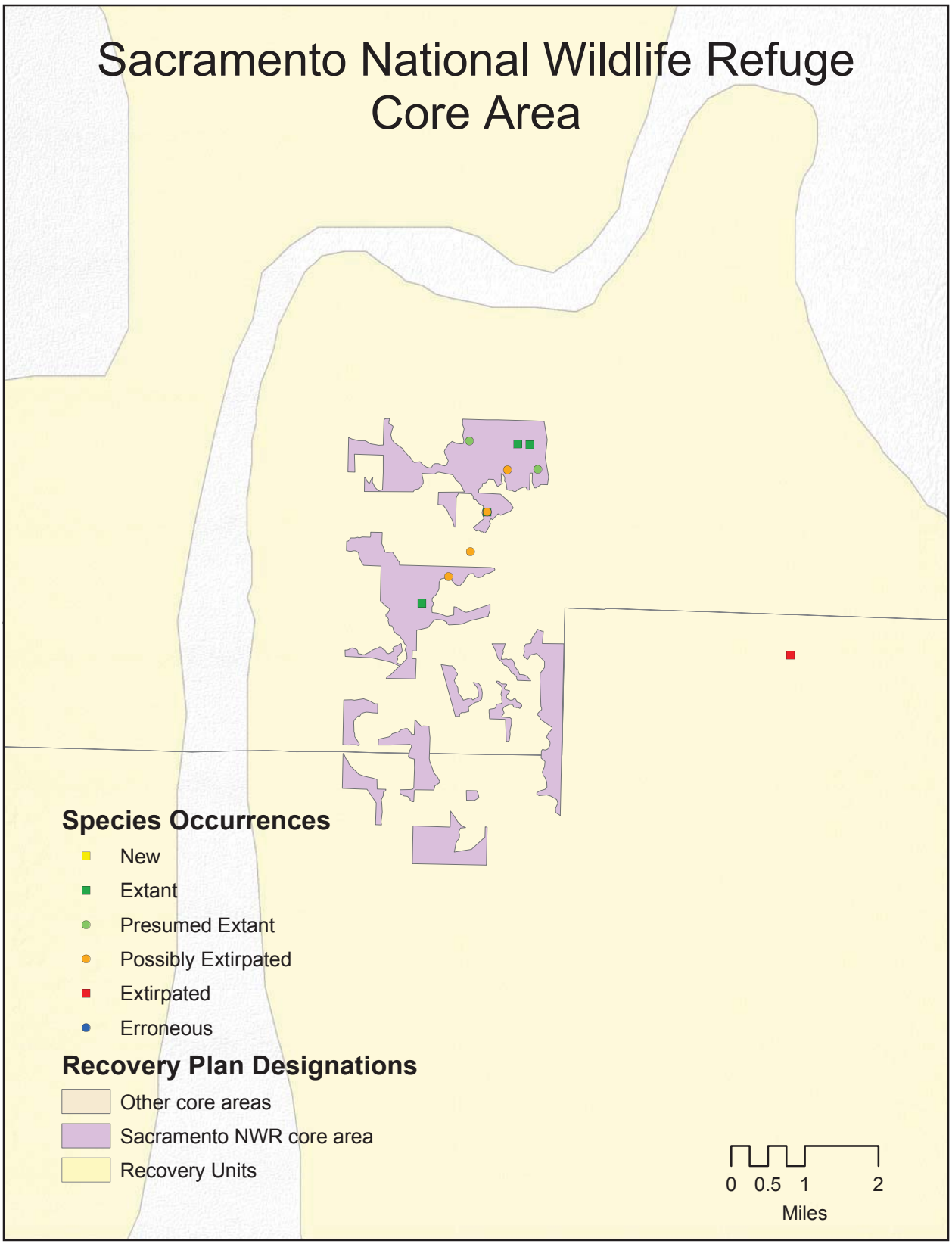

Figure 14: Sacramento National Wildlife Refuge Core Area.

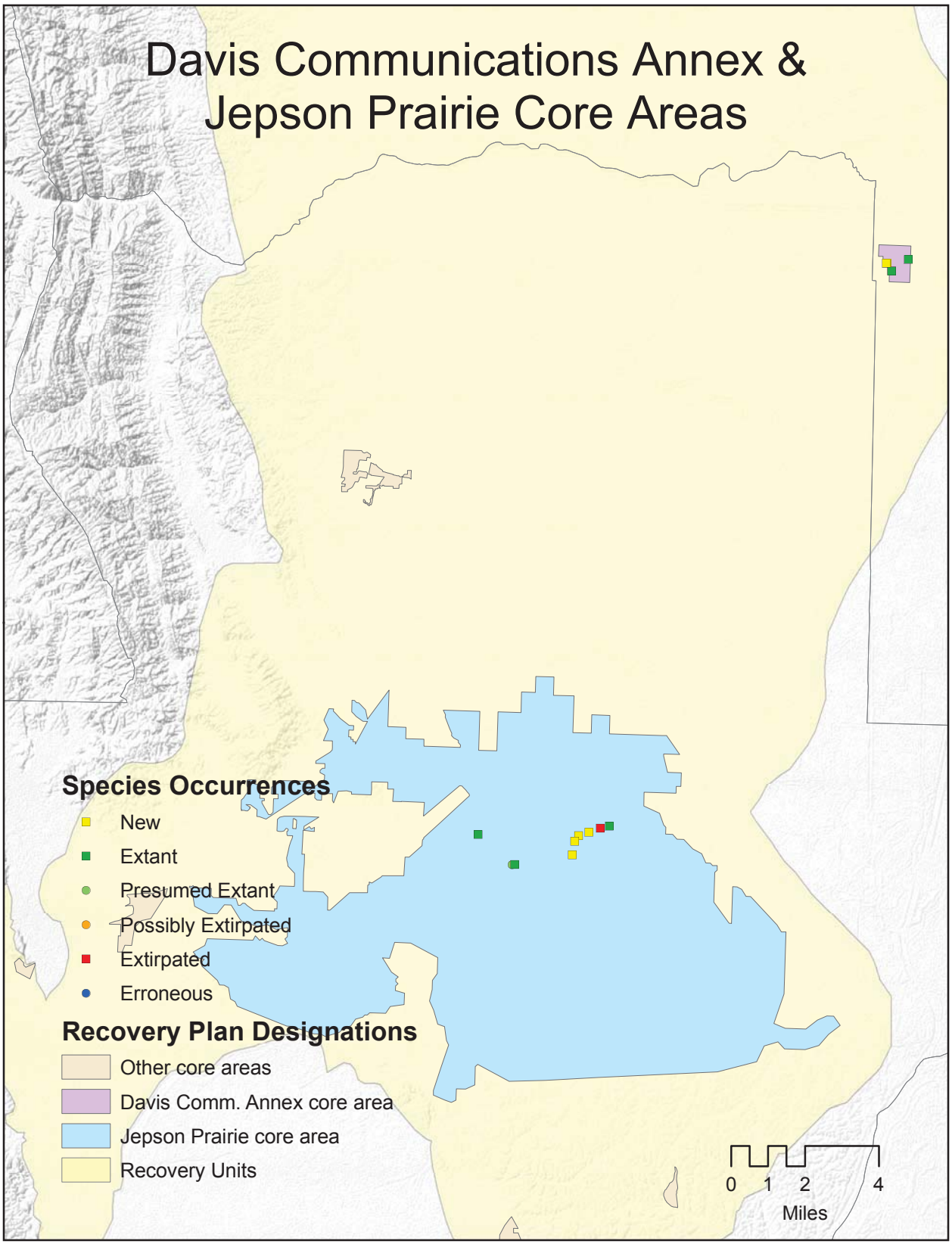

Figure 15: Davis Communications Annex and Jepson Prairie Core Areas.

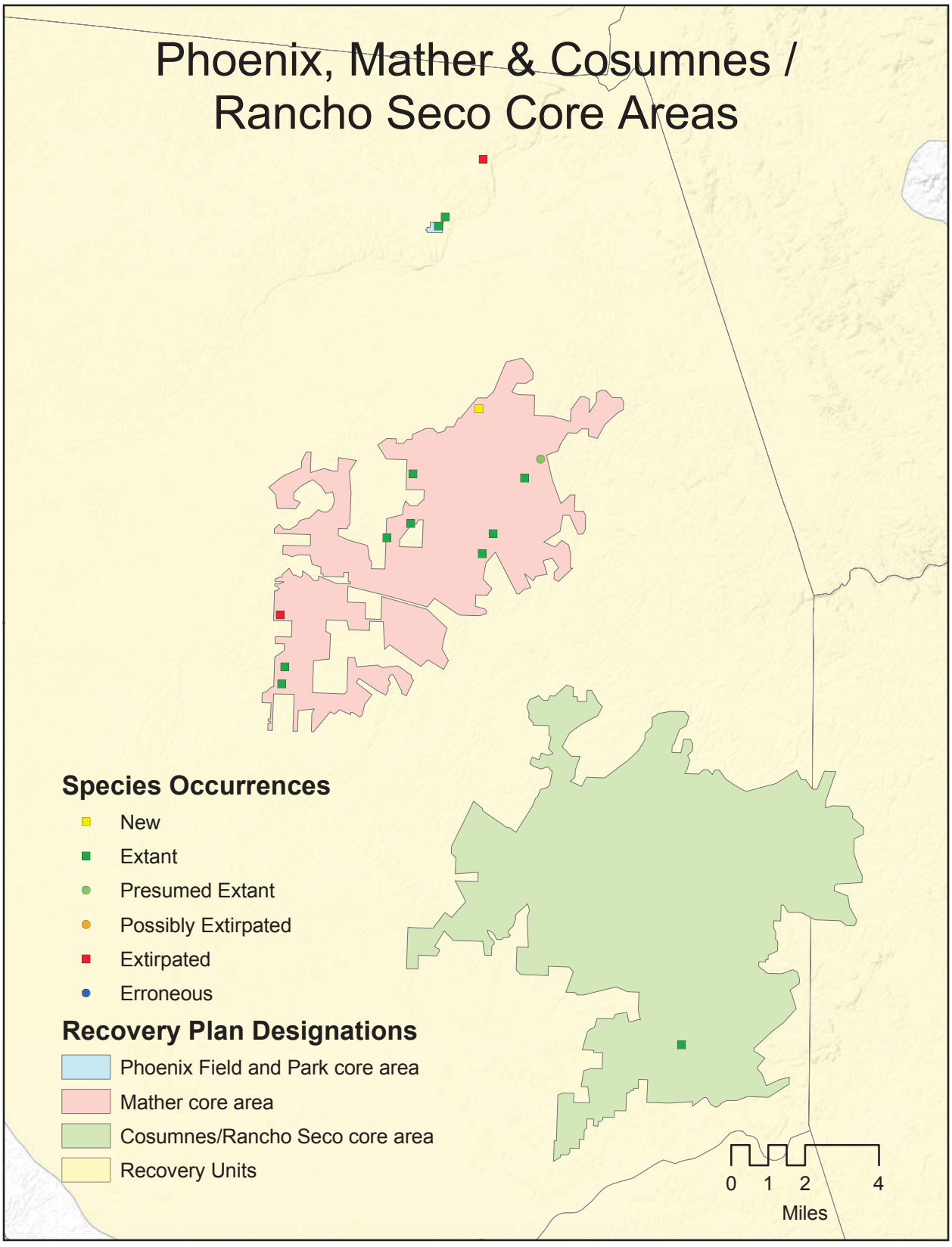

Figure 16: Phoenix Field and Park, Mather and Cosumnes/Rancho Seco Core Areas.

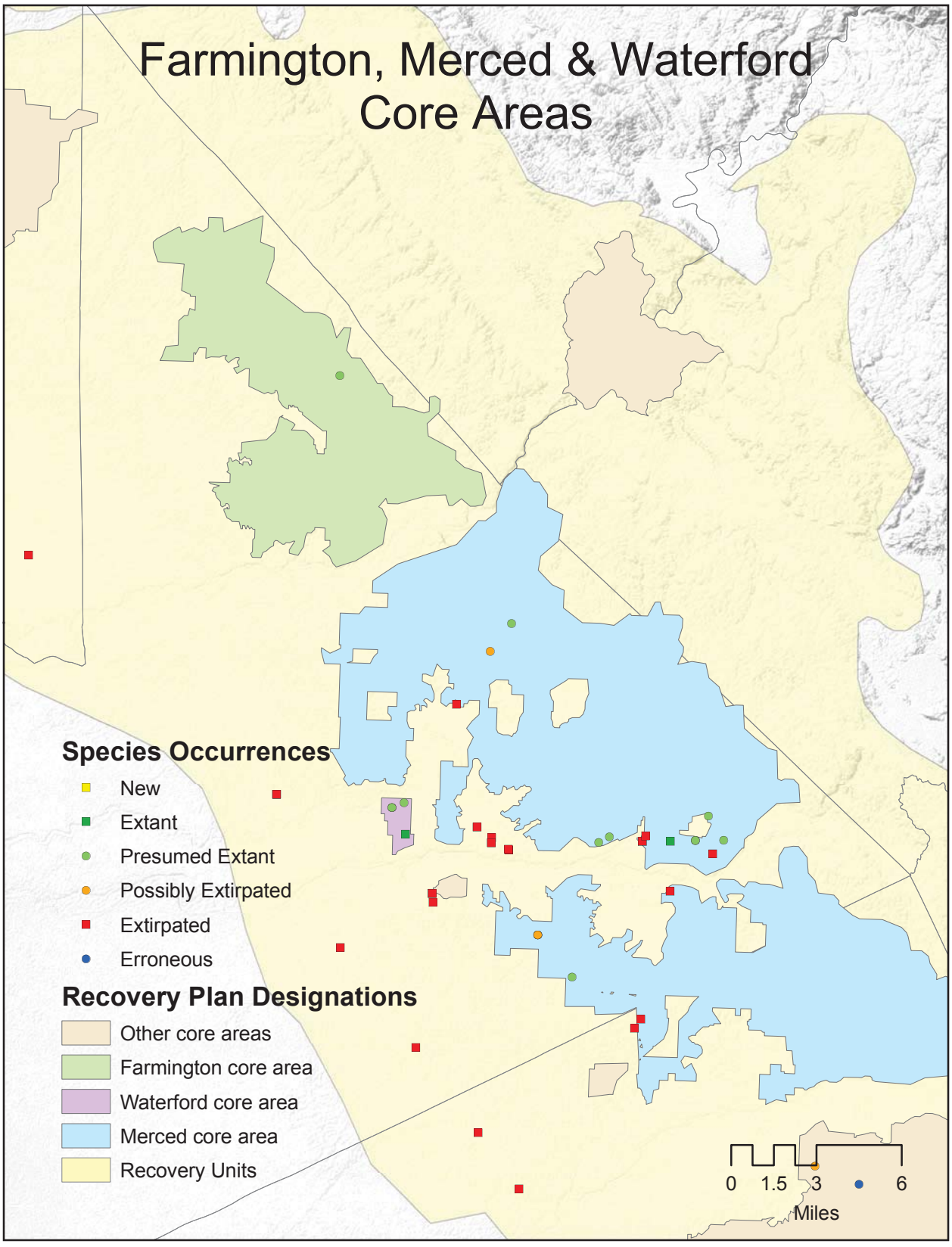

Figure 17: Farmington, Merced and Waterford Core Areas.

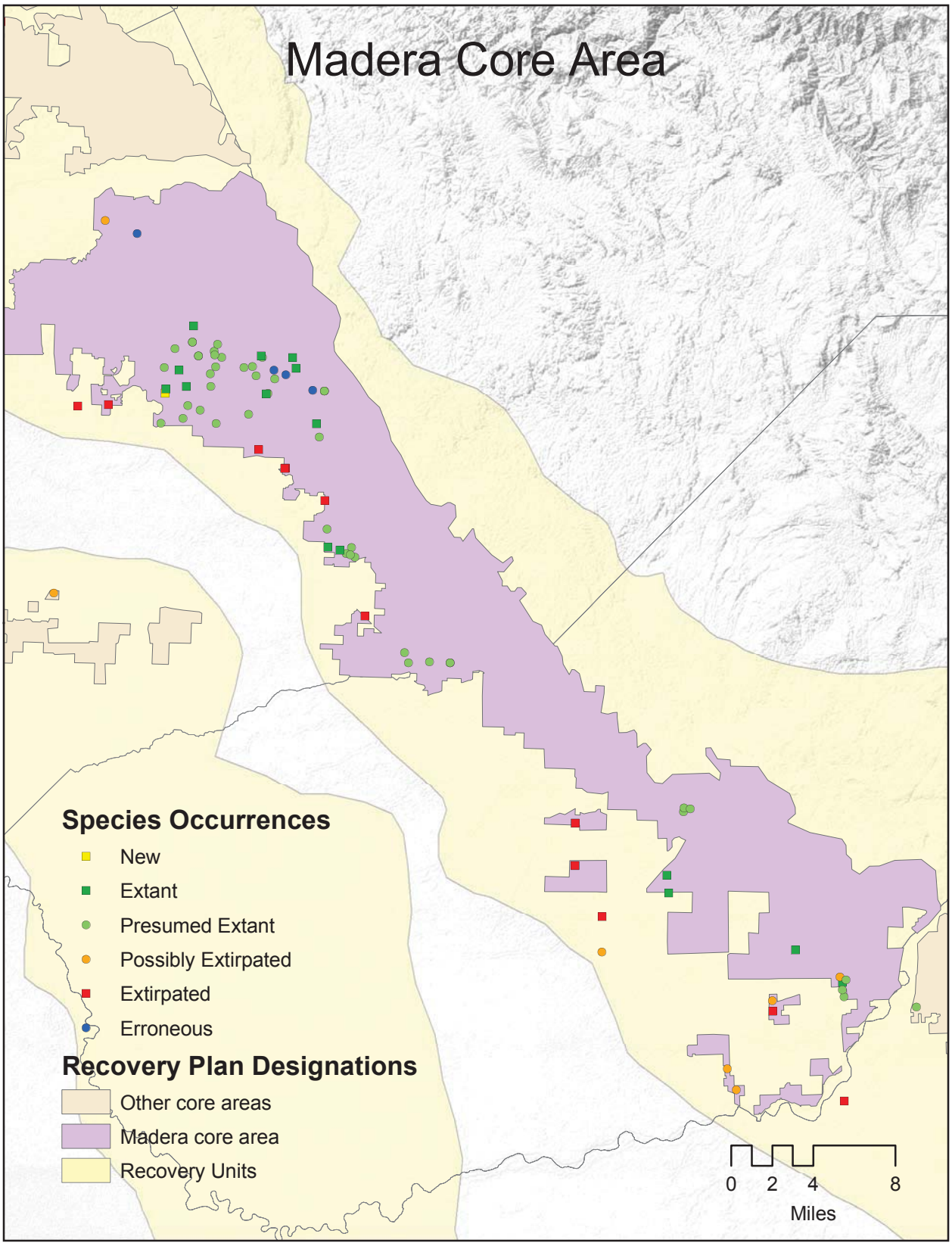

Figure 18: Madera Core Area.

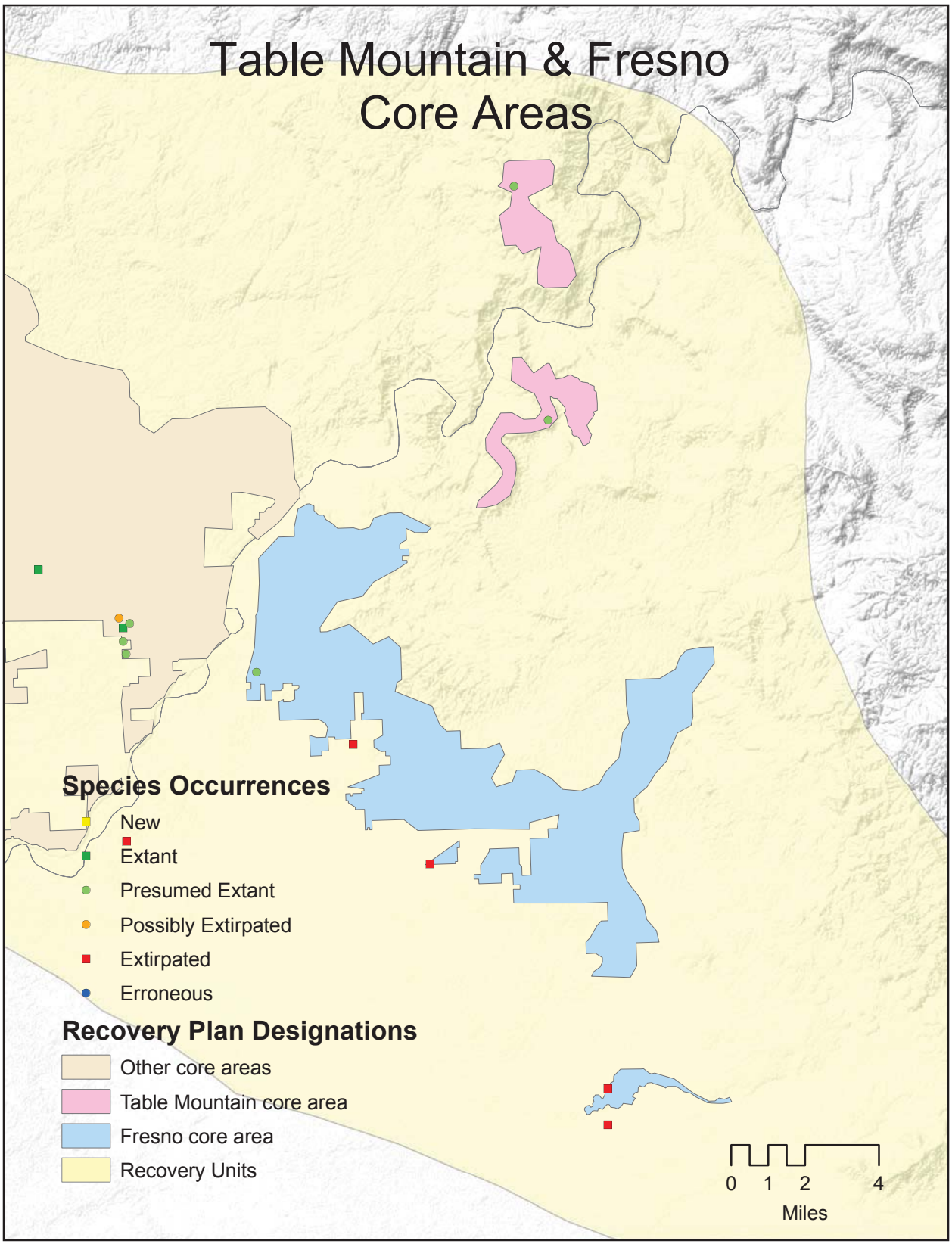

Figure 19: Table Mountain and Fresno Core Areas.

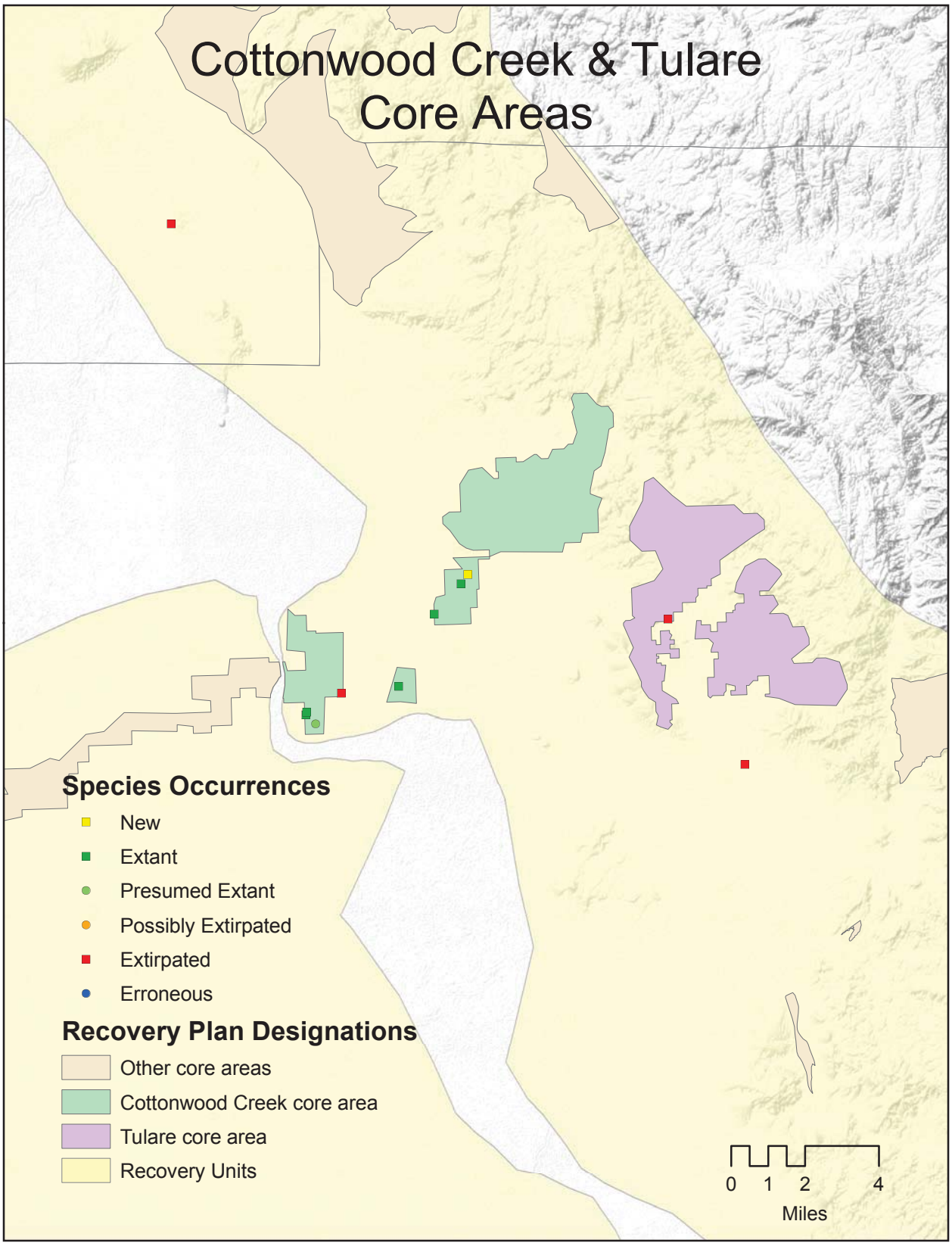

Figure 20: Cottonwood Creek and Tulare Core Areas.

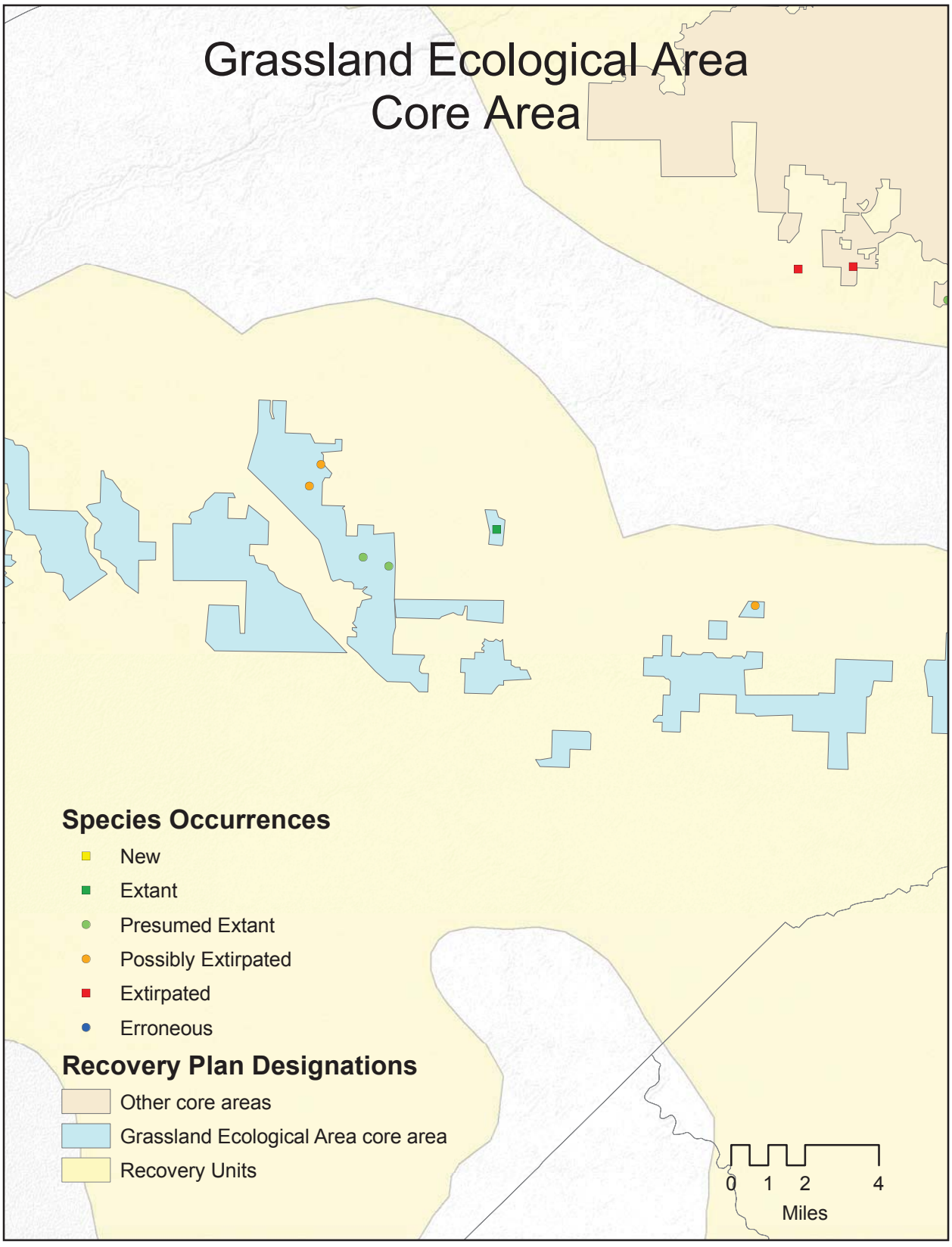

Figure 21: Grasslands Ecological Area Core Area.

Status Surveys for Seven Federally Listed Vernal Pool Grasses and *Chamaesyce hooveri* in the Sacramento and San Joaquin Valleys (Great Valley), California, USA

Grant Agreement: 80270-8-G137

APPENDIX A:

DATA BY SPECIES AND OCCURRENCE

Description of Fields Used in Appendix A

FIELDS from California Natural Diversity Database

EO: Acronym for Element Occurrence.

EONDX: An integer primary key that is unique for each Element Occurrence.

KEY (KEYCOUNTY): The California County which contains the occurrence.

PART (PARTS): The number of components that make up each Element Occurrence.

ACCURACY (ACC_VALUE): Measure of spatial uncertainty for the source feature.

PRESENCE: The condition of the occurrence at the site when it was last observed.

SITEDATE: The most recent date that an observer visited the site.

ELMDATE: The most recent date that an observer actually saw the element at this site.

OWNERMGT: The type of ownership of the site.

LOCATION: Physical location cited by observer and used to map the occurrence.

LOCDETAILS: Additional information on the location of the occurrence.

ECOLOGICAL: Comments about the ecology of the site from the observer.

THREAT: Comments about threats to the occurrence as reported by the observer.

GENERAL: General comments about an occurrence.

FIELDS used by Witham, 2013

OBSERVATIONS & NOTES: General observations and notes.

SITE: Date site was visited. No indicates that it was not visited.

POPULATION: Observations on plant counts, if made, or general status.

HABITAT: General observations on the habitat.

VIGOR: Estimate of the persistence of the occurrence at the site.

STATUS: General observations regarding whether the occurrence is protected, etc.

ABBREVIATIONS used by Witham, 2013

BLM: Bureau of Land Management.

CRT: California Rangeland Trust.

DFW: California Department of Fish and Wildlife.

FWS: U.S. Fish and Wildlife Service.

NWR: National Wildlife Refuge.

SMUD: Sacramento Municipal Utility District.

SVC: Sacramento Valley Conservancy.

TNC: The Nature Conservancy.

Appendix A-1: Current Status of Hoover's Spurge (*Chamaesyce hooveri*) in the Great Valley

California Natural Diversity Database, November 4, 2012														Witham, 2013					
EO	EONDX	KEY	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
1	18745	TEH	1	1 mile	Extirpated	19860624	XXXXXXXX	UNKNOWN	NEAR VINA.		DRIED MUD FLAT.	AREA IS NOW ORCHARDS, CAMPGROUNDS, PICNIC AREA.	UNKNOWN WHEN SP SEEN. POWELL STATES THIS SITE PROBABLY WRONG (1977). MALLOY STATES SITE MIGHT BE IN WOODSON BRIDGE STATE RECREATION AREA (1974). OCCURRENCE EXTIRPATED ACCORDING TO HUBBARD (1986).	Extirpated as per aerial review. Area now orchards.	No	Extirpated	Eliminated		
2	2372	TEH	1	80 meters	Presumed Extant	19860822	19860822	PVT	VINA PLAINS, 0.25 MILE EAST OF LENINGER ROAD, 1.0 MILE NORTH OF HIGHWAY 99.	C. HOOVERI WAS WELL DISTRIBUTED AND, WITH THE EXCEPTION OF SCATTERED PLANTS OF ERYNGIUM VASEYI, WAS THE ONLY VEGETATION OVER MOST OF THE POOL BED.	IN LARGE HARDPAN VERNAL POOL. ASSOCIATED WITH TUCTORIA GREENEI AND ERYNGIUM VASEYI.	CATTLE GRAZING IN WINTER PASTURE MAY THREATEN.	FEWER THAN 50 PLANTS IN 1980. 5-6000 PLANTS IN 1986, BUT CATTLE TRACKS IN VICINITY. POOLS IN EXCELLENT CONDITION. UNDER CURRENT GRAZING REGIME POPULATION IS LARGE AND PROBABLY STABLE.	Presumed extant. Habitat present in aerial review. Earl Foor Ranch under TNC easement. Protected.	No	Presumed Extant	Present and Natural	Unknown	Easement
3	2369	TEH	1	specific area	Presumed Extant	19870803	19800713	PVT	VINA PLAINS. 0.8 MILE NORTH OF HIGHWAY 99 JUST WEST OF LENINGER ROAD.	MAPPED IN TWO POOLS ON THE WEST SIDE OF ROAD. BIOSYSTEMS ANALYSIS (1988) NOTES THAT DUE TO HIGH PLANT COVER THE HABITAT AT THESE SITES APPEARED UNSUITABLE FOR CHAMAESYCE HOOVERI.	VERNAL POOLS IN GRASSLAND, ON VOLCANIC MUDFLOW. ASSOCIATED WITH TUCTORIA GREENEI, ERYNGIUM VASEYI, ALLOCARYA STIPITATA, PSILOCARPHUS BREVISSIMUS, ALOPECURUS SACCATUS, DOWNINGIA, AND NAVARRETIA LEUCOCEPHALA.	GRAZING, DRAINING OF WATER FROM POOLS.	IN 2 VERNAL POOLS. FEWER THAN 1000 SEEN IN 1980 WITH TUCTORIA GREENEI. NO PLANTS SEEN IN EITHER 1986 OR 1987; HYDROLOGY MAY HAVE BEEN NEGATIVELY AFFECTED BY PRESENCE OF WATER DRAIN PIPE IN ONE OF TWO POOLS. NEEDS FIELDWORK.	Presumed extant. Habitat present in aerial review. Earl Foor Ranch under TNC easement. Protected. Windshield survey on 08-17-2011, but could not see plants from road.	No	Presumed Extant	Present and Natural	Unknown	Easement
4	2298	BUT	1	80 meters	Presumed Extant	19860715	19860715	PVT	PENTZ VERNAL POOL. SOUTHEAST OF THE JUNCTION OF PENTZ ROAD AND HIGHWAY 99.	ALSO KNOWN AS ESQUON LAKE.	IN VERNAL POOL. ASSOCIATED WITH ORCUTTIA PILOSA, ERYNGIUM VASEYI, HORDEUM GENICULATUM, DESCHAMPSIA DANTHONIOIDES, NAVARRETIA LEUCOCEPHALA, N. HETERANDA, ALLOCARYA STIPITATA, DOWNINGIA, PROBOSCIDEA LOUSIANICA, AND TRIFOLIUM VARIEGATUM.	HEAVILY GRAZED AND TRAMPLED, BUT OCCURRENCE IS DOING FINE (1986).	UNK # SEEN IN 1980. 1000-2000 PLANTS OBSERVED IN 1986. UNDER THE CURRENT GRAZING REGIME THIS POPULATION IS LARGE AND PROBABLY STABLE.	Pentz Pool. Surveyed 09-09-2010. Habitat present but no plants found. Site going into mitigation bank. Rodney Lacey at EcoAnalysts current contact. He reports no plants 2007-2011, but did not survey in 2012.	9/9/2010	Presumed Extant	Present and Natural	Marginal	Proposed for Bank
5	6730	TEH	1	specific area	Presumed Extant	20020610	20020610	TNC-VINA PLAINS PRESERVE	VINA PLAINS, 0.1 MILE SOUTH OF LASSEN ROAD, 0.6 MILE ENE HIGHWAY 99.	MAPPED WITHIN THE NW 1/4 OF THE NE 1/4 OF SECTION 29 AND THE SW 1/4 OF THE SE 1/4 OF SECTION 20. THIS IS VINA PLAINS POOL #1.	COMMON IN CENTER OF LARGE VERNAL POOL ON VOLCANIC MUDFLOW. ASSOCIATED WITH ORCUTTIA PILOSA, PROBOSCIDEA LOUISIANICA, ERYNGIUM VASEYI, MARSILEA VESTITA, ASCLEPIAS FASCICULARIS, CONVOLVULUS ARVENSIS, AND AMARANTHUS ALBUS.	GRAZING COULD THREATEN; MAY HAVE CONTRIBUTED TO ESTABLISHMENT OF WEEDY, NON-NATIVE PLANTS.	SP SEEN IN 1977, 1980, 1981 AND 1990. ABOUT 3000 PLANTS IN 1986, BUT SOME EVIDENCE OF CATTLE. CLOVER (PLANTED BY PAST OWNER?) IN POOL. UNK # OF PLANTS SEEN DURING A VEGETATION SURVEY IN 2002.	TNC Vina Plains Pool #1. Surveyed 08-15-2010. Approximately 4,000 plants in an area of 4,600 square meters. Perimeter GPSed. The plant is not clover (Trifolium), but native Marsilea vestita.	8/15/2010	>4,000 Plants in 2010	Present and Natural	Persistent	Protected

Green highlighting indicates new data.

Appendix A-1: Current Status of Hoover's Spurge (*Chamaesyce hooveri*) in the Great Valley

California Natural Diversity Database, November 4, 2012														Witham, 2013					
EO	EONDX	KEY	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
7	22345	TEH	1	80 meters	Presumed Extant	19870819	19870819	PVT	VINA PLAINS, 3 MILES EAST OF LENINGER ROAD, 1.5 MILES NORTH OF HIGHWAY 99.	0.1 MILE WEST OF BRUSH CREEK IN THE W 1/2 OF THE SE 1/4 OF SECTION 15.	VERNAL POOL ON HEAVY CLAY. ASSOCIATED WITH ERYNGIUM VASEYI, XANTHIUM STRUMARIUM, ALLOCARYA STIPITATA, DOWNINGIA, NAVARRETIA LEUCOCEPHALA, PSILOCARPHUS BREVISSIMUS, AND ELEOCHARIS MACROSTACHYA. TUCTORIA GREENEI SEEN HERE IN 1980.	CATTLE GRAZING IN WINTER PASTURE. XANTHIUM COULD BECOME A PROBLEM HERE IN THE FUTURE.	FEWER THAN 50 PLANTS SEEN IN 1980. 1000+ PLANTS OBSERVED IN 1986 & 1987. UNDER CURRENT GRAZING REGIME THE CHAMAESYCE POPULATION IS LARGE AND PROBABLY STABLE.	Presumed extant. Habitat present in aerial review. Earl Foor Ranch under TNC easement. Protected.	No	Presumed Extant	Present and Natural	Unknown	Easement
8	6871	TEH	1	specific area	Presumed Extant	19860822	19860822	PVT	VINA PLAINS. VERNAL POOL 1 MILE EAST OF LENINGER ROAD AND 1.5 MILE WEST OF HIGHWAY 99.		LARGE VERNAL POOL. ORCUTTIA PILOSA IS DOMINANT PLANT IN POOL. OTHER ASSOCIATES INCLUDE ERYNGIUM VASEYI, XANTHIUM STRUMARIUM, ASCLEPIAS FASCICULARIS, AND MARSILEA VESTITA.	CATTLE GRAZING; INCREASE IN CATTLE GRAZING MAY LEAD TO STRONGER COMPETITION FROM WEEDY EXOTICS.	FEWER THAN 50 SEEN IN 1980. 3-4000 PLANTS SEEN IN 1986 CONCENTRATED IN CENTER OF POOL. MANY HUNTING DECOYS PRESENT AND POOL MAY BE ARTIFICIALLY FLOODED.	Presumed extant. Habitat present in aerial review. Earl Foor Ranch under TNC easement. Protected.	No	Presumed extant	Present and Natural	Unknown	Easement
9	2411	STA	6	specific area	Presumed Extant	19860830	19860830	PVT	HICKMAN VERNAL POOLS.	ENTIRE COMPLEX OF VERNAL POOLS MAPPED BUT C. HOOVERI ONLY REPORTED FROM THE MIDDLE OF THE STRING OF NORTH POOLS AND THE LARGE MIDDLE AND SOUTHERN POOLS.	LARGE VERNAL POOLS. ASSOCIATED WITH NEOSTAPFIA COLUSANA, ORCUTTIA PILOSA, SIDA HEDERACEA, AND LIPPIA NODIFLORA.	ALTERED HYDROLOGY, IRRGATION RUNOFF, AND GRAZING	POPULATION SIZE IN N POOL RANGES FROM "EXTENSIVE STAND" (1974) TO ENTIRELY ABSENT IN YEARS THE POOL DOES NOT DRY OUT (1986). MIDDLE AND SOUTH POOLS RANGE FROM FEW PLANTS TO EXTENSIVE BUT SPARSE STANDS. INCLUDES FORMER EOS #10 AND 15.	Hickman Vernal Pools inundated well into summer in both 2010 and 2011. Habitat is converting to a marsh due to agricultural runoff from surrounding orchards. Windshield survey only on main pools. Possibly extirpated.	10/16/2011	Possibly Extirpated	Modified by Ag Runoff	Declining	
11	2790	STA	1	80 meters	Presumed Extant	19860831	19860831	PVT	VERNAL POOL 1.6 MILES NORTH OF TUOLUMNE RIVER AND 0.4 MILE EAST OF RAIRDEN GULCH, JUST SOUTH OF MODESTO MAIN CANAL.	POOL MAPPED SOUTHWEST OF DIRT ROAD WITHIN THE NW 1/4 OF THE NE 1/4 OF SECTION 27. IN 1986, THE POOL BED APPEARED BARREN FROM A DISTANCE DUE TO SEVERE GRAZING AND TRAMPLING.	VERNAL POOL SURROUNDED BY ANNUAL GRASSLAND AND OPEN QUERCUS DOUGLASII WOODLAND. ASSOCIATED WITH NEOSTAPFIA COLUSANA, MARSILEA VESTITA, AND EREMOCARPUS SETIGERUS. SOIL MAPPED AS WHITNEY SANDY LOAM.	GRAZING, TRAMPLING; CATTLE GRAZE SURROUNDING AREAS.	SITE FIRST DOCUMENTED BY P. ALLEN IN 1962. SITE VISITED IN 1983. ABOUT 50-100 PLANTS SEEN IN 1986. OTHER POOLS NEARBY HAVE BEEN PLANTED WITH CLOVER AND CONVERTED TO CATTLE WATERING PONDS.	Presumed extant. Habitat present in aerial review. Site is posted and I was unable to gain access.	No	Presumed Extant	Present and Natural	Unknown	
12	18740	TUL	1	nonspecific area	Extirpated	19860624	19410726	PVT	DRIED-UP "HOG WALLOW" ALONG DINUBA BLVD, 8 MILES NORTH OF VISALIA CITY LIMITS.	MAPPED ALONG DINUBA BLVD AT MILEAGE GIVEN; EXACT LOCATION UNKNOWN.	VERNAL POOL.	ENTIRE AREA NOW ORCHARDS OR HOMES.	SP SEEN IN 1941. NO PLANTS SEEN IN 1986; HABITAT ELIMINATED, SITE EXTIRPATED.	Extirpated as per aerial review. Confirmed by windshield survey on 08-05-2010.	No	Extirpated	Eliminated		
13	407	TUL	1	specific area	Presumed Extant	19950720	19950720	DFG-STONE CORRAL ER	EAST OF SCE POWER LINE ALONG THE NORTH SIDE OF HIGHWAY 201, ABOUT 0.75 MILE WEST OF SEVILLE.	THIS MAY REPRESENT THE TYPE LOCALITY. VAGUE HOOVER COLLECTION FROM "YETTEM" ATTRIBUTED HERE.	DEGRADED ALKALINE VERNAL POOLS IN VALLEY GRASSLAND, LEWIS CLAY LOAM SOIL. WITH ERYNGIUM SPINOSEPALUM, LILAEA SCILLOIDES, POLYPOGON MONSPELIENSIS, ELEOCHARIS MACROSTACHYA, CHAMAESYCE OCELLATA, ALOPECURUS SACCATUS, ALLOCARYA STIPITATA, ETC.	EXCESSIVE GRAZING, TRAMPLING, ENCROACHING AGRICULTURE, AND AGRICULTURAL RUNOFF. POWER LINES THROUGH WESTERNMOST POOL.	50 PLANTS SEEN IN 1981, 1100+ IN 1986 IN 3 POOLS. ABOUT 500 SEEN IN 1995. COMPLEX DRAINAGE PATTERNS AT THIS SITE.	North Yetten Unit, DFW Stone Corrals Ecological Reserve. Mapped 2 polygons on 08-05-2010 and 08-06-2010. Approximately 2,000 plants in 3,000 square meters.	8/6/2010	2,000 Plants in 2010	Present and Natural	Persistent	Protected

Appendix A-1: Current Status of Hoover's Spurge (*Chamaesyce hooveri*) in the Great Valley

California Natural Diversity Database, November 4, 2012														Witham, 2013					
EO	EONDX	KEY	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
14	2378	BUT	1	80 meters	Presumed Extant	19870824	19870824	TNC-VINA PLAINS PRESERVE	WURLITZER RANCH, JUST SOUTH OF HAILLE ROAD.	WURLITZER RANCH ADDITION TO TNC VINA PLAINS PRESERVE; 0.4 MILE EAST OF VANDERGRIFT LAKE AND 0.8 MILE SOUTHWEST OF THE INTERSECTION OF HIGHWAY 99 AND HAILLE ROAD.	LARGE VERNAL POOL SURROUNDED BY ANNUAL GRASSLAND. POOL BED DOMINATED BY ELEOCHARIS MACROSTACHYA AND ERYNGIUM VASEYI IN 1987.	CATTLE GRAZING IN WINTER PASTURE. POOL IS HEAVILY TRAMPLED.	FEWER THAN 20 PLANTS IN 1978; NO PLANTS SEEN IN EITHER 1986 OR 1987; THIS IS THE ONLY POOL IN THE AREA THAT IS HEAVILY TRAMPLED. NEEDS FIELDWORK. INCLUDES FORMER OCCURRENCE #6.	TNC Vina Plains Wurlitzer unit. Presumed extant. Habitat present, but no plants observed in 08-11-2011. Other nearby pools also surveyed with no success. Note that the CNDDB record has an incorrect date for the last time the element was seen, should be 1978-10-12.	8/11/2011	Presumed Extant	Present and Natural	Marginal	Protected
16	2381	TEH	6	specific area	Presumed Extant	1995XXXX	1995XXXX	TNC-VINA PLAINS PRESERVE	TNC VINA PLAINS PRESERVE; JUST N OF BARN APPROX 0.6-0.9 MI NNE OF THE INTERSECTION OF HWY 99 AND PINE CREEK RD, CHICO.	N POLY IS VINA PLAINS PRESERVE "POOL #17" (OLD #4); 2 E POLYS ARE POOL #22 (OLD #6) & POOL #37 (OLD #7); 3 S POLYS ARE POOL #35 (OLD #8), POOL #34 (OLD #9), & POOL #36 (OLD #10). POOL NUMBERING SYSTEM BY KING (1992).	ON ANITA CLAY IN GRASSLAND. ASSOCIATED WITH TUCTORIA GREENEI, ORCUTTIA PILOSA, ERYNGIUM VASEYI, ALLOCARYA STIPITATA, ASCLEPIAS FASCICULARIS, MARSILEA VESTITA, DOWNINGIA, CRYPSIS SCHOENOIDES, ALOEPECURUS SACCATUS, AND BOISDUVALIA.	CATTLE GRAZING IN WINTER PASTURE, HEAVY TRAMPLING, & COMPETITION FROM WEEDY EXOTICS & NATIVE ERYNGIUM THREATEN.	N POLY: >1000 PLANTS IN 1986, NONE IN 1990, 3900 ESTIMATED IN 1995. 2 E POLYS: <50 IN 1986, NONE IN EITHER 1990 OR 1995. 3 S POLYS: >2000 PLANTS IN 1986, ABUNDANT IN 1990, ~8600 ESTIMATED IN 1995. INCLUDES FORMER EOS #17 & 18.	TNC Vina Plains Pool #17. On 08-16-2011 approximately 300 plants observed primarily along north and west side of the pool.	8/16/2011	300 Plants in 2011	Present and Natural	Persistent	Protected
19	6869	GLE	5	specific area	Presumed Extant	20070916	20070916	USFWS-SACRAMENTO NWR	NE PORTION OF SACRAMENTO NATIONAL WILDLIFE REFUGE, JUST S OF GRAVEL PIT.	SE POLY (TC-1): 400 IN '92; 25 IN '97; 0 IN '98-'07. W POLY: N PART (TAB-4) HAD 200 IN '93, 30 IN '94, 0 IN '95-'07, S PART (TAB-5) HAD 150 IN '93, 0 IN '94-'97, 75 IN '98, 300 IN '99, 0 IN '00-'07. ADDITIONAL POP INFO AVAILABLE AT CNDDB.	VALLEY GRASSLAND/SEASONAL WETLANDS WITH ALKALI SCALDS, DEPRESSIONS AND SWALES. WILLOW CLAY OR RIZ SANDY LOAM. PLANTS IN DEPRESSIONS GROWING OUT OF CRACKS IN POOL BED. WITH GRINDELIA CAMPORUM, CRESSA TRUXILLENSIS, FRANKENIA GRANDIFOLIA, ETC.		SW POLY (TAB-3): 110 IN '93, 0 IN '94-'07. N POLY: W PART (TAB-1) HAD 1000 IN '92 & '93, 6 IN '06, 0 IN '07; E PART (TC-2, TC-3) HAD 50 IN '92, 960 IN '06, 190 IN '07. E POLY (TC-4): 140 IN '98, 250 IN '06, 60 IN '07. INCL FORMER EO #20.	Sacramento NWR. Surveyed on 07-12-2011 and found ~50 small plants in the northeastern two polygons of this 5-part occurrence. No plants were observed in the other three polygons.	7/12/2011	50 Plants in 2011	Present but Modified	Persistent	Protected
21	2231	GLE	1	specific area	Presumed Extant	20070915	20070915	USFWS-SACRAMENTO NWR	SACRAMENTO NATIONAL WILDLIFE REFUGE, ON E SIDE OF LOGAN CREEK.	AT THE BOTTOM OF A SHALLOW VERNAL POOL. THIS IS SAC NWR VERNAL POOL ID "P1.1-1".	VALLEY GRASSLAND/SEASONAL WETLANDS W/ALKALI SCALDS, DEPRESSIONS & SWALES. IN WILLOWS CLAY SOILS. GROWING OUT OF CRACKS IN POOL BED W/CRESSA TRUXILLENSIS, FRANKENIA GRANDIFOLIA, DISTICHLIS SPICATA, CRYPSIS, ERYNGIUM SP., ETC.		500 PLANTS IN 1992, 250 IN 1993, 1 IN 1994, 0 IN 1995 & 1996, 200 IN 1997, 300 IN 1998, 200 IN 1999, 0 IN 2000 & 2001, 90 IN 2002, 5 IN 2003, 39 IN 2004, 0 IN 2005-2007 (POOL DID NOT FILL WITH WATER IN 2007).	Sacramento NWR. Presumed extant. Habitat present, but no plants observed on 07-12-2011.	7/12/2011	Presumed Extant	Present but Modified	Declining	Protected
22	6416	MEF	1	nonspecific area	Presumed Extant	19870529	19870529	PVT	APPROX 4 MI NW OF MERCED NWR, BERT CRANE RANCHES, SUNRISE RANCH.	MAPPED IN SW QUARTER OF NW QUARTER OF SECTION 17.	IN MODERATELY SALINE-ALKALINE SOILS. SURROUNDING NON-NATIVE GRASSLAND WITH BROMUS MOLLIS, ERODIUM BOTRYS, & DISTICHLIS SPICATA.	MODERATE CATTLE GRAZING. THE CORP HAS PROPOSED FLOOD CONTROL LEVEES ON BEAR CREEK WHICH COULD IMPACT THIS SITE.	APPROX 25 PLANTS IN 1987. AREA RECEIVES HEAVY WATERFOWL AND SHOREBIRD USE.	Sunrise Ranch with USFWS easement. Presumed extant. Habitat present, but no plants observed 09-25-2010 or 09-22-2011.	9/22/2011	Presumed Extant	Present and Natural	Declining	Easement

Appendix A-1: Current Status of Hoover's Spurge (*Chamaesyce hooveri*) in the Great Valley

California Natural Diversity Database, November 4, 2012														Witham, 2013					
EO	EONDX	KEY	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
23	6858	BUT	2	specific area	Presumed Extant	19870804	19870804	PVT	VINA PLAINS, NORTHWEST OF CHICO; 0.5-0.9 MILE SOUTHWEST OF THE INTERSECTION OF HIGHWAY 99 AND CANA HIGHWAY.	2 SUBPOPULATIONS, 0.1 MILE APART; NE-MOST POOL STRADDLING A FENCELINE WHICH RUNS N-S THROUGH MIDDLE OF SECTION 23. OTHER SUBPOPULATION (SW POLY) IS AN ARTIFICIAL POND BEHIND AN EARTHEN LEVEE.	IN DEEPEST PORTION OF POOL BED WHICH HAD BEEN SCRAPED IN THE PAST BY A BULLDOZER. ASSOCIATED WITH CRYPSIS, MARSILEA VESTITA, PSILOCARPHUS BREVISSIMUS, DOWNINGIA, ETC. OTHER SUBPOP. ON BED OF ARTIFICIAL POND IN AN INTERMITTENT STREAM.	AREA HEAVILY GRAZED, ESPECIALLY EAST OF THE FENCE.	500 PLANTS IN NE-MOST POLYGON, ONLY 1 OF WHICH WAS E OF THE FENCE IN 1987. 30 PLANTS IN SW-MOST POLYGON IN 1987. LARGE POOL DRAINS INTO POND DURING PERIODS OF HIGH WATER.	S. Temple Land Co. Five small plants observed in northern polygon on 08-11-2011. The site is pretty weedy.	8/11/2011	5 Plants in 2011	Present and Natural	Declining	
24	2063	TEH	1	80 meters	Presumed Extant	19870803	19870803	PVT	VINA PLAINS, 1.9 MI SSW OF INTERSECTION OF HWY 99 AND ROWLES RD.	FOUND ONLY AT THE NORTHERN END OF THE POOL, AND SPECIFICALLY IN THE NW END WHERE ORCUTTIA PILOSA DENSITY WAS NOTICEABLY REDUCED.	VERNAL POOL IN ANNUAL GRASSLAND. WITH ALLOCARYA STIPITATA, ERYNGIUM VASEYI, WITH TUCTORIA GREENEI AND ORCUTTIA PILOSA.	CATTLE GRAZING IN WINTER PASTURE.	FEWER THAN 1000 PLANTS IN 1987. UNDER CURRENT GRAZING REGIME THIS POPULATION APPEARS LARGE AND PROBABLY STABLE.	TNC Vina Plains. Protected. Two small plants observed 08-15-2011.	8/15/2011	2 Plants in 2011	Present and Natural	Declining	Protected
25	2447	TUL	1	specific area	Presumed Extant	1992XXXX	1992XXXX	PVT	NORTH OF VISALIA, ABOUT 1 MILE SOUTHEAST OF SEQUOIA AIRFIELD.	APPROX. 0.7 MILE WEST OF DINUBA BLVD AND 0.2-0.35 MI NORTH OF 12TH AVENUE NORTH. 0.2-0.4 MILE SSW OF WINDMILL.	VERNAL POOLS SURROUNDED BY ANNUAL GRASSLAND. ASSOCIATED WITH EREMOCARPUS, POLYPOGON, SIDA, HORDEUM GENICULATUM, ERYNGIUM SPINOSEPALUM, DISTICHLIS SPICATA, LILAEA SCILLOIDES, HEMIZONIA PUNGENS, AND ANTHOXANTHUM ODORATUM.	CATTLE GRAZING IN WINTER PASTURE AND POTENTIAL CONVERSION TO IRRIGATED AGRICULTURE.	MORE THAN 10,000 PLANTS OBSERVED IN 1986, SEVERAL THOUSAND IN 1992 UNDER THE CURRENT GRAZING REGIME THIS POPULATION IS LARGE AND PROBABLY STABLE.	Sequoia Field Unit of DFW Stone Corral Ecological Reserve. Presumed extant. Habitat present, but no plants found 08-06-2010 and 06-06-2011. GPSed only likely pool in area.	6/6/2011	Presumed Extant	Present and Natural	Declining	Protected
26	2389	TEH	1	80 meters	Presumed Extant	19870811	19870811	PVT	ABOUT 6 MILES NORTHEAST OF VINA AND 2.5 MILES NORTHEAST OF THE END OF REED ORCHARD ROAD.	MAPPED JUST EAST OF DEER CREEK ON THE WEST SIDE OF DEER CREEK IRRIGATION DITCH.	VERNAL POOL SURROUNDED BY ANNUAL GRASSLAND AND OPEN BLUE OAK WOODLAND. ASSOCIATED WITH ERYNGIUM VASEYI, ELEOCHARIS MACROSTACHYA, DOWNINGIA, ALOPECURUS SACCATUS, TRICHOSTMA LANCEOLATUM, CRYPSIS SCHOENOIDES, AND AMARANTHUS ALBUS.	CATTLE GRAZING IN WINTER PASTURE. COMPETITION FROM WEEDY EXOTIC, CRYPSIS.	MORE THAN 1000 PLANTS OBSERVED IN 1987. UNDER CURRENT GRAZING REGIME THIS POPULATION IS LARGE AND PROBABLY STABLE. POPULATION MAY DECLINE IF GRAZING INCREASES.	Leninger 3 Ranch with TNC easement. Presumed extant from aerial photography review. Protected.	No	Presumed extant	Present and Natural	Unknown	Easement
27	2373	TEH	1	80 meters	Presumed Extant	19870804	19870804	PVT	ABOUT 2.5 MILES NORTHEAST OF VINA, LOWERMOST (WEST) POOL IN THE SERIES OF FIVE LANIGER LAKES.		VERNAL POOL ALONG INTERMITTENT DRAINAGE SURROUNDED BY ANNUAL GRASSLAND. ASSOCIATED WITH ERYNGIUM VASEYI, DOWNINGIA, ALLOCARYA STIPITATA, BOISDUVALIA CLEISTOGAMA, PSILOCARPHUS BREVISSIMUS, ELEOCHARIS MACROSTACHYA, AND NAVARRETIA.	CATTLE GRAZING IN WINTER PASTURE.	FEWER THAN 50 PLANTS SEEN IN 1987. THE AREA WILL REMAIN IN DRY PASTURE IN THE FORSEEABLE FUTURE, BUT UNDER THE CURRENT GRAZING REGIME THIS IS A MARGINAL POPULATION.	Peak Ranch with TNC easement. Presumed extant from aerial photography interpretation. Protected.	No	Presumed Extant	Present and Natural	Unknown	Easement

Appendix A-1: Current Status of Hoover's Spurge (*Chamaesyce hooveri*) in the Great Valley

California Natural Diversity Database, November 4, 2012														Witham, 2013					
EO	EONDX	KEY	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
28	2368	TEH	5	specific area	Presumed Extant	19950623	19950623	PVT	VINA PLAINS, ABOUT 1 MILE SSW TO 1.6 MILES SOUTH OF JUNCITON OF HIGHWAY 99 AND ROWLES ROAD.	FIVE POOLS WITH CHAMAESYCE HOOVERI.	VERNAL POOLS. ASSOCIATED WITH ORCUTTIA PILOSA, ERYNGIUM VASEYI, BOISDUVALIA GLABELLA, DOWNINGIA, ALLOCARYA STIPITATA, PSILOCARPHUS BREVISSIMUS, CONVOLVULUS ARVENSIS, AND ASCLEPIAS FASCICULARIS.	CATTLE GRAZING IN WINTER PASTURE.	OBSERVED IN ALL 5 POOLS IN 1986; SUB-POPULATION SIZE RANGED FROM FEWER THAN 25 PLANTS IN THE S-MOST POOL TO FEWER THAN 1000 IN THE OTHER 4 POOLS. IN GENERAL, UNDER THE CURRENT GRAZING REGIME THE SUB-POPS ARE LARGE AND PROBABLY STABLE.	TNC Vina Plains. Protected. Plants observed in all 5 pools on 08-17-2011. The northeastern pool had several 1,000 plants ranging down to ~50 plants in the southernmost pool.	8/17/2011	>1,000 Plants in 2011	Present and Natural	Persistent	Protected
29	2374	TEH	1	80 meters	Presumed Extant	19870804	19870804	PVT	ABOUT 3.75 MILES NNE OF VINA AND 0.8 MILE NORTHEAST OF THE UPPERMOST (EAST) OF THE FIVE LANIGER LAKES.	MAPPED IN THE NW 1/4 OF THE NW 1/4 OF SECTION 31.	VERNAL POOL SURROUNDED BY ANNUAL GRASSLAND. ASSOCIATED WITH MARSILEA VESTITA, ERYNGIUM VASEYI, DOWNINGIA, ALLOCARYA STIPITATA, EREMOCARPUS, AMARANTHUS ALBUS, ELEOCHARIS MACROSTACHYA, BOISDUVALIA CLEISTOGAMA, AND NAVARRETIA LEUCOCEPHALA.	CATTLE GRAZING IN WINTER PASTURE.	A FEW HUNDRED PLANTS OBSERVED HERE IN 1987. SIGNIFICANT CHANGE IN GRAZING REGIME OR BREACHING OF ADJACENT LEVEE MAY IMPACT THIS POPULATION.	Possibly extirpated from aerial photography interpretation. Half of the pool was destroyed prior to 2005 imagery. It looks like it may be converting to marsh vegetation. Unable to gain access.	No	Possibly Extirpated	Present but Modified	Likely Declining	
30	1616	BUT	1	80 meters	Presumed Extant	19870803	19870803	PVT	VINA PLAINS; 2.3 MI SSW OF INTERSECTION OF HWY 99 AND ROWLES ROAD.	ON E SIDE OF SP RR.	VERNAL POOL FORMED IN AN INTERMITTENT DRAINAGE BEHIND THE ELEVATED GRADE OF THE RAILROAD. ASSOCIATED WITH CRYPSIS, ELEOCHARIS, AND PROBOSCIDEA LOUSIANICA.	CATTLE GRAZING IN WINTER PASTURE.	AT LEAST 10,000 PLANTS IN 1987. A 1938 COLLECTION BY HOOVER FROM "4 MILES SE OF VINA" ATTRIBUTED TO THIS SITE.	TNC Vina Plains, Wurlitzer Unit. Protected. Marginal habitat present 08-15-2011, but no plants were observed. Also looked in a pool southeast of this occurrence with no success.	8/15/2011	Presumed Extant	Present but Modified	Marginal	Protected
31	32044	TUL	2	specific area	Presumed Extant	19970619	19970619	PVT, DFG-STONE CORRAL ER	SSE OF SEQUOIA FIELD (AIRPORT), ABOUT 1 MI EAST OF DINUBA BLVD (HWY 63) AND 0.5 MI NORTH OF 12TH AVE, NORTH OF VISALIA.	TWO COLONIES; ONE WITHIN THE NW 1/4 SW 1/4 SECTION 19, THE SECOND IS WITHIN THE SW 1/4 NW 1/4 SECTION 19.	SHALLOW POOL WITH AN AREA OF APPROXIMATELY 350 SQ. METERS.	MODERATE GRAZING AT THIS SITE. COULD BE THREATENED BY CONVERSION TO IRRIGATED AGRICULTURE.	ABOUT 50 PLANTS IN 1992. AT LEAST PART OF SITE WITHIN DFG STONE CORRAL ECOLOGICAL RESERVE. UNKNOWN NUMBER OF PLANTS SEEN IN 1997. MORE INFORMATION NEEDED.	Sequoia Field Unit of DFW Stone Corral Ecological Reserve. One plant observed on 08-05-2010 and 50 plants were observed on 06-06-2011.	6/6/2011	50 Plants in 2011	Present and Natural	Persistent	Protected
32	32048	TUL	1	80 meters	Presumed Extant	19920630	19920630	PVT	1.4 MI NNW OF TAURUSA SCHOOL, 0.5 MI W OF TAURUSA RD (ROAD 140), 0.7 MI S OF ELKHORN AVE (AVE 368).	NW 1/4 OF SE 1/4 OF SECTION 16.	IN 3 POOLS WITH ERYNGIUM, XANTHIUM SPINOSUM, EREMOCARPUS, TRICHOSTEMMA, CRYPSIS, MARSILEA, & PSILOCARPHUS.	LAND CONVERSION AND EXCESS IRRIGATION RUNOFF THREATEN.	AT LEAST 800 PLANTS IN 1992.	Air Chief Unit of DFW Stone Corral Ecological Reserve. Two polygons mapped 08-05-2010. West polygon with 25 plants. East polygon with 1,500 plants in an area of approximately 600 square meters. No pool at CNDDB polygon.	8/5/2010	>1,500 Plants in 2010	Present and Natural	Persistent	Protected
33	32049	TUL	1	80 meters	Presumed Extant	19920614	19920614	DFG-STONE CORRAL ER, PVT	1 MILE SE OF YETTEM, 0.25 MI N OF AVE 376, JUST E OF ROAD 144. 0.7 MI S OF SAINT MARIES CHURCH.	JUST OPPOSITE SOUTH ENTRANCE OF JACOBI DAIRY.	ASSOCIATED WITH CRYPSIS AND AMARANTH.	LAND NEARBY AND POSSIBLY THIS SITE (?) WAS DISKED AND DRY FARMED IN 1980 OR 1981. LAND USED FOR CATTLE GRAZING.	APPROX. 350 PLANTS IN 1992.	Road 144 Unit of DFW Stone Corral Ecological Reserve. On 08-06-2010, six plants were found in one of the three pools. Population was GPSed as were the boundaries of the three pools. Threatened by runoff from dairy across the road. No plants observed 06-06-2011 and several Glyceria declinata plants were observed.	6/6/2011	6 Plants in 2010	Present and Natural	Declining	Protected

Green highlighting indicates new data.

Appendix A-1: Current Status of Hoover's Spurge (*Chamaesyce hooveri*) in the Great Valley

California Natural Diversity Database, November 4, 2012														Witham, 2013					
EO	EONDX	KEY	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
34	72457	GLE	1	80 meters	Presumed Extant	20070916	20070916	USFWS-SACRAMENTO NWR	SACRAMENTO NATIONAL WILDLIFE REFUGE, ~0.8 AIR MI WSW OF THE GRAVEL PIT, WILLOWS.	THIS IS SACRAMENTO NWR VERNAL POOL ID: TAB-6.	ASSOCIATES INCLUDE CRYPSIS SCHOENOIDES, CRESSA TRUXILLENSIS, DISTICHLIS SPICATA, SCHOENOPLECTUS MARITIMUS, ERYNGIUM VASEYI, & FRANKENIA SALINA.		100 PLANTS IN 1996, 400 IN 1997, 70 IN 1998, 0 IN 1999-2001, 425 IN 2002, 900 IN 2003, 1380 IN 2004, 80 IN 2005, 0 IN 2006, 9 IN 2007.	Sacramento NWR. Presumed extant based on aerial photography interpretation. Being monitored by Joe Silveira.	No	Presumed Extant	Present but Modified	Unknown	Protected
35	72458	GLE	1	80 meters	Possibly Extirpated	20070921	1994XXXX	USFWS-SACRAMENTO NWR	SACRAMENTO NATIONAL WILDLIFE REFUGE, ~1.6 AIR MILES ENE OF NORMAN, WILLOWS.	THIS IS SACRAMENTO NWR VERNAL POOL ID: T18-2.	LOCALIZED POP GROWING IN CRACKS IN ALKALI CLAY ON THE DRY BED OF A VERNAL POOL. 40% BARE GROUND WITH ABUNDANT CRESSA TRUXILLENSIS WITH VERY LITTLE SMALL/IMMATURE/STUNTED GRINDELIA CAMPORUM V. CAMPORUM AND CENTROMADIA PARRRYI SSP. RUDIS.		100 PLANTS IN 1993, 40 IN 1994, 0 IN 1995-2007.	Possibly extirpated. Habitat present, but no plants observed 07-12-2011. No plants seen since 1994.	7/12/2011	Possibly Extirpated	Present but Modified	Declining	Protected
N1		TEH						Private	Second Laniger Lake from the northeast.	Visited with LSA botanical staff in the spring of 2003. Map was obtained from Ken Whitney, but report was not.	Needs field work.		1 Plant in 2003.	Hamilton Ranch proposed bank. Presumed Extant based on aerial photography interpretation. Access denied.	No	Presumed Extant	Present and Natural	Unknown	Proposed for Bank
N2		TUL						RR Right-of-Way	Along abandoned RR tracks 0.4-0.6 miles northwest of its intersection with Highway 201.	Extends along RR tracks for 0.2 miles and into new orchard to northeast.	Plants are actually growing on the crown of the RR berm and in irrigated orchards to the northeast. Occurring with Chamaesyce ocellata, Centaurea solstitialis and Crypsis.	Herbicides are probably the biggest threat to this population.	100s large plants observed in this unusual occurrence.	Extant.	8/5/2010	100s Plants in 2010	Totally Modified	Unknown	

Appendix A-2: Current Status of Colusa Grass (*Neostapfia colusana*) in the Great Valley

California Natural Diversity Database, November 4, 2012														Witham, 2013					
EO	EONDX	KEY	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
1	2713	MEP	1	specific area	Presumed Extant	19860611	19860611	PVT, TNC	WEST OF BURNS CREEK ABOUT 1/2 MILE, 4.5 MILES NORTH OF PLANADA, FLYING M RANCH.	MAPPED IN THE SW 1/4 OF THE SW 1/4 OF SECTION 35.	LARGE PLAYA SURROUNDED BY ANNUAL GRASSLAND. ASSOCIATED WITH ORCUTTIA INAEQUALIS, ALLOCARYA STIPITATA, ERYNGIUM VASEYI, BOISDUVALIA, ALOPECURUS, NAVARRETIA, PSILOCARPHUS, SIDA, EREMOCARPUS, LASTHENIA, ETC. SOIL MAPPED AS RAYNOR COBBLY CLAY.	LIGHT GRAZING IS ONLY DISTURBANCE.	THOUSANDS OF PLANTS OBSERVED BY GUNN IN 1980. FEWER THAN 1000 PLANTS OBSERVED IN 1986. SITE IS PART OF A CONSERVATION EASEMENT HELD BY THE NATURE CONSERVANCY.	Flying M Ranch under TNC easement. Surveyed 09-26-2010. Habitat present, but no plants found. Orcuttia inaequalis doing well.	9/26/2010	Presumed Extant	Present and Natural	Declining	Easement
2	2412	STA	6	specific area	Presumed Extant	20010731	20010731	PVT	HICKMAN VERNAL POOLS, 1.4-4 MILES WEST OF TURLOCK LAKE. MOSTLY SOUTH OF LAKE ROAD.	SERIES OF LARGE INTERMITTENT LAKES INCLUDING SEVERAL SMALLER, HYDROLOGICALLY CONNECTED, VERNAL POOLS. N-MOST POLY: 200 IN 1981, <1000 IN 1986 & 1987, NONE IN 2001. POLYGON ON LAKE RD: HUNDREDS IN 1981,1986,1989; <50 IN 1987; NONE IN 2001.	VERNAL LAKES, POOLS, AND ARTIFICIAL PONDS WITH A TOTAL AREA OF 600 ACRES. ASSOCIATES INCLUDE ORCUTTIA PILOSA, CHAMAESYCE HOOVERI, LIPPIA NODIFLORA, SIDA HEDERACEA, CRYPSIS SCHOENOIDES, EREMOCARPUS, ET AL. SOILS MAPPED AS MEIKLE CLAY.	ALTERED HYDROLOGY, GRAZING, CATTLE TRAMPLING, COMPETITION FROM WEEDS, DISKING, AND PLANTING OF BUR CLOVER.	IN 1988 DENSE, NEARLY PURE STANDS ON BOTTOMS & DRYING MARGINS OF MOST LARGER POOLS, FEW TO DENSE STANDS IN SMALLER POOLS. MILLIONS OF PLANTS IN 2001. INCLUDES FORMER OCCURRENCES #3, 16, 25, 28, 35, & 44. FORMER OCC #35 POSSIBLY EXTIRPATED.	Hickman Vernal Pools inundated well into summer in both 2010 and 2011. Habitat is converting to a marsh due to agricultural runoff from surrounding orchards. Primary population is possibly extirpated. The 100 plants reported are from a small polygon north of Lake Road surveyed on 09-02-2010.	9/2/2010	100 Plants in 2010	Present but Modified	Declining	
4	2789	STA	3	specific area	Presumed Extant	20090902	20090902	PVT	NEAR CORRAL ON RODDEN RANCH, 3 MILES SOUTHWEST OF LA GRANGE IN 2 SMALL POOLS NORTH OF SMALL RESERVOIR.	MAPPED JUST EAST OF WINDMILL AND WITHIN THE NW 1/4 OF THE NE 1/4 OF SECTION 26.	VERNAL POOLS AND OR ARTIFICIAL PONDS SURROUNDED BY ANNUAL GRASSLAND. IN A DEEP DRAINAGE AREA - PLANTS MUCH GREENER HERE THAN ELSEWHERE ON PROPERTY; NO CRYPSIS IN POOL (HOGLE, 2001). PENTZ GRAVELLY LOAM SOIL.	POOL HAS BEEN PLOWED FOR GRAINFIELD IN 1981. HEAVY GRAZING AND WEED COMPETITION.	~200 PLANTS SEEN IN 1981. HABITAT OBSERVED AT A DISTANCE IN 1986; APPEARED INTACT BUT HEAVILY GRAZED. <10,000 PLANTS SEEN IN 2001. ~100 PLANTS SEEN IN 2009 IN LARGER POOL; NOT SEEN IN 2 SMALLER POOLS, POSSIBLY BECAUSE IT WAS A DRY YEAR.	Rodden Ranch. Presumed extant. Had been visited by Rob Preston in 2009 with ~100 plants seen.	No	Presumed Extant	Present and Natural	Unknown	
5	14368	STA	2	specific area	Presumed Extant	20010908	20010908	PVT	RODDEN RANCH NEAR CANAL, 1.2 MILES ENE OF WHERE CRABTREE ROAD CROSSES MODESTO MAIN CANAL.	TWO POOLS MAPPED; ONE IN THE NW 1/4 OF THE NW 1/4 OF SECTION 30 AND ONE IN THE NE 1/4 OF THE NE 1/4 OF SECTION 25.	TWO LARGE VERNAL POOLS SURROUNDED BY ANNUAL GRASSLAND. ASSOCIATED WITH EREMOCARPUS SETIGERUS, ERYNGIUM VASEYI, HORDUEM, ALLOCARYA, NAVARRETIA, BOISDUVALIA, ALOPECURUS, AND HEMIZONIA. SOIL MAPPED AS MEIKLE CLAY.	HEAVY CATTLE GRAZING AND POTENTIAL CONVERSION TO IRRIGATED AGRICULTURE.	MENTIONED AS ABUNDANT AT BOTH POOLS IN 1986; UNDER CURRENT GRAZING REGIME THIS POPULATION IS DAMAGED BUT LARGE AND PROBABLY STABLE. IN 2001, 50,000 PLANTS IN EASTERN POOL, AND 1 MILLION PLANTS IN THE WESTERN POOL.	Presumed extant based on aerial interpretation. Clearly posted and unable to gain access.	No	Presumed Extant	Present and Natural	Unknown	
6	14403	STA	1	specific area	Possibly Extirpated	20010908	1962XXXX	PVT	ABOUT 1.1 MILES EAST OF THE JUNCTION OF HWY 132 AND LAKE ROAD, NORTHEAST OF TURLOCK LAKE AND NORTH OF TUOLUMNE RIVER.	MAPPED IN THE NW 1/4 OF THE SW 1/4 OF SECTION 26.	ORIGINALLY A VERNAL POOL, NOW AN IRRIGATED FIELD (2001). PENTZ GRAVELLY LOAM SOILS.	HEAVY GRAZING, WEED COMPETITION. IRRIGATION RUNOFF HAS ALTERED THE HYDROLOGY OF THE VERNAL POOL.	INDIVIDUALS VERY SPARSE WHEN OBSERVED BY PERRY ALLEN IN 1962. NO PLANTS SEEN IN 1986 BY R. STONE OR BY HOGLE IN 2001; SITE BELIEVED TO BE EXTIRPATED. SITE IS NOW A SMALL DEPRESSION THAT IS NOW A PERMANENT POND DUE TO IRRIGATION RUNOFF.	Extirpated	No	Extirpated	Eliminated		

Appendix A-2: Current Status of Colusa Grass (*Neostapfia colusana*) in the Great Valley

California Natural Diversity Database, November 4, 2012														Witham, 2013					
EO	EONDX	KEY	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
7	2788	STA	1	80 meters	Possibly Extirpated	20010817	1969XXXX	PVT	N OF TUOLUMNE RIVER AND HWY 132 ABOUT 3 MI WEST OF LA GRANGE, 1.4 MI NE OF MODESTO MAIN CANAL CROSSING OF RAIRDEN GULCH.	POOL IS NEAR A FENCE AND MAPPED SOUTH AND EAST OF UNPAVED ROADS IN THE E 1/2 OF THE NE 1/4 OF SECTION 22.	IN SMALL VERNAL POOL ALONG A MINOR DRAINAGEWAY AND SURROUDED BY ANNUAL GRASSLAND. SOIL MAPPED AS BEAR CREEK LOAM.	INTENSIVE CATTLE GRAZING AND POTENTIAL CONVERSION TO IRRIGATED AGRICULTURE.	SITE REPORTED BY ALLEN IN 1969. NOT VISITED BY BIOSYSTEMS ANALYSIS, INC. SURVEYS IN 1986-1987 DUE TO INACCESSIBILITY OF PVT PROPERTY. HOGLE SEARCHED SITE EXTENSIVELY IN 2001 & FOUND NO VERNAL POOLS, HYDROLOGY MAY HAVE BEEN ALTERED.	Unknown. From aerial interpretation, this may be mis-mapped. Extensive habitat to the west. Unable to gain access to this private property. Hogle unable to locate in 2001.	No	Presumed Extant	Potentially Mis-mapped	Unknown	
8	22379	STA	1	80 meters	Presumed Extant	19860831	19860831	PVT	NE OF TURLOCK LAKE AND NORTH OF TUOLUMNE RIVER, ABOUT 0.5 MILE EAST OF MODESTO MAIN CANAL CROSSING OF RAIRDEN GULCH.	JUST SOUTH OF UNPAVED ROAD IN THE NW 1/4 OF THE NE 1/4 OF SECTION 27.	VERNAL POOL SURROUNDED BY ANNUAL GRASSLAND AND OPEN QUERCUS DOUGLASII WOODLAND. DEPAUPERATE NEOSTAPFIA PLANTS SCATTERED OVER POOL BED WITH MARSILEA VESTITA. ASSOCIATED WITH CHAMAESYCE HOOVERI AND EREMOCARPUS ON WHITNEY SANDY LOAMS.	CATTLE GRAZING AND TRAMPLING.	SITE VISITED IN 1983; TOO FULL TO SEE SPECIES. 1000 PLANTS OBSERVED IN 1986 BY STONE; SITE TOO DAMAGED TO COLLECT. SITE SEVERELY GRAZED AND TRAMPLED; UNDER CURRENT GRAZING REGIME THIS POPULATION IS DAMAGED AND PROBABLY DECLINING.	Presumed extant. Habitat present in aerial review. Site is posted and I was unable to gain access.	No	Presumed Extant	Present and Natural	Unknown	
9	22277	STA	1	1/5 mile	Extirpated	19860901	19380710	UNKNOWN	NORTH OF HWY 132 AND NORTH OF MODESTO MAIN CANAL IN VICINITY OF RUSHING ROAD.	MAPPED ACCORDING TO CNPS MAP BY PERRY ALLEN. SITE IS APPRENTLY BASED ON COLLECTIONS LABELED "12 MILES WEST OF WATERFORD".		VARIOUS AGRICULTURAL ACTIVITIES INCLUDING A GRAINFIELD, IRRIGATED PASTURE, AND CATTLE GRAZING.	SITE IS KNOWN FROM TWO COLLECTIONS BY HOOVER; JULY 10, 1938 (#3623) AND JUNE 11, 1936 (#1297). NEOSTAPFIA IS PRESUMED EXITIRPATED DUE TO ELIMINATION OF HABITAT. SEE MAP IN CNDDB FILES.	Extirpated. No habitat observed nearby on aerial photos.	No	Extirpated	Eliminated		
11	2304	STA	3	specific area	Presumed Extant	20010816	20010816	PVT	6 MILES EAST OF WATERFORD ALONG BOTH SIDES OF DIENSTAG ROAD & SOUTH OF MODESTO LAKE.	THREE COLONIES; ONE ON THE EAST SIDE OF THE ROAD ABOUT 0.2 MILE NORTH OF HWY 132, AND 2 ON THE WEST SIDE OF THE ROAD ABOUT 0.2 AND 0.5 MILE NORTH OF THE HIGHWAY.	VERNAL POOLS IN ANNUAL GRASSLAND. ASSOCIATED WITH ELEOCHARIS MACROSTACHYA, EREMOCARPUS SETIGERUS, MARSILEA VESTITA, RUMEX CRISPUS, TRICHOSTEMA LANCEOLATUM, ERYNGIUM, POLYPOGON, MOLLUGO, HEMIZONIA, AMARANTHUS, AND BERGIA. MIEKLE CLAY SOILS.	WESTERN COLONIES EXTIRPATED DUE TO ESTABLISHMENT OF ALMOND ORCHARD; E COLONY THREATENED BY GRAZING, ALTERED HYDROLOGY.	SITES WEST OF ROAD FORMERLY ASSOCIATED WITH ORCUTTIA PILOSA AND O. INAEQUALIS. 1000 PLANTS OBSERVED BY HOGLE IN 2001, ONLY ONE OF 3 HISTORIC COLONIES REMAINING. THIS POPULATION INCLUDES FORMER OCCURRENCE #30.	Extirpated. Was deep ripped on 09-04-2010. Reported to regulatory agencies as a possible violation. See Appendix B.	9/4/2010	Extirpated	Eliminated		Reported
12	22275	MEF	1	1 mile	Possibly Extirpated	19860707	19430528	PVT	ABOUT 1 MILE SOUTHWEST OF LAKE YOSEMITE (VIRGINIA LAKE FIELD), SAN JOAQUIN VALLEY.	EXACT SITE UNKNOWN. STONE AND ERZINGER REPORT TWO PROBABLE LOCATIONS; W 1/2 OF SECTION 4 AND W 1/2 OF SE 1/4 OF SECTION 32.	DRIED DUCK POND.	ONE SITE RECEIVES IRRIGATION RUNOFF AND HAS CONVERTED TO FRESHWATER MARSH, SECOND SITE IS UNDER IRRIGATED AGRICULTURE.	NEOSTAPFIA COLUSANA IS PROBABLY EXTIRPATED FROM ORIGINAL COLLECTION SITE DUE TO HABITAT MODIFICATION.	Extirpated	No	Extirpated	Eliminated		
13	2792	COL	1	nonspecific area	Extirpated	19860825	18980526	PVT	NEAR PRINCETON, ALONG STAGE ROAD TO NORMAN.	EXACT SITE UNKNOWN. MAPPED AT CNDDB ALONG THE ROAD BETWEEN PRINCETON AND NORMAN, EAST OF THE COUNTY LINE.	RAIN-POOLS ON THE HARD, UNCULTIVATED, ALKALI "GOOSE-LANDS" BESIDE THE STAGE ROAD.	MUCH OF REGION WEST OF PRINCETON AND EAST OF COUNTY LINE IS NOW IN IRRIGATED RICE FIELDS.	TYPE LOCALITY. REMAINING ALKALI PLAYAS IN THIS AREA ARE DOMINATED BY A WEEDY, NON-NATIVE GRASS, CRYPSIS SCHOENOIDES. CRAMPTON INDICATES THAT NEOSTAPFIA NO LONGER EXISTS IN COLUSA COUNTY.	Extirpated	No	Extirpated	Eliminated		

Appendix A-2: Current Status of Colusa Grass (*Neostapfia colusana*) in the Great Valley

California Natural Diversity Database, November 4, 2012													Witham, 2013					
EO	EONDX	KEY	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
14	2738	MER	1	80 meters	Presumed Extant	19860706	19860706	PVT	SMITH RANCH, ABOUT 2 MILES WNW OF HAYSTACK MOUNTAIN AND 0.35 MILE WEST OF BLACK RASCAL CREEK.	MAPPED AT SMALL POND IN THE N 1/2 OF THE NE 1/4 OF SECTION 30.	VERNAL POOL SURROUNDED BY AN ANNUAL GRASSLAND. ASSOCIATED WITH ERYNGIUM VASEYI, EREMOCARPUS SETIGERUS, DESCHAMPSIA, PSILOCARPHUS, ALLOCARYA, BOISDUVALIA, DOWNINGIA, AND LASTHENIA. SOILS MAPPED AS KEYES-PENTZ GRAVELLY LOAMS.	MODERATE CATTLE GRAZING ALTHOUGH PROBABLY NOT A LIMITING FACTOR IN POPULATION SIZE AT THIS SITE.	SITE FIRST REPORTED BY GUNN 1980. 39 PLANTS SEEN BY STONE AND ERZINGER IN 1986 (BIOSYSTEMS ANALYSIS INC, 1988).	Virginia Smith Trust with TNC conservation easement. Surveyed 09-21-2011. Habitat present, but no plants found.	9/21/2011	Presumed Extant	Present and Natural	Marginal	Easement
15	2741	MER	1	80 meters	Possibly Extirpated	19860706	198006XX	PVT	SMITH RANCH, ABOUT 2.5 MILES WNW OF HAYSTACK MOUNTAIN AND NEAR WINDMILL WHICH IS ADJACENT TO BENCHMARK 358'.	SOUTH SIDE OF ROAD IN THE SE CORNER OF THE NW 1/4 OF SECTION 19.	ARTIFICIAL POND FORMED BEHIND AND EARTHEN LEVEE IN ANNUAL GRASSLAND.	CATTLE GRAZING.	NO PLANTS SEEN IN 1986. SITE REPORTED TO BE THOROUGHLY TRAMPLED AND COMPLETELY DEVOID OF VEGETATION.	Virginia Smith Trust with TNC conservation easement. Surveyed 09-21-2011. Habitat present, but no plants found.	9/21/2011	Presumed Extant	Stockpond	Marginal	Easement
17	12162	MER	1	80 meters	Presumed Extant	19860612	19860612	PVT	FLYING M RANCH, EAST SIDE OF UNPAVED ROAD ABOUT 1.4 MILES WNW OF HAYSTACK MOUNTAIN.	IMMEDIATELY ALONG ROADSIDE IN THE SW 1/4 OF THE SE 1/4 OF SECTION 20.	VERNAL POOL ALONG BED OF INTERMITTENT STREAM SURROUNDED BY ANNUAL GRASSLAND. ASSOCIATED WITH ERYNGIUM VASEYI, ALLOCARYA STIPITATA, BOISDUVALIA, PSILOCARPHUS, VERONICA, HORDEUM, AND SIDALCEA. SOILS MAPPED AS PENTZ GRAVELLY LOAM.	LIGHT GRAZING; UNDER CURRENT CONDITIONS SITE IS PROBABLY STABLE.	FEWER THAN 50 PLANTS SEEN IN BY GUNN IN 1980, ABOUT 1000 PLANTS SEEN IN 1986 BY STONE AND CLIFTON.	Flying M. Presumed extant. Surveyed 09-26-2010. Very marginal habitat present, but no plants found.	9/26/2010	Presumed Extant	Present and Natural	Marginal	
18	6279	MER	1	80 meters	Presumed Extant	19920618	19920618	PVT	IN POOL, 0.9 MILE WNW OF HAYSTACK MOUNTAIN, FLYING M RANCH.	MAPPED AT INTERMITTENT POOL IN THE NE 1/4 OF THE NE 1/4 OF SECTION 29.	LARGE VERNAL POOL ON PETERS CLAY UNDERLAIN BY WELL-CEMENTED TUFFACEOUS DEPOSITS WITHIN VALLEY GRASSLAND. NEARLY SOLID STAND OVER ENTIRE BED WITH EREMOCARPUS. POOL MARGIN ASSOCIATES INCLUDE NAVARRETIA, ALLOCARYA, LASTHENIA, DOWNINGIA, ETC.	THREATS ARE NONE IF AREA STAYS IN RANGELAND ACCORDING TO BURNHAM (1981).	10,000+ PLANTS IN 1981 AND 1985. ABUNDANT IN 1986. UNKNOWN NUMBER OF PLANTS SEEN BY JOKERST IN 1992. ORCUTTIA INAEQUALIS ALSO REPORTED FROM THIS SITE.	Presumed Extant. Stockpond in center of the large Flying M Ranch.	No	Presumed Extant	Stockpond	Unknown	
19	6794	SOL	1	specific area	Presumed Extant	2007XXXX	2007XXXX	SOLANO LAND TRUST	OLCOTT LAKE, ON EAST SIDE OF COOK LANE WITHIN JEPSON PRAIRIE.	JUST SOUTH OF & AT THE EAST-WEST FENCE IN MID-LAKE. FORMERLY TNC'S JEPSON PRAIRIE PRESERVE; TRANSFERRED TO SOLANO COUNTY FARMLANDS & OPEN SPACE ON 8/97. TNC RETAINS CONSERVATION EASEMENT. POPULATION FLUCTUATES WITH WEATHER & GRAZING.	PLAYA-TYPE LAKE ON PESCADERO CLAY SOILS. WITH FRANKENIA SALINA, DISTICHLIS SPICATA NANA, LYTHRUM HYSSOPIFOLIA, PHYLLA NODIFLORA, CRESSA TRUXILLENSIS VALLICOLA, ERYNGIUM ARISTULATUM, MALVELLA LEPROSA, AND ELEOCHARIS MACROSTACHYA.	SHEEP GRAZING (FORMER THREAT) & INVASIVE PHYLLA NODIFLORA THREATEN. SITE NOT GRAZED IN 1995-1999.	1980: 1001-10000 PLANTS; '82: 10000+; '85: 3.7 MIL; '91: 15000; '92: >100,000; '93: 10000; '94: 1000; '95: >1 MIL; '96: 30000; '97: 20000; '98: ~1 MIL; '99: 50000; '00: 100,000; '01: 10000; '02-04: 100,000; '05: 1000+; '06: 100+; '07: NONE.	Olcott Lake. This population has been monitored annually since 1989 by volunteers organized by Carol Witham. '08: 10,000s; ,09: 1,000s; '10: ~100,000; '11: had been mistakenly grazed prior to monitoring; '12: 1,000s. The dataset from this monitoring is available for analysis.	8/25/2012	Extant	Present and Natural	Persistent	Protected
20	19992	STA	1	specific area	Presumed Extant	20010731	20010731	PVT	EAST OF TURLOCK LAKE, 0.8 MILE NNE OF LAKE ROAD CROSSING OF TURLOCK MAIN CANAL.	MAPPED 400 METERS NORTH OF BENCHMARK 248. WITHIN THE SW 1/4 OF THE SE 1/4 OF SECTION 33.	VERNAL POOL WITH NEAR "MONOCULTURE" OF NEOSTAPFIA. ASSOCIATED WITH CRYPSIS SCHOENOIDES, MARSILEA VESTITA, CYNODON DACTYLON, JUSSIAEA REPENS, AND LIPPIA NODIFLORA. MEIKLE CLAY SOIL.	GRAZING & TRAMPLING BY CATTLE; PLANTS NOT GROWING IN HOOFPRINTS WITHIN POOL. CONVERSION TO IRRIGATED AGRICULTURE; WEEDS.	IN GOOD SHAPE IN 1979, ABUNDANT IN DENSE STAND ON POOL BOTTOM IN 1987, NO STANDING WATER OR PLANTS IN 1988. MILLIONS OF PLANTS IN "MONOCULTURE" SEEN IN 1989, EXOTIC PLANTS IN POOL. 14 PLANTS IN 2001, ORCHARD ENCROACHING ON POOL.	Extirpated. Visited 09-02-2010 and it was being filled for agricultural production. Reported to regulatory agencies as a possible violation. See Appendix B.	9/2/2010	Extirpated	Eliminated		Reported

Green highlighting indicates new data.

Appendix A-2: Current Status of Colusa Grass (*Neostapfia colusana*) in the Great Valley

California Natural Diversity Database, November 4, 2012														Witham, 2013					
EO	EONDX	KEY	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
22	6322	STA	1	1 mile	Extirpated	19870904	19370622	PVT	3 MILES NORTHWEST OF WATERFORD.	MAPPED ALONG ROAD TO OAKDALE.		THIS VICINITY HAS BEEN CONVERTED TO IRRIGATED PASTURE OR LEVELED AND CULTIVATED.	PERRY ALLEN VISITED SITE IN 1974 AND DISCOVERED IT TO BE AN IRRIGATED FIELD. R. STONE SEARCHED IN 1987 AND INDICATED THAT NO VERNAL POOL HABITAT REMAINS IN THIS AREA. SITE EXTIRPATED.	Extirpated	No	Extirpated	Eliminated		
23	22271	STA	1	1/5 mile	Extirpated	19870721	19580722	PVT	3 MILES EAST OF HICKMAN, 1.4 MILES SOUTH OF LA GRANGE ROAD (YOSEMITE BLVD).		DRIED AND CRACKED LEAD-GREY ADOBE OF A LARGE VERNAL POOL, EDGES OF LOW HILLS.	SITE CONVERTED TO AGRICULTURE.	ACCORDING TO JOE MEDEIROS 1976, THIS AREA IS NOW A 1000 ACRE VINEYARD. SITE EXTIRPATED.	Extirpated. Verified by windshield survey.	No	Extirpated	Eliminated		
24	71575	STA	1	specific area	Presumed Extant	19810406	19810406	PVT	2 MILES SOUTH OF LAKE ROAD AND 2 MILES EAST OF HAWKINS ROAD. 1.5 MILES SOUTHWEST OF TURLOCK LAKE.	NEAR WELL 0.5 MILE SOUTHEAST OF HICKMAN VERNAL POOLS. THIS IS A RELATIVELY SMALL, POSSIBLY ARTIFICAL VERNAL POOL. IT MAY BE CONFLUENT WITH EO#2 DURING PERIODS OF HIGH WATER.		GRAZING, PLOWING OF NEARBY HILLS FOR GRAIN FARMING.	MORE THAN 1000 PLANTS OBSERVED IN 1981.	South of Hickman Pools. Presumed extant, based on aerial photo interpretation. However, it is probably declining due to summer runoff from nearby orchards. Not visited due to access issues.	No	Presumed Extant	Present but Modified	Unknown	
26	7291	MEF	1	specific area	Presumed Extant	19860611	19860611	PVT	FLYING M RANCH, 1.5 MILES WSW OF HAYSTACK MOUNTAIN AT HEAD OF TRIBUTARY TO BLACK RASCAL CREEK.	PLANTS ARE FOUND IN THREE STOCK PONDS SOUTH OF THE UNPAVED ROAD IN THE SE 1/4 OF THE SW 1/4 OF SECTION 29.	ARTIFICIAL PONDS SURROUNDED BY ANNUAL GRASSLAND. ASSOCIATED WITH CRYPSIS SCHOENOIDES, ELEOCHARIS MACROSTACHYA, AND ERYNGIUM VASEYI. KEYES GRAVELLY CLAY LOAM SOIL.	LIGHT CATTLE GRAZING; UNDER CURRENT REGIME POPULATION APPEARS TO BE LARGE AND STABLE.	HUNDREDS OF PLANTS OBSERVED IN 1981 IN VERNAL POOL; SEEN IN 1985 IN 3 STOCK PONDS. THOUSANDS OF PLANTS SEEN IN 1986. LANDOWNER INTENDS TO KEEP AREA AS DRY PASTURE IN THE FORSEEABLE FUTURE.	Presumed extant. Stockpond in center of the large Flying M Ranch.	No	Presumed Extant	Stockpond	Unknown	
27	6276	MEF	1	specific area	Presumed Extant	19860611	19810609	PVT	FLYING M RANCH NORTH OF PLANADA, APPROX 0.7 MILE SOUTHEAST OF HAYSTACK MOUNTAIN.	TWO SMALL POOLS NEAR CENTER OF SECTION 27. MAPPED AS A SINGLE POLYGON ALONG FENCE LINE (= DASHED RED LINE ON TOPO) FROM CREEK NORTH ABOUT 500 METERS.	SMALL, DEEP VERNAL POOLS ON CLAY. ERYNGIUM VASEYI ON POOL MARGINS. PENTZ GRAVELLY LOAM SOIL.	CATTLE GRAZING IN DRY PASTURE.	ALMOST PURE STAND OF NEOSTAPFIA; THOUSANDS OF PLANTS OVER A 10-100 SQ METER AREA OBSERVED IN 1981. STONE AND CLIFTON SEARCHED AREA IN 1986 BUT WERE UNABLE TO RELOCATE THIS SITE.	Flying M Ranch. Presumed extant. However this may be a mapping error. There are no aerial signatures typical of pools occupied by this species. Best habitat is bermed pool halfway between EO 27 and EO 36; I think both are mis-mapped based on habitat description.	No	Presumed Extant	Potentially Mis-mapped	Unknown	
29	2716	MEF	1	specific area	Presumed Extant	19860612	19860612	PVT	1.5 MI NW OF VABM HURRICANE AND 1 MI ENE OF THE LE GRAND CANAL CROSSING OF BLACK RASCAL CREEK, FLYING M RANCH.	MAPPED IN THE NE 1/4 OF THE SW 1/4 OF SECTION 32.	LARGE VERNAL POOL MIMA MOUND TOPOGRAPHY ON OLD CLAY SUBSTRATE. DOMINANT ASSOCIATES INCLUDE ALLOCARYA STIPITATA, PSILOCARPHUS BREVISSIMUS, ERYNGIUM VASEYI, AND BOISDUVALIA CLEISTOGAMA. RAYNOR COBBLY CLAY SOIL.	CATTLE GRAZING AND POTENTIAL FLOOD CONTROL PROJECT ON BLACK RASCAL CREEK THREATEN.	OVER 100 PLANTS SEEN IN 1981 BY GUNN, ABOUT 2000 PLANTS OBSERVED BY STONE AND CLIFTON IN 1986. CURRENT GRAZING REGIME MAY BE DAMAGING TO THE NEOSTAPFIA.	Presumed Extant. Natural playa pool in center of the large Flying M Ranch.	No	Presumed Extant	Present and Natural	Unknown	
32	2737	MEF	3	specific area	Presumed Extant	19860612	19860612	PVT	FLYING M RANCH, ABOUT 1.75 MILES NORTHWEST OF BURNS CREEK DAM, 3400 FEET ESE OF LOWER WELL IN BED OF VERNAL STREAM.	THREE POOLS MAPPED ALONG INTERMITTENT STREAM FEEDING THE WESTERNMOST ARM OF BURNS LAKE. MAPPED IN THE N 1/2 OF THE NE 1/4 OF SECTION 27 AND THE NW CORNER OF SECTION 26.	VERNAL POOLS ALONG INTERMITTENT STREAM, ON BEAR CREEK LOAM SOIL AND GREENFIELD SANDY LOAM OVER HARDPAN. ASSOCIATED WITH PSILOCARPHUS, DESCHAMPSIA, ERYNGIUM, CRYPSIS, ALLOCARYA, DOWNINGIA, BOISDUVALIA, HORDEUM, POLYPOGON, AND EREMOCARPUS.	LIGHT GRAZING, AREA WOULD BE FLOODED BY PROPOSED ENLARGEMENT OF BURNS CREEK DAM BY ARMY CORPS OF ENGINEERS.	HUNDREDS OF PLANTS IN TWO POOLS REPORTED BY HOLLAND IN 1981. ABOUT 600 PLANTS OBSERVED IN THREE POOLS IN 1986 BY STONE AND CLIFTON. ORCUTTIA INAEQUALIS ALSO OCCURS WITH NEOSTAPFIA IN THE MIDDLE POOL. INCLUDES FORMER OCCURRENCE #33.	Flying M Ranch. Presumed extant. Surveyed 09-26-2010. Habitat present, but no plants found. Orcittia inaequalis doing well.	9/26/2010	Presumed Extant	Present and Natural	Declining	

Appendix A-2: Current Status of Colusa Grass (*Neostapfia colusana*) in the Great Valley

California Natural Diversity Database, November 4, 2012														Witham, 2013					
EO	EONDX	KEY	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
34	3079	MEF	1	80 meters	Presumed Extant	19860711	19810609	PVT	1.1 MILES SOUTHEAST OF HAYSTACK MOUNTAIN, ABOUT 2 MILES WEST OF BURNS CREEK DAM.	TWO VERNAL POOLS MAPPED JUST NORTH OF FENCE (SOUTHERN BOUNDARY OF THE SECTION) AT ABOUT 1200 FEET ESE OF THE WINDMILL.	DEEP VERNAL POOLS ON PENTZ GRAVELLY LOAM SOIL. NEOSTAPFIA GROWING IN PURE STAND ALONG THE BOTTOM OF THE POOLS.	GRAZING.	THOUSANDS OF PLANTS IN TWO POPULATIONS OVER A 10-100 SQUARE METER AREA IN 1981. AREA SEARCHED BY STONE AND CLIFTON IN 1986 BUT SITE WAS NOT RELOCATED.	Flying M Ranch. Presumed extant. Surveyed 09-26-2010. Habitat present, but no plants found, and no aerial signatures typical of pools occupied by this species. This may be mis-mapped.	9/26/2010	Presumed Extant	Potentially Mis-mapped	Marginal	
36	14016	MEF	1	80 meters	Presumed Extant	200109XX	200109XX	PVT	FLYING M RANCH, APPROX 0.35 MILE SOUTHEAST OF HAYSTACK MOUNTAIN IN DRAINAGE ALONG THE EDGE OF SECTIONS 27 AND 28.	MAPPED ABOUT 0.25 MILE NORTH OF UNPAVED ROAD ALONG DRAINAGE WHERE IT CROSSES THE SECTION LINE.	SMALL BUT DEEP VERNAL POOLS. SOILS MAPPED AS PENTZ GRAVELLY LOAM. IN 2001, DEEP POOL WITH BUILT UP DIKE ALONG EAST SIDE. STANDING WATER IN POOL IN SEPTEMBER. WITHIN ROLLING TERRAIN OF VERNAL POOLS AND ANNUAL GRASSLAND.	LIGHT GRAZING.	OCCURRENCE BASED ON 1981 REPORT BY WESCO. FOLLOWING A YEAR OF FAVORABLE RAINFALL, NO PLANTS WERE OBSERVED DURING VISIT BY STONE AND CLIFTON IN 1986. 25 PLANTS SEEN BY HOGLE IN 2001.	Flying M Ranch. Presumed extant. However this may be a mapping error. There are no aerial signatures typical of pools occupied by this species. Best habitat is bermed pool halfway between EO 27 and EO 36; I think both are mis-mapped based on habitat description.	No	Presumed Extant	Potentially Mis-mapped	Unknown	
37	2462	MEF	1	specific area	Presumed Extant	19860706	19810620	UNKNOWN	PLAYA-LIKE LAKE BED 1.5-1.6 MILES SOUTHEAST OF BURNS CREEK DAM SPILLWAY. 7 MILES NORTHEAST OF PLANADA.	WITHIN THE NE 1/4 OF THE SE 1/4 OF SECTION 31 AND THE NW 1/4 OF THE SW 1/4 OF SECTION 32.	VERNAL PLAYA STRADDLING CONTACT ZONE OF AMADOR LOAM AND REDDING GRAVELLY LOAM SOILS. ASSOCIATED WITH ORCUTTIA INAQUALIS (99.9%), EREMOCARPUS SETIGERUS, AND ERYNGIUM. TYPICAL VERNAL POOL FLORA AROUND MARGIN.	OVERGRAZING IS EVIDENT & IS A THREAT.	HUNDREDS OF PLANTS SEEN IN 1981 OVER A 5-10 SQUARE METER AREA. SITE VISITED IN 1986 BY STONE AND ERZINGER BUT NO PLANTS WERE OBSERVED.	Morrison Ranch. Presumed extant, based on aerial photo interpretation. No access.	No	Presumed Extant	Present and Natural	Unknown	
38	2714	MEF	1	80 meters	Presumed Extant	19860611	19860611	PVT, TNC	FLYING M RANCH, HEAD OF INTERMITTENT TRIBUTARY WEST OF BURNS CREEK, 1.1 MILES SW OF BURNS CREEK DAM.	SITE IS 0.2 MILE SOUTH OF FENCELINE DIVIDING SECTIONS 26 AND 35 AND ABOUT 0.25 MILE NORTHWEST OF DIRT ROAD. NEAR THE CENTER OF THE N 1/4 OF SECTION 35.	VERNAL POOL SURROUNDED BY ANNUAL GRASSLAND. MUCH OF POOL RATHER BARREN. ASSOCIATED WITH ALLOCARYA STIPITATA, ERYNGIUM VASEYI, BOISDUVALIA CLEISTOGAMA, PSILOCARPHUS BREVISSIMUS, AND MONERMA CYLINDRICA. SOIL MAPPED AS RAYNOR CLAY.		HUNDREDS OF PLANTS SEEN OVER A 10 SQUARE METER AREA IN 1981. MORE THAN 1000 PLANTS OBSERVED IN 1986. SITE IS PART OF A CONSERVATION EASEMENT HELD BY THE NATURE CONSERVANCY. AREA IS LIGHTLY GRAZING; POP APPEARS STABLE UNDER CURRENT GRAZING.	Presumed Extant. Natural playa pool in center of the large Flying M Ranch.	No	Presumed Extant	Present and Natural	Unknown	Easement
39	6283	MEF	1	specific area	Possibly Extirpated	20090902	19820702	PVT	ANNUAL GRASS FIELD, SOUTHWEST OF THE CORNER OF MICHAEL ROAD AND HIGHWAY 59, 6 MILES NORTH OF EL NIDO.	MAPPED IN THE NE 1/4 OF THE SE 1/4 OF SECTION 24.	VERNAL POOL WITHIN VALLEY GRASSLAND. ASSOCIATED WITH DISTICHLIS SPICATA, FRANKENIA GRANDIFOLIA, AND HELEOCHLOA SCHOENOIDES.	HEAVY GRAZING. AREA IS BEING CONVERTED TO AGRICULTURAL LAND.	FEWER THAN 1000 PLANTS IN A 1+ HA AREA IN 1982. STONE VISITED SITE IN 1986; SUGGESTED THAT INTENSIVE CATTLE GRAZING HAS EXTIRPATED SPECIES AT SITE. SITE VISITED IN 2009, PRESTON NOTED HABITAT AS STILL PRESENT, ALTHOUGH SPECIES NOT SEEN.	Possibly extirpated. Surveyed 09-25-2010 and 09-22-2011, but no plants found. Marginal. Habitat is ungrazed with lots of thatch. Weedy. In 1986 it was overgrazed.	9/22/2011	Possibly Extirpated	Present but Degraded	Declining	
40	6295	MEF	1	specific area	Possibly Extirpated	20090902	198805XX	PVT	NORTHWEST OF JUNCTION OF RANGE ROAD AND VENTURA ROAD, 4.5 MILES NORTH OF THE MERCED NATIONAL WILDLIFE REFUGE.	SERIES OF 15 VERNAL POOLS IN THE E 1/2 OF SECTION 11 MAPPED AS A SINGLE POLYGON.	VERNAL POOLS APPARENTLY FORMED OVER LEWIS SALINE-ALKALINE SOILS. POOLS SURROUNDED BY VALLEY GRASSLAND. POOL ASSOCIATES INCLUDE AMARANTHUS ALBUS, POLYPOGON, CRYPSIS, ATRIPLEX, FRANKENIA, CRESSA, ERYNGIUM, DISTICHLIS, SIDA, NAVARRETIA, ETC.	DRY LAND CATTLE GRAZING, SURROUNDED BY IRRIGATED AGRICULTURE. CONVERTED TO IRRIGATED PASTURE BY 2001.	>10,000 PLANTS IN 1982, 13,000+ IN 1986, 23,000 IN 1987, ONLY 1300 IN 1988. TREND DATA AVAILABLE FOR THIS SITE. NO PLANTS SEEN IN 2001, CONVERTED TO IRRIGATED PASTURE. NO PLANTS SEEN IN 2009, PRESTON NOTED HABITAT IS STILL PRESENT THOUGH.	Site partially extirpated by agricultural conversion. Surveyed 09-25-2010, but no plants found. Surveyed 10-15-2011 and observed ~600 plants in 4 small GPSed polygons.	10/15/2011	~600 Plants in 2011	Present but Modified	Declining	

Appendix A-2: Current Status of Colusa Grass (*Neostapfia colusana*) in the Great Valley

California Natural Diversity Database, November 4, 2012														Witham, 2013					
EO	EONDX	KEY	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
41	4102	STA	5	specific area	Extirpated	20010906	19730927	PVT, STA COUNTY	4-5 MILES EAST OF WATERFORD, ALONG BOTH SIDES OF RESERVOIR ROAD AND EAST OF WATERFORD LOWER MAIN CANAL.	5 COLONIES MAPPED WITHIN THE SW 1/4 OF SECTION 21 AND THE SE 1/4 OF SECTION 20.	VERNAL POOLS. GROWING IN LIGHT GRAY SOIL IN THE MIDDLE OF A MOSTLY BARREN, CIRCULAR, VERNAL POOL, IN A BARLEY FIELD, WITH ELEOCHARIS ENGELMANII, MOLLUGO, & GNAPHALIUM. ALSO ASSOCIATED WITH ORCUTTIA PILOSA & O. INAEQUALIS. MEIKLE CLAY SOIL.	POOLS SOUTH OF RESERVOIR ROAD ELIMINATED BY ALMOND ORCHARD, POOL NORTH OF ROAD EXTIRPATED BY VEHICLE USE AND IRRIGATION.	SITE KNOWN HISTORICALLY FROM COLLECTIONS BY CRAMPTON IN THE 50'S & 60'S AND BY REEDER & REEDER IN 1973. POOL NORTH OF ROAD IS WITHIN MODESTO RESERVOIR COUNTY PARK. AREA SURVEYED AND DETERMINED TO BE EXTIRPATED IN 1987 & AGAIN IN 2001.	Extirpated	No	Extirpated	Eliminated		
42	22258	MEF	1	1 mile	Extirpated	20010906	20010906	PVT	2 MILES NNE OF PLANADA.	EXACT SITE UNKNOWN. COLLECTION SITE MAY HAVE BEEN ENE OF PLANADA ALONG HWY 140 ACCORDING TO STONE AND CLIFTON.		INTENSIVE AGRICULTURE, CATTLE GRAZING IN DRY PASTURE.	SEARCHED BY STONE & CLIFTON IN 1986, NO NEOSTAPFIA FOUND IN REMAINING HABITAT. NO PLANTS SEEN IN 2001 BY HOGLE. AREA SOUTH OF HWY CONTAINS NO SUITABLE HABITAT, NORTH OF HWY IS LEVELED, CULTIVATED. REMNANT SITE OF TUCTORIA GREENEI NEARBY.	Extirpated	No	Extirpated	Eliminated		
43	2712	MEF	2	specific area	Presumed Extant	19860706	19860706	PVT	1.0 AIR MILE ESE OF VABM HURRICANE, 3.5 MILES NORTH OF PLANADA, FLYING M RANCH.	ALONG INTERMITTENT TRIBUTARY WEST OF BURNS CREEK. SITE IS MAPPED SOUTH AND EAST OF DIRT ROADS THROUGH SW 1/4 OF SECTION 3.	VERNAL POOLS ALONG AN INTERMITTENT STREAM IN ANNUAL GRASSLAND, ONE SITE BEHIND EARTHEN LEVEE. ASSOCIATED WITH MACHAEROCARPUS CALIFORNICUS, ELEOCHARIS MACROSTACHYA, ALLOCARYA STIPITATA, MARSILEA VESTITA, AND ERYNGIUM. KEYES GRAVELLY LOAM.	LIGHT GRAZING IN 1977, PROPOSED NUCLEAR POWER PLANT STUDY AREA. POSSIBILITY OF LEVEE BEING BREACHED OR WASHED OUT.	SITE FIRST REPORTED BY ALLEN IN 1977. 10,000 PLANTS OBSERVED BY CLIFTON, STONE, AND ERZINGER IN 1986. POPULATION APPEARS TO BE LARGE AND STABLE UNDER PRESENT GRAZING REGIME.	Presumed extant based on aerial interpretation. Natural pools within the large Flying M Ranch.	No	Presumed Extant	Present and Natural	Unknown	
45	7289	MEF	1	specific area	Presumed Extant	19860612	19860612	PVT	FLYING M RANCH, TRIBUTARY OF BLACK RASCAL CREEK, 1.3 AIR MILES WSW OF HAYSTACK MOUNTAIN SUMMIT.	MAPPED AT LARGE STOCKPOND FORMED AT FORK IN INTERMITTENT TRIBUTARY. ABOUT 800 METERS NORTHEAST OF BENCHMARK 279. WITHIN THE NW 1/4 OF THE SE 1/4 OF SECTION 29.	IN A PARTLY DRAWN-DOWN CATTLE POND. PETERS CLAY SOIL.	LIGHT GRAZING; CATTLE CONCENTRATION ALONG POND MARGIN MAY LIMIT ABUNDANCE AND DISTRIBUTION OF NEOSTAPFIA AT THIS SITE.	HUNDREDS OF PLANTS OBSERVED IN 1985, FEWER THAN 25 PLANTS OBSERVED BY STONE AND CLIFTON IN 1986.	Presumed Extant. Stockpond in center of the large Flying M Ranch.	No	Presumed Extant	Stockpond	Unknown	
46	22382	MEF	1	specific area	Presumed Extant	19860612	19860612	PVT	FLYING M RANCH, TRIBUTARY OF BLACK RASCAL CREEK, 1.4 AIR MILES NORTHWEST OF HAYSTACK MOUNTAIN SUMMIT.	MAPPED ALONG THE WEST FORK OF UNNAMED TRIBUTARY TO BLACK RASCAL CREEK. WITHIN THE SW 1/4 OF THE NE 1/4 OF SECTION 20.	AT THE MARGIN OF A STOCK POND FORMED BEHIND EARTHEN LEVEE ALONG TRIBUTARY. PENTZ GRAVELLY LOAM SOIL.	SITE LIGHTLY GRAZED. MARGIN OF POND IS AN AREA OF CATTLE CONCENTRATION BUT SHOWED LITTLE EVIDENCE OF DAMAGE.	APPROXIMATELY 100 PLANTS SEEN IN 1985. 500-1000 PLANTS OBSERVED IN 1986 BY STONE AND CLIFTON.	Presumed Extant. Stockpond in center of the large Flying M Ranch.	No	Presumed Extant	Stockpond	Unknown	
47	19591	STA	1	specific area	Presumed Extant	19860724	19860724	PVT	APPROX 6 AIR MILES NORTHWEST OF KNIGHTS FERRY, AT HEADWATERS OF SHIRLEY CREEK.	5 MILES ESE OF EUGENE. INTERMITTENT POND WITHIN THE SW 1/4 OF THE SW 1/4 OF SECTION 34.	IN A 15 FOOT WIDE BAND BETWEEN BARE MUD AND AREA OF CRYPSIS VAGINIFLORA. IN THE DEEPEST PART OF A VERNAL POOL IN AN ANNUAL GRASSLAND. SOILS ARE A REDDING-PENTZ-PETERS ASSOCIATION.	PROPOSED WATER CANAL AND TURNOUT IN AREA COULD THREATEN POPULATION. GRAZING?	APPROXIMATELY 150 INDIVIDUALS IN FLOWER IN 1986. CATTLE GRAZING IN THE AREA DOESN'T APPEAR TO DISTURB THE HABITAT HERE ALTHOUGH IT MAY FACILITATE INVASION OF THE WEEDY, NON-NATIVE GRASS CRYPSIS VAGINIFLORA.	Presumed extant, based on aerial photo interpretation. Very remote and not threatened.	No	Presumed Extant	Present and Natural	Unknown	

Appendix A-2: Current Status of Colusa Grass (*Neostapfia colusana*) in the Great Valley

California Natural Diversity Database, November 4, 2012														Witham, 2013					
EO	EONDX	KEY	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
48	6311	SOL	1	80 meters	Presumed Extant	1992XXXX	19860703	SOLANO LAND TRUST	SOUTHWEST OF OLCOTT LAKE, IN "NEXT LARGEST VERNAL POOL".	3.4 KM (2.1 MI) SOUTH OF THE SACRAMENTO NORTHERN RR TRACKS AND 5.7 KM (3.5 MI) WEST OF HWY 113.	IN LARGE SALINE-ALKALINE PLAYA IN ANNUAL GRASSLAND. ASSOCIATED WITH TUCTORIA MUCRONATA, FRANKENIA GRANDIFOLIA, ERYNGIUM ARISTULATUM, SIDA HEDERACEA, CRYPSIS SCHOENOIDES, AND DISTICHLIS SPICATA. DELTA GREEN GROUND BEETLES ALSO IN THIS AREA.	CATTLE GRAZING IN WINTER PASTURE. PAST DISTURBANCE/GRAZING MAY HAVE LED TO ESTABLISHMENT OF WEEDY SIDA & CRYPSIS.	1 PLANT OBSERVED IN 1986, NONE FOUND BY C. WITHAM IN 1989, 1991, OR 1992.	Hamilton Ranch. Presumed extant, based on aerial photo interpretation. Marginal. A single plant was observed in 1986. Surveys in 1989, 1991, 1992, 2000, 2004, 2005, and 2010 failed to locate any plants.	9/5/2010	Presumed Extant	Present and Natural	Marginal	
49	5744	YOL	2	specific area	Presumed Extant	2009XXXX	2009XXXX	DOD-MCCLELLAN AFB	DAVIS AIR FORCE COMMUNICATION FACILITY. 4 MI S OF INTERSTATE 80, E OF RD 104, BETWEEN RD 34 AND RD 35.	DAVIS COMMUNICATIONS ANNEX. POPULATION IS IN DRAINAGE IN THE SOUTHERN PORTION OF THE FACILITY. IN POOL #9. ACCORDING TO A 2009 GERLACH REPORT, A SET OF REINTRODUCED POPULATIONS/RESTORED VERNAL POOLS EXISTS JUST NW OF THE NORTHERN POLYGON.	PLAYA TYPE VERNAL POOL ON LOW AREA ON PESCADERO CLAY LOAM. ASSOCIATED WITH DOWNINGIA, LASTHENIA FREMONTII, PLAGIOBOTHRYS, PSILOCARPHUS, MYOSURUS, LEPIDIUM LATIFOLIUM, CRYPSIS SCHOENOIDES, CRESSA TRUXILLENSIS, & TUCTORIA MUCRONATA.	HERBICIDE RUN-OFF AND INVASION BY EXOTIC PLANTS. SHEEP GRAZING AND TRAMPLING/BEDDING DOWN IN POOLS ALSO THREATENS.	1000S SEEN IN 93'. ~36000 IN 96'. IN N COLONY;~1000 IN 2001. GERLACH REPORT GIVES POP ESTIMATES FOR N POOL AS; 8435 PLANTS IN 03', 43732 IN 04', 22671 IN 05', 10897 IN 06', 8486 IN 08', 11314 IN 09'; NO PLANTS NOTED IN S POOL FROM 03-09'.	Davis Communication Annex. Extant. Being monitored by others--Helm, Gerlarh--and population counts should be obtained from them. Site has been the subject of various mis-management issues over the years. Required a good management plan before being taken over by Yolo County. No plants observed in south polygon in 2011.	10/15/2011	1,000s Plants in 2011	Present but Modified	Persistent	DOD/Yolo
50	19708	MER	1	nonspecific area	Presumed Extant	20010906	20010906	PVT	NORTH OF GREEN HOUSE ROAD AND EAST OF DAN MCNAMARA ROAD, 3.3 MILES NORTH OF THE NORTHWEST CORNER OF THE MERCED NWR.	WITHIN THE NE 1/4 OF THE SE 1/4 OF SECTION 17.	NORTHERN CLAYPAN VERNAL POOL ON STRONGLY SALINE LEWIS LOAM. ASSOCIATED WITH DISTICHLIS SPICATA. SURROUNDED BY NON-NATIVE GRASSLAND W/ BROMUS MOLLIS, ERODIUM BOTRYS, AND DISTICHLIS.	CATTLE GRAZING, PROPOSED BEAR CREEK FLOOD CONTROL LEVEES THREATEN.	25 PLANTS OBSERVED IN 1987. SITE IS PART OF THE SUNRISE RANCH PORTION OF THE BERT CRANE RANCHES. UNKNOWN NUMBER OF PLANTS IN 1997, FEWER THAN 50 PLANTS OBSERVED IN 2001. USFWS RECORDS INDICATE THIS AREA IS UNDER A CONSERVATION EASEMENT.	Presumed extant. Sunrise Ranch with FWS conservation easement. Surveyed extensively on 09-25-2010 and 09-22-2011, but no plants were found. Marginal. Does not consistently support the species. Atriplex persistens is doing well though.	9/22/2011	Presumed Extant	Present and Natural	Marginal	Easement
51	6282	MER	1	80 meters	Possibly Extirpated	20010730	19960604	PVT-SUNRISE RANCH	BERT CRANE RANCH, 1.6 MILES NNE OF THE BEAR CREEK CROSSING OF THE EAST SIDE CANAL, 7 MILES SOUTHWEST OF ATWATER.	WITHIN THE SE 1/4 OF THE SE 1/4 OF SECTION 36.	VERNAL POOL ON ALKALINE CLAY SOIL. ASSOCIATED WITH CRYPSIS, DISTICHLIS SPICATA, AND BROMUS SP. NON-NATIVE GRASSLAND SURROUNDS W/BROMUS MOLLIS, ERODIUM BOTRYS, AND DISTICHLIS SPICATA. LANDLOW CLAY SOIL.	AREA IS GRAZED HEAVILY, ANNUAL GRASSES ARE ABUNDANT. NUTRIENTS ALTERED BY TURKEY WASTE SPILL.	250 PLANTS SEEN IN 1987, 50 SEEN IN 1988. NONE SEEN IN 1989 OR 1990, POSSIBLY DUE TO DRY WEATHER CONDITIONS. ~200 PLANTS SEEN IN 1996. NO PLANTS IN 2001, NUTRIENT LEVELS HAVE BEEN ALTERED BY FOSTER FARMS TURKEY FARM (TO THE NE) WASTE SPILL.	Possibly extirpated. Surveyed 09-25-2010, but no plants were found. Weedy. Habitat present, but highly degraded due to accumulated organic matter.	9/25/2010	Possibly Extirpated	Present but Degraded	Marginal	
52	6281	MER	1	80 meters	Extirpated	20010730	19900623	USFWS-MERCED NWR	BERT CRANE RANCH, 0.9 MILE NNE OF THE BEAR CREEK CROSSING OF THE EAST SIDE CANAL, 7.5 MILES SOUTHWEST OF ATWATER.		NORTHERN CLAYPAN VERNAL POOL ON MODERATELY SALINE LEWIS CLAY. WITH CRYPSIS SCHOENOIDES. POOL SURROUNDED BY NON-NATIVE GRASSLAND W/ DISTICHLIS SPICATA, BROMUS, & ERODIUM. IN 2001 SITE DOMINATED BY WETLAND PLANTS AFTER DAM BREACH.	CATTLE GRAZING AND SOME VEHICULAR DAMAGE TO THE POOLS IS VISIBLE. PROPOSED FLOOD CONTROL PROJECT ALSO THREATENS.	20 PLANTS SEEN IN 1990. POOR SITE RATING DUE TO ADVERSE WEATHER CONDITIONS. ACTUAL SITE QUALITY SHOULD BE EVALUATED IN YEARS WITH MORE FAVORABLE RAINFALL. NO PLANTS IN 2001, HYDROLOGY HAS BEEN ALTERED BY DAM BREACH. SITE EXTIRPATED.	While the CNDDB states this is extirpated, there is suitable habitat in in the 2009 aerial photography. Not surveyed due to access limitations. Possibly mismapped as I don't see a dam or dam breach in the aerial photographs.	No	Possibly Extirpated	Present but Modified	Unknown	

Appendix A-2: Current Status of Colusa Grass (*Neostapfia colusana*) in the Great Valley

California Natural Diversity Database, November 4, 2012														Witham, 2013					
EO	EONDX	KEY	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
54	2717	MER	1	80 meters	Extirpated	20010731	19870703	PVT	KEYES ROAD 1.3 MILES WEST OF OLSEN ROAD, 2 MILES SOUTH OF TURLOCK LAKE.	MAPPED ALONG NORTH SIDE OF KEYES ROAD WHERE IT CROSSES INTERMITTANT STREAM ABOUT 200 METERS EAST OF THE WINDMILL. WITHIN THE NE 1/4 OF THE SW 1/4 OF SECTION 29.	TWO SMALL VERNAL POOLS IN ANNUAL GRASSLAND. GROWING IN DEEPEST PART OF POOL WITH ERYNGIUM VASEYI AND GLYCERIA DECLINATA; SURROUNDING PLANTS INCLUDE BOISDUVALIA, ALLOCARYA, RANUNCULUS, AND CRYPSIS. SOILS MAPPED AS RAYNOR CLAY.	HEAVY GRAZING & RELATED IMPACTS HAVE DAMAGED THIS SITE; CONVERSION TO IRRIGATED AGRICULTURE ALSO THREATENS.	A MODERATELY DENSE, PURE STAND OF NEOSTAPFIA (1000+ PLANTS) OBSERVED BY STONE IN 1987. IN 2001, SITE CONVERTED TO ORCHARDS, NO PLANTS SEEN. SITE EXTIRPATED.	Extirpated	No	Extirpated	Eliminated		
55	6269	STA	1	specific area	Presumed Extant	19880916	19880916	PVT	POND UNDER TRANSMISSION LINES ABOUT 4.7 AIR MILES SSE OF KNIGHTS LANDING.	1.6 MILES WEST OF WILLIAMS ROAD WITHIN THE NW 1/4 OF THE SW 1/4 OF SECTION 15 (ADJACENT TO SECTION LINE).	ARTIFICIAL POND ALONG INTERMITTANT DRAINAGE. ASSOCIATED WITH CRYPSIS VAGINIFLORA, XANTHIUM STRUMARIUM, AND AMARANTHUS. ANNUAL GRASSLAND SURROUNDS.	DRY PASTURE CATTLE GRAZING, COMPETITION FROM EXOTIC WEEDS MAY THREATEN.	1000+ PLANTS OBSERVED IN 1988. PRESENT GRAZING REGIME MAY BE CONSISTENT WITH EXISTENCE OF THIS OCCURRENCE, THOUGH TRAMPLING OF POND PROBABLY RESTRICTS DENSITY OF NEOSTAPFIA SEEDLINGS. TRANSMISSION LINE MAINTENANCE APPARENTLY NOT A THREAT.	Presumed extant, based on aerial photography interpretation. Site is very remote. No access.	No	Presumed Extant	Stockpond	Unknown	
56	2786	STA	1	specific area	Presumed Extant	20010815	20010815	PVT	APPROX. 3 MILES NORTHEAST OF WATERFORD AND 2 MILES WEST OF MODESTO RESERVOIR.	ALONG THE SOUTH SIDE OF TIM BELL ROAD ABOUT 0.7 MILE WEST OF HAZEL DEAN ROAD. MAPPED WITHIN THE SE 1/4 OF THE SW 1/4 OF SECTION 13.	VERNAL POOL IN ANNUAL GRASSLAND. ASSOCIATED WITH EREMOCARPUS SETIGERUS AS SCATTERED PLANTS OVER THE RELATIVELY BARE EASTERN PORTION OF THE POOL. CLAYPAN SOIL MAPPED AS MEIKLE CLAY.	HEAVY GRAZING HAS DAMAGED THIS SITE. IRRIGATION IS A POSSIBLE THREAT.	MORE THAN 1,000 PLANTS SEEN BY STONE IN 1986 & BY HOGLE IN 2001. SURROUNDING PASTURE IS MOWED, BUT OWNER APPARENTLY MOWS AROUND THE POOL. GRAZING APPEARS TO HAVE REDUCED NEOSTAPFIA DENSITY; OVERALL QUALITY IS DAMAGED AND POSSIBLY DECLINING.	Presumed extant, based on aerial photography interpretation. Clearly posted and no access. Habitat present and visible from road during windshield survey on 09-04-2010.	9/4/2010	Presumed Extant	Present and Natural	Unknown	
57	2787	STA	1	specific area	Presumed Extant	19870627	19870627	PVT	2.5 MILES NORTHEAST OF THE OLD PAUSELL WAREHOUSE.	LARGE INTERMITTENT POND ABOUT 1 MILE NORTH OF WARNERVILLE ROAD AND 1.6 MILES NORTHEAST OF JUNCTION WITH TIM BELL ROAD. JUST WEST OF CENTER OF SECTION.	ARTIFICIAL POND SURROUNDED BY ANNUAL GRASSLAND. ASSOCIATED WITH CRYPSIS SCHOENOIDES, ERYNGIUM VASEYI, ALLOCARYA STIPITATA, ELEOCHARIS, EREMOCARPUS, CONVOLVULUS, MOLLUGO, LOLIUM, AND PASPALUM. SOILS MAPPED AS RAYNOR CLAY AND PETERS CLAY.	CATTLE GRAZING AND TRAMPLING.	10,000 PLANTS OBSERVED IN 1987.	Possibly extirpated. Deep ripping was occuring south of the occurrence on 09-02-2010. As estimate of where ripping was occuring indicates that this population might have been in the area of destruction. Reported to regulatory agencies as a possible violation. See Appendix B.	No	Possibly Extirpated	Unknown	Unknown	Reported
58	5800	YOL	1	specific area	Presumed Extant	2009XXXX	2009XXXX	DOD-MCCLELLAN AFB	IN DRAINAGE ON THE EAST SIDE OF THE DAVIS AIR FORCE COMMUNICATIONS FACILITY, 2.5 MILES NNW OF SAXON.	FACILITY IS 4 MILES SOUTH OF DAVIS, EAST OF ROAD 104 AND BETWEEN ROAD 35 AND ROAD 36. WITHIN THE SE 1/4 OF THE NE 1/4 OF SECTION 31. IN POOL #3.	PLAYA TYPE VERNAL POOL ON PESCADERO CLAY LOAM. GROWING PRIMARILY ON DISTURBED GROUND IN AREAS OF LOW COMPETITION. THIS POPULATION OCCURS AS A VIRTUAL MONOCULTURE. W/DOWNINGIA SPP., LASTHENIA FREMONTII, PLAGIOBOTHRYS, PSILOCARPHUS, ETC.	HISTORIC DISKING, HERBICIDE RUN-OFF AND INVASION BY EXOTIC PLANTS. SHEEP GRAZING AND TRAMPLING/BEDDING DOWN IN POOLS.	SEVERAL THOUSAND PLANTS IN 1993. 1000 IN 1996. 2,208 PLANTS BETWEEN THIS EO AND EO #49 IN 2004. GERLACH REPORT GIVES POPULATION ESTIMATES AS; 842 PLANTS IN 05', 9013 IN 06', 0 IN 07', 12 IN 08', 0 IN 09'.	Davis Communication Annex. Extant. Being monitored by others--Helm, Gerlarh--and population counts should be obtained from them. Site has been the subject of various mis-management issues over the years. Required a good management plan before being taken over by Yolo County. This pool was severely damaged in 2009 when a concrete anchor was removed from the pool edge.	10/15/2011	100 Plants in 2011	Present but Modified	Persistent	DOD/Yolo

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California Natural Diversity Database, November 4, 2012														Witham, 2013					
EO	EONDX	KEY	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
59	2757	MER	2	specific area	Presumed Extant	199906XX	199906XX	PVT	SMITH RANCH; ABOUT 2.2 MILES ESE OF YOSEMITE LAKE AND 0.8 MILE NORTH OF LE GRAND CANAL, NORTHEAST OF MERCED.	MAPPED 2 VERNAL POOLS ALONG INTERMITTENT STREAM WITHIN THE N 1/2 SW 1/4 SECTION 36. COLONIES ARE FOUND ALONG EITHER SIDE OF DIRT ROAD.	NORTHERN HARDPAN VERNAL POOLS WITHIN ANNUAL GRASSLAND. MAPPED ON CORNING GRAVELLY LOAM AND REDDING GRAVELLY LOAM SOILS. WITH ERYNGIUM VASEYI, LOLIUM MULTIFLORUM, HORDEUM GENICULATUM, HEMIZONIA FITCHII, ALLOCARYA STIPITATA, ETC.	AREA IS HEAVILY GRAZED, POTENTIAL THREAT OF DEVELOPMENT FROM PROPOSED UC CAMPUS.	1 PLANT OBSERVED IN 1987 (R. STONE), UNKNOWN NUMBER OF PLANTS SEEN IN 1999. SITE IS WITHIN SPHERE OF INFLUENCE OF THE PROPOSED U.C. MERCED CAMPUS. THE RARE GRASS ORCUTTIA INAEQUALIS IS ALSO FOUND IN THESE POOLS.	Extant. This portion of the Virginia Smith Trust under TNC conservation easement. Surveyed on 09-22-2011. 33 plants found within the western polygon of this 2-parted occurrence. Marginal. This is small population with little linkages to others. Could not identify the polygon on the east side of the road.	9/22/2011	33 Plants in 2011	Present and Natural	Marginal	Easement
60	2715	MER	1	specific area	Presumed Extant	20010629	20010629	PVT	SMITH RANCH, ABOUT 4.5 MILES NNW OF PLANADA AND 1.6 MILES WSW OF VABM HURRICANE, JUST NORTH OF THE LE GRAND CANAL.	PLAYA IN THE NE 1/4 OF THE SE 1/4 OF SECTION 6. THIS IS THE SAME SITE AS 1987 COLLECTION BY STONE FROM "7 MILES NORTHEAST OF MERCED".	LARGE PLAYA SURROUNDED BY AN ANNUAL GRASSLAND. ASSOCIATED WITH ERYNGIUM VASEYI, EREMOCARPUS SETIGERUS, BOISDUVALIA CLEISTOGAMA, LOLIUM MULTIFLORUM, DESCHAMPSIA, TRICHOSTEMA, HEMIZONIA, LACTUCA, ETC. SOILS MAPPED AS RAYNOR COBBLY CLAY.	HEAVY GRAZING.	FEWER THAN 1000 PLANTS OBSERVED IN 1987. UNDER THE CURRENT GRAZING REGIME, THIS POPULATION IS DAMAGED AND APPEARS TO BE DECLINING. 5000+ PLANTS OBSERVED IN 2001. INCLUDES FORMER OCCURRENCE #53.	Presumed extant, based on aerial interpretation. Icord Ranch under CRT easement.	No	Presumed Extant	Present and Natural	Unknown	Easement
61	2718	MER	1	80 meters	Extirpated	20010731	19870703	PVT	ABOUT 9 MILES EAST OF MONTPELIER AND 1.2 MILES WNW OF THE INTERSECTION OF KEYES ROAD AND OLSEN ROAD, S OF TURLOCK LAKE.	MAPPED ALONG THE SOUTHWEST SHORE OF LARGE STOCKPOND IN THE NE 1/4 OF SECTION 29.	ARTIFICIAL POND ALONG AN INTERMITTENT DRAINAGE SURROUNDED BY ANNUAL GRASSLAND. ASSOCIATED WITH A DENSE COVER OF CRYPSIS SCHOENOIDES AND CYNODON DACTYLON. SOILS MAPPED AS BEAR CREEK SOIL SERIES. IN 2001 ENTIRE AREA CONVERTED TO ORCHARDS.	HEAVY GRAZING AND COMPETITIVE EXCLUSION BY CRYPSIS AND CYNODON ARE THREATS. AREA CONVERTED TO ORCHARDS.	ABOUT 500 PLANTS SEEN IN 1987 BY STONE. PLANTS DEPAUPERATE, SITE IS MARGINAL OCCURRENCE WITH LOW POTENTIAL FOR LONG-TERM VIABILITY. IN 2001 HOGLE UNABLE TO ACCESS PROPERTY, BUT ENTIRE AREA WAS CONVERTED TO ORCHARDS. SITE EXTIRPATED.	Extirpated	No	Extirpated	Eliminated		
62	12259	STA	1	80 meters	Presumed Extant	20010908	20010908	PVT	ABOUT 10 MI E OF WATERFORD AND 0.2 MI N OF MODESTO MAIN CANAL, 1.8 MILES ENE OF INTERSECTION OF HWY 132 AND CRABTREE RD.	SINGLE POOL MAPPED ABOUT MIDWAY ALONG THE LINE BETWEEN SECTIONS 19 AND 30.	VERNAL POOL SURROUNDED BY ANNUAL GRASSLAND. DENSE, PURE STAND OF ELEOCHARIS MACROSTACHYA FORMED DOMINANT PLANT COVER ON THE MAJORITY OF THE POOL BED; NEOSTAPFIA OCCURING OVER RELATIVELY BARREN PORTIONS OF POOL. SOIL MAPPED AS MEIKLE CLAY.	PRESENT HEAVY GRAZING IS PROBABLY DETRIMENTAL TO THIS SITE. CONVERSION TO IRRIGATED AGRICULTURE (ORCHARDS) IS A THREAT.	FEWER THAN 500 PLANTS IN 1986, 300 IN 2001. PRESENT GRAZING REGIME IS DAMAGING SITE BUT CESSATION OF GRAZING MIGHT LEAD TO COMPETITIVE EXCLUSION BY ELEOCHARIS; MODERATE LEVEL OF GRAZING MAY BE IMPORTANT IN HABITAT MANAGEMENT AT THIS SITE.	Presumed extant based on aerial interpretation. Clearly posted and unable to gain access.	No	Presumed extant	Present and Natural	Unknown	
63	4588	STA	1	80 meters	Extirpated	19870629	XXXXXXXX	PVT	ABOUT 4.5 MILES EAST OF WATERFORD AND 0.8 MILE NORTHWEST OF THE JUNCTION OF HWY 132 AND DEINSTAG ROAD.	MAPPED ABOUT 100 METERS EAST OF WINDMILL. WITHIN THE NE 1/4 OF THE NW 1/4 OF SECTION 28.	VERNAL POOL. MEIKLE CLAY SOIL.	ALMOND ORCHARD.	UNKNOWN WHEN PLANTS OBSERVED HERE, PROBABLY BETWEEN 1958 AND 1973 BY EITHER CRAMPTON OR REEDER & REEDER. HABITAT ELIMINATED; SITE IS NOW AN ALMOND ORCHARD. SITE EXTIRPATED.	Extirpated	No	Extirpated	Eliminated		

Appendix A-2: Current Status of Colusa Grass (*Neostapfia colusana*) in the Great Valley

California Natural Diversity Database, November 4, 2012														Witham, 2013					
EO	EONDX	KEY	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
64	2666	STA	1	specific area	Presumed Extant	20010815	20010815	PVT	ABOUT 3 MILES NORTHEAST OF WATERFORD AND 2.5 MILES WEST OF MODESTO RESERVOIR.	SITE IS 1.2 AIR MILES WSW OF THE INTERSECTION OF TIM BELL ROAD AND HAZEL DEAN ROAD.	VERNAL POOL IN ANNUAL GRASSLAND. ASSOCIATED WITH EREMOCARPUS, ERYNGIUM VASEYI, HORDEUM GENICULATUM, LOLIUM MULTIFLORUM, CRYPSIS VAGINIFLORA, AND PHALARIS PARADOXA. SOIL MAPPED AS MEIKLE CLAY. TUCTORIA GREENEI FORMERLY AT THIS SITE.	HEAVY GRAZING AND POSSIBLE CONVERSION TO IRRGATED AGRICULTURE. NUMEROUS CATTLE HOOF PRINTS. LAND IS FOR SALE (2001).	MORE THAN 1000 PLANTS OBSERVED IN 1986, 1987, & 2001. INTENSIVE GRAZING APPARENTLY LED TO THE EXTIRPATION OF TUCTORIA AT THIS SITE. NEOSTAPFIA DENSITY HAS BEEN REDUCED; UNDER PRESENT GRAZING REGIME SITE IS DAMAGED AND PROBABLY DECLINING.	Presumed extant, based on aerial photography interpretation. Clearly posted and no access. Windshield survey on 09-04-2010 with habitat visible from the road.	9/4/2010	Presumed Extant	Present and Natural	Unknown	
65	2783	STA	1	80 meters	Presumed Extant	20010815	20010815	PVT	ABOUT 2.5 MILES ENE OF WATERFORD AND 0.5 MILE NORTH OF MODESTO MAIN CANAL.	SITE IS 1.1 MILES NORTHWEST OF INTERSECTION OF HAZEL DEAN ROAD AND HIGHWAY 132. TO ACCESS SITE, BIKE OR WALK ALONG CANAL LEVEE TO SILVER TOWER. GO STRAIGHT THROUGH ORCHARD TO SEE POOL. WITHIN THE SE 1/4 OF THE SW 1/4 OF SECTION 24.	VERNAL POOL ON ALLUVIAL BASIN SITE. ASSOCIATED WITH EREMOCARPUS SETIGERUS, BOISDUVALIA, ALLOCARYA STIPITATA, ERYNGIUM VASEYI, LOLIUM, PHALARIS, POLYPOGON, ALOPECURUS, HORDEUM, CAPSELLA, SIDA, POA ANNUA, ETC. SOILS MAPPED AS MEIKLE CLAY.	HEAVY CATTLE GRAZING, HOOF PRINTS, EXOTIC PLANTS. POTENTIAL CONVERSION TO IRRIGATED AGRICULTURE. LAND MAY BE FOR SALE.	ABOUT 1000 OR MORE PLANTS OBSERVED IN 1987. SOIL DISTURBANCE BY CATTLE MAY HAVE LED TO THE ESTABLISHMENT OF MANY WEEDY, NON-NATIVE PLANTS. UNDER CURRENT GRAZING REGIME, SITE IS DAMAGED AND PERHAPS DECLINING. PLANTS NOT COUNTED IN 2001.	Extant. 300 plants observed 09-03-2010 in an area of >200 square meters. Occupied habitat GPSed. Marginal. Plants only occupying a very small clay inclusion within a larger pool of vertisol soils. Despite being marginal habitat, the population appears to be persistent.	9/3/2010	300 Plants in 2010	Present and Natural	Persistent	
66	43184	MER	1	specific area	Presumed Extant	199906XX	199906XX	PVT	NNW OF PLANADA; ABOUT 0.4 MILES NNW OF BLACK RASCAL CREEK AT LE GRAND CANAL CROSSING; NORTHEAST OF MERCED.	MAPPED WITHIN NW 1/4 SW 1/4 OF SECTION 31.	VERNAL POOLS AND STOCK PONDS. ORCUTTIA INAEQUALIS ALSO AT THIS SITE.	CATTLE GRAZING; WITHIN SPHERE OF INFLUENCE OF PROPOSED UC MERCED CAMPUS.	FOUND IN ONE VERNAL POOL AT THIS SITE IN 1999.	Virginia Smith Trust with TNC conservation easement. Surveyed 09-22-2011, 12 plants found. GPSed occupied pool. Habitat present but very flashy.	9/22/2011	12 Plants in 2011	Present and Natural	Marginal	Easement
67	43185	MER	1	specific area	Presumed Extant	199906XX	199906XX	PVT	ABOUT 2.9 MILES NW OF HAYSTACK MOUNTAIN ALONG SOUTHEAST SHORE OF SMALL POND, NORTHEAST OF MERCED.	POND MAPPED NEAR CENTER OF SECTION 18.	VERNAL POOLS AND STOCK PONDS. ORCUTTIA INAEQUALIS ALSO AT THIS SITE.	CATTLE GRAZING; WITHIN SPHERE OF INFLUENCE OF PROPOSED UC MERCED CAMPUS.	FOUND ALONG SHORE OF LARGE STOCK POND IN 1999.	Virginia Smith Trust with TNC conservation seasment. Surveye 09-21-2011, 29 plants found on margin of stockpond.	9/21/2011	29 Plants in 2011	Stockpond	Marginal	Easement
68	43186	MER	1	specific area	Presumed Extant	199906XX	199906XX	PVT	ABOUT 1.5 MILES EAST OF YOSEMITE LAKE, & 2.5 MILES SOUTH OF HORNITOS ROAD, NORTHEAST OF MERCED.	MAPPED AT EPHEMERAL POND IN NW 1/4 OF SW 1/4 OF SECTION 25.	VERNAL POOLS AND STOCK PONDS. ORCUTTIA INAEQUALIS ALSO AT THIS SITE.	CATTLE GRAZING; WITHIN SPHERE OF INFLUENCE OF PROPOSED UC MERCED CAMPUS.	PLANTS FOUND IN ONE VERNAL POOL/STOCK POND IN 1999.	Virginia Smith Trust with TNC conservation easement. Presumed extant. Surveyed 09-21-2011, but no plants found.	9/21/2011	Presumed Extant	Stockpond	Marginal	Easement
69	43187	MER	1	specific area	Presumed Extant	199906XX	199906XX	PVT	ABOUT 2.2 MILES EAST OF YOSEMITE LAKE, & 2.9 MILES SOUTH OF HORNITOS ROAD, NORTHEAST OF MERCED.	MAPPED AT EPHEMERAL POND NEAR CENTER OF SE 1/4 OF SECTION 25.	VERNAL POOLS AND STOCK PONDS. ORCUTTIA INAEQUALIS ALSO AT THIS SITE.	CATTLE GRAZING; WITHIN SPHERE OF INFLUENCE OF PROPOSED UC MERCED CAMPUS.	PLANTS FOUND IN ONE VERNAL POOL/STOCK POND IN 1999.	Virginia Smith Trust with TNC conservation easement. Habitat present in small bermed reservoir in natural swale.Extant. Surveyed 09-21-2011, 400 plants observed.	9/21/2011	400 Plants in 2011	Stockpond	Persistent	Easement
70	43188	MER	1	specific area	Presumed Extant	199906XX	199906XX	PVT	ABOUT 2.1 MILES ENE OF YOSEMITE LAKE & 1.8 MILES SOUTH OF HORNITOS ROAD, NORTHEAST OF MERCED.	MAPPED AT EPHEMERAL POND WITHIN NW 1/4 OF SE 1/4 OF SECTION 24.	VERNAL POOLS AND STOCK PONDS. ORCUTTIA INAEQUALIS ALSO AT THIS SITE.	CATTLE GRAZING; WITHIN SPHERE OF INFLUENCE OF PROPOSED UC MERCED CAMPUS.	PLANTS FOUND IN ONE VERNAL POOL/STOCK POND IN 1999.	Virginia Smith Trust with TNC conservation easement. Presumed extant. Surveyed 09-22-2011, but no plants found.	9/22/2011	Presumed Extant	Stockpond	Marginal	Easement
71	48996	STA	1	nonspecific area	Presumed Extant	20010817	20010817	UNKNOWN	0.8 MILES EAST OF RUSHING ROAD ON NORTH SIDE OF MODESTO MAIN CANAL.	EXACT LOCATION UNKNOWN; MAPPED BASED ON T-R-S PROVIDED BY HOGLE: T3S R13E NW 1/4 OF THE NE 1/4 OF SECTION 28.	HEAVILY GRAZED POLYPOGON AND ELEOCHARIS IN POOL. BORDERED BY ANNUAL GRASSLAND TO NORTH, EAST, AND WEST. ROAD AND CANAL TO THE SOUTH.	NOT GRAZED AT TIME OF VISIT, BUT DEEP HOOF PRINTS IN POOL INDICATE GRAZING DURING DRY DOWN IN LATE SPRING/SUMMER.	23 PLANTS OBSERVED IN 2001. HOGLE IS UNSURE WHY POPULATION IS SO SMALL AT THIS SITE, MAY BE A RECENT INTRODUCTION.	Extant. Mis-mapped by Hogle, is actually west of her polygon. Surveyed on 09-03-2010, with approximately 1,000 plants observed on western and northern margins of pool.	9/3/2010	1,000 Plants in 2010	Present and Natural	Persistent	
N1		SOL						Private	0.8 miles southwest of where Cook Road crosses the Southern Pacific RR tracks. On the west side of the tracks.	Nothing obvious on the topo map, but it is a natural extension of Olcott Lake across the tracks.	Natural playa pool associated with Cressa truxelensis and Frankenia salina. Used as winter/spring cattle grazing, but was high intensity horse grazing in early 1990s.	The Thompson Ranch parcel has been for sale on-and-off for years. There have been rumors of ill-conceived mitigation plantings occuring on this parcel.	2 plants observed in 2010. This was once probably part of Olcott Lake before the Northern Pacific RR. (I observed dozens of plants in this location back in the early 2000s, and thought someone else was submitting the data.)	Thompson Ranch. Extant.	9/5/2010	2 Plants in 2010	Present and Natural	Persistent	

Green highlighting indicates new data.

Appendix A-2: Current Status of Colusa Grass (*Neostapfia colusana*) in the Great Valley

California Natural Diversity Database, November 4, 2012														Witham, 2013					
EO	EONDX	KEY	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
N2		SOL						Private	1.0 miles southwest of where Cook Road crosses the Southern Pacific RR tracks. Population in in a pool 0.2 miles west of the RR tracks.	Northernmost playa in the NW 1/4 of Section 23 on USGS topo map.	Natural playa pool associated with Cressa truxelensis and Frankenia salina. Used as winter/spring cattle grazing, but was high intensity horse grazing in early 1990s.	The Thompson Ranch parcel has been for sale on-and-off for years. There have been rumors of ill-conceived mitigation plantings occuring on this parcel.	109 plants observed in two clusters in 2010. (I observed dozens of plants in this location back in the early 2000s, and thought someone else was submitting the data.)	Thompson Ranch. Extant.	9/5/2010	109 Plants in 2010	Present and Natural	Persistent	
N3		SOL						Private	1.2 miles southwest of where Cook Road crosses the Southern Pacific RR tracks. Population in in a pool 0.2 miles west of the RR tracks.	Southwest playa in the NW 1/4 of Section 23 on the USGS topo map.	Natural playa pool associated with Cressa truxelensis and Frankenia salina. Used as winter/spring cattle grazing, but was high intensity horse grazing in early 1990s.	The Thompson Ranch parcel has been for sale on-and-off for years. There have been rumors of ill-conceived mitigation plantings occuring on this parcel.	51 scattered plants observed in 2010.	Thompson Ranch. Extant.	9/5/2010	51 Plants in 2010	Present and Natural	Unknown	
N4		SOL						Private	1.55 miles southwest of where Cook Road crosses the Southern Pacific RR tracks. Population is immediately west of the tracks.	Southwestern most playa in Section 23 on the USGS topo map.	Natural playa pool associated with Cressa truxelensis and Frankenia salina. Used as winter/spring cattle grazing and occasionally sheep.	Deep tractor tracks in pool in 2010. Appears that the tractor discing fire breaks became mired in the playa.	>100 plants in two clusters mapped in 2010. Scar from pipeline runs between the two clusters.	Hamilton Ranch. In the playa where the original (not the 1993 realignment) PGE gas pipeline went under the RR tracks. Two clusters of plants.	9/5/2010	>100 Plants in 2010	Present and Natural	Unknown	
N5		MER						Private	2.0 miles due east of Yosemite Lake Road and the Campus entrance.	Large natural playa (where the Branchinecta conservatio was discovered).	NECO dominant in large playa pool associated with Eryngium castrense, Lythrum hyssopifolia and Plagiobothrys stipitatus. On Raynor Clay. May not pond every year.	The biggest threat to this population is future research use by UC Merced.	100,000s large plants observed in 2011.	Extant. Surveyed 09-22-2011. Uncertain as to why this is not in the database. Stone et al (1988) identified it as potential but unoccupied habitat for NECO and ORIN. EIP seems to have missed it entirely. Bob Holland says he has known about it for years. He also says that Orcuttia inaequalis also occurs here, but none found in 2011.	9/22/2011	100,000s Plants in 2011	Present and Natural	Persistent	Easement
N6		YOL						Yolo County	Yolo Grasslands Regional Park.	Mapped as 2 polygons.	Easternmost 2 of 3 created pools. Mostly bare ground.	Some previous issues with mis-management of the area including grazing management and firebreak management.	Although within 1/4 mile of EO#49, being reported separately because these are introduced populations in created pools.	Yolo Grasslands Park. Extant. New pools inoculated by John Gerlach. Actual census data should be obtained from John.	10/15/2011	~50 Plants in 2011	Artificial	New	Yolo Co

Appendix A-3: Current Status of San Joaquin Valley Orcutt Grass (*Orcuttia inaequalis*) in the Great Valley

California Natural Diversity Database, November 4, 2012													Witham, 2013					
EO	EONDX	KEY(	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
2	22400	MEF	1	1/5 mile	Possibly Extirpated	19860528	19370527	UNKNOWN	2 MI NE OF PLANADA.	EXACT LOCATION UNKNOWN. MAPPED BY CNDDB AS BEST GUESS ABOUT 2 MILES NE OF PLANADA ALONG HWY 140.			HOOVER'S COLLECTION IS ASSUMED TO HAVE BEEN ALONG HWY 140; NORTH SIDE OF HWY IS CULTIVATED, MARGINAL HABITAT EXISTS SOUTH OF HWY, NO PLANTS SEEN BY STONE & CLIFTON IN 1986.	Mapped on Fury Ranch which has a CRT easement. No plants observed when I did the easement baseline in 2000(?). Site has been smeared around. No plants found 09-22-2011.	9/22/2011	Extirpated	Eliminated		Easement
4	2739	MEF	1	80 meters	Presumed Extant	1986XXXX	198006XX	PVT	SMITH RANCH, ABOUT 2 MILES WNW OF HAYSTACK MTN AND 0.35 MILE WEST OF BLACK RASCAL CREEK.		IN VERNAL POOL WITH NEOSTAPFIA COLUSANA.		REPORTED HERE BY GUNN IN 1980. NOT FOUND IN 1986. MORE SURVEYS NEEDED TO VERIFY ID OF PLANTS REPORTED HERE BY GUNN IN 1980.	Virginia Smith Trust with TNC conservation easement. Surveyed 09-21-2011. Habitat present but very marginal for this species (flashy), but no plants found.	9/21/2011	Presumed Extant	Present and Natural	Marginal	Easement
5	7290	MEF	1	80 meters	Presumed Extant	1986XXXX	198006XX	PVT	SMITH RANCH, ABOUT 2.5 MILES WNW OF HAYSTACK MTN AND NEAR WINDMILL WHICH IS ADJACENT TO BENCHMARK 358'.	SE1/4 OF NW1/4 SEC 19.	ASSOCIATED WITH NEOSTAPFIA COLUSANA.		REPORTED HERE BY GUNN IN 1980. NOT FOUND IN 1986. MORE SURVEYS NEEDED TO VERIFY ID OF PLANTS REPORTED HERE BY GUNN IN 1980.	Virginia Smith Trust with TNC conservation easement. Surveyed 09-21-2011. Habitat present, but no plants found.	9/21/2011	Presumed Extant	Stockpond	Marginal	Easement
6	2740	MEF	1	2/5 mile	Presumed Extant	1986XXXX	198006XX	PVT	APPROXIMATELY 1.3 AIR MILES WNW OF HAYSTACK MTN & 0.3 MILE EAST OF BLACK RASCAL CREEK ON DIRT ROAD.	GUNN (1980) REPORTS THAT O. INAEQUALIS & N. COLUSANA ARE PRESENT IN THE NE 1/4 OF SEC 29 & ALONG THE RD GOING INTO SEC 20. MAPPED BY CNDDB AS A NON-SPECIFIC CIRCLE; POOLS IN THE AREA W/ N. COLUSANA SHOULD BE SEARCHED FOR ORCUTTIA INAEQUALIS	WITH NEOSTAPFIA COLUSANA.		REPORTED HERE BY GUNN IN 1980. NOT FOUND IN 1986 WHEN A NEOSTAPFIA COLUSANA-CONTAINING POOL IN THE AREA WAS SEARCHED. MORE SURVEYS NEEDED TO VERIFY ID OF PLANTS REPORTED HERE BY GUNN IN 1980. NEEDS FIELDWORK. INCL FORMER EO #25.	Flying M Ranch. Presumed extant. Surveyed 09-26-2010. Habitat present, but no plants found after searching the most obvious pools near the ranch road along the fence. Most of the pools here are very flashy.	9/26/2010	Presumed Extant	Present and Natural	Marginal	Easement
8	22399	MEF	1	1/5 mile	Extirpated	19870629	19620719	PVT	6.5 MILES SOUTH OF MONTPELIER, SITE OF OLD RYER STATION.	RYER STATION NO LONGER EXISTS. IN 1958, CRAMPTON NOTED THAT SURROUNDING ROLLING PLAINS ARE GRAIN FARMED; PLAYA MAY HAVE BEEN CULTIVATED AS O. INAEQUALIS IS PRESENT ON MARGINS AS WELL AS CENTRAL PORTION OF PLAYA.	LARGE VERNAL POOL IN A GRAINFIELD WITH DRIED CRACKED LEAD-GRAY ADOBE SOIL. GOWING WITH CENTROMADIA FITCHII, C. PUNGENS, SIDA HEDERACEA, BOISDUVALIA, NAVARRETIA LEUCOCEPHALA, ALLOCARYA, DOWNINGIA.	AGRICULTURE.	ACCORDING TO STONE (1987) WEST SIDE OF ROAD IS NOW AN EXTENSIVE VINEYARD & EAST SIDE OF ROAD WAS IN DRY-FARMED GRAIN & IRRIGATED PASTURE. BASED ON 2007 AERIAL IMAGERY, ENTIRE AREA IS IN AGRICULTURE; HABITAT ELIMINATED, SITE EXTIRPATED.	Extirpated	No	Extirpated	Eliminated		
9	22397	MEF	1	1 mile	Extirpated	19870629	19590804	UNKNOWN	3.3 TO 4.4 MILES SOUTH OF MONTPELIER.	ALONG OLD SOUTHERN PACIFIC RAILROAD. EXACT LOCATION UNKNOWN. MAPPED BY CNDDB AS BEST GUESS BETWEEN 3 AND 4 MILES SE OF MONTPELIER ALONG OAKDALE ROAD BASED ON 2 CRAMPTON COLLECTIONS.	IN A NEARLY BARREN BED OF A VERNAL POOL, IN CRACKED LEAD-GREY ADOBE. ASSOCIATED WITH ERYNGIUM, ELEOCHARIS, & NAVARRETIA LEUCOCEPHALA.		THIS SITE HAS BEEN LEVELED AND WAS IN DRY-FARMED GRAIN ACCORDING TO STONE (1987). 2007 AERIAL IMAGERY CONFIRMS THAT HABITAT IN AREA HAS BEEN ELIMINATED BY AGRICULTURE; SITE EXTIRPATED. INCLUDES FORMER OCCURRENCE #13.	Extirpated	No	Extirpated	Eliminated		
10	22398	MEF	1	1/5 mile	Possibly Extirpated	19870903	19630723	UNKNOWN	2.5 MILES SE OF LE GRAND ALONG SANTA FE AVE.		IN DRY VERNAL POOLS ALONG RAILROAD. ASSOCIATED WITH ELEOCHARIS AND CRYPSIS.		ACCORDING TO STONE (1987) AREA NOW CHOKED WITH NONNATIVE SPECIES; PRESENT VEGETATION CONDITIONS SUGGEST THAT THE DURATION OF INUNDATION HAS DECREASED, PERHAPS DUE TO AN INCREASE IN THE DIAMETER OF THE CULVERT UNDER THE RAILROAD GRADE.	Extirpated. Windshield survey on 09-22-2011 and no habitat remains.	9/22/2011	Extirpated	Eliminated		

Appendix A-3: Current Status of San Joaquin Valley Orcutt Grass (*Orcuttia inaequalis*) in the Great Valley

California Natural Diversity Database, November 4, 2012														Witham, 2013					
EO	EONDX	KEY	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
11	22396	STA	1	1/5 mile	Extirpated	19870721	19580722	PVT	3 MILES EAST OF HICKMAN AT EDGE OF LOW HILLS.		IN A LARGE VERNAL POOL ON EDGE OF LOW HILLS.		ALL OCCURRENCES IN STANISLAUS COUNTY HAVE BEEN EXTIRPATED ACC TO TOM GRIGGS. THIS SITE IS NOW PART OF AN EXTENSIVE VINEYARD ACCORDING TO STONE AND BUCK (1987); 2006 AERIAL IMAGERY CONFIRMS THAT HABITAT HAS BEEN ELIMINATED; SITE EXTIRPATED.	Extirpated. Windshield survey on 07-20-2010 and no habitat remains.	7/20/2010	Extirpated	Eliminated		
12	22391	STA	1	1 mile	Extirpated	19870629	19370703	UNKNOWN	MONTPELIER.	EXACT LOCATION UNKNOWN. MAPPED BY CNDDB AS BEST GUESS IN THE VICINITY OF MONTPELIER.	IN DRY BEDS OF VERNAL POOLS.	AGRICULTURE.	THE AREA AROUND MONTPELIER IS NOW DEVOTED ENTIRELY TO INTENSIVE AGRICULTURE ACCORDING TO STONE (1987); PRESUMED EXTIRPATED.	Extirpated	No	Extirpated	Eliminated		
14	22394	STA	1	1/5 mile	Extirpated	19870703	1937XXXX	UNKNOWN	2 MILES SOUTH OF HICKMAN.	EXACT LOCATION UNKNOWN. MEDEIROS SEARCHED THE AREA AROUND HICKMAN RD AND WHITMORE AVENUE IN 1983 AND FOUND THE SITE TO NOW BE OCCURPIED BY ALMOND ORCHARDS AND PERMANENT PASTURES.		AGRICULTURE.	HABITAT ELIMINATED BY AGRICULTURE; SITE EXTIRPATED.	Extirpated	No	Extirpated	Eliminated		
16	22395	STA	1	4/5 mile	Extirpated	19860901	19730702	UNKNOWN	WEST OF DIENSTAG ROAD & SOUTH OF RESERVOIR ROAD, SOUTH OF MODESTO RESERVOIR IN VERNAL POOL.	EXACT LOCATION UNK. MAPPED BY CNDDB IN THE VICINITY OF ORCUTTIA PILOSA & NEOSTAPFIA COLUSANA POPS S OF RESERVOIR RD, W OF DIENSTAG RD AND N OF HWY 132. VAGUE COLLECTIONS FROM 4 MILES TO 6.8 MILES E OF WATERFORD ALSO ATTRIBUTED TO THIS SITE.	DRY BED OF VERNAL POOL SURROUNDED BY GRAINFIELDS. ASSOCIATED WITH ORCUTTIA PILOSA AND NEOSTAPFIA COLUSANA.		HABITAT ELIMINATED, LAND PLOWED FOR ALMONDS IN SUMMER OF 1974; SITE EXTIRPATED. INCLUDES FORMER OCCURRENCES #17 & 42.	Extirpated	No	Extirpated	Eliminated		
18	22390	STA	1	1 mile	Extirpated	19870904	19370622	PVT	3 MILES NW OF WATERFORD.	EXACT LOCATION UNKNOWN. MAPPED BY CNDDB AS BEST GUESS ABOUT 3 MILES NW OF WATERFORD ALONG COUNTY HWY J9 (OAKDALE WATERFORD HWY).			PLANTS EXTIRPATED ACCORDING TO TOM GRIGGS (1983).	Extirpated	No	Extirpated	Eliminated		
19	22389	TUL	1	1 mile	Possibly Extirpated	19860523	19830613	UNKNOWN	5 MILES NW OF WOODLAKE.			N SIDE OF ROAD IN DRY PASTURE (1986) & CONTAINS MANY SMALL VERNAL POOLS. MARGINAL HABITAT FOR O. INAEQUALIS; NONE SEEN.	STEBBINS REPORTS POP. WAS BARELY PERSISTING IN 1983. STONE & CLIFTON SURVEYED AREA IN 1986: MUCH OF AREA IS NOW IN AG. ONE LARGE DEPRESSION IN A BARLEY FIELD 0.8 MI W OF ELDERWOOD ON THE S SIDE OF THE HWY HAS BEEN PLOWED REPEATEDLY.	Extirpated. Searched one remaining swale on 08-06-2010 and found no plants. Habitat marginal at best	8/6/2010	Extirpated	Eliminated		

Appendix A-3: Current Status of San Joaquin Valley Orcutt Grass (*Orcuttia inaequalis*) in the Great Valley

California Natural Diversity Database, November 4, 2012														Witham, 2013					
EO	EONDX	KEY	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
20	22387	FRE	1	1/5 mile	Extirpated	19870601	1936XXXX	UNKNOWN	3 MILES WEST OF ORANGE COVE.				STEBBINS SEARCHED THIS AREA FOR SEVERAL MILES BOTH WEST & SOUTHWEST OF ORANGE COVE. CURRENT LAND USE IS ENTIRELY AGRICULTURAL. THE MOST LIKELY SITE FOR HOOVER'S COLLECTION WAS THE LARGE DEPRESSION JUST SW OF THE INTERSECTION OF ADAMS AVE.	Extirpated	No	Extirpated	Eliminated		
21	22388	FRE	1	1 mile	Extirpated	19870601	19270527	UNKNOWN	NEAR LANE'S BRIDGE NEAR FRIANT.			DEVELOPMENT.	THIS REGION HAS BEEN LEVELED AND IS NOW BEING DEVELOPED FOR RESIDENTIAL AND COMMERCIAL USES AS WELL AS RECREATION ACCORDING TO STEBBINS (1987).	Extirpated	No	Extirpated	Eliminated		
22	22386	FRE	1	1/5 mile	Extirpated	19870601	19760607	UNKNOWN	NORTH OF COPPER AVE, ABOUT 0.5 MILE NORTHWEST OF JUNCTION OF COPPER & ARMSTRONG AVE.	EXACT LOCATION UNKNOWN. MAPPED BY CNDDB TO ENCOMPASS HISTORIC VERNAL POOLS IN VICINITY ACCORDING TO MAPS FROM 1981 AND 1988.		HABITAT ELIMINATED BY ALTERED HYDROLOGIC REGIME. NUMEROUS WEEDY, NON-NATIVE SPECIES NOW DOMINATE.	PLANTS SEEN IN 1976, DESPITE DROUGHT. NO PLANTS SEEN IN 1981, 83, 85 OR 87. ACCORDING TO STEBBINS, NO VIABLE HABITAT REMAINS DUE TO HYDROLOGIC ALTERATIONS TO A NEARBY STREAM PROJECT. SITE ALSO DAMAGED BY HORSEBACK RIDING AND ORVS.	Extirpated	No	Extirpated	Eliminated		
23	22384	MAD	1	1/5 mile	Extirpated	19870601	19790515	PVT	NORTH OF AVENUE 12, EAST OF ROAD 38, 11 MILES ESE OF MADERA.	IN 4 OF 6 POOLS IN THE SW 40 ACRES OF SECTION 36. MAPPED BY CNDDB TO ENCOMPASS HISTORIC VERNAL POOLS IN VICINITY ACCORDING TO MAPS FROM 1982 AND 1988.			THOUSANDS OF PLANTS OBSERVED IN 1979. THIS SITE HAS BEEN LEVELED AND PLOWED AND WAS IN DRYLAND WHEAT IN 1987 ACCORDING TO STEBBINS.	Extirpated. Windshield survey on 08-09-2010 and site was being actively used for winter wheat(?), but appeared leveled despie aerial photo signature.	8/9/2010	Extirpated	Eliminated		
26	2472	MER	1	specific area	Presumed Extant	20090603	20090603	PVT	FLYING M RANCH, 0.1 MILE WEST OF BURNS CREEK AND 0.8 MILE NNW OF BURNS CREEK DAM, IN BURNS RESERVOIR BASIN.	NE 1/4 OF NW 1/4 OF SECTION 25. IN LARGE VERNAL POOL BY AN ACCESS ROAD.	IN VERNAL POOL WITH HEAVY CLAY SOIL. WITH NAVARRETIA, MICROSERIS, ALLOCARYA, DOWNINGIA, ELEOCHARIS MACROSTACHYA, RUMEX CRISPUS, ERYNGIUM VASEYI, LASTHENIA FREMONTII, POLYPOGON MONSPELIENSIS, ALLOCARYA STIPITATA, AND MIMULUS TRICOLOR.	SITE WAS LIGHTLY GRAZED IN 1986 & 1997.	MORE THAN 1000 PLANTS WERE SEEN IN 1981 AND 1985. ABUNDANT IN 1986. AT LEAST 10,000 PLANTS OBSERVED IN 1997. TENS OF THOUSANDS OF PLANTS OBSERVED IN 2009; HOLLAND STATES THAT THIS POPULATION SIZE HAS BEEN CONSISTENT OVER THE PAST 7 YEARS.	This is part of the Flying M Ranch under TNC easement. Extant. Several thousand plants seen on 09-26-2010. However on 04-14-2012, the pool was dry and no plants were observed in this unusually dry season.	4/14/2012	1,000s in 2010	Present and Natural	Persistent	Easement
28	2465	MER	6	specific area	Presumed Extant	20090603	20090603	PVT	FLYING M RANCH; 1.6-2.0 MILES NE OF VABM HURRICANE, APPROXIMATELY 1.8 MILES SW OF BURNS CREEK DAM.	MAPPED AS 6 POLYGONS: 1 POLYGON MAPPED IN THE SOUTH HALF OF THE SE 1/4 OF SECTION 34 AND 5 POLYGONS MAPPED IN THE SW 1/4 OF SECTION 35.	IN SEVERAL VERNAL POOLS SURROUNDED BY ANNUAL GRASSLAND. RAYNOR CLAY SOIL. WITH NEOSTAPFIA COLUSANA, ALLOCARYA STIPITATA, ERYNGIUM VASEYI, BOISDUVALIA CLEISTOGAMA, ALOPECURUS SACCATUS, ELEOCHARIS MACROSTACHYA, PSILOCARPHUS BREVISSIMUS, ETC.	SITE IS GRAZED. NE POLY APPEARS TO HAVE INCREASED INUNDATION DUE TO ROAD COMPACTION.	SECTION 34: <1000 PLANTS IN 1981, NONE IN 2009. SECTION 35: 1981: ~1500 PLANTS; 1986: MORE THAN 5100 PLANTS; 2009: NO PLANTS SEEN IN 2 W POLYGONS AND SE POLY, 12 IN CENTER POLY, AND ~3000 IN NE POLY. INCLUDES FORMER OCCURRENCES #29, 37, 40.	FLYING M Ranch playa at the entrance. Five polygons within the occurrence with the center one being a playa. >1M plants 9-26-2010 all in central polygon. None on 4-14-2012 and the pool was dry during this low rainfall year. Central polygon is the most persistent. Also according to Holland is the one by the road (northeasternmost).	4/14/2012	>million in 2010	Present and Natural	Persistent	Easement

Appendix A-3: Current Status of San Joaquin Valley Orcutt Grass (*Orcuttia inaequalis*) in the Great Valley

California Natural Diversity Database, November 4, 2012														Witham, 2013					
EO	EONDX	KEY(	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
31	22381	MAI	1	1/5 mile	Extirpated	19870602	1973XXXX	PVT	0.3 MILE SOUTH OF MADERA AIR FORCE STATION ALONG ROAD 600.		WAS ASSOCIATED WITH ORCUTTIA PILOSA ACCORDING TO HOOVER, R. #1252.		SITE DESTROYED IN THE SUMMER OF 1978. NO PLANTS FOUND DURING 1978 AND 1979 SEARCHES BY GRIGGS. SITE WAS IN DRYLAND OATS IN 1987, BUT HAS BEEN PLOWED IN PAST SEASONS.	Extirpated. Windshield survey on 08-08-2010.	8/8/2010	Extirpated	Eliminated		
33	2473	MEF	1	specific area	Presumed Extant	20090603	20090603	PVT	FLYING M RANCH, ABOUT 1.8 MILES WNW OF BURNS CREEK DAM SPILLWAY, ESE OF LOWER WELL.	MAPPED ON THE BORDER BETWEEN THE SE 1/4 OF SECTION 22 AND THE NE 1/4 OF SECTION 27.	ON GREENFIELD SANDY LOAM SOILS OVER HARDPAN, ASSOCIATED WITH NEOSTAPFIA COLUSANA, PSILOCARPHUS BREVISSIMUS, DESCHAMPSIA DANTHONIODES, ERYNGIUM VASEYI, CRYPSIS SCHOENOIDES, ALLOCARYA STIPITATA, DOWNINGIA, HORDEUM, ETC.	SITE IS GRAZED. EVIDENCE OF GRASSHOPPER DAMAGE IN 1986.	SEVERAL TENS OF THOUSANDS OF PLANTS IN 1981 (VIRTUALLY PURE STANDS). PLANTS ABUNDANT IN 1986. SEVERAL TENS OF THOUSANDS OF PLANTS IN 2009. INCLUDES FORMER OCCURRENCE #27.	Flying M Ranch. Extant. Thousands of plants observed 09-26-2010. However no plants observed on 4-14-2012 due to the particularly dry year. The 2010 polygon probably represents the most persistent population.	9/26/2010	1,000s in 2010	Present and Natural	Persistent	
34	22380	MEF	2	specific area	Presumed Extant	20090603	19810609	PVT	ABOUT 1 AIR MILE WEST OF BURNS CREEK DAM.	TWO COLONIES MAPPED IN THE EAST HALF OF THE SW 1/4 OF SECTION 26 ACCORDING TO A 1981 MAP FROM A WESCO REPORT ON THE BURNS CREEK DAM PROJECT.	IN TWO VERNAL POOLS IN SAN JOAQUIN SOILS WITH DOWNINGIA BICORNUTA.	LOW CATTLE TRAMPLING IN POOLS. BURNS CREEK DAM EXPANSION MAY IMPACT WATERSHED.	FEWER THAN 10,000 PLANTS OBSERVED IN 1981. NO PLANTS FOUND IN 1986 AND 2009.	Flying M Ranch. Might be a mis-mapping. Stone et al (1988) describe a large dumbell shaped pool, presumably from the herbarium specimen label. The Westco report (1981) has two colonies mapped.	9/26/2010	Erroneous	Present but Not Suitable		Easement
35	2463	MEF	1	specific area	Presumed Extant	1981XXXX	1981XXXX	UNKNOWN	PLAYA-LIKE LAKE 1.5-1.6 MI SE OF BURNS CREEK DAM SPILLWAY. 1.3 MILES DUE NORTH OF JCT OF BEAR CREEK AND CUNNINGHAM RDS.	AT HEAD OF INTERMITTENT TRIBUTARY NORTH OF BEAR CREEK.	ON PLAYA ON CONTACT ZONE BETWEEN AMADOR LOAM AND REDDING GRAVELLY LOAM.	OVERGRAZING IS A THREAT.	PLANTS SEEN IN AN AREA 5-20 SQ METERS. INCLUDES FORMER OCCURRENCE #32.	Morrison Ranch. Presumed extant, based on aerial photo interpretation. No access.	No	Presumed Extant	Present and Natural	Unknown	
38	12614	MEF	1	specific area	Presumed Extant	19870905	19810626	PVT	NE OF LE GRAND, 1.5 MILES WEST OF WHITEROCK ROAD. 0.1 MILE SE OF WINDMILL 279'.		IN VERNAL POOLS IN VALLEY GRASSLAND ON RAYNOR CLAY. ASSOCIATED WITH EREMOCARPUS AND ERYNGIUM SPP.	GRAZING IS A POTENTIAL THREAT. IN 1986, CATTLE STAYED ON SITE THROUGH SUMMER.	SITE SEARCHED FOR BUT NOT LOCATED IN EITHER 1986 (STONE AND ERZINGER) OR IN 1987 (STONE).	Presumed extant, based on aerial photo interpretation. No access.	No	Presumed extant	Present and Natural	Unknown	
39	2461	MEF	1	specific area	Presumed Extant	19860705	19860705	PVT	2 MILES NE OF LE GRAND, 1.3 MILES NE OF INTERSECTION OF FRESNO AND JORDAN ROADS, 1.85 MILES EAST OF FRESNO ROAD.	FOUND THROUGHOUT MAIN POOL AND SOUTHERN EXTENSION. ALSO IN SMALL POOL NORTH OF MAIN POOL.	IN RAYNOR CLAY IN VERNAL POOL IN VALLEY GRASSLAND. ASSOCIATED WITH EREMOCARPUS SETIGERUS, ERYNGIUM VASEYI, ALLOCARYA STIPITATA, DOWNINGIA SPP., HORDEUM GENICULATUM, POLYPOGON MONSPELIENSIS, PHALARIS PARADOXA, AND PSILOCARPHUS BREVISSIMUS.	GRAZING IS A POTENTIAL THREAT.	OVER 10,000 PLANTS OBSERVED IN 1986.	Presumed extant, based on aerial photo interpretation. No access. Habitat present, but the most likely location is 0.15 miles southeast of the mapped polygon.	No	Presumed Extant	Present and Natural	Unknown	

Appendix A-3: Current Status of San Joaquin Valley Orcutt Grass (*Orcuttia inaequalis*) in the Great Valley

California Natural Diversity Database, November 4, 2012														Witham, 2013					
EO	EONDX	KEY(	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
41	6232	MAD	1	specific area	Presumed Extant	19950904	19950904	PVT	ALONG NORTH SIDE OF AVENUE 15 ABOUT 0.35 MILE WEST OF ROAD 39 1/2, 4 MILES WEST OF LITTLE TABLE MOUNTAIN.	MAPPED WITHIN THE S 1/2 OF THE SW 1/4 OF SECTION 18.	GROWING ON DRY CRACKED CLAY IN CENTER OF VERNAL POOLS WITHIN VALLEY GRASSLAND. ASSOCIATED WITH ERYNGIUM, DOWNINGIA, PSILOCARPHUS BREVISSIMUS, PLAGIOBOTHRYS, CASTILLEJA CAMPESTRIS VAR. SUCCULENTA, PLAGIOBOTHRYS STIPITATA, AND VULPIA MYUROS.	THREATENED BY GRAZING, AGRICULTURAL DEVELOPMENT, AND RANCH SUBDIVISION.	APPROXIMATELY 200 PLANTS SEEN IN 1982; 400 PLANTS IN 1983 AND 1986. THIS IS THE ONLY GOOD POPULATION SOUTH OF MERCED COUNTY ACCORDING TO J. STEBBINS. 1100+ OBSERVED IN 1995. MANY OTHER RARE SPECIES OCCUR IN THESE POOLS AS WELL.	Extant. Area surveyed on 08-08-2010 and 65 plants found in a single pool. No other pools were found to be occupied. Note that it appeared that someone else, perhaps a consultant, was conducting rare plant surveys on the site; ATV tracks leading from pool to pool.	8/8/2010	65 Plants in 2010	Present and Natural	Persistent	
43	2302	MAD	7	specific area	Presumed Extant	20100629	20100629	PVT, CALTRANS	BOTH SIDES OF HIGHWAY 41 FROM ~1.4-2 MILES NORTH OF JUNCTION WITH AVENUE 12, 3 MILES SOUTHWEST OF LITTLE TABLE MOUNTAIN.	7 COLONIES TOTAL. W SIDE OF HWY 41: 3 POOLS, CALTRANS POOL #'S 210, 213, & 211. E SIDE OF HWY: 4 POOLS, 3 ALONG ROAD AND 1 ~0.2 MI E OF ROAD. A 1973 COLLECTION FROM "8 MI N OF PINEDALE ON HWY 41" ALSO ATTRIBUTED TO THIS SITE.	POOLS IN A LARGE DRY-FARMED GRAINFIELD. HIGH TERRACE SITE WITH HARDPAN SOILS MAPPED AS SAN JOAQUIN SANDY LOAM. W/ LYTHRUM HYSSOPIFOLIA, JUNCUS BUFONIUS, HEMIZONIA FITCHII, ERYNGIUM SP., PSILOCARPHUS BREVISSIMUS, DOWNINGIA ORNATISSIMA, ETC.	DEVELOPMENT, HWY EXPANSION, AGRICULTURE, & POSSIBLY MICE WHICH MAY EAT SPIKELETS. SITE DISKED (ANNUALLY?) & GRAZED.	POPULATION NUMBERS ARE FOR PARTS OF OCCURRENCE. W SIDE OF HWY: >1000 PLANTS SEEN IN 1986, >10,000 PLANTS IN 1992, NO PLANTS IN 2009 (DUE TO DROUGHT?). E SIDE OF HWY: ~100 PLANTS SEEN IN 1995 AND ~350 IN 2010. INCLUDES FORMER OCCURRENCE #52.	Extant 08-09-2010 when three polygons were mapped. 1 poly west of road with 3,000 plants. 2 polys east of road with 1 in north and 75 in south pools. East of road had a bunch of created pools. On 10-16-2011 the area west of Highway 41 had been plowed.	10/16/2011	Extant, but pools on west side of the road were disced in 2011. Also note CalTrans mitigation on east side of road.	Present but Degraded	Declining	
44	22373	MAD	1	1 mile	Possibly Extirpated	19870602	19730815	UNKNOWN	8.0 MILES NORTH OF MADERA.	EXACT LOCATION UNKNOWN. MAPPED BY CNDDB AS BEST GUESS ABOUT 8 MILES NORTH OF MADERA ON ROAD 28 1/2. A 1936 HOOVER COLLECTION FROM "6 MILES NORTH OF MADERA ON ROAD 28 1/2" ALSO ATTRIBUTED TO THIS SITE.	IN 1973, ORCUTTIA PILOSA IS MENTIONED AS ALSO OCCURRING AT THIS SITE.	AGRICULTURE.	ACCORDING TO STEBBINS, MUCH OF THIS AREA IS NOW UNDER INTENSIVE AGRICULTURE.	Extirpated	No	Extirpated	Eliminated		
45	9516	MAD	1	specific area	Presumed Extant	20090903	19910911	PVT	EAST OF MADERA RANCHOS SUBDIVISION, JUST NORTH OF MADERA CANAL, MADERA.	PLANTS UNDER PG&E POWER LINES IN THE WEST HALF OF THE NW 1/4 OF SECTION 36.	LARGE VERNAL POOLS IN ANNUAL GRASSLAND WITH ERYNGIUM VASEYI, TRICHOSTEMA, POLYPOGON, PSILOCARPHUS, AND BROMUS RUBENS.	SITE PLOWED & PLANTED TO WHEAT IN 1986, BUT ORCUTTIA PLENTIFUL 5 YEARS LATER. ORV USE, CANAL, & SURROUNDING AG THREATEN.	VIGOROUS POPULATION OF APPROXIMATELY 1000 PLANTS IN 1983, 60 PLANTS IN 1986, NONE SEEN IN 1987, 3000 IN 1991. NO PLANTS SEEN IN 2009, PROBABLY DUE TO DROUGHT.	Extant 08-09-2010 when two polygons were mapped. A total of 800 plants were observed. On 10-16-2011 the site was being disced by 3 separate machines. However, wetland signature remains in 2012 NAIP imagery.	10/16/2011	Possibly Extirpated	Probably Elminiated	Declining	
46	2464	MER	1	nonspecific area	Presumed Extant	19810620	19810620	PVT	APPROX 5.0 AIR MI ESE OF HAYSTACK MTN.	NE 1/4 OF SW 1/4 OF SECTION 31.	IN VERNAL POOL IN VALLEY GRASSLAND ON RAYNOR CLAY. ASSOCIATED WITH EREMOCARPUS SETIGERUS & ERYNGIUM SPP.		FEWER THAN 1000 PLANTS IN 1981. NO MAP GIVEN; MAP DETAIL NEEDED.	Morrison Ranch. Believed erroneous, based on aerial photo interpretation I BELIEVE THIS IS MIS-MAPPED. Should be the same location as T. Burnham mapped NECO on 6/20/81… which would be the same location as ORIN EO#35.	No	Erroneous	Probably EO#35	Unknown	

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EO	EONDX	KEY(	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
47	7471	FRE	1	specific area	Presumed Extant	20020526	20020526	BLM-HOLLISTER RA, PVT	TOP OF TABLE MOUNTAIN, APPROX 3/4 MILE NW OF MARSHALL HILL, 1 MILE NW OF JUNCTION OF AUBERRY ROAD AND WELLBARN ROAD.	KNOWN AS "TABLE D", OR THE "FORD-BLM TABLE."	ORCUTTIA IN 2 POOLS SURROUNDED BY GRASSLAND. WITH CASTILLEJA CAMPESTRIS SUCCULENTA, ERYNGIUM VASEYI, ALOPECURUS HOWELLII, POGOGYNE DOUGLASII, LASTHENIA GLABERRIMA, DOWNINGIA BICORNUTA, PLAGIOBOTHRYS STIPITATUS, AND GRATIOLA HETEROSEPALA.	NEARBY POOLS ON TABLE C HAVE BEEN DEGRADED BY GRAZING. TABLE D POOLS MOSTLY UNGRAZED. OHV USE SURROUNDING POOLS.	2000 PLANTS IN 1987, APPROXIMATELY 8000 IN 1990, ABOUT 560,000 ESTIMATED IN 1993, "THOUSANDS" OBSERVED IN 1995, AT LEAST 5000 IN 1997, UNKNOWN NUMBER SEEN IN 2002.	Table Mountain. Presumed extant based on aerial photo interpretation.	No	Presumed Extant	Present and Natural	Unknown	Half BLM
48	6891	MAI	1	80 meters	Presumed Extant	19920617	19920617	PVT	0.9 MI N OF AVENUE 12, 0.1 MI E OF HWY 41.	POOL #5E-28 FOR CALTRANS RTE 41 NORTH PROJECT.	LARGE VERNAL POOL IN ANNUAL GRASSLAND WITH ERYNGIUM SP., PSILOCARPHUS BREVISSIMUS, EREMOCARPUS SETIGERUS.	CATTLE GRAZING AND TRAMPLING HAVE DAMAGED POOLS. SITE UNDER STUDY BY CALTRANS FOR FREEWAY ALIGNMENT (1992).	FEWER THAN 10 PLANTS IN 1992.	Presumed extant based on aerial photo interpretation. No access.	No	Presumed extant	Present and Natural	Unknown	
49	2756	MEF	2	specific area	Presumed Extant	19990615	19990615	PVT	SMITH RANCH; ABOUT 2.2 MILES ESE OF YOSEMITE LAKE AND 0.8 MILE NORTH OF LE GRAND CANAL, NORTHEAST OF MERCED.	MAPPED IN 2 VERNAL POOLS ALONG INTERMITTENT STREAM WITHIN THE N 1/2 SW 1/4 SECTION 36. COLONIES ARE FOUND ALONG EITHER SIDE OF DIRT ROAD.	NORTHERN HARDPAN VERNAL POOLS WITHIN ANNUAL GRASSLAND. MAPPED ON CORNING GRAVELLY LOAM AND REDDING GRAVELLY LOAM SOILS. WITH ERYNGIUM VASEYI, LOLIUM MULTIFLORUM, HORDEUM GENICULATUM, HEMIZONIA FITCHII, ALLOCARYA STIPITATA, ETC.	AREA IS HEAVILY GRAZED, THREAT OF DEVELOPMENT FROM PROPOSED UC CAMPUS.	1 PLANT OBSERVED IN 1987 (R.D. STONE, BIOSYSTEMS); UNKNOWN NUMBER OF PLANTS SEEN IN 1999. SITE IS WITHIN SPHERE OF INFLUENCE OF THE PROPOSED UC MERCED CAMPUS. THE RARE GRASS NEOSTAPFIA COLUSANA IS ALSO FOUND IN THESE POOLS.	Extant. This portion of the Virginia Smith Trust either under or proposed for a conservation easement. Surveyed on 09-22-2011. 41 plants found within the western polygon of this 2-parted occurrence. Could not identify the polygon on the east side of the road. Habitat marginal, but population appears persistent.	9/22/2011	41 Plants in 2011	Present and Natural	Persistent	Easement
50	2468	MEF	1	specific area	Presumed Extant	20090603	19870630	PVT	FLYING M RANCH; 3.8 MILES NNW OF PLANADA, 1.3 MILES SW OF VABM HURRICANE.	O. INAEQUALIS MOST ABUNDANT IN EASTERN END OF POOL. MAPPED IN THE SW 1/4 OF THE NE 1/4 OF SECTION 8.	LARGE VERNAL POOL SURROUNDED BY ANNUAL GRASSLAND. RAYNOR CLAY SOIL. WITH ERYNGIUM VASEYI, PSILOCARPHUS BREVISSIMUS, BROMUS MOLLIS, HORDEUM GENICULATUM, LOLIUM MULTIFLORUM, EREMOCARPUS SETIGERUS, BOISDUVALIA CLEISTOGAMA, VULPIA MYUROS, ETC.	SITE IS HEAVILY GRAZED. MANY NONNATIVE PLANT SPECIES HERE, TOO.	FEWER THAN 500 PLANTS OBSERVED IN 1987. NO PLANS FOUND IN 2009.	Flying M Ranch. Presumed extant based on aerial interpretation.	No	Presumed Extant	Present and Natural	Unknown	
51	12615	MEF	1	specific area	Presumed Extant	19870904	19870904	PVT	1.7 MI NE OF LE GRAND AND 0.9 MI NE OF INTERSECTION OF FRESNO AND JORDAN RDS.	O. INAEQUALIS FOUND THROUGHOUT POOL. NW1/4 OF SW1/4 SEC 9.	SMALL VERNAL POOL SURROUNDED BY ANNUAL GRASSLAND. RAYNOR CLAY SOIL. WITH EREMOCARPUS SETIGERUS, ERYNGIUM VASEYI, ALLOCARYA STIPITATA, BOISDUVALIA CLEISTOGAMA, HORDEUM GENICULATUM, PHALARIS PARADOXA, POLYPOGON MONSPELIENSIS, AND ALOPECURUS.	SITE HEAVILY GRAZED EARLIER IN YEAR.	10,000 PLANTS OBSERVED BY STONE IN 1987.	Presumed extant, based on aerial photo interpretation. No access. Habitat present, but the most likely location is 0.08 miles north of the centroid of the mapped polygon.	No	Presumed Extant	Present and Natural	Unknown	

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EO	EONDX	KEY(	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
53	30718	FRE	1	specific area	Presumed Extant	19960525	19960525	PVT	ABOUT 0.25 MI E OF FRIANT ROAD AND 0.5 MI S OF LITTLE DRY CREEK.		LARGE (APPROX. 1 ACRE) VERNAL POOL IN NONNATIVE GRASSLAND. WITH ALOPECURUS HOWELLII, CASTILLEJA CAMPESTRIS SUCCULENTA, LYTHRUM HYSSOPIFOLIUM, AND PSILOCARPHUS BREVISSIMUS. PROBABLE FAIRY SHRIMP SITE AND EXCELLENT AMPHIBIAN HABITAT.	URBAN DEVELOPMENT THREATENS.	300 PLANTS IN 1996.	Presumed extant, based on aerial photo interpretation. No access.	No	Presumed Extant	Present and Natural	Unknown	
54	30295	MAI	1	specific area	Presumed Extant	19950812	19950812	USBOR	E OF MADERA EQUALIZATION RESERVOIR; 1.2-1.3 MI DUE N OF ADOBE RANCH.		2 ARTIFICIAL VERNAL POOLS CREATED IN 1993. O. INAEQUALIS INOCULATED AT THAT TIME. ASSOCIATED WITH LYTHRUM HYSSOPIFOLIUM, ERYNGIUM VASEYI, AND PLAGIOBOTHRYS STIPITATUS.	POOLS FENCED TO EXCLUDE GRAZING. GRASSHOPPERS OBSERVED FEEDING ON O. INAEQUALIS IN 1995.	EACH POOL WITH SEVERAL HUNDRED PLANTS IN 1995.	Presumed extant, based on aerial photo interpretation. No access.	No	Presumed Extant	Created	Unknown	
55	30592	MAI	1	nonspecific area	Presumed Extant	19950903	19950903	PVT	NW FINGER OF KENNEDY TABLE; 0.3-0.5 MI DUE W OF HIDEAWAY RANCH.	NEAR AN OLD STONE FENCE.	LARGE POOL (APPROX. 6 ACRES) IN NONNATIVE GRASSLAND WITH DOWNINGIA BICORNUTA, ERYNGIUM VASEYI, PLAGIOBOTHRYS STIPITATUS, AND POGOGYNE DOUGLASII. HISTORICAL COLLECTION OF GRATIOLA HETEROSEPALA FROM THIS SITE.		MILLIONS OF PLANTS IN 1995. MAPPED AS NON-SPECIFIC POLYGON; MAP DETAIL NEEDED.	Kennedy Table Mountain. Presumed extant based on aerial photo interpretation. No access. Polygon in CNDDB could be tightened up, but this is the right location.	No	Presumed Extant	Present and Natural	Unknown	
56	35397	TUL	1	specific area	Presumed Extant	20060613	20060613	DFG-STONE CORRAL ER	SSE OF SEQUOIA FIELD (AIRPORT), ABOUT 1 MI EAST OF DINUBA BLVD (HWY 63) AND 0.6 MI NORTH OF 12TH AVE, NORTH OF VISALIA.	STONE CORRAL ECOLOGICAL RESERVE. MAPPED WITHIN THE SW 1/4 OF THE NW 1/4 SECTION 19.	VERNAL POOL WITH CHAMAESYCE HOOVERI, CRYPSIS, DISTICHLIS SPICATA, DOWNINGIA CUSPIDATA, HORDEUM DEPRESSUM, LILAEA SCILLOIDES, AND POLYPOGON MONSPELIENSIS. ADJACENT UPLAND DOMINATED BY ANNUAL GRASSES; POOL IS MOSTLY FREE OF EXOTIC PLANTS.		250 PLANTS OBSERVED IN 1997. FEWER THAN 100 PLANTS OBSERVED IN 2006. LONG-TERM VIABILITY QUESTIONED DUE TO SMALL SIZE OF PRESERVE.	Sequoia Field Unit of DFW Stone Corral Ecological Reserve. No plants observed 08-05-2010. ~1,000 plants observed on 06-06-2011.	6/6/2011	1,000 Plants in 2011	Present and Natural	Persistent	Protected
57	43173	MER	3	specific area	Presumed Extant	20010629	20010629	PVT-ICHORD RANCH	SOUTHEAST OF YOSEMITE LAKE, NORTH SIDE OF FAIRFIELD CANAL ABOUT 0.5 MI NNW OF BLACK RASCAL CREEK CROSSING, NE OF MERCED.	ALONG INTERMITTENT DRAINAGE THAT IS BLOCKED BY BERM. MOSTLY WITHIN THE SE 1/4 NE 1/4 SECTION 11. ONE COLONY IN ADJACENT NW 1/4 SEC 12.	LARGE VERNAL POOL WITH EPILOBIUM DENSIFLORUM, EPILOBIUM SPP., ELEOCHARIS MACROSTACHYA, PLAGIOBOTHRYS STIPITATA VAR. MICRANTHA, AND LYTHRUM HYSSOPIFOLIA. LEPIDURUS PACKARDI ALSO FOUND IN THIS POOL.	SITE IS HEAVILY GRAZED. ADJACENT PARCELS CONVERTED TO OAT HAY CULTIVATION, IRRIGATED FARMLAND.	ABOUT 10,000 PLANTS OBSERVED IN 1999. UNKNOWN NUMBER OBSERVED IN 2001.	Ichord Ranch with CRT easement. Presumed extant based on aerial photo interpretation.	No	Presumed Extant	Present and Natural	Unknown	Easement
58	44069	MER	1	specific area	Presumed Extant	20000805	20000805	PVT	SOUTH OF BEAR CREEK, ABOUT 0.15 MILE SOUTH OF BEAR CREEK ROAD AND 0.4 MI WEST OF CUNNINGHAM ROAD, NORTHEAST OF PLANADA.	SINGLE COLONY MAPPED WITHIN THE NW 1/4 NE 1/4 SECTION 7.	GROWING IN LARGE PLAYA POOL (300' X 400') WITHIN ANNUAL GRASSLAND HABITAT.	LAND APPEARS SOMEWHAT OVERGRAZED.	5000+ PLANTS OBSERVED IN 2000.	Extant. Mapped two polygons 09-22-2011. North poly with 150 plants. South poly with >5,000 plants.	9/22/2011	>5,000 Plants in 2011	Present and Natural	Persistent	

Appendix A-3: Current Status of San Joaquin Valley Orcutt Grass (*Orcuttia inaequalis*) in the Great Valley

California Natural Diversity Database, November 4, 2012														Witham, 2013					
EO	EONDX	KEY	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
59	45575	MER	1	specific area	Presumed Extant	20090603	20000415	PVT-FLYING M RANCH	FLYING M RANCH, ABOUT 0.6 AIR MILE WSW OF THE BURNS CREEK DAM, 2.3 AIR MILES ESE OF HAYSTACK MOUNTAIN, ENE OF MERCED.	IN LARGE VERNAL POOL NORTHWEST OF THE FIRST ROAD JUNCTION PAST THE BURNS CREEK CROSSING. MAPPED WITHIN THE SW 1/4 OF THE SW 1/4 OF SECTION 25.	IN LARGE PLAYA-LIKE POOL WITH DOWNINGIA, PSILOCARPHUS, PLAGIOBOTHRYS, ERYNGIUM, AND ISOETES. THE RARE GRATIOLA HETEROSEPALA AND CASTILLEJA CAMPESTRIS SSP. SUCCULENTA ALSO OCCUR AT THIS SITE.	CATTLE GRAZING.	UNKNOWN NUMBER OF PLANTS OBSERVED IN 2000. NO PLANTS FOUND IN 2009.	ERRONEOUS. This site was a mis-mapping of the central polygon of ORIN EO#28 (EONDX 2465) by Carol Witham in 2000. Need to fix the GRHE and CACAS occurrence records as well.	9/23/2010	Erroneous			
60	50337	MER	1	80 meters	Presumed Extant	20010629	20010629	PVT-ICHORD RANCH	APPROXIMATELY 1.5 MILES NORTH OF YOSEMITE AVE, JUST WEST OF LE GRAND CANAL.	MAPPED WITHIN THE SW 1/4 OF THE NW 1/4 OF SECTION 6.	WELL DEFINED VERNAL POOL. ASSOCIATES INCLUDE PLAGIOBOTHRYS STIPITATUS VAR. MICRANTHUS, PSILOCARPHUS BREVISSIMUS, POLYPOGON MONSPELIENSIS, LOLIUM MULTIFLORUM, ERYNGIUM SPP., AND HORDEUM MARINUM GUSSONEANUM.	POSSIBLE THREATS INCLUDE HYDROLOGICAL ALTERATIONS AND OVERGRAZING.	POSSIBLY THOUSANDS OF PLANTS OBSERVED IN 2001; NOT COUNTED.	Ichord Ranch with CRT easement. Presumed extant based on aerial photo interpretation.	No	Presumed Extant	Present and Natural	Unknown	Easement
61	50338	MER	1	80 meters	Presumed Extant	20010630	20010630	PVT-ICHORD RANCH	APPROXIMATELY 0.9 MILE NORTH OF YOSEMITE AVE, ON TERRACE OF RASCAL CREEK, JUST WEST OF MAIN ENTRANCE ROAD ON RANCH.	MAPPED WITHIN THE NE 1/4 OF THE NE 1/4 OF SECTION 12.	IN DEEPEST PART OF VERNAL POOL. ASSOCIATES INCLUDE NAVARRETIA LEUCOCEPHALA, PSILOCARPHUS BREVISSIMUS, ERYNGIUM SPP, PLAGIOBOTHRYS STIPITATUS VAR. MICRANTHUS, HORDEUM MARINUM SSP GUSSONEANUM. 60% VEGETATION COVER, 5% COBBLE, 35% BARE SOIL.	HYDROLOGY MAY BE ALTERED DUE TO PROXIMITY TO DIRT ROAD. DEEP CATTLE HOOF PRINTS WITHOUT ANY VEGETATION OBSERVED.	UNKNOWN NUMBER OF PLANTS OBSERVED IN 2001. PLANTS NOT AS VIGOROUS AS OTHER OCCURRENCES ON THE RANCH.	Ichord Ranch with CRT easement. Presumed extant based on aerial photo interpretation.	No	Presumed Extant	Present and Natural	Unknown	Easement
62	55309	MER	1	nonspecific area	Presumed Extant	20000721	20000721	PVT	NE OF BAXTER RD INTERSECTION W/ MARGUERITE RD. N OF MERCED/MADERA CO LINE. APPROX 3.9 MI NE OF BRENDA RESERVOIR DAM.	MAPPED ACCORDING TO T-R-S PROVIDED BY HARTESVELDT: T09S R17E E SE 1/4 OF SW 1/4 OF SECTION 5.	IN NORTHERN HARDPAN VERNAL POOL WITH HORDEUM MARINUM GUSSONIANUM, PLAGIOBOTHRYS STIPITATUS, AND PSILOCARPHUS BREVISSIMUS. TUCTORIA GREENEI ALSO PRESENT.	GRAZING BY CATTLE & HORSES.	MORE THAN 30 PLANTS OBSERVED IN 2000. SITE IS A PROPOSED MITIGATION BANK FOR ENDANGERED SPECIES AND WETLANDS.	Flynn Ranch. Presumed extant. Surveyed 09-23-2010. Habitat present, but no plants found after searching all pools in an extensive area. Site is pretty weedy. This also might be mis-mapped given the not about it being proposed for a bank. The Wildlands bank is to the west.	9/23/2010	Presumed Extant	Present but Degraded	Declining	
63	55310	SOL	1	80 meters	Presumed Extant	20030612	20030612	PVT	EAST OF TRAVIS AIR FORCE BASE, JUST EAST OF POWERLINES ABOUT 1.4 MILES SSW OF WHERE POWERLINES CROSS AQUEDUCT.	MAPPED WITHIN THE SW 1/4 OF THE NE 1/4 OF SECTION 17.	IN PORTION OF ALKALI PLAYA POOL ON SOLANO LOAM, AND IN ADJACENT VERNAL POOL/SWALE IN NON-NATIVE GRASSLAND COMMUNITY. ONLY POOL OF SEVERAL IN THE AREA TO SUPPORT THIS GRASS. ASSOCIATES: FRANKENIA SALINA, PLAGIOBOTHRYS STIPITATUS, ERYNGIUM.	GRAZING/TRAMPLING BY CATTLE.	ABOUT 1600 PLANTS SEEN IN 2003 BY BUXTON. THIS IS THE ONLY KNOWN POPULATION OF ORCUTTIA INAEQUALIS IN SOLANO COUNTY. POSITIVE DETERMINATION WAS MADE BY DR. JOHN REEDER AND CORROBORATED BY DNA ANALYSIS BY LAURA BOYKIN.	Muzzy Ranch proposed mitigation bank. Access denied. Information provided by Steve Foreman and Rebecca Doubledee of LSA.	2011	1,000s in 2011	Present and Natural	Persistent	Proposed Bank

Appendix A-3: Current Status of San Joaquin Valley Orcutt Grass (*Orcuttia inaequalis*) in the Great Valley

California Natural Diversity Database, November 4, 2012														Witham, 2013					
EO	EONDX	KEY	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
64	72487	MER	1	80 meters	Presumed Extant	20010419	20010419	PVT	APPROXIMATELY 1.4 MILES E OF THE INTERSECTION OF SNELLING RD & YOUD RD, S OF CANAL CREEK, SNELLING.		ASSOCIATES INCLUDE DOWNINGIA CUSPIDATA, PLAGIOBOTHRYS STIPITATUS MICRANTHUS, LASTHENIA FREMONTII, PSILOCARPHUS BREVISSIMUS, ALOPECURUS SACCATUS, CRASSULA AQUATICA, CALLITRICHE MARGINATA, ELATINE CALIFORNICA, ELEOCHARIS ACICULARIS, ETC.		UNKNOWN NUMBER OF PLANTS SEEN IN 2001 DURING A VEGETATION SURVEY.	Chance Ranch. Possibly erroneous. Area thoroughly searched 07-20-2010 and 09-23-2010. Two members of the vernal pool team felt this was not where we recalled seeing Orcutt grass on the Chance Ranch in 2001. We recalled a very rocky pool amongst tall mima mounds.	9/23/2010	Erroneous	Present but Not Suitable		Easement

Appendix A-4: Current Status of Hairy Orcutt Grass (*Orcuttia pilosa*) in the Great Valley

California Natural Diversity Database, November 4, 2012														Witham, 2013					
EO	EONDX	KEY(	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
1	5631	STA	2	specific area	Extirpated	19860901	19730529	PVT	WEST OF DIENSTAG ROAD, 6.8 MILES EAST OF WATERFORD, SOUTH OF MODESTO LAKE.	MAPPED IN TWO POOLS IN THE FAR EAST HALF OF THE OF NE 1/4 OF SEC 28. POOLS LOCATED ABOUT 0.2 AND 0.5 MILE NORTH OF HIGHWAY 132.	PLANTS GROWING ON MARGIN OF LARGE VERNAL POOL. ASSOCIATED SPECIES INCLUDE NEOSTAPFIA COLUSANA IN 1958.	PLOWED FOR AN ALMOND ORCHARD ACCORDING TO P. ALLEN & R. STONE.	SITE KNOWN FROM TWO 1958 CRAMPTON COLLECTIONS AND A 1973 REEDER & REEDER COLLECTION. SITE SURVEYED BY STONE IN 1986; HABITAT ELIMINATED, SITE EXTIRPATED.	Extirpated	Windshield survey 9/4/2010	Extirpated	Eliminated		
2	12677	STA	6	specific area	Presumed Extant	20010518	20010518	PVT	HICKMAN VERNAL POOLS, 1.4-4 MILES WEST OF TURLOCK LAKE, MOSTLY SOUTH OF LAKE ROAD. COVERS PARTS OF SEVERAL SECTIONS.	O. PILOSA FOUND MOSTLY ON THE MARGINS OF THE LARGER POOLS WHERE THE DENSITY OF NEOSTAPFIA COLUSANA IS REDUCED. N-MOST POLYGON: SEEN IN 1958, '62, '76, '77, '81 BUT NOT IN '86, '87, & 2001. POLYGON ALONG LAKE RD: 500-1000 IN '81, 100 IN '86.	VERNAL LAKES AND POOLS WITH A TOTAL AREA OF 600 ACRES. ASSOCIATED WITH NEOSTAPFIA COLUSANA, CHAMAESYCE HOOVERI, LIPPIA NODIFLORA, SIDA HEDERACEA, CRYPSIS SCHOENOIDES, EREMOCARPUS, ET AL. SOILS MAPPED AS MEINKLE CLAY.	ALTERED HYDROLOGY, GRAZING, TRAMPLING, DISKING, COMPETITION FROM WEEDS, PLANTING OF BUR CLOVER, VINEYARD CONVERSION.	LARGE POLYGON S OF LAKE RD: ABUNDANT IN '86 & '87. 750 PLANTS IN "POOL A" IN 2001 (POOL A = N-MOST PORTION OF LARGEST POLY). NO PLANTS IN THE 3 EASTERN POLYS; THESE ARE ONLY KNOWN TO HAVE N. COLUSANA. INCLUDES FORMER OCCURRENCES 3-6, 8, 27.	Hickman Vernal Pools inundated well into summer in both 2010 and 2011. Habitat is converting to a marsh due to agricultural runoff from surrounding orchards. Primary population is possibly extirpated. The 500 plants reported are from a small polygon north of Lake Road surveyed on 09-02-2010.	9/2/2010	500 Plants in 2010	Present but Modified	Declining	
7	22329	STA	1	1/5 mile	Extirpated	19860901	19380611	UNKNOWN	12 MILES EAST OF WATERFORD.	MAPPED BY CNDDB AT 1.3 MILES WEST OF RAIRDEN GULCH, IN VICINITY OF MODESTO MAIN CANAL AND RUSHING ROAD; BIOSYSTEMS ANALYSIS 1988 REPORT MENTIONS THAT THIS AREA IS THE MOST LIKELY LOCATION FOR HOOVER'S COLLECTION OF O. PILOSA.		VICINITY IS IMPACTED BY GRAINFIELD, IRRIGATED PASTURE, AND CATTLE GRAZING IN DRY PASTURE.	SITE KNOWN FROM THREE COLLECTIONS BY HOOVER BETWEEN 1936 AND 1938. TOM GRIGGS DID NOT LIST THIS POPULATION IN A 1977 STATUS REPORT. SITE INSPECTED BY STONE IN 1986; HABITAT ELIMINATED, SITE EXTIRPATED.	Extirpated	No	Extirpated	Eliminated		
9	22330	MAD	1	1/5 mile	Extirpated	19870602	19730815	PVT	ALONG ROAD 28.5 ABOUT 6 MILES NORTH OF MADERA ON WEST SIDE OF ROAD, 0.3 MI S OF MADERA AIR FORCE STATION.	MAPPED IN THE SW 1/4 OF SECTION 29.	VERNAL POOL.	HABITAT ELIMINATED BY AGRICULTURE.	SITE HAS BEEN PLOWED SINCE 1973 AND WAS LEVELED IN THE SUMMER OF 1978. SITE WAS DRYLAND OATS WHEN VISITED BY STEBBINS IN 1987; NO VERNAL POOL HABITAT REMAINS IN AREA, SITE EXTIRPATED.	Extirpated	No	Extirpated	Eliminated		
10	3634	MEF	1	specific area	Possibly Extirpated	20090902	19580723	PVT	3.2 MILES SOUTH OF SNELLING ON THE WEST SIDE OF SNELLING ROAD TO MERCED.	WITHIN A SWALE DAMMED FOR LIVESTOCK. NEAR THE CENTER OF THE WEST HALF OF SECTION 21.	NEARLY BARREN VERNAL POOL ON REDDISH BROWN SOIL IN OPEN, LOW FOOTHILL AREA. ASSOCIATED SPECIES INCLUDE MARSILEA, TRICHOSTEMA, AND HELEOCHLOA.	CATTLE GRAZING IN DRY PASTURE.	PLANT COMMON IN 1957. NO PLANTS FOUND WHEN SITE WAS VISITED BY STONE IN 1986 AND BY PRESTON IN 2009. HABITAT APPEARED SUITABLE BUT THE SURROUNDING AREA IS USED FOR SUMMER PASTURE AND THE POND IS AN AREA OF CATTLE CONCENTRATION.	Searched on 09-25-2010 and 09-26-2011. Habitat present, but no plants found. Highly impacted by cattle congregating here. Also appears that water is being pumped into this stock pond.	9/26/2011	Possibly Extirpated	Stockpond	Declining	
11	22326	MAD	2	specific area	Presumed Extant	20100629	20100629	PVT	NORTH SIDE OF HIGHWAY 145, JUST EAST AND WEST OF JUNCTION WITH ROAD 33, APPROXIMATELY 7 MILES EAST OF MADERA.	LARGE, NON-SPECIFIC WESTERN POLYGON BASED ON A 1968 CRAMPTON COLLECTION AND A 1982 FIELD OBSERVATION BY STEBBINS; NOW EXTIRPATED BY AGRICULTURE. EASTERN POLYGON BASED ON 2 BOYKIN & HALL FIELD SURVEY FORMS AND AN O'LEARY SURVEY FORM.	E POLY: GROWING IN THE DRAINAGE AREA OF A BARLEY FIELD. LARGE DRY DISTURBED VERNAL POOL W/ CRACKED SOIL, LINES IN SOIL OF POOL FROM DISKING. ASSOCIATED WITH MOLLUGO VERTICILLATA. ELEOCHARIS MACROSTACHYA GROWING IN THE DEEPEST AREA OF POOL.	W POLY: DEVELOPMENT & AGRICULTURE HAVE ELIMINATED HABITAT. E POLY: AGRICULTURE THREATENS (BARLEY INVADING), POOL PLOWED.	W POLY EXTIRPATED; NO VIABLE HABITAT ON EITHER SIDE OF HWY W OF INTERSECTION WITH RD 33 ACCORDING TO STEBBINS (1987). E POLY HAD 5,000 PLANTS IN 2000, 500 IN 2001 (SITE RECENTLY PLOWED), APPROX 1000 IN 2010. INCLUDES FORMER OCCURRENCE #47.	Plants present in eastern polygon on 08-08-2010 amd 10-15-2011. Approximately 1500 plants in 2011; plants were growing in rows along old plow lines. Western polygon is extirpated; it is now an orchard.	10/15/2011	1,500 Plants in 2011	Present but Degraded	Persistent	

Appendix A-4: Current Status of Hairy Orcutt Grass (*Orcuttia pilosa*) in the Great Valley

California Natural Diversity Database, November 4, 2012														Witham, 2013					
EO	EONDX	KEY(	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
12	6870	TEH	1	specific area	Presumed Extant	19880727	19880727	PVT	VINA PLAINS, 1 MILE EAST OF LENINGER ROAD AND 1.5 MILE NORTH OF HIGHWAY 99.		LARGE VERNAL POOL IN A FLAT DRY AREA OF ANNUAL GRASSLAND. ASSOCIATED WITH CHAMAESYCE HOOVERI, ERYNGIUM VASEYI, XANTHIUM STRUMARIUM, ASCLEPIAS FASCICULARIS, AND MARSILEA VESTITA.	CATTLE GRAZING A THREAT.	THOUSANDS OF PLANTS OBSERVED IN 1980. ABUNDANT IN 1986, 10,000+ IN 1988. UNDER THE CURRENT GRAZING REGIME THE POPULATION IS LARGE AND RELATIVELY STABLE. AREA WILL REMAIN AS DRY PASTURE IN THE FORSEEABLE FUTURE.	Earl Foor Ranch under TNC conservation easement. Presumed extant from aerial photo interpretation.	No	Presumed Extant	Present and Natural	Unknown	Easement
13	6729	TEH	1	specific area	Presumed Extant	20070519	20070519	TNC-VINA PLAINS PRESERVE	VINA PLAINS, IN VERNAL POOL 0.1 MILE SOUTH OF LASSEN ROAD AND 0.6 MILE ENE OF HIGHWAY 99.	MAPPED WITHIN THE NW 1/4 OF THE NE 1/4 OF SECTION 29 AND THE SW 1/4 OF THE SE 1/4 OF SECTION 20. IN POOL #1. POOL IS IN EXCELLENT CONDITION.	DRY LAKE BED ON VOLCANIC MUDFLOW. ASSOCIATED SPECIES INCLUDE CHAMAESYCE HOOVERI, ERYNGIUM VASEYI VALLICOLA AND PROBOSCIDIA LOUISIANICA. LOTS OF CLOVER IN POOL (PLANTED BY PREVIOUS OWNER).	THREATENED BY CATTLE GRAZING IN SURROUNDING GRASSLAND AND TRAMPLING IN LAKE BED. WEEDS PRESENT.	300 PLANTS IN 1980; 10,000 IN 1983 AND 1986-1988; <500 IN 1990; >A MILLION IN 1995; 5,000 IN 2000; 10,000 IN MAY AND AUGUST 2001; UNK # IN 2002; MANY MILLIONS OF PLANTS IN 2007. INCLUDES FORMER OCCURRENCE #17.	Vina Plains pool #1. On 08-15-2011 plants were seen scattered throughout with the highest density (>10 per square meter) at the northern end of the pool.	8/15/2011	150,000 Plants 2011	Present and Natural	Persistent	Protected
15	22325	MAD	1	1/5 mile	Extirpated	19870602	19410531	PVT	4 MILES EAST OF MADERA.	MAPPED ALONG HIGHWAY 145. COLLECTION MADE "3 MILES OUT OF MADERA ON THE NORTHFORK ROAD" ARE ALSO ATTRIBUTED TO THIS SITE. AREA NEAR HIGHWAY 145 AND ROADS 300 AND 400 SEARCHED IN 1981.		DEVELOPMENT, SMALL HORSE PASTURES, ORCHARDS, ROADS, ETC.	AREA SEARCHED IN 1981 & 1987 BUT NO SUITABLE HABITAT REMAINS; SITE EXTIRPATED. INCLUDES FORMER OCCURRENCE #14.	Extirpated	No	Extirpated	Eliminated		
16	3584	MEF	1	1/5 mile	Extirpated	19380720	19380720	PVT	NEAR TOWN OF MERCED, CROCKER-HOFFMAN RANCH.	MAPPED BY WAGNER AT BELLVUE RANCH, WHICH SERVED AS HEADQUATERS FOR THE CROCKER-HUFFMAN OPERATIONS (BIOSYSTEMS ANALYSIS, INC. 1988). SE 1/4 OF NE 1/4 OF SECTION 6.	SITE DESCRIBED AS "A SMALL IRRIGATION DITCH" WITH ADJACENT "POOR DRAINAGE AREAS."	MUCH OF AREA CONVERTED TO IRRIGATED PASTURE; CATTLE GRAZING IN DRY PASTURE IS ADDITIONAL THREAT. DEVELOPMENT THREATENS.	OCCURRENCE KNOWN ONLY FROM 1938 COLLECTION BY WAGNON. SITE NOT VISITED BY BIOSYSTEMS ANALYSIS, INC. FOR 1988 REPORT. 2006 AERIAL IMAGERY SHOWS HOUSING DEVELOPMENT AND AGRICULTURE IN AREA; SITE PRESUMED EXTIRPATED.	Extirpated	No	Extirpated	Eliminated		
18	6915	MAD	1	specific area	Presumed Extant	20010517	20000704	PVT	ALONG WEST SIDE OF ROAD 33, 0.7-0.8 MILE NORTH OF HIGHWAY 145, NORTHEAST OF MADERA.	FOUND IN AT LEAST 2 POOLS IN THE AREA. MAPPED WITHIN THE E 1/4 OF THE NE 1/4 OF SECTION 36.	VERNAL POOLS ON CLAY SOIL IN VALLEY GRASSLAND REMNANT. ASSOCIATED WITH PSILOCARPHUS BREVISSIMUS, HOLOCARPHA HEERMANNII, LUPINUS FORMOSUS, AND TRICHOSTEMA LANCELATUM. SURROUNDED BY PLANTED BARLEY IN 1992.	DISKING, PLOWING, & CATTLE GRAZING. SURROUNDED BY AGRICULTURE. OWNER NOT AWARE OF RARE PLANT PRESENCE IN 2001.	400 PLANTS IN 1982. PLOWED IN 1983; POP. DAMAGED. SITE WAS DRY PASTURE BY 1987; 1000 PLANTS IN 2 POOLS. 10,000 PLANTS IN S-POOL & 6000 IN N-POOL IN 1992; 3000 PLANTS IN N-POOL & 3 IN S-POOL IN 2000. NOT SEEN IN 2001, SITE RECENTLY PLOWED.	Extant. Binocular survey from road on 08-08-2010 and observed ~300 plants. Site is being "hayed", but the pool nearest road is relatively undisturbed by that activity.	8/8/2010	300 Plants in 2010	Present but Degraded	Declining	
19	25989	MAD	2	specific area	Presumed Extant	19860521	19860521	PVT	0.5-0.9 MILE EAST OF SANTA FE RAILROAD TRACKS, ON BOTH SIDES OF AVENUE 15, EAST OF MADERA.	POOLS ON THE SOUTH SIDE OF AVENUE 15 ARE IN BARLEY. MAPPED WITHIN THE SE 1/4 OF THE SE 1/4 OF SECTION 16 AND THE N 1/4 OF THE NE 1/4 OF SECTION 21.	REMNANT VERNAL POOLS ON CLAY SOIL, WITHIN REMNANT GRASSLAND. ASSOCIATED WITH DOWNINGIA, PHALARIS PARADOXA, ERYNGIUM VASEYI, LYTHRUM HYSSOPIFOLIA, AND PSILOCARPHUS BREVISSUMUS.	GRAZING, AGRICULTURE ARE IMMEDIATE THREATS. S POLY THREATENED BY DISKING, THOUGH POOLS WERE AVOIDED DURING PAST DISKING.	POPULATION OF OVER 1000 INDIVIDUALS IN LESS THAN ONE HECTARE IN 1982. 3 INDIVIDUALS OBSERVED IN 1986. SITE QUALITY MARGINAL IN 1983 AND 1986. POOLS ON NORTH SIDE HAVE BEEN GRAZED.	Probably extirpated. On 08-08-2010 the north side of the road was in orchard; they avoided the pools, but they are weedy. Pools on the south side had been repeatedly plowed and no vernal features were evident. Sumitted to regulatory agencies as possible violation. See Appendix B.	8/8/2010	Possibly Extirpated	Present but Degraded	Declining	Reported

Appendix A-4: Current Status of Hairy Orcutt Grass (*Orcuttia pilosa*) in the Great Valley

California Natural Diversity Database, November 4, 2012														Witham, 2013					
EO	EONDX	KEY	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
20	4421	STA	5	specific area	Extirpated	19860901	19730529	PVT	4 MILES EAST OF WATERFORD, SOUTH OF MODESTO RESERVOIR, NORTH OF TUOLUMNE RIVER.	MAPPED AS 4 POLYGONS, SOUTH OF RESERVOIR ROAD WITHIN THE SW 1/4 OF SECTION 21 AND THE SE 1/4 OF SECTION 20.	VERNAL POOLS. GROWING IN ASSOCIATION WITH NEOSTAPFIA COLUSANA.	EXTENSIVE ALMOND ORCHARD NOW COVERS THE AREA.	PLANTS "THRIVING WELL" ACCORDING TO 1958 CRAMPTON COLLECTIONS. BOTH NEOSTAPFIA COLUSANA AND O. PILOSA WERE NOTED AS "COMMON" IN 1973. HABITAT ELIMINATED AT THIS SITE BY ALMOND ORCHARD; SITE EXTIRPATED.	Extirpated	No	Extirpated	Eliminated		
21	4582	STA	1	80 meters	Extirpated	19860901	XXXXXXXX	PVT	6-7 MILES EAST OF WATERFORD. SOUTH OF MODESTO RESERVOIR AND NORTH OF TUOLUMNE RIVER.	MAPPED ACCORDING TO A MAP IN A 1988 BIOSYSTEMS ANALYSIS REPORT. MAPPED NEAR CENTER OF NW1/4 SEC 28.	VERNAL POOL.	EXTENSIVE ALMOND ORCHARD COVERS ENTIRE AREA.	DATE THIS POPUALTION WAS SEEN IS UNKNOWN. NO PLANTS SEEN BY STONE DURING A 1986 SURVEY. HABITAT ELIMINATED; SITE EXTIRPATED.	Extirpated	No	Extirpated	Eliminated		
22	2300	MAD	1	specific area	Presumed Extant	19860521	19860521	PVT	4.6 MILES EAST OF HIGHWAY 99 ON AVENUE 9 AT CORNER OF AVENUE 9 AND ROAD 36; 2.3 MI EAST OF GREGG RAILROAD STOP.	MAPPED WITHIN THE NE 1/4 OF THE SE 1/4 OF SECTION 16.	LARGE VERNAL POOL ON DRY CLAY IN VALLEY GRASSLAND. ASSOCIATED SPECIES INCLUDE DOWNINGIA, ERYNGIUM, BROMUS MOLLIS, B. DIANDRUS, AND AGOSERIS HETEROPHYLLA.	SURROUNDED BY AGRICULTURE. THREATS INCLUDE OFF-ROAD VEHICLE USE AND COMPETING WEEDY SPECIES ESTABLISHED AFTER DISKING.	POPULATION OF MORE THAN 1000 INDIVIDUALS OBSERVED IN 1983 PER STEBBINS. 150 PLANTS IN 1986.	Probably extirpated. Windshield survey 08-07-2010. A horse paddock with no vegetation. Note that the wetland feature is actually about 0.19 miles south of the centroid of the mapped polygon.	8/7/2010	Probably Extirpated	Present but Degraded	Declining	
23	2383	TEH	1	80 meters	Presumed Extant	19880726	19830617	TNC-VINA PLAINS PRESERVE	TNC VINA PLAINS PRESERVE, ABOUT 1 MILE NNW OF JUNCTION OF HIGHWAY 99 AND PINE CREEK ROAD, CHICO.	THIS IS VINA PLAINS POOL #14 (OLD POOL #2); POOL NUMBERING SYSTEM BY KING 1992. NW1/4 OF SW1/4 SEC 28.	VERNAL POOL ON TUSCAN CLAY LOAM IN GRASSLAND. ASSOCIATED SPECIES INCLUDE TUCTORIA GREENEI, ERYNGIUM VASEYI, MARSILEA VESTITA, CRYPSIS SCHOENOIDES, CONVOLVULUS ARVENSIS, BOISDUVALIA, DOWNINGIA, PSILOCARPHUS, EREMOCARPUS, AND ELEOCHARIS.	CATTLE GRAZING, INVASIVE WEEDS.	2 PLANTS OBSERVED IN 1983, NONE IN 1987, 1988, NOR 1995. SOIL DISTURBANCE BY CATTLE MAY HAVE LED TO ESTABLISHMENT OF WEEDY EXOTICS, & COMPETITIVE EXCLUSION BY THESE WEEDS MAY HAVE CONTRIBUTED TO DISAPPEARANCE OF O. PILOSA. NEEDS FIELDWORK.	Vina Plains pool #14. Pool had been consumed by prescribed burn just prior to survey on 08-16-2011. No plants found though there were a few scattered TUGR. Given the population history in this pool, it is at best marginal habitat for this species. The observations in 1983 could have been waifs.	8/16/2011	Presumed Extant	Present and Natural	Marginal	Protected
24	2239	TEH	5	specific area	Presumed Extant	20070518	20070518	TNC-VINA PLAINS PRESERVE	TNC VINA PLAINS PRESERVE, ABOUT 1.2 MILES NORTH OF THE JUNCTION OF HIGHWAY 99 AND PINE CREEK ROAD, CHICO.	VINA PLAINS POOLS #22 (E POLY); 16, 17, 18 (N POLY); 34, 35, 36 (3 S POLYS). POOL NUMBERING SYSTEM BY KING 1992. IN 1995, THE MAJORITY OF PLANTS IN THE N POLY WERE IN THE CENTER POOL (POOL #17) WITH <5 PLANTS IN THE 2 OTHER POOLS.	VERNAL POOLS ON ANITA CLAY IN GRASSLAND. ASSOCIATES INCLUDE CHAMAESYCE HOOVERI, TUCTORIA GREENEI, ALLOCARYA STIPITATA, XANTHIUM STRUMARIUM, CONVOLVULUS ARVENSIS, PROBOSCIDEA LOUISIANICA, ASCLEPIA FASCICULARIS, ERYNGIUM VASEYI, ETC.	PAST GRAZING, WEEDY EXOTICS. SOME POOLS TRAMPLED IN 1986. IN EXCELLENT CONDITION IN 2001.	N POLY: <10,000 IN '83; 2-3000 IN '88; ~4 MILL IN '95; 100,000 IN '01; MILLIONS IN '07. E POLY: <100 IN '83, NONE IN '88 OR '95. 3 S POLYS: ABUNDANT IN '86; >10,000 IN '88; ~6 MIL IN '95; 200,000 IN '01; UNK # IN '02. INCL FRMR EOS 25 & 26.	Vina Plains. This occurrence has five parts and the following uses numbering established by King. Pool 17 scattered plants and clusters, >1,000 plants, perhaps more. Pools 16 & 18, no plants. Pool 22, no plants (note that Rob Schlising does not mention ORPI in this pool). Pool 34, 3,000 plants scattered throughout. Pool 35, ~10,000 plants. Pool 36, no plants. Pools 17, 34 and 35 probably constitute the core of this metapopulation.	8/16/2011	>10,000 Plants in 2011	Present and Natural	Persistent	Protected
28	2301	MAD	1	specific area	Presumed Extant	19860810	19860810	PVT	VERNAL POOL NORTHEAST OF INTERSECTION OF AVENUE 8 AND ROAD 36, APPROX. 3 AIR MILES NORTHEAST OF HERNDON.	MAPPED IN THE NE 1/4 OF THE SW 1/4 OF SECTION 22.	VERNAL POOL WITH ASSOCIATES ERYNGIUM VASEYI, TRICHOSTEMA LANCEOLATUM, AND DOWNINGIA SP. SURROUNDED BY ANNUAL GRASSLAND.	SURROUNDED BY AGRICULTURE. GRAZING IN GRASSLAND.	200 PLANTS OBSERVED IN 1986. OWNER WILL ALLOW ACCESS FOR FUTURE STUDIES.	Possibly extirpated. Aerial photography review shows varios plowinging over the years. Additionally, the "pond" signature seems to move around in the aerials. Could not figure out how to get to the site; all roads either gated or posted.	No	Possibly Extirpated	Possibly Eliminated	Unknown	

Appendix A-4: Current Status of Hairy Orcutt Grass (*Orcuttia pilosa*) in the Great Valley

California Natural Diversity Database, November 4, 2012														Witham, 2013					
EO	EONDX	KEY(	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
29	2303	MAI	1	80 meters	Presumed Extant	19920430	19860815	PVT	WEST OF STATE ROUTE 41, 1.9 MILES NORTH OF INTERSECTION WITH AVENUE 12 AND 5.1 MILES NORTH OF LANES BRIDGE.	MAPPED IN SINGLE POOL, ABOUT 0.7 MILE SOUTH OF ROAD 204 AND 0.1 MILE WEST OF SR 41. WITHIN THE NE 1/4 OF THE NW 1/4 OF SECTION 28.	NORTHERN HARDPAN VERNAL POOL ON SAN JOAQUIN FINE SANDY LOAM. POOL SURROUNDED BY DRY-FARMED GRAINFIELD. ASSOCIATES INCLUDE ERYNGIUM VASEYI, TRICHOSTEMA SP., ELEOCHARIS PALUSTRIS, DOWNINGIA BICORNUTA, PLAGIOBOTHRYS STIPITATUS MICRANTHUS, ETC.	AREA DRY FARMED; CURRENTLY IN OATS. SITE UNDER STUDY FOR FUTURE FREEWAY CORRIDOR.	2 PLANTS OBSERVED IN 1986, NONE FOUND IN 1992. SEED BED MAY STILL BE PRESENT; SHOULD BE FIELD CHECKED ANNUALLY. QUESTIONABLE ID; PLANTS ID'D IN 1986 AS O. PILOSA, IN 1992 ID'D AS O. INAEQUALIS. 1986 VOUCHER BY MARTIN WAS LOST.	On 08-09-2010 extensively surveyed both sides of Highway 41, but no plants found. On 10-16-2011, the west side of the highway had been plowed. [CalTrans reports plants from their mitigation bank on the east side of Highway 41. Contact Reagen O'Leary.]	8/9/2010	Probably Extirpated	Present but Degraded	Marginal	
30	2296	BUT	1	80 meters	Presumed Extant	19860625	19860625	PVT	0.4 MILE SOUTH OF JUNCTION OF PENTZ ROAD AND HWY 99, EAST SIDE OF HIGHWAY 99.			GRAZING.	POOL HEAVILY TRAMPLED. INFORMATION FROM OCCURRENCE EVALUATION FORM FOR CHAMAESYCE HOOVERI; IDENTIFICATION NEEDS CONFIRMATION.	ERRONEOUS. All other records for Pentz Pool indicate the grass is T. greenei. Surveyed 09-09-2010. Habitat present but no plants found. Site going into mitigation bank. Rodney Lacey at EcoAnalysts current contact. He reports no plants 2007-2011, but did not survey in 2012.	9/9/2010	Erroneous	Present and Natural	Marginal	Proposed Bank
32	6863	TEH	1	80 meters	Presumed Extant	20070519	19900710	TNC-VINA PLAINS PRESERVE	TNC VINA PLAINS PRESERVE, JUST S OF LASSEN RD APPROX. 1.8 MILES FROM ITS INTERSECTION W/ HWY 99, CHICO.	THE IS VINA PLAINS "POOL #21" (OLD POOL #3); NUMBERING SYSTEM BY KING (1992).	VERNAL POOL ON TUSCAN LOAM IN GRASSLAND. ASSOCIATED WITH TUCTORIA GREENEI.		ABUNDANT IN THE SOUTH END OF POOL IN 1990. IN 2007, TUCTORIA GREENEI FOUND IN POOL BUT NO O. PILOSA FOUND.	ERRONEOUS. Vina Plains pool #21. Surveyed 06-23-2011, 08-12-2011 and 08-13-2011, no ORPI found. The only record for ORPI from this pool was a 1989 TNC report; all other records for this pool are TUGR.	8/13/2011	Erroneous	Present and Natural	Marginal	Protected
33	2062	TEH	1	80 meters	Presumed Extant	19870803	19870803	PVT	VINA PLAINS, 1.9 MILES SSW FROM JUNCTION OF HWY 99 & ROWLES ROAD, 0.2 MILE NORTH OF TEHAMA/BUTTE COUNTY LINE.	WITHIN THE SW 1/4 OF THE SE 1/4 OF SECTION 31. POPULATION OCCURS ON THE DEEPEST, NORTHERN END OF THE POOL BED, REACHING HIGHEST DENSITY OVER THE NE PORTION.	VERNAL POOL IN ANNUAL GRASSLAND. GROWING WITH ALLOCARYA STIPITATUS, ERYNGIUM VASEYI, TUCTORIA GREENEI, CHAMAESYCE HOOVERI, BOISDUVALIA CLEISTOGAMA, B. GLABELLA, DOWNINGIA, ELEOCHARIS MACROSTACHYA, & CRYPSIS SCHOENOIDES.	CATTLE GRAZING IN WINTER PASTURE.	>10,000 PLANTS OBSERVED IN 1987. THIS POPULATION IS LARGE AND PROBABLY STABLE. POOL IS FENCED TO EXCLUDE LIVESTOCK. NEEDS FIELDWORK.	TNC Vina Plains west unit. Presumed extant. Surveyed 08-15-2011, but no plants found. Heather Davis visited this pool in 2007 and 2008 to collect TUGR, but did not mention observing ORPI in her notes. I also do not recall seeing the fence mentioned in Stone et al 1988.	8/15/2011	Presumed Extant	Present and Natural	Declining	Protected
34	6843	STA	1	1/5 mile	Extirpated	19870721	19730909	PVT	3 MILES EAST OF HICKMAN, 0.4 MILE SOUTHEAST OF HIGHLINE CANAL AT LAKE ROAD.	ONLY SOURCE OF INFORMATION IS A 1973 GRIGGS COLLECTION.	EPHEMERAL POND.	SITE NOW PART OF AN EXTENSIVE VINEYARD.	IN 1973, GRIGGS MENTIONED THAT THERE WERE ISOLATED INDIVIDUALS IN THE DEEPER PORTIONS OF A DRIED EPHEMERAL POND. HABITAT HAS BEEN ELIMINATED AND POPULATION EXTIRPATED ACCORDING TO STONE AND BUCK (BIOSYSTEMS ANALYSIS, INC. 1988).	Extirpated. Windshield survey 07-20-2010.	7/20/2010	Extirpated	Eliminated		
35	157	GLE	1	specific area	Presumed Extant	20070523	20070523	USFWS-SACRAMENTO NWR	SACRAMENTO NATIONAL WILDLIFE REFUGE, 0.25 MILE SOUTH OF REFUGE BOUNDARY AND 2.3 MILES EAST OF I-5.	MAPPED ACCORDING TO 2003, 2005 & 2007 GPS INFORMATION. THIS IS SACRAMENTO NW REFUGE UNIT "TAB" AND VERNAL POOL ID "TAB-2".	DRY BED OF VERNAL POOL.		1000 INDIVIDUALS IN 1993, 2400 IN 1994, 4000 IN 1995, 3000 IN 1996, 3250 IN 1997, 0 IN 1998, 1100 IN 1999, 5000 IN 2000, 5100 IN 2001, 9000 IN 2002, 8500 IN 2003, 12000 EXTRA LARGE PLANTS IN 2004, 1200 IN 2005, 5000 IN 2006, 540 IN 2007.	Sacramento NWR. Extant. 1,100 plants observed 07-12-2011.	7/12/2011	1,100 Plants in 2011	Present and Natural	Persistent	Protected

Appendix A-4: Current Status of Hairy Orcutt Grass (*Orcuttia pilosa*) in the Great Valley

California Natural Diversity Database, November 4, 2012														Witham, 2013					
EO	EONDX	KEY	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
36	2232	GLE	1	specific area	Presumed Extant	20070916	20040506	USFWS-SACRAMENTO NWR	SACRAMENTO NATIONAL WILDLIFE REFUGE, 0.6 MILE SOUTH OF REFUGE BOUNDARY AND 2.6 MILES EAST OF I-5.	MAPPED BY CNDDB AROUND ENTIRE POOL; HOWEVER, 2003 GPS INFORMATION INDICATES O. PILOSA ONLY OCCURS ON THE NW SIDE OF POOL. THIS IS SACRAMENTO NW REFUGE UNIT "TC" AND VERNAL POOL ID "TC-1". THIS VERNAL POOL IS ALSO CALLED "HOUR-GLASS LAKE".	ALKALINE SOIL ON THE MARGIN OF A DRY VERNAL POOL. ASSOCIATES INCLUDE CRYPSIS SCHOENOIDES, CRESSA TRUXILLENSIS, FRANKENIA SALINA, MALVELLA LEPROSA, GRINDELIA CAMPORUM, & SCIRPUS MARITIMUS/S. TUBEROSUS.		3000 PLANTS IN 1993, 0 IN 1994, 500 IN 1995, 50 IN 1996, 400 IN 1997, 0 IN 1998-2003, 29 SMALL PLANTS IN 2004, 0 PLANTS IN 2005-2007.	Sacramento NWR. Presumed extant. Surveyed 07-12-2011, but no plants found.	7/12/2011	Presumed Extant	Present and Natural	Declining	Protected
37	2234	GLE	1	80 meters	Possibly Extirpated	20070916	19930524	USFWS-SACRAMENTO NWR	SACRAMENTO NATIONAL WILDLIFE REFUGE, 0.7 MILE SOUTH OF REFUGE BOUNDARY AND 2.2 MILES EAST OF I-5.	MAPPED ACCORDING TO 2003 GPS INFO. THIS IS SACRAMENTO NW REFUGE UNIT "TAB" AND VERNAL POOL ID "TAB-3". THIS VERNAL POOL ALSO KNOWN AS "GAME WARDEN LAKE".	DRY BED OF A LARGE, BARREN, MARSHY VERNAL POOL. GROWING WITH CRESSA TRUXILLENSIS AND LYTHRUM TRIBRACTEATUM.		E POLY: 20 PLANTS IN 1993 BUT NO PLANTS IN 1994-1999, 2001-2007; NOT SURVEYED IN 2000.	Sacramento NWR. Surveyed 07-12-2011, but no plants found.	7/12/2011	Possibly Extirpated	Present and Natural	Marginal	Protected
38	2230	GLE	1	specific area	Presumed Extant	20070915	20060808	USFWS-SACRAMENTO NWR	SACRAMENTO NATIONAL WILDLIFE REFUGE, 1.3 MILES SOUTH OF REFUGE BOUNDARY AND 2 MILES EAST OF I-5.	MAPPED ACCORDING TO 2003 & 2005 GPS INFORMATION. THIS IS SACRAMENTO NW REFUGE UNIT "P1.1" AND VERNAL POOL ID "P1.1-1".	ALKALINE SOIL ON THE MARGIN OF A DRY VERNAL POOL. ASSOCIATES INCLUDE CRYPSIS SCHOENOIDES, CRESSA TRUXILLENSIS, DISTICHLIS SPICATA, FRANKENIA SALINA, ERYNGIUM VASEYI.		1000 IN 1993, 20 IN 1994, 50 IN 1995, 30 IN 1996, 40 IN 1997, 0 IN 1998, 10 IN 1999, 50 IN 2000, 140 IN 2001, 160 IN 2002, 500 IN 2003, 800 IN 2004, 800 IN 2005, 600 IN 2006, 0 IN 2007 (POOL DID NOT FILL WITH WATER IN 2007).	Sacramento NWR. Surveyed 07-12-2011. Approximately 1,000 plants observed.	7/12/2011	1,000 Plants in 2011	Present and Natural	Persistent	Protected
39	2228	GLE	2	specific area	Presumed Extant	20070921	20050906	USFWS-SACRAMENTO NWR	SACRAMENTO NATIONAL WILDLIFE REFUGE, 2.5 MILE SOUTH OF REFUGE BOUNDARY AND 1.2 MILES EAST OF I-5.	MAPPED ACCORDING TO 2003 & 2005 GPS INFORMATION. SE-POLY IS SACRAMENTO NW REFUGE UNIT "T18" AND VERNAL POOL ID "T18-1". NW POLY IS SACRAMENTO NW REFUGE UNIT "T18" AND VERNAL POOL ID "T18-3". NW1/4 OF SW1/4 SEC 14.	DRY ALKALINE SOIL NEAR THE EDGE OF A LARGE VERNAL POOL. ASSOCIATES INCLUDE PLANTAGO ERECTA, P. ELONGATA, CRESSA TRUXILLENSIS, CRYPSIS SCHOENOIDES, POLYGONUM PROLIFICUM, ERYNGIUM VASEYI, EPILOBIUM PYGMAEUM.		SE: 1000 IN '93; 120 IN '94; 500 IN '95; 400 IN '96; 0 IN '97, '98, '00, '02, '03; 100 IN '99; 20 IN '01; 22 IN '04; 5 IN '05; 0 IN '07. NW: 300 IN '97; 0 IN '98, '02, '03; 20 IN '99, 100 IN '00, 5 IN '01, 29 IN '04, 10 IN '05; 0 IN '07.	Sacramento NWR. Surveyed 07-12-2011. 90 small plants observed in western polygon. No plants observed in eastern polygon.	7/12/2011	90 Plants in 2011	Present and Natural	Declining	Protected
40	2229	GLE	1	1/5 mile	Presumed Extant	1937XXXX	1937XXXX	USFWS-SACRAMENTO NWR	FARMER WAITE LAKE, SACRAMENTO NATIONAL WILDLIFE REFUGE, ABOUT 1.3 MILE ESE OF HEADQUARTERS.	NOW APPROXIMATED BY "CELL 3 OF POOL 1A" AT THE REFUGE. EXACT LOCATION UNKNOWN. NEED BETTER MAP DETAIL FOR "CELL 3, POOL 1A".	DAMP BED OF LAKE.		COLLECTION MADE IN 1937 BY ANDERSON (SN, UNKNOWN HERBARIUM; POSSIBLY HOUSED AT REFUGE). UNKNOWN IF AREA SEARCHED BY OSWALD AND SILVEIRA IN 1995.	Sacrament NWR. Possibly extirpated. Aerial photo review shows this area is a managed wetland and predominantly marsh. Windshield survey 07-12-2011 confirmed marsh vegetation.	7/12/2011	Possibly Extirpated	No Habitat	Marginal	Protected
41	2367	TEH	5	specific area	Presumed Extant	20070519	20070519	PVT	VINA PLAINS, 1.1 MILES SSE TO 1.6 MILES SOUTH OF JUNCTION OF ROWLES ROAD AND HIGHWAY 99.	UNDER CURRENT GRAZING REGIME IN 1986, THE 3 NE COLONIES ARE LARGE AND PROBABLY STABLE. POPULATION IS DAMAGED AND DECLINING IN THE S-MOST POOL DUE TO CATTLE GRAZING.	VERNAL POOLS WITH CHAMAESYCE HOOVERI, ERYNGIUM VASEYI, ASCLEPIAS FASCICULARIS, BOISDUVALIA GLABELLA, DOWNINGIA, ALLOCARYA STIPITATA, PSILOCARPHUS BREVISSINMUS, AND CONVOLVULUS ARVENSIS.	CATTLE GRAZING.	ABUNDANT IN 4 OF 5 POOLS IN 1986. UNK # OF PLANTS IN THE LARGEST POOL & THE "U" SHAPED POOL IN 2002 (SEEN DURING A VEG SURVEY). MILLIONS IN THE NE-MOST POOL & THE "U" SHAPED POOL IN 2007. 1 PLANT IN POOL TO E OF "U" SHAPED POOL IN 2007.	TNC Vina Plains west unit. Extant. Surveyed 08-17-2011. Five part occurrence. Northernmost with>150,000 plants. Directly south from there, no ORPI observed. West from there (U shaped pool), >15,000 plants. Southwest from there, >45,000 plants patchily scattered throughout pool. Southernmost pool, no plants observed. Two pools without plants are marginal for this species and probably only support it in a very favorable year.	8/17/2011	>260,000 Plants in 2001	Present and Natural	Persistent	Protected

Appendix A-4: Current Status of Hairy Orcutt Grass (*Orcuttia pilosa*) in the Great Valley

California Natural Diversity Database, November 4, 2012														Witham, 2013					
EO	EONDX	KEY(	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
42	2388	TEH	1	specific area	Presumed Extant	19870811	19870811	PVT	ABOUT 6 MILES NORTHEAST OF VINA AND 1.8 MILES ENE OF THE END OF REED ORCHARD ROAD.	MAPPED IN THE NW 1/4 OF THE SW 1/4 OF SECTION 35. THE CENTRAL PORTION OF THE BED COVERED BY A DENSE STAND OF XANTHIUM STRUMARIUM. O. PILOSA OCCURS IN A BAND SEVERAL METERS WIDE IMMEDIATELY ABOVE THE XANTHIUM ZONE.	LARGE VERNAL POOL SURROUNDED BY ANNUAL GRASSLAND. ASSOCIATED WITH XANTHIUM STRUMARIUM, MARSILEA VESTITA, ERYNGIUM VASEYI, DOWNINGIA, BOISDUVALIA GLABELLA, AND ELEOCHARIS MACROSTACHYA.	CATTLE GRAZING IN WINTER PASTURE. COMPETITIVE EXCLUSION BY XANTHIUM LIMITS ORCUTTIA DENSITY.	MORE THAN 10,000 PLANTS AT MODERATE DENSITY OBSERVED IN 1987. THIS IS A LARGE POPULATION, BUT UNDER CURRENT CONDITIONS IT IS DAMAGED AND PERHAPS DECLINING.	Leninger 3 Ranch under TNC conservation easement. Presumed extant through aerial photo interpretation	No	Presumed Extant	Present and Natural	Unknown	Easement
43	30296	MAI	1	specific area	Presumed Extant	19950812	19950812	PVT	E OF MADERA EQUALIZATION RESERVOIR, 1.4 MI NNE OF ADOBE RANCH.	IN 2 VERNAL POOLS ABOUT 50 YARDS APART. EO #44 IS WITHIN A QUARTER MILE OF THIS EO; HOWEVER, IT WAS KEPT SEPARATE BECAUSE EO #44 IS A CREATED POOL AND THIS EO IS NATURAL.	ASSOCIATED WITH LYTHRUM HYSSOPIFOLIUM, ERYNGIUM VASEYI, AND PLAGIOBOTHRYS STIPITATUS. CASTILLEJA CAMPESTRIS SUCCULENTA FOUND IN EASTERN POOL.	PROPERTY GRAZED; A HIGH DEGREE OF TRAMPLING WAS NOTED IN 1995.	W POOL WITH THOUSANDS OF PLANTS AND E POOL WITH HUNDREDS OF PLANTS IN 1995.	Madera Equalization Reservoir. Presumed extant, based on aerial photo interpretation. No access.	No	Presumed Extant	Present and Natural	Unknown	
44	4476	MAI	1	80 meters	Presumed Extant	19950812	19950812	USBOR	E OF MADERA EQUALIZATION RESERVOIR; ABOUT 1.5 MI DUE N OF ADOBE RANCH.	SE 1/4 OF SE 1/4 OF SECTION 7. EO #43 IS WITHIN A QUARTER MILE OF THIS EO; HOWEVER, IT WAS KEPT SEPARATE BECAUSE EO #43 IS A NATURAL POOL AND THIS EO IS CREATED.	ARTIFICIAL VERNAL POOL CREATED IN 1993. O. PILOSA INOCULATED AT THAT TIME. ASSOCIATED WITH LYTHRUM HYSSOPIFOLIUM, ERYNGIUM VASEYI, AND PLAGIOBOTHRYS STIPITATUS.	POOL FENCED TO EXCLUDE CATTLE.	100 PLANTS IN 1995.	Madera Equalization Reservoir. Presumed extant, based on aerial photo interpretation, though the signatures are not as evident at the natural pools around EO#43. No access.	No	Presumed Extant	Created	Unknown	
45	32752	MAI	1	80 meters	Presumed Extant	19950912	19950912	CALTRANS	EAST SIDE OF HIGHWAY 41 ABOUT 1.2 MILES NORTH OF AVENUE 12, NORTH OF LANES BRIDGE.	JUST NORTH OF EAST-WEST RUNNING TRANSMISSION LINES.	SWALE-LIKE VERNAL POOL WITHIN NON-NATIVE GRASSLAND. ASSOCIATED WITH DOWNINGIA ORNATISSIMA, ERYNGIUM VASEYI, AND PLAGIOBOTHRYS STIPITATUS.	GRAZING.	50 PLANTS OBSERVED IN 1995. LAND WAS PURCHASED TO PRESERVE AND ENHANCE VERNAL POOLS AS MITIGATION FOR THOSE IMPACTED BY THE REALIGNMENT OF HIGHWAY 41.	Presumed extant though no plants found 08-09-2010. Note that the polygon is incorrect: should be 0.19 miles north of current centroid to put it north of the transmission lines. This might make it part of EO#29.	8/9/2010	Presumed Extant	Habitat Present, but EO is MIS-MAPPED	Marginal	CalTrans Bank
48	84430	MAI	1	specific area	Presumed Extant	20100629	20100629	CALTRANS	EAST SIDE OF HIGHWAY 41, APPROXIMATELY 0.9 MILE SOUTH OF ROAD 204, NORTH OF FRESNO.	MAPPED IN THE APPROXIMATE CENTER OF THE NE 1/4 OF SECTION 28 ACCORDING TO 2010 DIGITAL DATA PROVIDED BY CALTRANS.	LARGE DRY RESTORED SECTION OF VERNAL POOL SURROUNDED BY ANNUAL GRASSLAND. ASSOC W/ EPILOBIUM CLEISTOGAMUM, ORCUTTIA INAEQUALIS, PSILOCARPHUS BREVISSIMUS, LYTHRUM HYSSOPIFOLIA, AND ERYNGIUM SPINOSEPALUM (LIKELY INTERMEDIATE W/ E. CASTRENSE).		2 PLANTS OBSERVED IN 2010. CALTRANS IS IN THE PROCESS OF TRANSFERRING THIS PROPERTY TO DFG. THIS IS A NATURAL POPULATION, BUT IN 2009 THE SITE WAS UNDER CONSTRUCTION FOR THE CREATION, RESTORATION, AND ENHANCEMENT OF VERNAL POOLS AND SWALES.	New population in created pool. Reported by Reagan O'Leary. Presumed extant.	No	Presumed Extant	Created	Marginal	CalTrans Bank

Appendix A-5: Current Status of Slender Orcutt Grass (*Orcuttia tenuis*) in the Great Valley

EO	EONDX	KEY	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
1	15620	SHA	1	specific area	Presumed Extant	19880623	19880623	PVT	HAWES RANCH, ABOUT 1.7 MILES DUE EAST OF THE SOUTH END OF MAIN RUNWAY OF REDDING MUNICIPAL AIRPORT, STILLWATER PLAINS.	IN 1986, O. TENUIS OCCURRED NEAR THE WEST END OF THE POOL BED AND IN TWO RELATIVELY BARREN DEPRESSIONS AT THE SOUTH END OF THE POOL BED. MAPPED BY CNDDB AROUND ENTIRE POOL OUTLINED ON TOPO MAP IN THE SOUTH HALF OF THE NE 1/4 OF SECTION 36.	IN LARGE VERNAL POOL SURROUNDED BY GRASSLAND. HIGH TERRACE AREA UNDERLAIN BY IRON-SILICA HARDPAN. WITH ELEOCHARIS MACROSTACHYA, ERYNGIUM VASEYI, ALOPECURUS SACCATUS, BOISDUVALIA GLABELLA, DESCHAMPSIA DANTHONIOIDES, ALLOCARYA STIPITATA.	FURTHER ALTERATION OF HYDROLOGY, GRAZING, AND COMPETITION WITH ELEOCHARIS ARE THREATS. RECENT VEHICLE TRACKS IN 1986.	CONDITION IS MARGINAL. POOL SIZE REPORTED AS 5 ACRES IN 1975 AND AS 1 ACRE IN 1984. PLANTS ABUNDANT THROUGHOUT POOL IN 1981. POPULATION SIZE SMALL IN 1984; FEWER THAN 100 PLANTS IN 1986. A SMALL POPULATION WAS OBSERVED IN 1988.	Hawes Ranch Mitigation Bank. Presumed extant based on aerial photo interpretation. According to Brent Helm, many of the created pools and wetlands on this mitigation bank support ORTE.	No	Presumed Extant	Natural and Created	Unknown	Bank
2	5520	SHA	2	specific area	Presumed Extant	19950829	19950829	PVT	EITHER SIDE OF HARTNELL AVE, 0.1 MILE WEST OF ITS INTERSECTION WITH ARGYLE ROAD, REDDING.	IN TWO VERNAL POOLS. IN SW 1/4 SECTION 3 AND NW 1/4 SECTION 10.	DOMINANTS: ELEOCHARIS MACROSTACHYA AND ERYNGIUM CASTRENSE. OTHER ASSOCIATES: DESCHAMPSIA DANTHONIOIDES, SIDALCEA HIRSUTA, JUNCUS LEIOSPERMUS, AGROSTIS HENDERSONII, MARSILEA VESTITA.	PORTIONS OF NORTHERN POOL HAVE BEEN FILLED. PROBABLE FUTURE DEVELOPMENT (AS OF 1995) IN S POOL. ORV USE AT BOTH SITES.	1001-10,000 PLANTS OBSERVED IN 1982 BUT POOL PARTIALLY FILLED WITH SOIL. NORTHERN COLONY: 1001-10,000 PLANTS IN 1984 & 1986, 500 IN 1993. SOUTHERN COLONY: ~1000 IN 1995. INCLUDES FORMER OCCURRENCES #5 & 70.	Argyle Road, Redding. Surveyed 08-10-2011. 1,500 plants in four small patches in south polygon; occurs only in openings in the dense Eleocharis. No plants in north polygon; appears that it has been modified (expanded) recently; expanded areas bare while the main pool was 8" tall Marsilea thatch.	8/10/2011	1,500 Plants in 2011	Present and Natural	Declining	
3	22313	SHA	2	specific area	Presumed Extant	20030716	20030716	CITY OF REDDING	SOUTH END OF REDDING AIRPORT. 0.7 AIR MILE ESE OF THE INTERSECTION OF AIRPORT ROAD AND MEADOWVIEW DRIVE.	IN TWO POOLS IN WEST 1/2 OF SECTION 35. MAPPED ACCORDING TO MAP DRAWN BY BIOSYSTEMS ANALYSIS (1988).	VERNAL POOLS. ASSOCIATES INCLUDE ELEOCHARIS MACROSTACHYA, ERYNGIUM ARISTULATUM, DESCHAMPSIA DANTHONIOIDES, MACHAEROCARPUS CALIFORNICUS, ALLOCARYA STIPITATA, MARSILEA VESTITA, DOWNINGIA, POLYPOGON MONSPELIENSIS, EREMOCARPUS SETIGERUS, ETC.	DEVELOPMENT HAS DESTROYED MUCH OF THIS EO & CONTINUES TO THREATEN. ALTERED DRAINAGE & SOIL DISTURBANCE ALSO THREATENS.	<1000 PLANTS IN 1984 (O. TENUIS IN A FEW FAIRLY BARREN PATCHES), "ABUNDANT" IN 1986, UNK # IN 2003. EO FORMERLY EXTENDED FURTHER NW, W, & SW TO AIRPORT RD IN OTHER VERNAL POOLS WHICH HAVE BEEN EXTIRPATED. INCL FORMER EOS #6, 7, 8, & 29.	Redding Airport. Presumed extant based on aerial photo interpretation. Unable to gain access to the sites.	No	Presumed extant	Present and Natural	Unknown	
4	5519	SHA	1	80 meters	Presumed Extant	19930714	19930714	CITY OF REDDING	5 MILES NORTH OF ANDERSON, JUST WEST OF AIRPORT ROAD AND REDDING MUNICIPAL AIRPORT.	ORCUTTIA FOUND IN NORTH END OF POOL IN 1993, ABOUT 50 FEET WEST OF DRAINAGE DITCH AND 70 FEET SOUTH OF DIRT ROAD SURROUNDING POOL.	VERNAL POOL ON GREYISH SOIL. DOMINATED BY ELEOCHARIS MACROSTACHYA & ERYNGIUM VASEYI CASTRENSE. ORCUTTIA IN AREA WITH GREATEST INUNDATION, WITH RELATIVELY LOW PLANT COVER. OTHER ASSOC INCLUDE ELATINE BRACHYSPERMA AND DOWNINGIA BICORNUTA.	PROPOSED FOR RESIDENTIAL DEVELOPMENT (1993). ORV TRACKS FOUND WITHIN 2 FT OF PLANT. POOL PARTIALLY DRAINED. GRAZING.	DEPAUPERATE POPULATION SEEN IN 1981; NEARLY EXTIRPATED IN 1982; NO PLANTS OBSERVED IN 1984. DITCH THRU CENTER DRAINS POOL. 1 PLANT IN 1993 (POOL WAS DRY AT TIME OF SURVEY).	Wetland preserve west of Redding Airport. Probably extirpated. Surveyed 08-10-2011, but no plants found. Site is extremely dry and overgrown. A combination of the ditch draining the wetland and lack of vegetation management has severely degraded this site.	8/10/2011	Probably Extirpated	Present but Degraded	Declining	City of Redding
11	2154	TEH	2	specific area	Presumed Extant	19860722	19860722	PVT	ROUGHLY 1/2 AIR MILE WEST OF MANTON RD (LONG RD), 2.5 ROAD MILES SW OF THE JUNCTION OF MANTON & SPRING BRANCH CREEK RDS.	TWO COLONIES IN VERNAL POOLS. MAPPED IN NW 1/4 AND IN SW 1/4 SECTION 7.	VERNAL POOLS. ASSOCIATED WITH ALOPECURUS SACCATUS, ERYNGIUM VASEYI, ALLOCARYA STIPITATA, NAVARRETIA LEUCOCEPHALA, DOWNINGIA BICORNUTA, GRATIOLA HETEROSEPALA, MACHAEROCARPUS CALIFORNICUM, AND ELEOCHARIS MACROSTACHYA.	GRAZING IS A THREAT. WEEDY SPECIES & DUCK BLINDS ALSO PRESENT.	OVER 10,000 PLANTS OBSERVED IN 1982 AND 1984. ALSO OBSERVED IN 1986. INCLUDES FORMER OCCURRENCE #17.	Long Valley Ranch/Soap Butte Hunting Club. Presumed extant based on aerial photo interpretation and windshield survey. Habitat evident on 08-09-2011 but plants could not be observed from this distance. No access.	8/9/2011	Presumed Extant	Present and Natural	Unknown	

Green highlighting indicates new data.

Appendix A-5: Current Status of Slender Orcutt Grass (*Orcuttia tenuis*) in the Great Valley

EO	EONDX	KEY	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
12	6840	TEH	5	specific area	Presumed Extant	20070823	20070823	BLM, PVT	DALES LAKE AND EAST SIDE OF LONG ROAD, APPROXIMATELY 1.4 AIR MILES NNW OF DALES.	5 COLONIES LOCATED IN VARIOUS POOLS. EOS 61, 72-74 ARE WITHIN A QUARTER MILE OF THIS EO; HOWEVER THEY ARE INTRODUCED POPULATIONS AND WERE NOT LUMPED WITH EO 12 WHICH IS A NATURALLY OCCURRING POPULATION. INCLUDES FORMER EO #49, 51, & 65.	LARGE EPHEMERAL POND ON VOLCANIC MUDFLOW, BASALTIC BEDROCK. ELEOCHARIS MACROSTACHYA, ERYNGIUM VASEYI, POLYPOGON MONSPELIENSIS, ALLOCARYA STIPITATA, MACHAEROCARPUS CALIFORNICUM, DOWNINGIA, NAVARRETIA LEUCOCEPHALA, MARSILEA, HORDEUM, ETC.	GRAZING AND TRAMPLING COULD THREATEN. BARBED WIRE FENCE CROSSES DALES LAKE POOL. ELEOCHARIS & ERYNGIUM LIMIT ABUNDANCE.	>100 PLANTS IN N POOL IN 1992. DALES LAKE: 10,000+ IN 1982 & 1984, ABUNDANT IN 1986, 1 MILLION IN 1991, PRESENT IN 2002, THOUSANDS IN 2007. 5,000 PLANTS IN CENTER POOL IN 1987. >10,000 IN E POOL IN 1987. PLANTS ABUNDANT IN S POOL IN 1987.	DFW Dales Lake Ecological Reserve west of Manton Road and private east of Manton Road. Dales Lake surveyed 08-12-2011 with ~1 million plants present. Four polygons east of road not surveyed, but habitat remains.	8/12/2011	~1m Plants in 2011	Present and Natural	Persistent	Part Protected
13	6835	TEH	2	specific area	Presumed Extant	20090618	20090618	BLM	HOG LAKE AND THE POOL JUST NW OF THE LAKE, 10.8 MILES NE OF RED BLUFF ALONG HIGHWAY 36.	MAPPED BY CNDDB AS TWO POLYGONS IN THE WEST HALF OF THE NW 1/4 OF SECTION 17 AND THE NE 1/4 OF NE 1/4 OF SECTION 18.	ASSOC W/ MACHAEROCARPUS CALIFORNICUS, MARSILEA, EREMOCARPUS SETIGERA, ALOPECURUS, ERYNGIUM CASTRENSE, GRATIOLA HETEROSEPALA, ERYNGIUM CASTRENSE, ISOETES HOWELLII, I. ORCUTTII, PLAGIOBOTHRYS STIPITATUS MICRANTHUS, ELEOCHARIS ACICULARIS, ETC.	MUCH OF THE POOLS DOMINATED BY ELEOCHARIS MACROSTACHYA. NO GRAZING SINCE 1995.	SE POOL: 1-2 MILLION IN 1981, 10,000+ ON >1 HECTARE IN 1982 & 1984, "ABUNDANT" IN 1986, 259 PLANTS/SQ M IN 1995, SEEN DURING 2002 VEG SURVEYS, UNKNOWN NUMBER OBSERVED IN 2005 AND 2009. NW POOL: >1000 PLANTS IN 1996. INCLUDES FORMER EO #75.	BLM Hog Lake and adjacent pool. Reconnaissance survey 08-12-2011. Millions of plants in Hog Lake and hundreds of thousands in adjacent pool. Western pool shows signs of feral pig damage.	8/12/2011	~1m Plants in 2011	Present and Natural	Persistent	Protected
14	1355	TEH	1	80 meters	Presumed Extant	19950804	19950804	BLM-REDDING RA	1.5 MILES NE OF BEND, 100 YDS SW OF PRIVATELY OWNED RESERVOIR #368.		ON BED OF VERNAL POND IN OAK WOODLAND. ASSOCIATED WITH ELEOCHARIS, ERYNGIUM VASEYI, LOLIUM MULTIFLORUM, HORDEUM GENICULATUM, PSILOCARPHUS BREVISSIMUS, ALOPECURUS SACCATUS, ALLOCARYA STIPITATA, HEMIZONIA FITCHII, & BRODIAEA MINOR.	ELEOCHARIS APPEARED TO LIMIT THE DISTRIBUTION AND ABUNDANCE OF O. TENUIS. SITE HASN'T BEEN GRAZED SINCE 1991.	APPROXIMATELY 100,000 PLANTS IN 1981 AND 1982, ABOUT 5000 PLANTS IN 1987, 1465 PLANTS IN 1995. SITE MONITORED BY BLM.	BLM near Bend. Surveyed 08-10-2011, no plants found. Pool has dense vegetation including Lolium thatch. Grazing was removed from the site approximately a decade ago. BLM claims that there are plants in the newly created wetlands to the east, but did not provide a map or additional information.	8/10/2011	Possibly Extirpated	Present and Natural	Declining	Protected
15	14850	TEH	2	specific area	Presumed Extant	19860720	19860720	PVT	TABLE MOUNTAIN; APPROXIMATELY 1 MILE SE OF JELLYS FERRY AT MOUNTAIN LAKE, AND 0.1 MILE SE OF TABLE MOUNTAIN LAKE.	O. TENUIS FORMED EXTENSIVE STANDS ALONG THE BROAD NORTH AND SOUTH MARGINS OF THE LAKE BED.	LARGE VERNAL LAKE ON BASALT/TOOMES VERY ROCKY SILT LOAM SURROUNDED BY ANNUAL GRASSLAND AND BLUE OAK WOODLAND. ASSOCIATED SPECIES INCLUDE DOWNINGIA, ERYNGIUM, NAVARRETIA, MARSILEA, CHAMAESYCE, BOISDUVALIA, AND ELEOCHARIS.	GRAZING COULD THREATEN.	POPULATION OF OVER 10,000 PLANTS SEEN IN 1980. SEASONAL GRAZING BUT NO NEGATIVE IMPACTS APPARENT. ALSO OBSERVED HERE IN 1986.	Table Mountain Ranch, Jelly's Ferry. Presumed extant based on aerial photo interpretation. No access.	No	Presumed Extant	Present and Natural	Unknown	
16	22364	SAC	2	specific area	Presumed Extant	200310XX	200310XX	PVT	WEST SIDE OF LAGUNA CREEK, 0.2 MILE EAST OF EXCELSIOR ROAD, 1.6 MILES NORTH OF CALVINE ROAD.	SOUTH POLYGON BASED ON A 1988 AND A 2005 REPORT. NORTH POLYGON BASED ON A 1981 REPORT.	ELONGATE, NARROW VERNAL POOL SURROUNDED BY ANNUAL GRASSLAND. ASSOCIATED WITH ELEOCHARIS MACROSTACHYA, ALLOCARYA STIPITATA, DOWNINGIA BICORNUTA, NAVARRETIA LEUCOCEPHALA, PSILOCARPHUS BREVISSIMUS, ERYNGIUM VASEYI, ETC.	INDUSTRIAL PARK PROPOSED FOR PARCEL. THATCH BUILD-UP, INVASIVES, HYDROLOGICAL CHANGES, HERBICIDE RESIDUES, HUMAN DISTURB	SOUTH POLYGON: HOLLAND REPORTED 10,000+ PLANTS IN 1983, ABUNDANT IN 1986 AND 1987, SEVERAL HUNDRED INDIVIDUALS IN 2003. UNKNOWN NUMBER IN NORTH POLYGON (YEAR OBSERVED UNKNOWN, MENTIONED IN A 1981 REPORT). INCLUDES FORMER OCCURRENCE #19	Klotz Property. Surveyed 08-13-2010 and found 1,500 plants in 2 polygons within a single vernal pool. CNDDB north polygon is erroneous as per reports and maps from Sarah VonderOhe and a thorough on-site survey.	8/13/2010	1,500 Plants in 2010	Present and Natural	Persistent	

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EO	EONDX	KEY	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
20	7493	TEH	1	80 meters	Presumed Extant	20050524	20050524	BLM	1.0 AIR MILE SOUTH OF HOG LAKE, 1.5 AIR MILES NE OF TUSCAN BUTTES SUMMIT.	MAPPED AROUND VERNAL POOL IN THE NW 1/4 OF THE NW 1/4 OF SECTION 20.	VERNAL POOL ON VOLCANIC MUDFLOW WITH COBBLES. ASSOCIATED SPECIES INCLUDE ELEOCHARIS MACROSTACHYA, HEMIZONIA FITCHII, HORDEUM GENICULATUM, NAVARRETIA LEUCOCEPHALA, ERYNGIUM VASEYI, ALOPECURUS SACCATUS, ALLOCARYA STIPITATA, AND DOWNINGIA.	ORCUTTIA DISTRIBUTION AND ABUNDANCE LIMITED BY DENSE COVER OF ELEOCHARIS. FENCED IN 1995 TO EXCLUDE CATTLE.	SITE IN EXCELLENT CONDITION IN 1980'S. POOL IS 100 SQUARE METERS. LARGE, HEALTHY POPULATION OF OVER 10,000 PLANTS OBSERVED IN 1981, 1982, 1984, 460 PLANTS/SQ M IN 1995 (SITE QUALITY GOOD). OBSERVED IN POOL DURING 2002 & 2005 VEG SURVEYS.	BLM Seven Mile Lake. Extant. Surveyed on 08-12-2011 with ~80,000 plants observed (>10/sq m).	8/12/2011	90,000 Plants in 2011	Present and Natural	Persistent	Protected
21	7250	TEH	2	specific area	Presumed Extant	19950816	19950816	BLM-REDDING RA	0.6-0.8 AIR MILE SE OF COLEMAN FISH HATCHERY, SOUTH OF BATTLE CREEK & NORTH OF MANTON ROAD, RED BLUFF.	E POLY IS ALSO KNOWN AS "COLEMAN POOL"; A DIKE WAS CONSTRUCTED ACROSS THE LOWER END YEARS AGO INCREASING WATER SURFACE ACRES (1982). W POLY: SMALL POND CREATED BY EARTHEN DAM BUILT BEFORE 1965. BOTH POOLS HAVE PERMANENT TRANSECTS IN THEM.	E-POLY: VERNAL POOL ON TUSCAN COBBLY LOAM; ASSOCIATED W/ ELEOCHARIS, MARSILEA, PSILOCARPHUS, ALLOCARYA, NAVARRETIA, LASTHENIA, ERYNGIUM, & GRATIOLA HETEROSEPALA. W POLY: TUSCAN COBBLY LOAM ASSOCIATED WITH ELEOCHARIS SP.	MAJORITY OF BOTH SITES FENCED TO EXCLUDE CATTLE (1990, 1992).	W POLY: 100,000+ IN 1990, 237 PLANTS/SQ M IN 1995. E POLY: <10,000 IN 1982; 12,000,000 IN 1984 AT A DENSITY OF 302/SQ METER ACROSS 2 HA; LARGE, VIGOROUS POP REPORTED BY STONE & ERZINGER IN 1986; 216 PLANTS/SQ M IN 1995. INCL FORMER EO #44.	BLM "Coleman Pools". Surveyed 08-09-2011. >5000 plants in western polygon. Eastern polygon with ~1 million plants (>100 per square meter).	8/9/2011	~1m Plants in 2011	Present and Natural	Persistent	Protected
22	2212	SHA	2	specific area	Presumed Extant	19950817	19950817	BLM, PVT	HAWES RANCH, NW OF THE JUNCTION OF DERSCH & DESCHUTES ROADS, STILLWATER PLAINS.		VERNAL POOLS IN VALLEY GRASSLAND. ASSOCIATED SPECIES INCLUDE ELEOCHARIS MACROSTACHYA, ERYNGIUM VASEYI, ALLOCARYA STIPITATA, PSILOCARPHUS BREVISSIMUS, NAVARRETIA LEUCOCEPHALA, DOWNINGIA, AND LASTHENIA FREMONTII.	PORTIONS OF POOLS ON BLM LAND NOT GRAZED SINCE 1987, PRIVATELY OWNED PORTIONS STILL GRAZED (1995).	AT LEAST 1000 PLANTS IN 1984 WITH HIGHEST DENSITY IN UPPER 1/3 OF SITE, OVER 10,000 PLANTS SEEN IN 1987 BUT DAMAGED BY GRAZING. SITE MONITORED BY BLM.	Hawes Ranch Mitigation Bank and BLM. Presumed extant based on aerial photo interpretation. According to Brent Helm, many of the created pools and wetlands on this mitigation bank support ORTE.	No	Presumed Extant	Natural and Created	Unknown	Bank
23	22304	TEH	1	nonspecific area	Presumed Extant	19811002	19811002	UNKNOWN	3 AIR MILES SE OF VINA.	EXACT LOCATION UNKNOWN. MAPPED ACCORDING TO THE LOCATIONS WHICH WERE GIVEN ONLY BY T-R-S AS: T24N, R1W, SECTIONS 20 (PROUTY INFO), 29, AND 31 (COLLECTIONS BY JOKERST, ET AL).			AREA SEARCHED AS PART OF STUDY BY BIOSYSTEMS; NO SUITABLE HABITAT FOUND. NEED BETTER LOCATION INFORMATION.	General area surveyed in 2011 as part of this project. No ORTE were found in Sections 20, 29 or 31. Not sure what to make of this collection as Rob Schlising was part of the group and he has never mentioned additional ORTE pools to me (other than OE#26 & EO#57). It is also odd that the labels mention CHHO. I feel pretty strongly that these specimens had to have come from the known occurrence on Vina.	8/16/2011	Probably Erroneous	Likely Mis-mapped		Protected
24	22302	TEH	1	1/5 mile	Possibly Extirpated	19840924	XXXXXXXX	PVT	NEAR BATTLE CREEK ABOUT 1 MILE EAST OF SACRAMENTO RIVER.				UNKNOWN WHEN ORIGINALLY SEEN. BURK SEARCHED A LARGE AREA IN 1984 AND FOUND NO PLANTS. THE SE 1/4 OF SECTION 2 MAY BE THE MOST PROMISING. AREA SEARCHED AS PART OF STUDY BY BIOSYSTEMS; NO SUITABLE HABITAT FOUND. MORE INFO NEEDED.	Probably erroneous, but if not extirpated. Surveyed a large area on 08-09-2011, but found no plants. All "pond" margins were surveyed.	8/9/2011	Probably Erroneous	No Habitat Present		

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EO	EONDX	KEY	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
26	2238	TEH	1	specific area	Presumed Extant	1995XXXX	1995XXXX	TNC-VINA PLAINS PRESERVE	TNC VINA PLAINS PRESERVE. JUST SOUTH OF LASSEN ROAD NEAR EASTERN PRESERVE BOUNDARY.	POOL #29. VERNAL POOL NUMBERING SYSTEM ESTABLISHED BY KING IN 1992.	VERNAL POOL ON TUSCAN LOAM IN GRASSLAND. ASSOCIATED WITH DOWNINGIA BELLA, ERYNGIUM VASEYI, MARSILEA VESTITA, ALLOCARYA STIPITATA, ALOPECURUS SACCATUS, AND PSILOCARPHUS BREVISSIMUS.	SITE WAS LIGHTLY GRAZED IN 1988, WITH PLANS TO PHASE OUT.	MORE THAN 1000 PLANTS IN 1986, "ABUNDANT" IN 1987, OVER 4000 PLANTS IN 1988. UNKNOWN HOW MANY SEEN IN 1995. INCLUDES FORMER OCCURRENCE #91.	TNC Vina Plains pool #29. Extant. Surveyed 08/13/2011 and found 2,500 small plants (>10 per sq m in occupied area). This pool has an exclosure fence which is broken down.	8/13/2011	2,500 Plants in 2011	Present and Natural	Persistent	Protected
28	7499	TEH	1	80 meters	Presumed Extant	19860823	19860823	PVT	INKS CREEK RANCH, ABOUT 1.25 AIR MILES WSW OF DALES LAKE, JUST SW OF JUNCTION OF NATURAL GAS PIPELINES.		IN GRASSLAND IN GRAVELLY SHALLOW LOAM VERNAL POOL BOTTOM WITH LOOSE COBBLE STONES THE SIZE OF BASEBALLS. ASSOCIATED WITH ERYNGIUM VASEYI, ALLOCARYA STIPITATA, LASTHENIA GLABERRIMA, AND GRATIOLA HETEROSEPALA (ALSO RARE).	MODERATE GRAZING; NO IMMEDIATE THREAT TO POPULATION.	THOUSANDS OF PLANTS IN 1983, ABUNDANT IN 1986.	Inks Creek Ranch under TNC conservation easement. Bermed natural vernal pool. Surveyed 08-12-2011. Approximately 150,000 plants (>10/square meter).	8/12/2011	150,000 Plants in 2011	Present and Natural	Persistent	Easement
30	2195	TEH	2	specific area	Presumed Extant	19860721	19860721	PVT	1 MILE SE OF HIGHWAY 36, ALONG DIRT ROAD LEADING FROM HIGHWAY 36 SOUTH OF HOG LAKE TO TUSCAN BUTTES, NE OF RED BLUFF.	POND IS FORMED BEHIND AN EARTHEN LEVEE. PLANTS FOUND MOSTLY AT NORTH AND SOUTH ENDS OF LEVEE. MAPPED BY CNDDB AS 2 POLYGONS IN THE NE 1/4 OF THE NE 1/4 OF SECTION 20.	SEASONAL LIVESTOCK WATERING POND UNDERLAIN BY VOLCANIC BEDROCK, W/SOIL MAPPED AS TOOMES VERY ROCKY LOAM. W/ALLOCARYA STIPITATA, EREMOCARPUS SETIGERUS, TRICHOSTEMA LANCEOLATUM, CRYPSIS SCHOENOIDES, ELEOCHARIS MACROSTACHYA AND MACHAEROCARPUS.	POND IS AN AREA OF CATTLE CONCENTRATION AND IS EXTENSIVELY GRAZED & DISKED. COMPETITION WITH ELEOCHARIS ALSO THREATENS.	FEWER THAN 1000 PLANTS OBSERVED IN 1984. AT LEAST 10,000 PLANTS IN TWO SUB-POPULATIONS OBSERVED IN 1986.	Tuscan Ranch with TNC conservation easement. Stockpond. Surveyed 08-12-2011 with >10,000 plants. Plants in a strip 1 m wide on dam and 3-5 m wide on gradual slopes.	8/12/2011	>10,000 Plants in 2011	Stockpond	Persistent	Easement
31	6051	SHA	3	specific area	Presumed Extant	19860717	19860717	PVT	MILLVILLE PLAINS, BETWEEN TULE LAKE AND COW CREEK.	OCCURRING IN THREE VERNAL POOLS IN THE FAR WESTERN PORTION OF SECTION 33 AND NEAR THE INTERSECTION OF SECTIONS 28, 29, 32, AND 33.	VERNAL POOLS SURROUNDED BY ANNUAL GRASSLAND. ASSOCIATED WITH ERYNGIUM VASEYI, ALLOCARYA STIPITATA, ELEOCHARIS MACROSTACHYA, MARSILEA VESTITA, HEMIZONIA FITCHII, AND DOWNINGIA BICORNUTA. TERRACE SITES UNDERLAID BY AN IRON-SILICA HARDPAN.	POSSIBLE DEVELOPMENT, GRAZING, ORV USE.	PLANTS ABUNDANT IN 1986. NORTHERNMOST POOL HAS HAD ITS PERIOD OF INUNDATION ARTIFICALLY INCREASED BY A MAN-MADE EARTHEN DAM.	Millville Plains. Presumed extant based on aerial photo interpretation. Habitat behind a locked gate. The northernmost polygon looks like a perennial marsh.	No	Presumed Extant	Present	Unknown	
32	6027	SHA	2	specific area	Presumed Extant	20050728	19910618	PVT	BETWEEN MILLVILLE PLAINS AND STILLWATER PLAINS; EAST SIDE OF COW CREEK, 0.6 AIR MILE NORTH OF DERSCH ROAD.	TWO COLONIES. NORTH COLONY NO LONGER A VIABLE POOL AS OF 2005.	VERNALLY WET AREAS IN VALLEY GRASSLAND.		S COLONY: 2 ARTIFICIALLY CREATED DELIBERATELY SEEDED POOLS, UP TO 500,000 PLANTS SEEN IN 1987. N COLONY: 20 PLANTS IN 1991, FORMED IN POOL CAUSED BY TEMPORARILY CLOGGED DRAIN PIPE; NO LONGER VIABLE IN 2005. INCLUDES FORMER OCCURRENCE #48.	Millville Plains. Presumed extant based on aerial photo interpretation. Habitat behind a locked gate	No	Presumed Extant	Present	Unknown	
37	7503	TEH	1	80 meters	Presumed Extant	19930511	19930511	PVT	0.6 MILE NORTHWEST OF DALES LAKE, 1.65 AIR MILES NORTH OF HWY 36 AND LONG ROAD JUNCTION.		SMALL STOCK POND IN DAMMED SWALE IN VOLCANICS. IN INKS COBBLY LOAM SOIL. WITH ANOTHER RARE PLANT: GRATIOLA HETEROSEPALA.	CATTLE GRAZING COULD THREATEN. POND MARGIN DOMINATED BY ELEOCHARIS.	PLANTS ABUNDANT IN 1986. UNKNOWN NUMBER OF PLANTS OBSERVED IN 1993. SITE OWNED BY DENNY LAND AND CATTLE.	Inks Creek Ranch under TNC conservation easement. Shallow stockpond created by berm in a swale. Surveyed 08-09-2011. Approximately 60,000 plants (>10/square meter).	8/12/2011	60,000 Plants in 2011	Stockpond	Persistent	Easement

Green highlighting indicates new data.

Appendix A-5: Current Status of Slender Orcutt Grass (*Orcuttia tenuis*) in the Great Valley

EO	EONDX	KEY	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
38	7496	TEH	1	80 meters	Presumed Extant	19930511	19930511	PVT	APPROXIMATELY 2.5 MILES SOUTHWEST OF DALES LAKE, 1.6 MILES SOUTHWEST OF JUNCTION OF NATURAL GAS PIPELINES.	ORCUTTIA WAS DENSE IN NORTHERN PORTION OF POOL IN 1986.	VOLCANIC VERNAL POOL WITH ELEOCHARIS MACROSTACHYA, ERYNGIUM VASEYI, ALLOCARYA STIPITATA, ALOPECURUS SACCATUS, BRODIAEA MINOR, MACHAEROCARPUS SETIGERUS, MARSILEA VESTITA, AND GRATIOLA HETEROSEPALA (ALSO RARE).	SITE IS LIGHTLY GRAZED. ORCUTTIA DISTRIBUTION & ABUNDANCE LIMITED DUE TO DENSE ELEOCHARIS COVER.	ORCUTTIA WAS ABUNDANT HERE IN 1986. UNKNOWN HOW MANY PLANTS SEEN IN 1993. SITE OWNED BY DENNY LAND AND CATTLE.	Inks Creek Ranch under TNC conservation easement; part of pool on BLM lands. Surveyed 08-12-2011. Approximately 20,000 plants (>5/square meter). No plants on BLM side of the fence.	8/12/2011	20,000 Plants in 2011	Present and Natural	Persistent	Easement
39	2005	TEH	4	specific area	Presumed Extant	19920408	19920408	PVT	1.5 MILES WEST OF LONG ROAD (AKA MANTON RD), 2.3 AIR MILES NORTH OF DALES.	IN FOUR VERNAL POOLS.	VERNAL POOLS WITHIN A QUERCUS DOUGLASII WOODLAND. ASSOC WITH ELEOCHARIS MACROSTACHYA, ALLOCARYA STIPITATA MICRANTHA, ERYNGIUM VASEYI, & THE RARE GRATIOLA HETEROSEPALA & CUSCUTA HOWELLIANA.	CATTLE GRAZING, COMPETITIVE EXCLUSION BY ELEOCHARIS.	~1200 PLANTS IN 1986 IN THE 3 SW POOLS. >1000 IN 1992 IN THE NE POOL. INCLUDES FORMER OCCURRENCE #64.	Inks Creek Ranch under TNC conservation easement. Series of depressions in a rocky lava area. Surveyed 08-12-2011, but no plants found. Habitat is probably marginal except for the wettest years.	8/12/2011	Presumed Extant	Present and Natural	Marginal	Easement
40	7249	TEH	2	specific area	Presumed Extant	19920429	19920429	PVT	APPROXIMATELY 0.6 MILE SOUTH OF SPRING BRANCH CREEK, 1.3-1.5 MILES WEST OF COUNTY ROAD A6 (LONG RD ON TOPO).	MAPPED AS 2 POLYGONS.	VERNAL POOLS/EPHEMERAL LAKES IN VOLCANICS. WITH ALLOCARYA STIPITATA MICRANTHA AND ERYNGIUM VASEYI. OTHER RARE PLANTS IN POOLS: GRATIOLA HETEROSEPALA AND CUSCUTA HOWELLIANA.	CATTLE GRAZING AND TRAMPLING, VOLCANIC ROCK HARVESTING, AND GAS PIPELINE CONSTRUCTION THREATEN.	MORE THAN 10,000 PLANTS WERE OBSERVED AT THIS SITE IN 1986. PLANTS FOUND IN 2 OF THE 3 VERNAL POOLS IN 1992.	Long Valley Ranch/Soap Butte Hunting Club. Presumed extant based on aerial photo interpretation and windshield survey. Habitat evident on 08-09-2011 but plants could not be observed from this distance. No access.	8/9/2011	Presumed Extant	Present and Natural	Unknown	
43	1909	TEH	1	nonspecific area	Presumed Extant	19870804	19870804	PVT	IN 4 OF THE 5 LANIGER LAKES, APPROXIMATELY 2.5 MILES NNE OF VINA.	O. TENUIS GROWING CONSISTENTLY THROUGHOUT POOLS EXCEPT NEAR MARGIN. NO PLANTS FOUND IN SOUTHERNMOST POOL.	ANOTHER RARE PLANT (TUCTORIA GREENEI) FOUND IN 1 OF THE 5 LAKES. ASSOCIATED SPECIES INCLUDE ERYNGIUM, ELEOCHARIS, DOWNINGIA, PSILOCARPHUS, EREMOCARPUS, BOISDUVALIA, MARSILEA, ALOPECURUS, AND CRYPSIS.	MODERATE GRAZING MAY THREATEN, ALSO COMPETITION WITH ELEOCHARIS COULD THREATEN.	ORCUTTIA ABUNDANT IN THE 4 LAKES IN 1987. SPECIMENS COLLECTED FROM 3RD LAKE IN 1987 (STONE #834 JEPS).	Hamilton Ranch proposed as a conservation bank. Presumed extant based on aerial photo interpretation. Landowner denied access due to delay in getting bank established. Ken Whitney is contact for this site.	No	Presumed Extant	Present and Natural	Unknown	Proposed Bank
45	15619	SHA	1	80 meters	Presumed Extant	19880623	19880623	PVT	HAWES RANCH, ABOUT 1 MILE EAST OF REDDING AIRPORT, STILLWATER PLAINS.	ACCORDING TO STONE, 3 PLANTS ALSO FOUND IN SOUTH 1/2 OF EAST 1/2 OF SECTION 25, BUT NO MAP GIVEN. ONLY MAPPED IN NORTH 1/2 OF SECTION 25.	NATURAL SPILLWAYS HAVE BEEN ELEVATED TO IMPOUND MORE WATER.		LAND USED AS A PRIVATE HUNTING CLUB. LARGE POPULATION IN 1988 ACCORDING TO STONE.	Hawes Ranch Mitigation Bank. Presumed extant based on aerial photo interpretation. According to Brent Helm, many of the created pools and wetlands on this mitigation bank support ORTE.	No	Presumed Extant	Natural and Created	Unknown	Bank
47	4683	SHA	1	80 meters	Presumed Extant	19860720	19860720	PVT	0.6 MILE WEST OF DESCHUTES ROAD, 2.5 MILES EAST OF REDDING MUNICIPAL AIRPORT, STILLWATER PLAINS.		POOL SURROUNDED BY ANNUAL GRASSLAND. HIGH TERRACE SITE UNDERLAIN WITH IRON-SILICA HARDPAN. SOIL MAPPED AS MODA LOAM. WITH ERYNGIUM VASEYI, NAVARRETIA LEUCOCEPHALA, ALLOCARYA STIPITATA, DOWNINGIA, PSILOCARPHUS BREVISSIMUS, ALOPECURUS.	GRAZING COULD THREATEN.	OVER 1000 PLANTS IN 1986.	Hawes Ranch Mitigation Bank. Presumed extant based on aerial photo interpretation. According to Brent Helm, many of the created pools and wetlands on this mitigation bank support ORTE.	No	Presumed Extant	Natural and Created	Unknown	Bank

Green highlighting indicates new data.

Appendix A-5: Current Status of Slender Orcutt Grass (*Orcuttia tenuis*) in the Great Valley

EO	EONDX	KEY	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
50	2210	TEH	1	80 meters	Presumed Extant	19860723	19860723	PVT	INKS CREEK RANCH, 2.6 MILES NW OF DALES LAKE.	O. TENUIS GROWS JUST ABOVE THE ELEOCHARIS ZONE, BUT ONLY IN ISOLATED LOCATIONS WHERE THE TOPOGRAPHY RISES GRADUALLY AWAY FROM THE POND. SW 1/4 OF NW 1/4 OF SECTION 21.	ARTIFICIAL POND UNDERLAIN WITH IRON-SILICA CEMENTED HARDPAN, SURROUNDED BY ANNUAL GRASSLAND. ASSOCIATED WITH MARSILEA VESTITA AND ELEOCHARIS MACROSTACHYA.	GRAZING & TRAMPLING BY CATTLE THREATEN BUT COMPETITIVE EXCLUSION BY MARSILEA & ELEOCHARIS IS MAIN THREAT.	OVER 1000 PLANTS IN 1986 IN THREE SMALL SUB-POPULATIONS.	Inks Creek Ranch under TNC conservation easement. Stockpond. Presumed extant from aerial photo interpretation. Remote and protected.	No	Presumed Extant	Stockpond	Unknown	Easement
52	2194	TEH	1	specific area	Presumed Extant	19870810	19870810	PVT	MANTON (LONG) ROAD, 2.9 MILES NE OF DALES.	IN 2 POOLS: NORTHERN POOL IS AN ARTIFICIAL POND WHICH RECEIVES DRAINAGE FROM THE SOUTHERN POOL (WHICH IS NATURAL).	HIGH TERRACE SITES UNDERLAIN BY IRON-SILICA CEMENTED HARDPAN. TUSCAN COBBLY LOAM SOIL. POOLS DOMINATED BY ELEOCHARIS MACROSTACHYA, ERYNGIUM VASEYI, PSILOCARPHUS BREVISSIMUS, ALLOCARYA STIPITATA, DOWNINGIA, & NAVARRETIA LEUCOCEPHALA.	COMPETITIVE EXCLUSION BY ELEOCHARIS MACHROSTACHYA IS MAJOR THREAT. MODERATE GRAZING.	"ABUNDANT" IN 1987.	Extant. Posted. Windshield survey on 08-09-2011, and plants evident from road.	8/9/2011	Unknown# in 2011	Present and Natural	Unknown	
57	2237	TEH	1	80 meters	Presumed Extant	19860824	19860824	PVT	VINA PLAINS, 0.4 MILE SW OF LASSEN ROAD CROSSING OF SINGER CREEK.		TUSCAN LOAM VERNAL POOL SURROUNDED BY ANNUAL GRASSLAND. WITH ELEOCHARIS MACROSTACHYA, ERYNGIUM VASEYI, ALLOCARYA STIPITATA, PSILOCARPHUS BREVISSIMUS, MARSILEA VESTITA, ALOPECURUS SACCATUS, AND DOWNINGIA.	ORCUTTIA DISTRIBUTION AND ABUNDANCE WAS LIMITED BY DENSE STANDS OF ELEOCHARIS. GRAZING COULD ALSO THREATEN.	ABUNDANT IN 1986.	Pool just east of Vina Plains on private property. Extant. Surveyed 08-13-2011 and found ~1,000 plants as scattered individuals and small clusters thoughout the pool basin. Site was ungrazed in 2001.	8/13/2011	~1,000 Plants in 2011	Present and Natural	Persistent	
60	21389	TEH	1	80 meters	Presumed Extant	19870818	19870818	PVT	0.5 MILE NE OF THE NORTH END OF TABLE MOUNTAIN LAKE, 1.2 MILES EAST OF JELLYS FERRY, 10 MILES NNE OF RED BLUFF.		NATURAL VERNAL POOL, BED STREWN WITH BASALTIC STONES & DOMINATED IN PART BY DENSE STANDS OF ELEOCHARIS. ASSOCIATED WITH ERYNGIUM VASEYI, MARSILEA VESTITA, MACHAEROCARPUS, NAVARRETIA LEUCOCEPHALA, GRATIOLA EBRACTEATA, & ALLOCARYA STIPITATA.	GRAZING MAY THREATEN.	O. TENUIS ABUNDANT AT THIS SITE IN 1987. IT GROWS DENSELY THROUGHOUT POOL, ESPECIALLY WHERE ELEOCHARIS WAS REDUCED.	Table Mountain Ranch, Jelly's Ferry. Presumed extant based on aerial photo interpretation. No access.	No	Presumed Extant	Present and Natural	Unknown	
61	1257	TEH	1	specific area	Presumed Extant	19860721	19860721	DFG-DALES LAKE ER	0.5 MILE NE OF DALES LAKE, 2.25 MILES SOUTH OF COTTONWOOD SPRING.	O. TENUIS RESTRICTED TO AN AREA ABOUT 10 METERS LONG BY UP TO 2 METERS WIDE, ALONG A RELATIVELY BARREN BULLDOZER SCRAPING NEAR THE POOL WEST MARGIN. SE 1/4 OF NW 1/4 OF SECTION 26.	ARTIFICIAL BORROW PIT UNDERLAIN BY IRON-SILICA CEMENTED HARDPAN. WITH ELEOCHARIS AND POPULUS FREMONTII. ANOTHER RARE PLANT, GRATIOLA HETEROSEPALA, ALSO FOUND HERE.	LONG TERM VIABILITY OF O. TENUIS THREATENED BY ELEOCHARIS DOMINANCE IN THIS POOL.	POOL WAS COMPLETELY DRY IN LATE JULY 1986.	DFW Dales Lake Ecological Reserve. This is the borrow pit. Surveyed 08-09-2011 with >10,000 plants.	8/9/2012	>10,000 Plants in 2011	Borrow Pit	Persistent	Protected
62	2211	TEH	1	specific area	Presumed Extant	19860723	19860723	PVT	INKS CREEK RANCH; 'RESERVOIR 466', APPROXIMATELY 3.6 MILES NW OF DALES LAKE.	O. TENUIS OCCUPIED AREA JUST ABOVE THE ELEOCHARIS ZONE, BUT ONLY IN ISOLATED LOCATIONS WHERE THE TOPOGRAPHY RISES GRADUALLY AWAY FROM THE LAKE. SITE IS ACTUALLY 6 SMALL SUBPOPULATIONS AROUND MARGIN OF RESERVOIR.	ARTIFICIAL RESERVOIR UNDERLAIN BY IRON-SILICA CEMENTED HARDPAN, SURROUNDED BY ANNUAL GRASSLAND. ELEOCHARIS MACROSTACHYA DOMINATES POOL WITH SALIX LAEVIGATA AND POPULUS FREMONTII ON MARGIN.	MODERATE GRAZING THREATENS AND ELEOCHARIS COMPETITION APPEARS TO LIMIT O. TENUIS ABUNDANCE.	AT LEAST 1000 PLANTS IN 1986. FORMER OCCURRENCE #53 IS INCLUDED AT THIS SITE (3.6 MILES NW OF DALES LAKE, INK CREEK RANCH).	Inks Creek Ranch under TNC conservation easement. Stockpond. Presumed extant from aerial photo interpretation. Remote and protected.	No	Presumed Extant	Stockpond	Unknown	Easement

Appendix A-5: Current Status of Slender Orcutt Grass (*Orcuttia tenuis*) in the Great Valley

EO	EONDX	KEY	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
63	19139	TEH	1	specific area	Presumed Extant	19860722	19860722	PVT	INKS CREEK RANCH; 'RESERVOIR 612', APPROXIMATELY 1.3 MILES NNW OF DALES LAKE.	ALSO IN THE NW 1/4 OF THE SW 1/4 OF SECTION 23.	RESERVOIR SURROUNDED BY ANNUAL GRASSLAND. TERRACE BREAK SITE UNDERLAIN BY IRON-SILICA HARDPAN; SOILS MAPPED AS INKS COBBLY LOAM. ELEOCHARIS MACHROSTACHYA IS DENSE HERE. MAPPED WITH SAGITTARIA SANFORDII.	RESERVOIR IS AN AREA OF CATTLE CONCENTRATION, BUT MAJOR THREAT IS COMPETITIVE EXCLUSION BY ELEOCHARIS.	OVER 10,000 PLANTS IN 1986.	Inks Creek Ranch under TNC conservation easement. Very large stockpond. Reconnaisance surveyed on 08-12-2011. Plants abundant (>10,000) on the perimeter of the reservoir.	8/12/2011	>10,000 Plants in 2011	Stockpond	Persistent	Easement
66	2204	TEH	1	80 meters	Presumed Extant	19860722	19860722	PVT	INKS CREEK RANCH; JUST NORTH OF NATURAL GAS PIPELINE, 1.7 MILES WNW OF DALES LAKE.	POND FORMED BEHIND AN EARTHEN LEVEE. 2 SMALL SUBPOPULATIONS AT THIS SITE. NW 1/4 OF SE 1/4 OF SECTION 28.	ARTIFICIAL POND IN INKS COBBLY LOAM SOIL. POOL DOMINATED BY ELEOCHARIS MACROSTACHYA. ORCUTTIA FOUND JUST ABOVE ELEOCHARIS ZONE, BUT ONLY IN ISOLATED LOCATIONS WHERE THE TOPOGRAPHY RISES GRADUALLY AWAY FROM THE POND.	POND IS AN AREA OF CATTLE CONCENTRATION, BUT MAIN THREAT IS COMPETITIVE EXCLUSION BY ELEOCHARIS.	OVER 1000 PLANTS IN 1986.	Inks Creek Ranch under TNC conservation easement. Very small stockpond. Surveyed on 08-12-2011. 150 plants found scattered along the margin of the pond.	8/12/2011	150 Plants in 2011	Stockpond	Persistent	Easement
67	2196	TEH	1	80 meters	Presumed Extant	20011010	20011010	BLM	INKS CREEK RANCH; APPROXIMATELY 2.4 MILES SW OF DALES LAKE.	SITE IS CALLED "NORDIC POOL." MAPPED WITHIN THE NW 1/4 OF NW 1/4 OF SECTION 4.	SMALL VERNAL POOL UNDERLAIN BY BASALTIC BEDROCK WITH SOIL MAPPED AS TOOMES EXTREMELY ROCKY LOAM. POOL DOMINATED BY ELEOCHARIS MACROSTACHYA, ERYNGIUM VASEYI, BRODIAEA MINOR, ALLOCARYA STIPITATA, DESCHAMPSIA DANTHONIOIDES, NAVARRETIA, ETC.	AREA WAS MODERATELY GRAZED IN 1986, BUT MAJOR THREAT TO ORCUTTIA IS COMPETITIVE EXCLUSION BY ELEOCHARIS & ERYNGIUM.	OVER 1000 PLANTS IN 1986. MORE THAN 4000 PLANTS OBSERVED IN 2001. NO THREATS OR DISTURBANCES NOTED IN 2001.	BLM has removed the grazing and this pool is highly impacted by feral pigs. Surveyed 08-12-2011 with ~5,000 plants observed, but with lots of potential habitat rototilled by the pigs.	8/12/2011	~5,000 Plants in 2011	Present but Degraded	Declining	Protected
71	272	SAC	1	80 meters	Presumed Extant	2010XXXX	2010XXXX	PVT	EAST OF MATHER AIR FORCE BASE, 0.8 AIR MILE SE OF THE INTERSECTION OF SUNRISE BLVD AND DOUGLAS ROAD, RANCHO CORDOVA.	MONTELENA WETLAND PRESERVE. ON THE BORDER OF THE SECTION LINE BETWEEN SECTIONS 8 AND 17.	ASSOCIATED WITH ELEOCHARIS MACROSTACHYA, ERYNGIUM VASEYI, AND NAVARRETIA LEUCOCEPHALA.		500 PLANTS ESTIMATED IN 1993. UNKNOWN NUMBER OF PLANTS OBSERVED IN MONTELENA WETLAND PRESERVE IN 2010.	Montelena Wetland Preserve. Site is being monitored annually as per BO 1-1-04-F-0343. '06: 8,500; '08: 12,000; '09: 100; '10: 1,800; '11: 1,100; '12: 300 plants. Being managed for conservation values even this is a very small (50 acre) preserve.	10/9/2012	300 Plants in 2012	Present and Natural	Persistent	Protected
72	30949	TEH	1	specific area	Presumed Extant	199506XX	199506XX	DFG-DALES LAKE ER	JUST SOUTH OF DALES LAKE, WEST SIDE OF LONG (AKA MANTON) ROAD. 0.9-0.1 MILE NORTH OF TOWN OF DALES.	O. TENUIS IN 6 POOLS.	SPARSELY VEGETATED FIRST YEAR ARTIFICIAL VERNAL POOLS.	MANY TYPHA PLANTS REMOVED BY HAND IN 1995.	59 PLANTS COUNTED IN 1995 IN 11 OF 21 ARTIFICIAL POOLS (COMBINED COUNT BETWEEN EOS 72-74).	DFW Dales Lake Ecological Reserve. This is a cluster of pools created in the 1990s. Since then the berms have breaches and the pools have stabilized into small and flashy features. Surveyed 08-09-2011 with no plants and no suitable habitat observed.	8/9/2011	Extirpated Artificial	Created and Not Suitable		Protected
73	21091	TEH	1	specific area	Presumed Extant	199506XX	199506XX	DFG-DALES LAKE ER	0.5 MILE NORTH OF DALES LAKE, 0.3-0.5 MILE WEST OF LONG (AKA MANTON) ROAD.	O. TENUIS IN 3 POOLS.	SPARSELY VEGETATED FIRST YEAR ARTIFICIAL VERNAL POOL. LIMNANTHES FLOCCOSA FLOCCOSA ALSO AT THIS SITE.	MANY TYPHA PLANTS REMOVED BY HAND IN 1995.	59 PLANTS COUNTED IN 1995 IN 11 OF THE 21 ARTIFICIAL POOLS (BETWEEN EOS 72, 73 AND 74).	DFW Dales Lake Ecological Reserve. This is a cluster of pools created in the 1990s. Since then the berms have breaches and the pools have stabilized into small and flashy features. Surveyed 08-09-2011 with no plants and no suitable habitat observed.	8/9/2011	Extirpated Artficial	Created and Not Suitable		Protected

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EO	EONDX	KEY	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
74	30945	TEH	1	specific area	Presumed Extant	199506XX	199506XX	DFG-DALES LAKE ER	0.4 MILE NORTH OF DALES LAKE, JUST WEST OF LONG (AKA MANTON) ROAD.	O. TENUIS IN ONE POOL. IN NE 1/4 OF SW 1/4 OF SEC 26.	SPARSELY VEGETATED, FIRST YEAR, ARTIFICIAL VERNAL POOLS. CREATED IN 1994. LIMNANTHES FLOCCOSA FLOCCOSA ALSO AT THIS SITE.	MANY TYPHA PLANTS REMOVED BY HAND IN 1995.	IS THIS A SITE WORTH MAPPING? A TOTAL OF 59 PLANTS RECORDED IN 11 OF THE 21 ARTIFICIAL POOLS IN 1995 (BETWEEN EOS 72, 73 AND 74).	DFW Dales Lake Ecological Reserve. This is a single pool created in the 1990s. Since then the berms have breaches and the pools have stabilized into small and flashy features. Surveyed 08-09-2011 with no plants and no suitable habitat observed.	8/9/2011	Extirpated Artificial	Created and Not Suitable		Protected
80	48940	BUT	1	specific area	Presumed Extant	20070523	20070523	PVT	EAST OF HIGHWAY 70, APPROXIMATELY 0.6 AIR MILE NORTHWEST OF POWERHOUSE HILL ROAD AND PALERMO ROAD INTERSECTION.	THERE WAS SOME UNCERTAINTY AS TO THE ID OF THIS PLANT; HOWEVER, ROB SCHLISING CONFIRMED THAT IT WAS O. TENUIS AND NOT O. PILOSA. IN NW1/4 OF NE1/4 SEC 11.	VERNAL POOL, ANNUAL GRASSLAND, DOMINANTS - ERYNGIUM CASTRENSE, PSILOCARPHUS BREVISSIMUS, DESCHAMPSIA DANTHONIDES, PLAGIOBOTHRYS STIPITATUS, NAVARRETIA LEUCOCEPHALA SSP. LEUCOCEPHALA, ELEOCHARIS MACROSTACHYS.	ROADSIDE OCCURRENCE, SITE IS GRAZED (2000). POSSIBLY THREATENED BY DEVELOPMENT (2007).	500 PLANTS OBSERVED IN 2000 BETWEEN THIS OCCURRENCE AND OCCURRENCE #81 COMBINED. 70 PLANTS OBSERVED IN 2007 BETWEEN THIS AND OCCURRENCE #81.	Presumed extant based on aerial photo interpretation. Unable to gain access to the sites. Elena (Alfieri) Gregg was a consultant for this site. She visited the site again in 2008 to photograph the occurrence.	No	Presumed Extant	Natural and Created	Unknown	
81	48941	BUT	1	specific area	Presumed Extant	20080625	20080625	PVT	EAST OF HIGHWAY 70, APPROXIMATELY 0.15 AIR MILE NNE OF INTERSECTION WITH PALERMO ROAD, WEST OF PALERMO.	THERE WAS SOME UNCERTAINTY AS TO THE ID OF THIS PLANT; HOWEVER, ROB SCHLISING CONFIRMED THAT IT WAS O. TENUIS AND NOT O. PILOSA. IN NW1/4 OF NE1/4 SECTION 11.	VERNAL POOL, ANNUAL GRASSLAND, DOMINANTS - ERYNGIUM CASTRENSE, PSILOCARPHUS BREVISSIMUS, DESCHAMPSIA DANTHONIDES, PLAGIOBOTHRYS STIPITATUS, NAVARRETIA LEUCOCEPHALA SSP. LEUCOCEPHALA, ELEOCHARIS MACROSTACHYS.	ROADSIDE OCCURRENCE, SITE IS GRAZED (2000). POSSIBLY THREATENED BY DEVELOPMENT (2007).	500 PLANTS OBSERVED IN 2000 BETWEEN THIS OCCURRENCE AND OCCURRENCE #80 COMBINED. 70 PLANTS OBSERVED IN 2007 BETWEEN THIS AND OCCURRENCE #80. UNKNOWN NUMBER OF PLANTS OBSERVED IN 2008.	Presumed extant based on aerial photo interpretation. Unable to gain access to the sites. Elena (Alfieri) Gregg was a consultant for this site. She visited the site again in 2008 to photograph the occurrence.	No	Presumed Extant	Natural and Created	Unknown	
90	62864	SAC	1	specific area	Presumed Extant	20040609	20040609	PVT	NE OF THE INTERSECTION OF EXCELSIOR ROAD AND DIERKS ROAD.	APPROXIMATELY 1100 FEET EAST OF EXCELSIOR ROAD AND 1000 FEET NORTH OF DIERKS ROAD.	DEEP VERNAL POOL WITHIN VERNAL POOL - SWALE - GRASSLAND COMPLEX. ASSOCIATED WITH GLYCERIA DECLINATA, LASTHENIA GLABERRIMA, RANUNCULUS ALVEOLATUS, ELEOCHARIS MACROSTACHYA, ERYNGIUM VASEYI, PSILOCARPHUS BREVISSIMUS, AND LEPIDURUS PACKARDII.	CURRENT AND PAST CATTLE GRAZING. RESIDENTIAL DEVELOPMENT NEARBY, BUT NOT ON THIS PARCEL.	500-1000 PLANTS OBSERVED IN 2004.	SVC Werre parcel. Surveyed 08-30-2010 and observed >5,000 plants in a single vernal pool.	8/30/2010	>5,000 Plants in 2010	Present and Natural	Persistent	
94	72349	TEH	1	80 meters	Presumed Extant	20020425	20020425	TNC-VINA PLAINS PRESERVE	APPROXIMATELY 1.7 AIR MILES SE OF THE INTERSECTION OF HWY 99 AND LASSEN ROAD, CHICO.	MAPPED ACCORDING TO GPS INFORMATION FROM THE UC DAVIS VERNAL POOL TEAM. UNKNOWN IF O. TENUIS OCCURS IN OTHER PARTS OF THIS VERNAL POOL.	ASSOCIATED WITH MARSILEA VESTITA, ERYNGIUM CASTRENSE, PLAGIOBOTHRYS STIPITATUS V. MICRANTHUS, DOWNINGIA BICORNUTA, EPILOBIUM CLEISTOGAMUM, EREMOCARPUS SETIGERUS, O. PILOSA, & PSILOCARPUS BREVISSIMUS V. BREVISSIMUS.		UNKNOWN NUMBER OF PLANTS IN 2002 IN THE BOTTOM OF THE VERNAL POOL. PRESENCE OF PLANTS NOTED DURING A VEGETATION SURVEY. NEEDS FIELDWORK.	MIS-IDENTIFICATION. TNC Vina Plains pool #35. This was reported in April 2002 when the plants were not yet in bloom. Someone on the vernal pool team just assumed it was O. tenuis. ORTE has never been reported from pool #35. The pool does contain ORPI and TUGR.	8/16/2011	Erroneous	Mis-id		Protected

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EO	EONDX	KEY	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
95	72350	TEH	1	80 meters	Presumed Extant	20020611	20020611	UNKNOWN	ALONG INKS CREEK RD, APPROX 0.72 MI WEST OF THE INTERSECTION OF COUNTY HWY A6 (LONG RD) AND INKS CREEK RD, RED BLUFF.	MAPPED BY CNDDB ACCORDING TO GPS INFORMATION FROM THE UC DAVIS VERNAL POOL TEAM.	ASSOC W/ PLAGIOBOTHRYS STIPITATUS MICRANTHUS, ERYNGIUM SP, ISOETES ORCUTTII, ELATINE CHILENSIS, MACHAEROCARPUS CALIFORNICUS, DOWNINGIA BICORNUTA, ELEOCHARIS ACICULATIS ACICULARIS, BRODIAEA CALIFORNICA, E. PALUSTRIS, MARSILEA VESTITA, ETC.		UNKNOWN NUMBER OF PLANTS IN 2002 IN THE BOTTOM OF THE VERNAL POOL. PRESENCE OF PLANTS NOTED DURING A VEGETATION SURVEY. NEEDS FIELDWORK.	ERRONEOUS. There is no pool here. This was probably a transposition of UTM coordinates, or a generalized location point for a releve without coordinate data.	9/13/2011	Erroneous	No Habitat Present		Easement
96	72353	SHA	1	specific area	Presumed Extant	20060606	20060606	PVT	APPROXIMATELY 1.5 AIR MILES NE OF REDDING MUNICIPAL AIRPORT, STILLWATER PLAINS.	MAPPED BY CNDDB ACCORDING TO A 2006 BURK MAP. O. TENUIS OCCURS THROUGHOUT THE DEEPER PORTIONS OF A LARGE VERNAL POOL ABOUT 4 TO 5 ACRES IN SIZE.	SURROUNDING TOPO IS NEARLY FLAT TO GENTLY SLOPING. ASSOC: NAVARRETIA LEUCOCEPHALA, ERYNGIUM CASTRENSE, ELEOCHARIS MACROSTACHYA, RANUNCULUS BONARIENSIS TRISEPALUS & LEGENERE LIMOSA. POOL SURROUNDED BY ANNUAL GRASSLAND & BLUE OAK WOODLAND.		10,000+ PLANTS IN 2006. SITE IS ADJACENT TO STILLWATER PLAINS MITIGATION BANK; SITE OWNER IS CONSIDERING PRESERVING/ENHANCING SITE TO MITIGATE FOR LOSS OF WETLANDS ELSEWHERE.	Presumed extant based on aerial photo interpretation. Unable to gain access to the site.	No	Presumed Extant	Present and Natural	Unknown	
N1		TEH						Private	Large, shallow playa pool approximately 0.5 miles due north of Laniger Lakes.	Visited with LSA botanical staff in the spring of 2003. Map was obtained from Ken Whitney, but report was not.	Needs field work.		1,000s plants seen in 2003 during a rare plant survey of the site.	Hamilton Ranch proposed bank. Presumed Extant based on aerial photography interpretation. Access denied. From the 2003 LSA map, at least the southern portion of the playa pool is within the parcel boundary.	No	Presumed Extant	Present and Natural	Unknown	Proposed for Bank
N2		SHA						Private	Large "horsershoe" shaped pond in Stillwater Business Park. 0.95 miles northeast of the northern tip of the runway of the Redding Municipal Airport.	Plants strongly associated with the Eryngium zone of the pond margin.		The survey was associated with a proposed business park development. Actual threat to the population is unknown.	10,000s of plants seen in 2009 survey of the site. Apparently site was originally discovered in 2003.	Stillwater Business Park. Data and maps were obtained from Heather Kelly. No access.	No	Presumed Extant	Pond	Unknown	

Appendix A-6: Current Status of Sacramento Orcutt Grass (*Orcuttia viscida*) in the Great Valley

California Natural Diversity Database, November 4, 2012													Witham, 2013					
OCC	EONDX	KEY	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
1	40832	SAC	1	specific area	Presumed Extant	20070527	20070527	SAC COUNTY, PVT	GRANT LINE ROAD, ABOUT 2.9 MILES NORTH OF JACKSON HIGHWAY (HWY 16), NORTH OF SLOUGHHOUSE.	MAPPED IN LARGE POOL ALONG E SIDE OF ROAD, ABOUT 1 MILE NORTHEAST OF KIEFER ROAD AND JUST SW OF THE BEND IN GRANT LINE ROAD ACCORDING TO A 1998 JONES AND STOKES ASSOC MAP. KIEFER POOL #208.	DEEP VERNAL POOL WITH ISOETES HOWELLII, ERYNGIUM VASEYI, PSILOCARPHUS BREVISSIMUS, LILAEA SCILLOIDES, PLAGIOBOTHRYS STIPITATUS MICRANTHUS, ELEOCHARIS MACROSTACHYA, CRASSULA AQUATICA, DOWNINGIA ORNATISSIMA, EPILOBIUM CLEISTOGAMUM, ETC.	GRAZING (THREAT?), COMPETITION WITH ELEOCHARIS MACROSTACHYA AND EXOTIC GLYCERIA DECLINATA.	TYPE LOCALITY. ABUNDANT IN 1986 AND 1987; ABOUT 400,000 IN 1995; 138,000 IN 1998; UNK # IN 2005; MILLIONS IN 2007. NUMEROUS COLLECTIONS MADE BY CRAMPTON AT THIS SITE. THIS SITE FORMERLY INCLUDED WITH NEARBY OCCURRENCE #6.	Kiefer Landfill Wetland Preserve pool #208. Being monitored as per BO 1-1-03-F-0308. Annual monitoring reports are available at vernalpools.org/KLWP. >1.5m in 2005; 525,000 in 2006; 641,000 in 2007; 1.2m in 2008; 643,000 in 2009; 957,000 in 2010; 1.2m in 2011; ~3,000 in 2012 which was an extremely odd rainfall year.	10/12/2012	~3,000 Plants in 2012	Present and Natural	Persistent	Protected
4	22369	SAC	1	1/5 mile	Extirpated	19860616	19580707	PVT	0.4 MI E OF THE JUNCTION OF MAIN AVE & GREENBACK LN, ABOUT 2 MI E OF ORANGEVALE, 2.1 MI NW OF FOLSOM.		NEARLY BARREN AREA IN THE MIDDLE OF LARGE VERNAL POOL WITH ERYNGIUM. OPEN ROLLING PLAINS WITH BLUE OAKS.	AREA NOW DEVELOPED FOR HOUSING, SHOPPING CENTER, & PARKING LOTS.		Extirpated	No	Extirpated	Eliminated		
5	18718	SAC	1	specific area	Presumed Extant	20070517	20070517	DFG-PHOENIX FIELD ER	"PHOENIX VERNAL POOLS", NORTH OF SUNSET BLVD, JUST EAST OF PHOENIX FIELD AIRPORT, FAIR OAKS.	MAPPED ACCORDING TO A 1996 MOREY MAP. POOLS WITH A LOT OF ERYNGIUM DO NOT HAVE O. VISCIDA ACCORDING TO COCHRANE (1982). POOL ACQUIRED & FENCED BY CDFG AS ECOLOGICAL RESERVE.	IN SILICA-IRON HARDPAN IN VERNAL POOLS IN BLUE OAK WOODLAND W/ ERYNGIUM VASEYI, PSILOCARPHUS BREVISSIMUS, BRODIAEA MINOR, SIDALCEA CALYCOSA. NAVARRETIA MYERSII ALSO AT THIS SITE.	PROPERTY INVADED BY EXOTIC PLANTS, ESP FROM ADJACENT YARDS. ORVS, DRAINAGE, & RUNOFF THREATEN.	MONITORED ANNUALLY. ~59,000 IN 1980; ~30,000 IN 1981; ~154,000 IN 1983; ~57,000 IN 1983; ~146,000 IN 1984; ~46,400 IN 1985; ~216,000 IN 1986; THOUSANDS IN 1991; OVER 100,000 IN 1994-1996; ~9500 IN 1997; 100,000 IN 2007. INCL FORMER EO #2.	DFW Pheonix Field Ecological Reserve. Extant. >5,000 plants occurring in two pools (GPSed) on 09-08-2010.	9/8/2010	>5,000 Plants in 2010	Present and Natural	Persistent	Protected
6	14411	SAC	10	specific area	Presumed Extant	20070527	20070527	SAC COUNTY, PVT	NEAR KIEFER LANDFILL, EAST SIDE OF GRANT LINE RD, NORTH AND SOUTH OF KIEFER BLVD, SOUTHEAST OF RANCHO CORDOVA.	MAPPED ACC TO A 1990 JONES & STOKES REPORT. SEARCHED FOR BUT NOT FOUND S OF KIEFER FOR MANY YRS (SINCE 1974?); MAY BE EXTIRPATED FROM THERE DUE TO AG & USE AS PERMANENT LIVESTOCK PONDS. TADPOLE SHRIMP FOUND IN POOLS WITH O. VISCIDA IN 1995.	VERNAL POOLS SURROUNDED BY ANNUAL GRASSLAND. REDDING GRAVELLY LOAM SOIL. ASSOCIATED WITH ELEOCHARIS MACROSTACHYA, ERYNGIUM VASEYI, ALLOCARYA STIPITATA, PSILOCARPHUS BREVISSIMUS, LILAEA SCILLOIDES, MARSILEA VESTITA, & DOWNINGIA BICORNUTA.	LANDFILL EXPANSION MAY DESTROY SOME POOLS.	1000'S OF PLANTS IN 1990; 1,000,000+ IN 1995; 129,000+ IN 1998; UNK # SEEN IN A 2005 VEG SURVEY; 100,000S IN 2007. INCLUDES FORMER OCC #'S 3, 7, 9, 10, 12, AND 14.	Kiefer Landfill Wetland Preserve and bufferlands. The polygon southwest of Kiefer Blvd has been extirpated for years. Being monitored as per BO 1-1-03-F-0308. Annual monitoring reports are available at vernalpools.org/KLWP. 243,000 in 13 pools in 2005; 335,000 in 9 pools in 2006; 525,000 in 13 pools in 2007; 497,000 in 14 pools in 2008; 32,000 in 12 pools in 2009; 133,000 in 12 pools in 2010; 184,000 in 15 pools in 2011; ~1,000 in 8 pools in 2012 which was an odd rainfall year.	10/17/2012	~1,000 Plants in 2012, one poly extirpated	Present and Natural	Presistent	Protected
15	30943	SAC	1	80 meters	Presumed Extant	20070517	20070517	CITY OF FAIR OAKS-PARKS & REC	PHOENIX PARK, SOUTH OF SUNSET AVE, 0.5 MILE EAST OF HAZEL AVE, FAIR OAKS.	EO #5 AND 15 ARE WITHIN A QUARTER MILES OF EACH OTHER BUT WERE KEPT AS SEPARATE OCCURRENCES BECAUSE EO #5 IS NATIVE/NATURAL AND EO #15 IS INTRODUCED. THIS SITE IS COMPLETELY SURROUNDED BY DEVELOPMENT W/ NO BUFFER ZONE.	ON REDDING SERIES SOILS. ASSOCIATES INCLUDE ELEOCHARIS MACROSTACHYA, PLAGIOBOTHRYS STIPITATA, DOWNINGIA BICORNUTA, TRICHOSTEMA LANCEOLATUM, PSILOCARPHUS BREVISSIMUS, ERYNGIUM VASEYI, LILAEA SCILLOIDES, AND BRODIAEA MINOR.	SUMMER RUNOFF FROM ADJACENT BALL PARK ENTERS W LOBE OF POOL. ALSO THREATENED BY RECREATIONAL USES INCL TRAMPLING.	THIS EO ESTABLISHED FROM SEED COLLECTED FROM NEARBY NATIVE EO #5 BY T. GRIGGS IN 1978. 1000+ PLANTS IN 1985, 10,000+ IN 1986, 1000+ IN 1991, ABOUT 100,000 IN 1995, 35 IN 1996, 1000 IN 1997, UNK # SEEN IN 2002, 1000S IN 2007.	City of Fair Oaks Phoenix Park. Extant. 1,500 plants observed 09-08-2010 (GPSed). Runoff issue seems to have been resolved. Some off-trail activity, but not too bad.	9/8/2010	1,500 Plants in 2010	Present and Natural	Persistent	Open space

Appendix A-6: Current Status of Sacramento Orcutt Grass (*Orcuttia viscida*) in the Great Valley

California Natural Diversity Database, November 4, 2012														Witham, 2013					
OCC	EONDX	KEY	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
16	30970	SAC	2	specific area	Presumed Extant	20070524	20050630	SMUD	APPROX 0.55 MILE ESE OF SOUTH END OF DAM AT RANCHO SECO LAKE, 0.15 MILE EAST OF PAVED ACCESS ROAD.	ORCUTTIA RESTRICTED TO SMALL, RELATIVELY BARREN AREA AT EASTERN END OF MAIN POOL IN 1986 & 1987. GRAPHICS REVISED IN 1995 TO REFLECT INFO FROM JONES & STOKES ASSOC: PLANTS FOUND ON SMUD LANDS TO E OF WHERE PREVIOUSLY MAPPED.	VERNAL POOLS WITH ERYNGIUM VASEYI, ALLOCARYA STIPITATA MICRANTHA, DOWNINGIA BICORNUTA, ELEOCHARIS MACROSTACHYA. LEGENERE LIMOSA FOUND IN SOUTHERN POLYGON IN '95. SURROUNDED BY ANNUAL GRASSLAND WITH 3 ISLANDS OF UPLAND HABITAT IN ITS CENTER.	CATTLE GRAZING & COMPETITION FROM GLYCERIA DECLINATA THREATEN.	APPROXIMATELY 500 PLANTS IN 1986, 200 IN 1987, 300 IN W POLYGON IN 1995, ~55 IN W POLYGON IN 2005, NO PLANTS FOUND IN 2007 (POOLS DEGRADED W/ ALGAL MATS). TADPOLE SHRIMP (LEPIDURUS PACKARDII) CARAPACES FOUND IN BOTH POLYGONS IN 1995.	SMUD Rancho Seco. Extant. 41 plants observed in western polygon on 07-26-2011; no plants in eastern polygon. No plants were observed in either polygon on 08-10-2010. This population was established by Holland and Griggs in 1974 by "scattering seeds along several transects."	7/26/2011	41 Plants in 2011	Present and Natural	Marginal	Protected
17	21912	SAC	1	80 meters	Presumed Extant	20070524	20070524	PVT	EAST SIDE OF SUNRISE BLVD, APPROX. 0.2 MI NORTH OF ITS INTERSECTION WITH KIEFER BLVD.	SITE OF PROPOSED INDUSTRIAL PARK DEVELOPMENT; POPULATION TO BE WITHIN PRESERVE/MITIGATION AREA.	Y-SHAPED VERNAL POOL SURROUNDED BY ANNUAL GRASSLAND. W/ERYNGIUM VASEYI, ELEOCHARIS MACROSTACHYA, ALLOCARYA STIPITATA, PSILOCARPHUS, GRATIOLA EBRACTEATA AND NAVARRETIA LEUCOCEPHALA.	MODERATE-INTENSIVE GRAZING. GLYCERIA DECLINATA AND WIDENING OF SUNRISE BLVD MAY ALSO THREATEN. ALTERED HYDROLOGY.	GREATER THAN 10,000 PLANTS IN 1987 IN 1995. 1000S SEEN IN 2007. ANNUAL DURATION OF INUNDATION HAS BEEN ARTIFICIALLY INCREASED BY ELEVATED GRADE OF SUNRISE BLVD.	Anatolia Preserve. Extant. 1,200 plants observed on 08-18-2010. GPSed. A lot of apparent nutrient build-up and Glyceria in pool, probably related to road runoff.	8/18/2010	1,200 Plants in 2011	Present and Natural	Persistent	Easement
18	22363	SAC	1	80 meters	Presumed Extant	20070524	20070524	PVT	APPROX. 0.9 MILE NORTHEAST OF INTERSECTION OF KIEFER BLVD & SUNRISE BLVD.	BENEATH TRANSMISSION LINES. ONLY IN CENTER DEEPEST PART OF POOL IN 2007.	VERNAL POOL SURROUNDED BY ANNUAL GRASSLAND. WITH ELEOCHARIS MACROSTACHYA, ERYNGIUM VASEYI, PSILOCARPHUS BREVISSIMUS, ALLOCARYA STIPITATA, NAVARRETIA LEUCOCEPHALA, DOWNINGIA BICORNUTA, ETC.	GRAZING, COMPETITION FROM ELEOCHARIS, & ACTIVITIES ASSOCIATED WITH TRANSMISSION LINE MAINTENANCE & DEVELOPMENT THREATEN.	1000 PLANTS ESTIMATED IN 1987. 1000S OF PLANTS IN 2007.	Anatolia Preserve. Extant. 400 plants observed on 08-18-2010. GPSed. Only occupies a small lobe of the pool, but that is consistent with my prior observations of this pool.	8/18/2010	400 Plants in 2010	Present and Natural	Persistent	Easement
19	5231	SAC	3	specific area	Presumed Extant	20070517	20070517	PVT	ALONG GLORY LANE, APPROXIMATELY 0.75 MI E OF THE INTERSECTION OF GRANT LINE RD AND GLORY LANE, ENE OF MATHER AFB.	PRESENT IN 4 POOLS S OF GLORY LANE AND 1 POOL N OF GLORY LANE.	POOLS WITHIN GRASSLAND IN RED BLUFF/REDDING SOILS. WITH ERYNGIUM VASEYI, NAVARRETIA LEUCOCEPHALA, DOWNINGIA BICORNUTA.	POOLS MODERATELY TRAMPLED BY CATTLE. POSSIBLY WITHIN SACRAMENTO CO URBAN LIMIT. SITE RECENTLY SOLD TO DEVELOPER (2007).	2 POLYS S OF GLORY LANE: HUNDREDS OF PLANTS IN 1994, 1.2 MILLION ESTIMATED IN 1995, SEVERAL THOUSAND IN 2007. POLY JUST S OF GLORY LANE (MIDDLE POLY): 1000S OF PLANTS IN 2007. POLY N OF GLORY LANE: SEVERAL HUNDRED IN 2007.	Extant. Found in 4 pools south of Glory Lane on 08-30-2010. South pool (south polygon) with ~5,000 plants. 3 pools (central polygon) with approximately 300 plants total. No plants in north polygon, which may be mismapped, or in the vicinity of that polygon. One likely pool appeared to be being artificially watered (pipe from house across Glory Lane). Also, portions south of Glory Lane are within the proposed Cordova Hills development.	8/30/2010	>5,000 Plants in 2010	Present and Natural	Declining	
20	63059	SAC	1	1/5 mile	Presumed Extant	19980730	19980730	UNKNOWN	ON THE NORTH SIDE OF FLORIN RD, CIRCA 1/4 MILE EAST OF EXCELSIOR AVE.		IN MUDFLOW VERNAL POOLS WITH ROCKY BOTTOMS.		ONLY SOURCE OF INFORMATION FOR THIS OCCURRENCE IS A 1998 COLLECTION BY HRUSA. NEEDS FIELDWORK.	Extirpated. Arroyo Seco Mitigation Bank. Hrusa verified which pool the collection was made from and it is now permanent marsh due to runoff from nursery across Florin Road. Entire Arroyo Seco Preserve surveyed 08-13-2010 and again 07-26-2011.	7/26/2011	Extirpated	Eliminated		

Green highlighting indicates new data.

Appendix A-6: Current Status of Sacramento Orcutt Grass (*Orcuttia viscida*) in the Great Valley

California Natural Diversity Database, November 4, 2012														Witham, 2013					
OCC	EONDX	KEY	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
21	72362	SAC	1	specific area	Presumed Extant	20070817	20070817	PVT	APPROXIMATELY 0.55 AIR MI NNW OF THE INTERSECTION OF GLORY LANE AND PLEASANT HILL LANE, RANCHO CORDOVA.	ORCUTTIA WAS FOUND IN THE DEEPEST PORTION OF THIS 0.15 ACRE POOL WHERE ERYNGIUM IS SPARSEST.	ASSOCIATES INCLUDE ALOPECURUS SACCATUS, PSILOCARPHUS BREVISSIMUS, ERYNGIUM CASTRENSE, DOWNINGIA SP., LASTHENIA GLABERRIMA, NAVARRETIA LEUCOCEPHALUS, AND PLAGIOBOTHRYS STIPITATUS.		~5000 PLANTS OBSERVED IN 2007. THIS POPULATION WAS OBSERVED INCIDENTALLY DURING THE COURSE OF A WETLAND DELINEATION.	Cordova Hills. Presumed extant based on aerial interpretation.	No	Presumed extant	Present and Natural	Unknown	
N1		SAC						Private	Approximately 1.44 air mi north of Douglas Blvd and 0.5 air mi west of Grant Line Road. In large pool on a Bluff south of White Rock Road.	Orcuttia was dominant species in photographs.		Within a proposed development project called: Heritage Falls.	Source of information on this site was through verifying the plant's identity via photographs. 1,000s of plants evident in photos from 2008.	Presumed extant based on aerial interpretation. No access.	No	Presumed extant	Present and Natural	Unknown	

Appendix A-7: Current Status of Greene's Tuctoria (*Tuctoria greenei*) in the Great Valley

California Natural Diversity Database, November 4, 2012														Witham, 2013					
OE	EONDX	KEY	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
1	2371	TEH	1	80 meters	Presumed Extant	19860822	19860822	PVT	VINA PLAINS, ABOUT 1 MILE NORTHEAST OF LENINGER ROAD, 1.5 MILES NORTH OF HIGHWAY 99.	MAPPED IN THE SE 1/4 OF THE SW 1/4 OF SECTION 17.	VERNAL POOL SURROUNDED BY ANNUAL GRASSLAND. ASSOCIATED WITH CHAMAESYCE HOOVERI, ERYNGIUM VASEYI, DESCHAMPSIA, NAVARRETIA, DOWNINGIA, TRIFOLIUM, PSILOCARPHUS, ETC.	CATTLE GRAZING.	FEWER THAN 10,000 PLANTS OVER A 10-100 SQ M AREA IN 1980, 1000+ PLANTS OBSERVED IN 1986.	Earl Foor Ranch under TNC conservation easement. Presumed extant based on aerial interpretation.	No	Presumed Extant	Present and Natural	Unknown	Easement
2	22360	TEH	1	80 meters	Presumed Extant	19870803	19800621	PVT	LENINGER VERNAL POOL, NORTH SIDE OF LASSEN ROAD, ABOUT 0.25 MILE EAST OF JUNCTION WITH HIGHWAY 99, NORTH OF CHICO.	MAPPED IN THE VICINITY OF A SMALL VERNAL POOL NORTH OF THE ROAD.	IN 1987, PLANTS PRESENT IN THIS POOL INCLUDE ERYNGIUM VASEYI, ALLOCARYA STIPITATA, DOWNINGIA, NAVARRETIA LEUCOCEPHALA, ALOPECURUS SACCATUS.		UNK NUMBER OF PLANTS SEEN BY TAYLOR ET AL. IN 1980. BOTH SIDES OF ROAD SEARCHED IN 1987; NO PLANTS OBSERVED. BIOSYSTEMS ANALYSIS REPORT (1988) INDICATES THAT THE HABITAT AT THIS SITE APPEARS MARGINAL AT BEST. INCLUDES FORMER OCCURRENCE #30.	Earl Foor Ranch under TNC easement. Probably mis-mapped from confusing herbarium label data. Area searched 08-15-2011 and no plants or suitable habitat was found. This could even be TUGR EO#4 which K. Stern discovered just days before the S. Taylor collection.	8/15/2011	Probably Erroneous	Present but Unsuitable	Marginal	Easement
3	2366	TEH	2	specific area	Presumed Extant	20070519	20070519	TNC-VINA PLAINS PRESERVE	VINA PLAINS, 1.3 MILES SSE OF JUNCTION OF ROWLES ROAD AND HIGHWAY 99, 0.6 MILE SW OF HWY 99, SE OF VINA.	MAPPED AS TWO POLYGONS IN THE NW 1/4 OF SECTION 32. S POLY IS A LONG AND MEANDERING POOL SEPARATED BY A FENCE; NE PORTION IS POOL 100A AND S PORTION (S OF FENCE) IS POOL 100B.	VERNAL POOL SURROUNDED BY ANNUAL GRASSLAND. ASSOCIATED WITH ERYNGIUM VASEYI, CHAMAESYCE HOOVERI, AND CRYPSIS SCHOENOIDES.	GRASSHOPPER DAMAGE IN 1986, CATTLE GRAZING IN WINTER PASTURE AND SOIL DISTURBANCE, COMPETITIVE EXCLUSION BY CRYPSIS.	NORTHERN POLYGON: 1000 PLANTS OBSERVED IN THE S PORTION OF POOL IN 1986, HUNDREDS OF THOUSANDS TO MILLIONS IN 2007 (MOSTLY VEGETATIVE). SOUTHERN POLYGON: APPROXIMATELY 10,000 PLANTS IN 2007.	TNC Vina Plains west unit. Extant. Surveyed 08-11-2011. North polygon with ~100,000 plants (10-25 per square meter). South polygon with ~1,000 plants. GPSed main populations.	8/17/2011	>100,000 Plants in 2011	Present and Natural	Persistent	Protected
4	2370	TEH	1	specific area	Presumed Extant	20070519	20070519	PVT	VINA PLAINS, 0.8 MILE NORTH ON LENINGER ROAD FROM HIGHWAY 99, CORNING.	ON WEST SIDE OF ROAD. TWO POOLS MAPPED IN THE E 1/2 OF THE NE 1/4 OF SECTION 19. UNDER CURRENT REGIME OF LIGHT GRAZING THIS OCCURRENCE IS LARGE AND PROBABLY STABLE (1988).	VERNAL POOLS ON VOLCANIC MUDFLOW. ASSOCIATED WITH CHAMAESYCE HOOVERI, ERYNGIUM VASEYI, ALLOCARYA STIPITATA, PSILOCARPHUS BREVISSIMUS, ALOPECURUS, DOWNINGIA, AND NAVARRETIA LEUCOCEPHALA. ORCUTTIA PILOSA ERRONEOUSLY REPORTED FROM HERE.	INCREASE IN CATTLE GRAZING INTENSITY.	SEVERAL THOUSAND PLANTS OBSERVED IN NORTH POOL AND DENSE STAND OF PLANTS AT SW END OF SOUTHERN POOL IN 1980. EACH POOL WITH 1000+ PLANTS IN 1986, 1988, & 2007.	Earl Foor Ranch under TNC conservation easement. Presumed extant based on aerial interpretation. Windshield survey only, 08-17-2011, no plants seen from road.	8/17/2011	Presumed Extant	Present and Natural	Unknown	Easement
5	22359	STA	1	1/5 mile	Extirpated	19870627	1980XXXX	PVT	EAST OF THE OLD PAULSELL WAREHOUSE; ABOUT 12.8 ROAD MILES SOUTHEAST OF OAKDALE.	MAPPED ACCORDING TO A 1988 BIOSYSTEMS ANALYSIS MAP INDICATING THAT THE OCCURRENCE OCCURS IN A "LARGE...PLAYA AT THE SW BASE OF A PROMINENT KNOB-LIKE HILL".	LARGE PLAYA WITH DEEPLY CRACKED LEAD-GREY ADOBE SOIL.	THIS SITE NOW A GRAIN FIELD.	SEEN BY GRIGGS IN 1980. SITE WAS FALLOW IN 1987, HAD BEEN PLANTED TO BARLEY AND WORKED BY TILLAGE TOOLS. NO HABITAT REMAINS, SITE EXTIRPATED.	Extirpated	No	Extirpated	Eliminated		
6	7501	STA	1	1 mile	Extirpated	19870904	19370622	PVT	3 MILES NORTHWEST OF WATERFORD.	ONLY SOURCE OF INFORMATION FOR THIS OCCURRENCE ARE SEVERAL COLLECTIONS BY HOOVER IN 1936 & 1937. EXACT LOCATION UNKNOWN.		AGRICULTURE.	PLANTS EXTIRPATED ACCORDING TO GRIGGS (1983) & STONE (1987). SITE IS NOW AN IRRIGATED PASTURE. THERE WAS SOME QUESTION AS TO THE DIRECTIONS FOR THIS SITE; P. ALLEN THOUGHT IT WAS SOUTHEAST OF TOWN, BUT LABEL SAYS NORTHWEST.	Extirpated	No	Extirpated	Eliminated		
8	22358	SJQ	1	1 mile	Extirpated	19870720	19360611	PVT	FARMINGTON.	OCCURRENCE BASED ON A 1936 HOOVER COLLECTION. EXACT LOCATION UNKNOWN.		IRRIGATED AGRICULTURE, CATTLE GRAZING IN DRY PASTURE.	NO VIABLE VERNAL POOL HABITAT REMAINING IN THIS VICINITY ACCORDING TO STONE (1987) AND BUCK (BIOSYSTEMS ANALYSIS, 1988); SITE EXTIRPATED.	Extirpated	No	Extirpated	Eliminated		

Green highlighting indicates new data.

Appendix A-7: Current Status of Greene's Tuctoria (*Tuctoria greenei*) in the Great Valley

California Natural Diversity Database, November 4, 2012														Witham, 2013					
OE	EONDX	KEY(	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
9	22357	MAI	1	1 mile	Possibly Extirpated	19870602	19360529	UNKNOWN	8 MILES NORTH OF MADERA.	MAPPED ON ROAD 28 1/2, BUT COULD BE ROAD 26 FURTHER TO THE WEST. OCCURRENCE BASED ON A 1936 HOOVER COLLECTION. EXACT LOCATION UNKNOWN.		PRIMARILY INTENSIVE IRRIGATED AGRICULTURE.	AREA LEVELED AND IRRIGATED AND POPULATION PROBABLY EXTIRPATED ACCORDING TO GRIGGS (1983). NO PLANTS FOUND DURING 1987 FIELD SEARCHES BY STONE.	Extirpated	No	Extirpated	Eliminated		
10	22355	MEF	1	2/5 mile	Possibly Extirpated	19870904	19750601	PVT	3.0-3.6 MILES NORTH OF LE GRAND.	CRAMPTON MAPPED SITE ON WEST SIDE OF CUNNINGHAM ROAD (BIOSYSTEMS ANALYSIS, 1988). POOL NEAR INTERSECTION OF CHILDS AVE AND CUNNINGHAM RD SEARCHED IN 1981; NO PLANTS FOUND.	LARGE BUT SOMEWHAT SHALLOW VERNAL POOL WITH DEEPLY CRACKED LEAD SOIL. ASSOCIATED SPECIES INCLUDE ELEOCHARIS, POGOGYNE AND ALLOCARYA.	MOST OF THE SITE WAS AN IRRIGATED PASTURE IN 1981.	SEEN 3.6 MILES NORTH OF LE GRAND BY CRAMPTON (#5042) IN 1958, SEEN 3 MILES NORTH OF LE GRAND BY REEDER (#6660) IN 1975. NO PLANTS OBSERVED IN 1981, 1986, 1987. INCLUDES FORMER OCCURRENCE #33.	Extirpated. Windshield survey 09-23-2011 and no suitable habitat.	9/23/2011	Extirpated	Present but Unsuitable		
11	2415	MEF	1	specific area	Presumed Extant	19920615	19920615	PVT	1.8 MI N OF LEGRAND, 2 MI S OF CUNNINGHAM & CHILDS RD JCT, 0.1-0.2 MI E OF CUNNINGHAM RD.	MAPPED WITHIN THE W 1/2 OF THE NW 1/4 OF SECTION 8. SOIL DISRUPTION BY CATTLE MAY HAVE CONTRIBUTED TO ESTABLISHMENT OF WEEDY, NON-NATIVE PLANT SPECIES ON THE POOL BED.	LARGE PLAYA IN VALLEY PLAINS WITH DEEPLY CRACKED BLACK ADOBE SOIL IN ANNUAL GRASSLAND. ASSOCIATED SPECIES INCLUDE EREMOCARPUS, BOISDUVALIA, ERYNGIUM, ALOPECURUS, ALLOCARYA, DOWNINGIA, LILAEA, HORDEUM, PHALARIS, POLYPOGON, AND LOLIUM.	CATTLE GRAZING; UNDER CURRENT REGIME POPULATION IS LARGE BUT DAMAGED & PROBABLY DECLINING. AG & WEEDS MAY THREATEN.	>10,000 PLANTS SEEN IN 1981. ABUNDANT IN 1986 BUT NO PLANTS SEEN IN 1987 FOLLWING A WINTER OF LOW RAINFALL. >10,000 PLANTS IN 1992.	Roen Ranch, Merced County. Extant. >10,000 very large plants observed on 09-23-2011.	9/23/2011	>10,000 Plants in 2011	Present and Natural	Persistent	
13	22352	MEF	1	80 meters	Possibly Extirpated	19860706	1980XXXX	PVT	5 MILES SOUTHEAST OF LE GRAND ALONG SANTA FE AVENUE.	MAPPED BY CRAMPTON ON THE EAST SIDE OF THE ROAD 0.1 MILE NORTH OF MARGUERITE ROAD (BIOSYSTEMS ANALYSIS, 1988).	DRY VERNAL POOL WITH DEEPLY CRACKED BLACK ADOBE SOIL. ASSOCIATED SPECIES INCLUDE JUNCUS BUXIFORMIS, MIMULUS LATIDENS, VERONICA PEREGRINA.	CATTLE GRAZING, RAILROAD RIGHT-OF-WAY MAINTENANCE (& ASSOC HERBICIDE USE), HYDROLOGIC MODIFICATIONS, AG CONVERSION.	LAST SEEN IN 1980 BY GRIGGS; 1986 STONE SURVEYS SHOWED NO PLANTS. POOL BED APPEARED TO BE RELATIVELY UNDISTURBED BUT THE HYDROLOGY HAS BEEN ALTERED BY THE ELEVATED RAILROAD GRADE. NEEDS FIELDWORK.	Wildlands Great Valley Bank. Presumed extant based on aerial photo interpretation. Windshield survey only 09-23-2011. No plants seen from road.	9/23/2011	Presumed Extant	Present and Natural	Unknown	Bank
14	22350	STA	1	1/5 mile	Extirpated	19870721	1958XXXX	PVT	1.4 MILES SOUTH OF LA GRANGE ROAD, 3 MILES EAST OF HICKMAN.	IN VALLEY BETWEEN LOW HILLS.	LARGE PLAYA WITH DRIED AND CRACKED LEAD-GRAY ADOBE SOIL. ASSOCIATED SPECIES INCLUDE ORCUTTIA INAEQUALIS AND NEOSTAPFIA COLUSANA.	SITE IS NOW PART OF AN EXTENSIVE VINEYARD, SURROUNDED BY GRAIN FARM.	PLANT VERY RARE AT THIS SITE IN 1958 (CRAMPTON #5031). EXTIRPATED IN 1980 PER GRIGGS, 1987 PER STONE AND BUCK. INCLUDES FORMER OCCURRENCE #25 (SOUTH OF LAKE ROAD ABOUT 2 MILES EAST OF HICKMAN; HARRISON AND FERREIRA, 1981).	Extirpated. Windshield survey 07-20-2010 and no suitable habitat.	7/20/2010	Extirpated	Eliminated		
15	22347	SJQ	1	1/5 mile	Extirpated	19870720	19360608	UNKNOWN	2 MILES EAST OF ESCALON.			AGRICULTURE.	SITE ONLY KNOWN FROM 1936 COLLECTION BY HOOVER. AREA NOW DEVOTED ENTIRELY TO INTENSIVE AGRICULTURE ACCORDING TO STONE AND BUCK (BIOSYSTEMS ANALYSIS, 1988).	Extirpated	No	Extirpated	Eliminated		
16	22349	FRE	1	1/5 mile	Extirpated	19870601	19360604	PVT	4 MILES NORTH OF SANGER.			AREA DEVOTED ENTIRELY TO INTENSIVE AGRICULTURE, PRIMARILY IRRIGARED PASTURE, ORCHARDS, AND VINEYARDS.	SITE KNOWN ONLY FROM 1936 COLLECTION BY HOOVER. POPULATION EXTIRPATED PER GRIGGS 1983, AND PER STEBBINS (BIOSYSTEMS ANALYSIS, 1988).	Extirpated	No	Extirpated	Eliminated		

Green highlighting indicates new data.

Appendix A-7: Current Status of Greene's Tuctoria (*Tuctoria greenei*) in the Great Valley

California Natural Diversity Database, November 4, 2012														Witham, 2013					
OE	EONDX	KEY(	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
17	22351	FRE	1	1/5 mile	Extirpated	19870601	1956XXXX	UNKNOWN	3 MILES NORTH OF SANGER.	MAPPED NEAR INTERSECTION OF BELMONT ROAD AND ACADEMY AVENUE.	BED OF DRIED POOL.	AREA IS NOW ORANGE ORCHARDS AND VINEYARDS.	SITE ONLY KNOWN FROM 1956 COLLECTION BY HOWELL AND BARNEBY. AREA SURVEYED BY STEBBINS IN 1987, NO PLANTS FOUND; HABITAT ELIMINATED, SITE EXTIRPATED.	Extirpated	No	Extirpated	Eliminated		
18	2299	BUT	1	80 meters	Presumed Extant	20070523	20070523	PVT	0.4 MILE SOUTH OF JUNCTION WITH PENTZ RD. (AKA ESQUON LAKE), ALONG HIGHWAY 99, 10 MILES SOUTHEAST OF CENTRAL CHICO.	MAPPED ABOUT 0.4 MILE SE OF PENTZ LANE AND 0.1 MILE EAST OF HIGHWAY 99.	LARGE VERNAL POOL, WITH STONY BED IN ROLLING PLAINS. ASSOCIATED SPECIES INCLUDE ERYNGIUM VASEYI, BOISDUVALIA, HORDEUM, DESCHAMPSIA, NAVARRETIA, ALLOCARYA, DOWNINGIA, PROBOSCIDEA, AND TRIFOLIUM. CHAMAESYCE HOOVERI ALSO HERE.	CATTLE GRAZING; UNDER CURRENT REGIME POP IS LARGE BUT DAMAGED & POSSIBLY DECLINING. WEEDS & HEAVY TRAMPLING IN 2007.	SEEN IN 1973, 1974, 1978, 1985. >1000 PLANTS IN 1986, UNK # IN 1988; 600 IN 2 SMALL AREAS IN 2007. SOIL DISTURBANCE BY CATTLE MAY HAVE CONTRIBUTED TO ESTABLISHMENT OF WEEDY, NON-NATIVE PLANT SPECIES SUCH AS HORDEUM AND PROBOSCIDEA (1988).	Pentz Pool, Butte County. Proposed as a mitigation bank. Extant. Estimated >10,000 plants on 09-09-2010 and GPSed perimeter of population. Rodney Lacey estimated 81,000 plants in 2010 and 156,000 plants in 2011.	9/9/2010	156,000 Plants in 2011	Present and Natural	Persistent	Proposed Bank
19	2236	BUT	1	80 meters	Presumed Extant	20070523	19860618	PVT	RICHVALE VERNAL POOLS.NEAR WEST FENCE LINE, ABOUT 0.75 MILE SOUTH OF JUNCTION WITH HIGHWAY 162.	MAPPED ABOUT 0.2 MILE WEST OF HWY 99 WITHIN THE E 1/2 OF THE SE 1/4 OF SECTION 24.	VERNAL POOL. SOIL IS RED GRAVELLY LOAM WITH A HIGH PROPORTION OF CLAY PARTICLES; IN SAN JOAQUIN SERIES. ASSOCIATED SPECIES INCLUDE SIDALCEA HIRSUTA, ERYNGIUM VASEYI VALLICOLA.	WEEDY NON-NATIVES ARE INVADING. PAST GRAZING. HEAVILY DEGRADED SITE, PROBABLY DISKED AND OVER-GRAZED	<1000 MATURE PLANTS SEEN IN 5-10 SQ METER AREA IN 1979. FEWER PLANTS SEEN IN 1982, ~20 PLANTS IN 1986, NONE SEEN IN 2007. NEEDS BURNING OR GRAZING. PRIMARY FACTOR RESTRICTING TUCTORIA AT THIS SITE IS ABUNDANCE OF NON-NATIVE WEEDY SPP.	Richvale Vernal Pools. Possibly extirpated. Surveyed 09-09-2010 and 08-11-2011. Site is a weedy mess with dense Lolium thatch.	8/11/2011	Possibly Extirpated	Present but Degraded	Marginal	Proposed Protected
20	2397	TUL	1	1 mile	Extirpated	19860523	19360604	PVT	WOODLAKE.			MUCH OF AREA IN NOW UNDER INTENSIVE AGRICULTURE (CITRUS).	SITE KNOWN FROM 1936 COLLECTION BY HOOVER (#1287). AREA SEARCHED IN 1986, NO PLANTS SEEN. HABITAT ELIMINATED, SITE EXTIRPATED.	Extirpated. Windshield survey on 08-06-2010.	8/6/2010	Extirpated	Eliminated		
21	22343	STA	2	nonspecific area	Presumed Extant	19860901	19380710	PVT	NEAR OIL WELL JUST WEST OF RUSHING ROAD, ABOUT 1.5 MILES NORTH OF JUNCTION WITH HIGHWAY 132.	MAPPED ACCORDING TO A 1974 CNPS MAP AND A 1988 BIOSYSTEMS ANALYSIS MAP.	DRY POOLS WITH CLAY SOIL.	POLY W OF RUSHING RD THREATENED BY AGRICULTURE; POLY E OF RUSHING RD THREATENED BY OVER-GRAZING.	POLY W OF RUSHING RD MAPPED ACC TO A 1988 BIOSYSTEMS ANALYSIS MAP; NO PLANTS IN 1986; HABITAT ELIMINATED. POLY E OF RUSHING RD MAPPED ACC TO A 1974 CNPS MAP (DATE SEEN UNK), NO PLANTS IN 1986 BUT HABITAT APPEARS EXTANT. INCL FORMER EO #38.	Southwest polygon extirpated. Northeast polygon searched on 09-03-2010; no plants found. Given notes in CNDDB, the northeast polygon may be erroenous. Nice pool, but no plants, and no ideal habitat. Southwest polygon extirpated.	9/3/2010	Extirpated (see notes)	Eliminated		
22	22344	FRE	1	1/5 mile	Extirpated	19870601	19370527	PVT	5 MILES NORTHEAST OF CLOVIS.	MAPPED IN THE VICINITY OF TOLLHOUSE ROAD AND NEES AVENUE.		RUMEX AND SWAMP TIMOTHY IN POOL.	SITE KNOWN FROM 1937 COLLECTION BY HOOVER (#2317). AREA SEARCHED IN 1981, 1987 BUT NO PLANTS SEEN. ACC TO BIOSYSTEMS ANALYSIS, 1988, NO VERNAL POOL HABITAT REMAINS IN THIS AREA; HABITAT ELIMINATED, SITE EXTIRPATED.	Extirpated	No	Extirpated	Eliminated		

Appendix A-7: Current Status of Greene's Tuctoria (*Tuctoria greenei*) in the Great Valley

California Natural Diversity Database, November 4, 2012														Witham, 2013					
OE	EONDX	KEY	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
23	2667	MEF	1	1/5 mile	Presumed Extant	19860705	19810603	PVT	4 MILES ESE OF PLANADA EAST OF CUNNINGHAM ROAD, 1.4 MILES SOUTH OF CUNNINGHAM ROAD/CHILDS ROAD JUNCTION.		VERNAL POOL SURROUNDED BY ANNUAL GRASSLAND. NOT A TYPICAL TUCTORIA POOL, BUT A LOT OF OTHER VERNAL POOL SPECIES PRESENT.	INTENSIVE CATTLE GRAZING, CONVERSION TO IRRIGATED AGRICULTURE.	TUCTORIA DISTRIBUTION IS VERY SPARSE AT THIS SITE, 11-50 PLANTS SEEN OVER A 1-5 SQUARE METER AREA IN 1981. NO PLANTS FOUND BY STONE & ERZINGER IN 1986 FOLLOWING A YEAR OF FAVORABLE RAINFALL. NEEDS FIELDWORK.	Presumed extant. Surveyed 09-23-2011 but no plants found; no hightly suitable habitat was observed either.	9/23/2011	Presumed Extant	Present and Natural	Marginal	
24	22342	TEH	1	1/5 mile	Extirpated	19870803	XXXXXXXX	PVT	EAST OF HOAG SLOUGH, 1.4 MILES WEST OF JUNCTION HIGHWAY 99 AND ROWLES ROAD ON SOUTH SIDE OF ROWLES ROAD.	MAPPED FAIRLY GENERALLY IN NW1/4 OF NE1/4 SEC 25.	VERNAL POOL.	DEVELOPMENT. A GRAVEL QUARRY AND A SERIES OF RANCHETTE-STYLE HOMES NOW OCCUPY AREA.	THIS EO BASED ON MAP LOCATION RECORDED BY THE CALIFORNIA NATIVE PLANT SOCIETY; ORIGINAL SOURCE OF THIS REPORT IS UNK. AREA SEARCHED IN 1986 & 1987 BUT NO PLANTS SEEN AND NO POOL HABITAT REMAINS (BIOSYSTEMS ANALYSIS, 1988).	Extirpated	No	Extirpated	Eliminated		
27	2387	TEH	1	80 meters	Presumed Extant	19870819	19800925	PVT	JUST WEST OF BRUSH CREEK AND ABOUT 1.2 MILES NORTH OF LASSEN ROAD.	SW1/4 OF SE1/4 SEC 15.	VERNAL POOL SURROUNDED BY ANNUAL GRASSLAND. ASSOCIATED WITH CHAMAESYCE HOOVERI, ERYNGIUM VASEYI, XANTHIUM STRUMARIUM, ALLOCARYA STIPITATA, DOWNINGIA, NAVARRETIA LEUCOCEPHALA, PSILOCARPHUS BREVISSIMUS, AND ELEOCHARIS MACROSTACHYA.	CATTLE GRAZING.	OCCURRENCE BASED ON 1980 FIELD OBSERVATION BY GRIGGS. AREA SEARCHED BUT NO PLANTS OBSERVED BY STONE IN 1986 & 1987. NEEDS FIELDWORK	Leninger 3 Ranch under TNC conservation easement. Presumed extant based on aerial photo interpretation.	No	Presumed Extant	Present and Natural	Unknown	Easement
28	22341	MEF	1	1/5 mile	Presumed Extant	19860606	198106XX	PVT	5.8 MILES NORTHWEST OF SHARON ON SANTA FE BLVD, JUST NORTH OF CHOWCHILLA RIVER AND THE MERCED COUNTY LINE.	WATERSHED DESTROYED ACCORDING TO TOM GRIGGS, 1983. HOWEVER, HABITAT APPEARS EXTANT BASED ON 2006 AERIAL IMAGERY.	VERNAL POOLS IN PASTURE.	PASTURELAND IS DISKED BUT OWNER DISKS AROUND VERNAL POOLS; INTENSIVE CATTLE GRAZING AND CONVERSION TO INTENSIVE AG.	POPULATION OF 1001-10000 PLANTS OVER A 100 SQUARE METER TO 1 HECTARE AREA IN 1981. AREA SURVEYED IN 1986 BUT NO PLANTS OBSERVED (BIOSYSTEMS ANALYSIS, 1988). NEEDS FIELDWORK.	Wildlands Great Valley Bank. Presumed extant based on aerial photo interpretation. Windshield survey only 09-23-2011.	9/23/2011	Presumed Extant	Present and Natural	Unknown	Bank
29	2413	MEF	1	80 meters	Presumed Extant	19870629	19870629	PVT	2 MILES NORTHEAST OF PLANADA ALONG THE SOUTH SIDE OF HIGHWAY 140.	JUST EAST OF SMALL, ISOLATED EUCALYPTUS GROVE. MAPPED WITHIN THE SW 1/4 OF THE NW 1/4 OF SECTION 24.	EXTENSIVE BUT SHALLOW VERNAL POOL SURROUNDED BY ANNUAL GRASSLAND. ASSOCIATED SPECIES INCLUDE POGOGYNE, ERYNGIUM, LOLIUM, PHALARIS, POLYPOGON, HORDEUM, BOISDUVALIA, DOWNINGIA, EREMOCARPUS, CENTAURIUM, NAVARRETIA, ALOPECURUS, LYTHRUM, ETC.	CATTLE GRAZING, DISKING AND AGRICULTURAL EXPANSION ARE THREATS.	POPULATION OF 101-1000 PLANTS OVER A 10-100 SQUARE METER AREA IN 1981. POOL SMALLER IN 1981 DUE TO DISKING. FEWER THAN 500 PLANTS OBSERVED IN 1986, ONLY 5 PLANTS IN 1987 AFTER WINTER OF LOW RAINFALL. INCLUDES FORMER OCCURRENCES 12 & 26.	Mapped on Fury Ranch which has a CRT conservation easement. No plants observed when I did the easement baseline in 2000(?). Site has been smeared around. No plants found 09-22-2011.	9/22/2011	Extirpated	Eliminated		Easement

Appendix A-7: Current Status of Greene's Tuctoria (*Tuctoria greenei*) in the Great Valley

California Natural Diversity Database, November 4, 2012														Witham, 2013					
OE	EONDX	KEY	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
31	2365	TEH	1	80 meters	Presumed Extant	20070519	20070519	TNC-VINA PLAINS PRESERVE	VINA PLAINS, 1.9 MILES SSW OF JUNCTION OF HIGHWAY 99 & ROWLES ROAD, JUST NORTH OF TEHAMA/BUTTE COUNTY LINE.	WITHIN THE SW 1/4 OF THE SE 1/4 OF SECTION 31. THIS SITE CONSISTS OF A LARGE WESTERN POOL WITH A SMALL ADJACENT EASTERN POOL SEPARATED BY A LOW BERM. AREA APPEARS AS THOUGH IT WILL REMAIN AS DRY PASTURE IN THE FORESEEABLE FUTURE (1988).	VERNAL POOL IN ANNUAL GRASSLAND. GROWING WITH ALLOCARYA STIPITATA, ERYNGIUM VASEYI, ORCUTTIA PILOSA, AND CHAMAESYCE HOOVERI.	CATTLE GRAZING; POOL HAS BEEN FENCED TO EXCLUDE LIVESTOCK.	10,000+ PLANTS OBSERVED IN 1987; THIS POPULATION IS LARGE AND PROBABLY STABLE. IN 2007, W POOL HAD ~10,000 PLANTS & E POOL HAD ~1,000 PLANTS.	TNC Vina Plains west unit. Extant. Surveyed 08-15-2011. ~1,000 plants in three clusters.	8/15/2011	1,000 Plants 2011	Present and Natural	Persistent	Protected
32	22333	MEF	1	2/5 mile	Presumed Extant	19870629	19750601	PVT	4.0 MILES ENE OF PLANADA ALONG HIGHWAY 140.	A SMALL VERNAL POOL ABOUT 0.5 MILE NORTH OF HIGHWAY 140. EXACT LOCATION UNKNOWN. MAPPED BY CNDDB AS BEST GUESS ABOUT 4 MI ENE OF PLANADA AND 0.5 MI N OF HWY 140.	VERNAL POOL.	CATTLE GRAZING IN WINTER PASTURE, CONVERSION TO IRRIGATED AGRICULTURE.	UNK # OF PLANTS SEEN IN 1975 BY REEDER & REEDER. FOLLOWING A WINTER OF LOW RAINFALL, NO PLANTS WERE FOUND IN THIS AREA BY STONE IN 1987. SUITABLE HABITAT STILL PRESENT. NEEDS FIELDWORK.	Presumed extant. Surveyed 09-22-2011 but no plants found; no hightly suitable habitat was observed either.	9/22/2011	Presumed Extant	Present but Unsuitable	Marginal	
34	2382	TEH	1	80 meters	Presumed Extant	20070518	20070518	TNC-VINA PLAINS PRESERVE	TNC VINA PLAINS PRESERVE, ABOUT 1.4 MILES SOUTHEAST OF THE INTERSECTION OF HIGHWAY 99 AND LASSEN ROAD.	MAPPED WITHIN THE NW 1/4 OF THE SW 1/4 OF SECTION 28. THIS IS VINA PLAINS "POOL #14" (OLD POOL #2); NUMBERING SYSTEM BY KING (1992). SOIL DISTURBANCE BY CATTLE MAY HAVE CONTRIBUTED TO ESTABLISHMENT OF WEEDY NON-NATIVE PLANTS (1988).	VERNAL POOL ON TUSCAN CLAY LOAM IN GRASSLAND. WITH ERYNGIUM VASEYI VALLICOLA, BOISDUVALIA CLEISTOGAMA, EREMOCARPUS SETIGERUS, & DOWNINGIA BICORNUTA. ORCUTTIA PILOSA ALSO OCCURS IN POOL.	AREA STILL GRAZED UNDER AGREEMENT WITH PREVIOUS LANDOWNER. UNDER PRESENT REGIME POPULATION IS LARGE BUT DAMAGED.	95 PLANTS OBSERVED IN 1982; >1000 PLANTS IN 1987; UNK # IN 1990; 96,400 PLANTS ESTIMATED IN 1995 "BASED ON ONLY THE PORTION OF THE POOL SAMPLED, RATHER THAN THE ENTIRE POOL AREA"; 1000S IN 2007.	TNC Vina Plains pool #14. Pool had been consumed by prescribed burn just prior to survey on 08-16-2011. Five plants found and an unknown number were observed 06-23-2011 during a reconnaissance visit.	8/16/2011	5 Plants in 2011	Present and Natural	Persistent	Protected
35	2380	TEH	3	specific area	Presumed Extant	20070518	20070518	TNC-VINA PLAINS PRESERVE	TNC VINA PLAINS PRESERVE; JUST N OF BARN APPROX 0.6-0.9 MI NNE OF THE INTERSECTION OF HWY 99 AND PINE CREEK RD, CHICO.	N-MOST POOL IS VINA PLAINS POOL #35 (OLD POOL #8); SE-MOST POOL IS VINA PLAINS POOL #36 (OLD POOL #10). PLANTS HISTORICALLY OCCURRED IN SW-MOST POLY (VINA PLAINS POOL #34, OLD POOL #9). POOL NUMBERING SYSTEM BY KING (1992).	IN TWO VERNAL POOLS ON ANITA CLAY IN GRASSLAND. ASSOCIATED SPECIES INCLUDE ERYNGIUM VASEYI VALLICOLA, ORCUTTIA PILOSA AND CHAMAESYCE HOOVERI.	WEEDY GRASSES DOMINATE MUCH OF AVAILABLE HABITAT. CATTLE ALSO GRAZE SITE.	SE POLY: <100 IN 1986, 200-300 IN 1988, 0 IN 1995. N POLY: ABUNDANT IN 1990; 225,600 EST IN 1995; 100,000 IN 2001, >100,000 IN 2007. UNKNOWN WHEN PLANTS WERE FIRST SEEN IN SW POLY (1983?), NONE SEEN IN 2007; NEED BETTER INFO.	TNC Vina Plains. Three part polygon. Pool numbers from King. Pool 34, no plants (also not on Rob Schlising's list for TUGR). Pool 35, ~15,000 plants concentrated at south end of pool. Pool 36, 250 plants in two small locations.	8/16/2011	15,000 Plants in 2011	Present and Natural	Persistent	Protected
36	6862	TEH	1	80 meters	Presumed Extant	20070519	20070519	TNC-VINA PLAINS PRESERVE	TNC VINA PLAINS PRESERVE JUST S OF LASSEN ROAD, 2 MI E OF JUNCTION WITH HWY 99.	THE IS VINA PLAINS "POOL #21" (OLD POOL #3); NUMBERING SYSTEM BY KING (1992).	VERNAL POOL ON TUSCAN LOAM IN GRASSLAND. ASSOCIATED SPECIES INCLUDE ORCUTTIA PILOSA, DOWNINGIA BICORNUTA, ERYNGIUM, NAVARRETIA AND PLAGIOBOTHRYS. IN DEEPER CLAYS AT SOUTHERN END OF POOL IN 1988.		1000+ PLANTS OBSERVED IN 1986; 2000 PLANTS IN 1988; 106,300 PLANTS ESTIMATED IN 1995; >10,000 IN 2007.	TNC Vina Plains pool #21. Extant. Surveyed 08-13-2011. Estimated >5,000 plants (>10 plants per square meter in densest area. No ORPI (EO#32) found in the pool.	8/13/2011	>5,000 Plants in 2011	Present and Natural	Persistent	Protected
37	2384	TEH	2	specific area	Presumed Extant	20070518	20070519	TNC-VINA PLAINS PRESERVE	TNC VINA PLAINS PRESERVE. 0.6 MI SOUTH OF LASSEN RD & 2 MI ESE OF ITS JCT WITH HWY 99.	ALONG THE SECTION LINE WITHIN THE NE 1/4 OF THE SE 1/4 OF SECTION 28. N POLY IS VINA PLAINS "POOL #22" (OLD POOL #6) & S POLY IS VINA PLAINS "POOL #37" (OLD POOL #7); NUMBERING SYSTEM BY KING (1992).	TWO VERNAL POOLS ON ANITA CLAY IN GRASSLAND. ASSOCIATED SPECIES INCLUDE ERYNGIUM VASEYI, DOWNINGIA BICORNUTA, BOISDUVALIA CLEISTOGAMA, ALLOCARYA STIPITATA, ALOPECURUS SACCATUS, MARSILEA VESTITA, CHAMAESYCE HOOVERI, AND ORCUTTIA PILOSA.	CATTLE GRAZING UNDER AN AGREEMENT WITH PREVIOUS LANDOWNER.	N POLY: 1000 PLANTS SEEN IN 1986; ABUNDANT IN E HALF OF POOL IN 1990; 1,319 ESTIMATED IN 1995; 1000S IN 2007. S POLY: SEEN IN 1982 & 1983 BUT NOT IN 1986 NOR 1990; 173,200 ESTIMATED IN 1995; 100,000S IN 2007.	TNC Vina Plains. Two part polygon with pool numbers following King. Pool #22, ~50,000 plants. Pool #37, ~3,000 plants.	8/16/2011	53,000 Plants in 2011	Present and Natural	Persistent	Protected

Green highlighting indicates new data.

Appendix A-7: Current Status of Greene's Tuctoria (*Tuctoria greenei*) in the Great Valley

California Natural Diversity Database, November 4, 2012														Witham, 2013					
OE	EONDX	KEY	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
39	22322	STA	1	specific area	Presumed Extant	19870904	19730909	PVT	ABOUT 0.1 MILE SOUTH OF TIM BELL ROAD AND 1.1 MILE WEST OF HAZEL DEAN ROAD, 2 MILES WEST OF MODESTO.	MAPPED WITHIN THE NE 1/4 OF THE NE 1/4 OF SECTION 23.	VERNAL POOL IN ANNUAL GRASSLAND. ASSOCIATED WITH NEOSTAPFIA COLUSANA, EREMOCARPUS SETIGERUS, ERYNGIUM VASEYI, HORDEUM GENICULATUM, LOLIUM MULTIFLORUM, CRYPSIS VAGINIFLORA, AND PHALARIS PARADOXA.	SITE HEAVILY GRAZED.	SEEN BY GRIGGS IN 1973. STONE VISITED SITE IN 1986 & 1987 (THE FIRST FOLLOWING A YEAR OF FAVORABLE RAINFALL); NO PLANTS FOUND. NEEDS FIELDWORK.	Presumed extant, based on aerial photography interpretation. Clearly posted and no access. Windshield survey only on 09-04-2010. Habitat visible from road, but could not see plants.	9/4/2010	Presumed Extant	Present and Natural	Unknown	
40	6860	BUT	1	nonspecific area	Presumed Extant	20070519	19890517	TNC-VINA PLAINS PRESERVE	WURLITZER UNIT OF VINA PLAINS PRESERVE; APPROX 0.5 MI S OF JCT HAILLE ROAD AND HWY 99.	JUST W OF THE FARM POND. MAPPED AS PER OSWALD FIELD FORM IN NE1/4 OF NW1/4 SEC 4.	SHALLOW DRYING VERNAL POOL.		50-100 PLANTS ESTIMATED IN 1989, NONE SEEN IN 2007. THIS TNC ACQUISITION IS NOT CONNECTED TO THE ORIGINAL PRESERVE BOUNDARIES.	TNC Vina Wurliltzer Unit. Presumed extant. Surveyed on 08-11-2011, but no plants found. Habitat did not seem overly suitable for this species.	8/11/2011	Presumed Extant	Present and Natural	Marginal	Protected
42	2414	MEF	1	80 meters	Presumed Extant	19860705	19860705	PVT	1.7 MILE NORTHEAST OF LE GRAND, 0.9 MILE NNE OF JUNCTION OF FRESNO AND JORDAN ROADS.	MAPPED NEAR THE CENTER OF THE S 1/2 OF THE NE 1/4 OF SECTION 8.	VERNAL SWALE WITHIN AN ANNUAL GRASSLAND. ASSOCIATED WITH ERYNGIUM VASEYI, POGOGYNE DOUGLASII, NAVARRETIA, LASTHENIA, DESCHAMPSIA, BOISDUVALIA, ALLOCARYA, DOWNINGIA, VERONICA, ET AL. ORCUTTIA INAEQUALIS ALSO MAPPED AT THIS SITE.	CATTLE GRAZING IN WINTER PASTURE.	1000 PLANTS OBSERVED IN 1986. HABITAT APPEARED MARGINAL FOR TUCTORIA; ABUNDANCE AND SEED PRODUCTION MAY FLUCTUATE WIDELY FROM YEAR TO YEAR.	Ron Richard Ranch. Extant. Surveyed 09-23-2011 and found and GPSed 150 plants. Really marginal habitat for this species, but it seems to persist. No Orcuttia inaequalis found though the CNDDB record for this site indicates it was also observed here.	9/23/2011	150 Plants in 2011	Present but Marginal	Persistent	
43	17213	TEH	1	80 meters	Presumed Extant	19870804	19870804	PVT	APPROX 2.5 MILES NNE OF VINA, 3RD OF 5 LANIGER LAKES.	MIDDLE POOL IN THE SERIES OF LANINGER (LENINGER) LAKES.	VERNAL POOL ALONG INTERMITTENT STREAM. ASSOCIATED WTH ELEOCHARIS MACROSTACHYA, ERYNGIUM VASEYI, ALOPECURUS, DOWNINGIA, ALLOCARYA, VERONICA, PSILOCARPHUS, LASTHENIA, ET AL. ANOTHER RARE PLANT (ORCUTTIA TENUIS) ALSO MAPPED HERE.	CATTLE GRAZING IN WINTER PASTURE.	MORE THAN 10,000 PLANTS OBSERVED IN 1987. UNDER CURRENT GRAZING REGIME THIS POPULATION IS LARGE AND PROBABLY STABLE (BIOSYSTEMS ANALYSIS, 1988).	Hamilton Ranch proposed as a conservation bank. Presumed extant based on aerial photo interpretation. Landowner denied access due to delay in getting bank established. Ken Whitney is contact for this site.	No	Presumed Extant	Present and Natural	Unknown	Proposed Bank
44	2396	MEF	1	80 meters	Presumed Extant	19870702	19870702	PVT	1.7 MILES NORTHEAST OF LE GRAND, 0.8 MILE EAST OF FRESNO ROAD.	MAPPED WITHIN THE NE 1/4 OF THE SW 1/4 OF SECTION 9.	VERNAL POOL SURROUNDED BY ANNUAL GRASSLAND. ASSOCIATED WITH ERYNGIUM VASEYI, BOISDUVALIA CLEISTOGAMA, EREMOCARPUS SETIGERUS, NAVARRETIA LEUCOCEPHALA, ALLOCARYA STIPITATA, LASTHENIA FREMONTIA, ALOPECURUS SACCATUS, POLYPOGON, AND HORDUEM.	CATTLE GRAZING IN WINTER PASTURE.	FOLLOWING A WINTER OF LOW RAINFALL, ONLY 1 PLANT WAS OBSERVED IN 1987. HABITAT APPEARED MARGINAL FOR TUCTORIA AND THE POPULATION HAS LOW POTENTIAL FOR LONG-TERM VIABILITY.	Presumed extant, based on aerial photo interpretation. No access.	No	Presumed Extant	Present and Natural	Unknown	
45	32754	MEF	1	80 meters	Presumed Extant	19970903	19970903	PVT	FLYING M RANCH; WITHIN BURNS CREEK RESERVOIR, 2.9 AIRMI DUE S OF COURTHOUSE ROCK.	TUCTORIA FOUND ON POOL FRINGES (UNUSUAL FOR THIS SPECIES). POOL IS NEAR A DIRT ROAD.	VERNAL POOL DOMINATED BY PSILOCARPHUS BREVISSIMUS. WITH HORDEUM MARINUM GUSSONEANUM, EPILOBIUM CLEISTOGAMUM, AND ERYNGIUM VASEYI.	ALTERED HYDROLOGY FROM RESERVOIR FLOODING THREATENS.	50 PLANTS ESTIMATED IN 1997.	Flying M Ranch under TNC conservation easement. Extant. 200 plants observed 09-26-2010. However no plants observed on 4-14-2012 due to the particularly dry year.	4/14/2012	200 Plants in 2010	Present and Natural	Persistent	Easement

Appendix A-7: Current Status of Greene's Tuctoria (*Tuctoria greenei*) in the Great Valley

California Natural Diversity Database, November 4, 2012														Witham, 2013					
OE	EONDX	KEY	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
46	46829	MER	1	nonspecific area	Presumed Extant	20000721	20000721	PVT	NE OF BAXTER RD INTERSECTION W/ MARGUERITE RD. N OF MERCED/MADERA CO LINE. APPROX 3.9 MI NE OF BRENDA RESERVOIR DAM.	MAPPED IN THE SE 1/4 OF THE SW 1/4 OF SECTION 5.	ASSOCIATED WITH HORDEUM MARINUM GUSSONIANUM, PLAGIOBOTHRYS STIPITATUS, PSILOCARPHUS BREVISSIMUS AND RARE ORCUTTIA INAEQUALIS (PREVIOUSLY IDENTIFIED AS O. PILOSA).	CATTLE & HORSE GRAZING ON SITE.	30+ INDIVIDUALS OBSERVED IN 2000. SITE IS A PROPOSED MITIGATION BANK FOR ENDANGERED SPECIES AND WETLANDS.	Flynn Ranch. Presumed extant. Surveyed 09-23-2010. Habitat present, but no plants found after searching all pools in an extensive area. Site is pretty weedy. This also might be mis-mapped given the note about it being proposed for a bank. The Wildlands bank is to the west.	9/23/2010	Presumed Extant	Present but Degraded	Marginal	
47	47161	TEH	1	specific area	Presumed Extant	19800925	19800925	PVT	VINA PLAINS; ~1.3 AIR MI NE OF INTERSECTION OF SR 99 AND LASSEN RD.	LARGE POOL IN SE 1/4 OF SECTION 17.	VERNAL POOL	CATTLE GRAZING.	<10,000 PLANTS OBSERVED IN 1980.	Earl Foor Ranch under TNC conservation easement. Presumed extant based on aerial interpretation.	No	Presumed Extant	Present and Natural	Unknown	Easement
48	50958	BUT	1	nonspecific area	Presumed Extant	20020614	20020614	PVT	ENE OF SHIPPEE, NORTH OF COTTONWOOD ROAD, JUST WEST OF SUBSTATION ON TOPO.	SITE LOCATED PRIMARILY IN THE SW 1/4 OF THE SW 1/4 OF SECTION 28 & SLIGHTLY IN THE SE 1/4 OF THE SE 1/4 OF SECTION 29.	WITHIN A VERNAL POOL WITH EPILOBIUM PYGMAEUM, ERYNGIUM CASTRENSE, NAVARRETIA LEUCOCEPHALA, DOWNINGIA SP., PLAGIOBOTHRYS STIPITATUS, LASTHENIA SP., CASTILLEJA CAMPESTRIS & EREMOCARPUS SETIGERUS.	OVERGRAZING, HOOFPRINTS.	APPROXIMATELY 110 PLANTS OBSERVED IN 2002.	Presumed extant. Surveyed extensive area on 08-11-2011, but no plants found; no really likely habitat identified either. Area mostly a big Lolium flat on gray Anita clays. GPSed the only spot with vernal pool vegetation.	8/11/2011	Presumed Extant	Present but Marginal	Marginal	
49	72435	GLE	1	specific area	Possibly Extirpated	20070915	1997XXXX	USFWS-SACRAMENTO NWR	SACRAMENTO NATIONAL WILDLIFE REFUGE, 1.3 MILES SOUTH OF REFUGE BOUNDARY AND 2 MILES EAST OF I-5.	THIS IS SACRAMENTO NW REFUNGE UNIT "P1.1" AND VERNAL POOL ID "P1.1-1".	ALKALINE ADOBE SOIL ON THE DRY BED OF A VERNAL POOL. GROWS WITH ORCUTTIA PILOSA, CRYPSIS VAGINIFLORA.		55-60 PLANTS IN 1994, 1 PLANT IN 1995, 5 IN 1996, 26 IN 1997, NONE IN 1998-2007.	Possibly extirpated. Surveyed 07-12-2011, but no plants observed.	7/12/2011	Possibly Extirpated	Present but Marginal	Marginal	Protected
51	72445	BUT	1	nonspecific area	Possibly Extirpated	19740812	19740812	UNKNOWN	ON KEEFER ROAD, CA 1 MILE E OF HWY 99E, CHICO.	EXACT LOCATION UNKNOWN. MAPPED BY CNDDB ABOUT 1 MI E OF HWY 99; HOWEVER, THIS IS LESS THAN "16 MILES N OF CHICO" AS STATED ON HERBARIUM SPECIMEN.	GROWING ABOUT THE BOTTOM OF A LARGE EPHEMERAL POND. ASSOCIATED WITH ERYNGIUM VASEYI.	SITE MAY BE EXTIRPATED BASED ON 2006 AERIAL IMAGERY WHICH SHOWS A LOT OF HOUSING AND AGRICULTURE IN AREA.	ONLY SOURCE OF INFORMATION IS A 1973 AND A 1974 GRIGGS COLLECTION.	Extirpated. Wetland evident in 1990 b&w DOQQ is now turfed. Windshield survey 09-09-2010 verified no habitat present.	9/9/2010	Extirpated	Eliminated		
54	84686	MER	1	specific area	Presumed Extant	20100630	20100630	PVT-WILDLANDS INC	~0.15 AIR MI NORTH OF MARGUERITE RD AND 1 MI EAST OF INTERSECTION WITH SANTA FE BLVD, NORTH OF CHOWCHILLA RIVER.	MAPPED BASED ON 2010 CALTRANS DIGITAL DATA.	ON THE NORTHERN EDGE OF LARGE DRY VERNAL POOL WITH DEEPLY CRACKED BLACK ADOBE SOIL, SURROUNDED BY ANNUAL GRASSLAND. ASSOCIATES INCLUDE EPILOBIUM CLEISTOGAMUM AND EREMOCARPUS SETIGERUS.	NO THREATS NOTED. THIS IS AN ESTABLISHED MITIGATION BANK.	APPROXIMATELY 200 PLANTS SEEN IN 2010.	Wildlands Great Valley Bank. Presumed extant based on aerial photo interpretation. Windshield survey only 09-23-2011.	No	Presumed Extant	Present and Natural	Unknown	Bank
N1		BUT						USFWS-SACRAMENTO NWR	Llano Seco Unit of USFWS Sacramento NWR. 0.8 miles SSW of the visitors entrance on 7 Mile Road.	Llano Seco. Created pool #4. Pools #4 and #6 may constitute a single EO.	In sparsely vegetated created pools.	No threats noted. This is part of the USFWS SWR.	Seeded in 2010 as part of a Masters project by Erin Gottschalk Fisher. Plants present in 2011 and 2012.	Site visited 07-12-2011. Data from 2012 courtesy of Erin Gottschalk Fisher. She only counted reproductive plants, and not seedlings that perished before reaching maturity.	7/12/2011	2,009 Plants in 2012	Created	Persistent	Protected
N2		BUT						USFWS-SACRAMENTO NWR	Llano Seco Unit of USFWS Sacramento NWR. 0.8 miles SSW of the visitors entrance on 7 Mile Road.	Llano Seco. Created pool #6. Pools #4 and #6 may constitute a single EO.	In sparsely vegetated created pools.	No threats noted. This is part of the USFWS SWR.	Seeded in 2010 as part of a Masters project by Erin Gottschalk Fisher. Plants present in 2011 and 2012.	Site visited 07-12-2011. Data from 2012 courtesy of Erin Gottschalk Fisher. She only counted reproductive plants, and not seedlings that perished before reaching maturity.	7/12/2011	51 Plants in 2012	Created	Persistent	Protected

Appendix A-7: Current Status of Greene's Tuctoria (*Tuctoria greenei*) in the Great Valley

California Natural Diversity Database, November 4, 2012														Witham, 2013					
OE	EONDX	KEY(	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
N3		BUT						USFWS-SACRAMENTO NWR	Llano Seco Unit of USFWS Sacramento NWR. 0.8 miles SSW of the visitors entrance on 7 Mile Road.	Llano Seco. Created pool #11.	In sparsely vegetated created pools.	No threats noted. This is part of the USFWS SWR.	Seeded in 2010 as part of a Masters project by Erin Gottschalk Fisher. Plants present in 2011 and 2012.	Site visited 07-12-2011. Data from 2012 courtesy of Erin Gottschalk Fisher. She only counted reproductive plants, and not seedlings that perished before reaching maturity.	7/12/2011	110 Plants in 2012	Created	Persistent	Protected

Appendix A-8: Current Status of Solano Grass (*Tuctoria mucronata*) in the Great Valley

California Natural Diversity Database, November 4, 2012														Witham, 2013					
EO	EONDX	KEY(	PART	ACCURACY	PRESENCE	SITEDATE	ELMDATE	OWNERMGT	LOCATION	LOCDETAILS	ECOLOGICAL	THREAT	GENERAL	OBSERVATIONS & NOTES	SITE	POPULATION	HABITAT	VIGOR	STATUS
1	6795	SOL	1	specific area	Extirpated	2006XXXX	19930731	SOLANO LAND TRUST	JEPSON PRAIRIE, 12 MILES SOUTH OF DIXON, OLCOTT LAKE WEST OF COOK LANE, ALONG ISLAND EDGE NEAR MIDDLE OF LAKE.	ONE SMALL POPULATION IS LOCATED IN THE SOUTHERN BORDER OF ADJACENT SECTION 14 AND SECTION 23. FORMERLY TNC'S JEPSON PRAIRIE PRESERVE; TRANSFERRED TO SOLANO COUNTY FARMLANDS & OPEN SPACE ON 8/97. TNC RETAINS CONSERVATION EASEMENT.	ON ALKALI, DRY LAKE OF PESCADERO CLAY SOILS. ASSOCIATED WITH FRANKENIA GRANDIFOLIA, ERYNGIUM ARISTULATUM, LIPPIA NODIFLORA, CRYPSIS SCHOENOIDES, CRESSA TRUXILLENSIS VAR. VALLICOLA, AGROSTIS AVENACEA, AND ELEOCHARIS MACROSTACHYA.	THIS PORTION OF OLCOTT IS PROTECTED FROM GRAZING. OVERCOLLECTION AND CHANGES IN HYDROLOGY MAY HAVE CAUSED EXTIRPATION.	TYPE LOCALITY. 100-150 PLANTS IN 1958, ~24 IN 1973, NONE IN 1976-80, 2 IN 1981, 52 IN 1982, 241 IN 1984, 553 IN 1985, 100 IN 1986, NONE IN 1987-92, 4 IN 1993, NONE IN 1994-2006. MULTIPLE COLLS FROM CRAMPTON, GRIGGS, AND MALLOCH ATTRIB HERE.	Jepson Prairie Olcott Lake. No plants in 1994-1992 and 1994-2012. Only four plants in 1993. Both altered hydrology and lack of disturbance may be a factor in its local extirpation. Two areas found by Crampton and one found by Stone are searched every year along with a series of meandering transects.	8/22/2012	Extirpated	Present and Natural		Protected
2	6310	SOL	1	specific area	Presumed Extant	2005XXXX	2005XXXX	PVT	APPROXIMATELY 2.5 MILES SW OF OLCOTT LAKE.	3.4 KM (2.1 MI) SOUTH OF THE SACRAMENTO NORTHERN RR TRACKS AND 5.7 KM (3.5 MI) WEST OF HIGHWAY 113. IN NW 1/4 NE 1/4 AND THE NE 1/4 NW 1/4 SECTION 28. PLANTS FOUND IN DIFFERENT LOCATIONS IN POOL EACH YEAR; NOT FOUND THROUGHOUT ENTIRE POOL.	IN LARGE SALINE-ALKALINE PLAYA/POOL IN ANNUAL GRASSLAND. ASSOCIATED WITH MALVELLA LEPROSA, FRANKENIA SALINA, CRESSA TRUXILLENSIS, ERYNGIUM ARISTULATUM, DISTICHLIS SPICATA, AND NEOSTAPFIA COLUSANA. SEEN ALSO WITH DELTA GREEN GROUND BEETLES.	CATTLE/SHEEP GRAZING, DUCK HUNTING. PAST DISTURBANCE/GRAZING MAY HAVE LED TO ESTABLISHMENT OF WEEDY SIDA & CRYPSIS.	763 PLANTS SEEN IN 1985, ~250 PLANTS IN 1986, 114 IN 1989, 1 IN 1991, 142 IN 1992, 38 IN 2000, 26 IN 2004, AND 3 IN 2005. 1986 COLLECTION BY STONE ATTRIBUTED HERE. IS POP. DECLINING, OR IS THIS CLIMATE INDUCED? LACK OF DISTURBANCE?	Hamilton Ranch. Extant. Surveyed 09-05-2010 with 64 plants counted in three separate areas (GPSed) within a single large playa pool.	9/5/2010	64 Plants in 2010	Present and Natural	Declining	
3	6337	YOL	2	specific area	Presumed Extant	20050805	20050805	DOD-MCCLELLAN AFB, YOL COUNTY	DAVIS AIR FORCE COMMUNICATION FACILITY, EAST OF ROAD 104, BETWEEN ROAD 34 AND ROAD 35, 4 MILES SOUTH OF I-80.	DAVIS COMMUNICATIONS ANNEX. MAPPED AS 2 POLYGONS ACCORDING TO 2004 ESA MAP. IN THE NW 1/4 SE 1/4 AND THE SW 1/4 SE 1/4 SECTION 31.	LOW AREA ON PESCADERO CLAY LOAM. N SUBPOP. RESTRICTED TO DISTURBED GROUND. S SUBPOP. IN ALKALI SCALD, ALSO SHOWS SIGNS OF DISTURBANCE. ASSOCIATES INCLUDE CRYPSIS SCHOENOIDES AND LEPIDIUM LATIFOLIUM. NEOSTAPFIA COLUSANA ALSO PRESENT.	FORMER GROUND DISTURBANCE: BORROW PITS & FIREBREAKS. INVASION BY NONNATIVE PLANTS: SALSOLA TRAGUS & LEPIDIUM LATIFOLIUM.	2 POLYGONS WITH ~10,000 PLANTS TOTAL IN 1993, 2700 IN 1996, 1993 IN 2001, 4310 IN 2003, 1403 IN 2004, 8977 IN 2005, 1177 IN 2006, AND 5350 IN 2008. WEEDS TAKING OVER BY 2001. PART OF OCCURRENCE MANAGED BY YOLO COUNTY PARKS.	Davis Communication Annex. Extant. Being monitored by others--Helm, Gerlarh--and population counts should be obtained from them. Site has been the subject of various mis-management issues over the years. Required a good management plan before being taken over by Yolo County.	10/15/2011	1,000s Plants in 2011	Present but Modified	Persistent	DOD/Yolo
N1		YOL						Yolo County	Yolo Grasslands Regional Park.	Mapped as 2 polygons.	Westernmost 2 of 3 created pools. Mostly bare ground.	Some previous issues with mis-management of the area including grazing management and firebreak management.	Although within 1/4 mile of EO#3, being reported separately because these are introduced populations in created pools.	Yolo County Grasslands Park. Extant. New pools inoculated by John Gerlach. Actual census data should be obtained from John.	10/15/2011	~50 Plants in 2011	Artificial	New	Yolo Co

Green highlighting indicates new data.

Status Surveys for Seven Federally Listed Vernal Pool Grasses and *Chamaesyce hooveri* in the Sacramento and San Joaquin Valleys (Great Valley), California, USA

Grant Agreement: 80270-8-G137

APPENDIX B:

REPORTS ON POTENTIAL VIOLATIONS

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September 21, 2010

Paul Jones
U.S. Environmental Protection Agency
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Zachary Simmons
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Steve Rosenblaum
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Ken Sanchez
U.S. Fish and Wildlife Service, Sacramento Field Office
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Ellen Cypher
Department of Fish and Game, Central Region
ecypher@dfg.ca.gov VIA EMAIL

RE: Potential 404/401/ESA/CESA Violation – STANISLAUS COUNTY (Warnerville Road)

Violation Location:	Stanislaus County, North of Warnerville Road Approximately east of intersection with TimBell Road
Location Description:	Former vernal pool grassland deep ripped ; appears to be preparation for conversion to orchards.
Violation Description:	~1,900 acres deep ripped, leveled and with irrigation system being installed; note that northern boundary of activity is approximated. Known occurrence of *Neostapfia colusana* (EO#57)
Date Observed:	September 2, 2010
Date of Violation:	Unknown (post 2009 aerial imagery)
Responsible Party:	Unknown

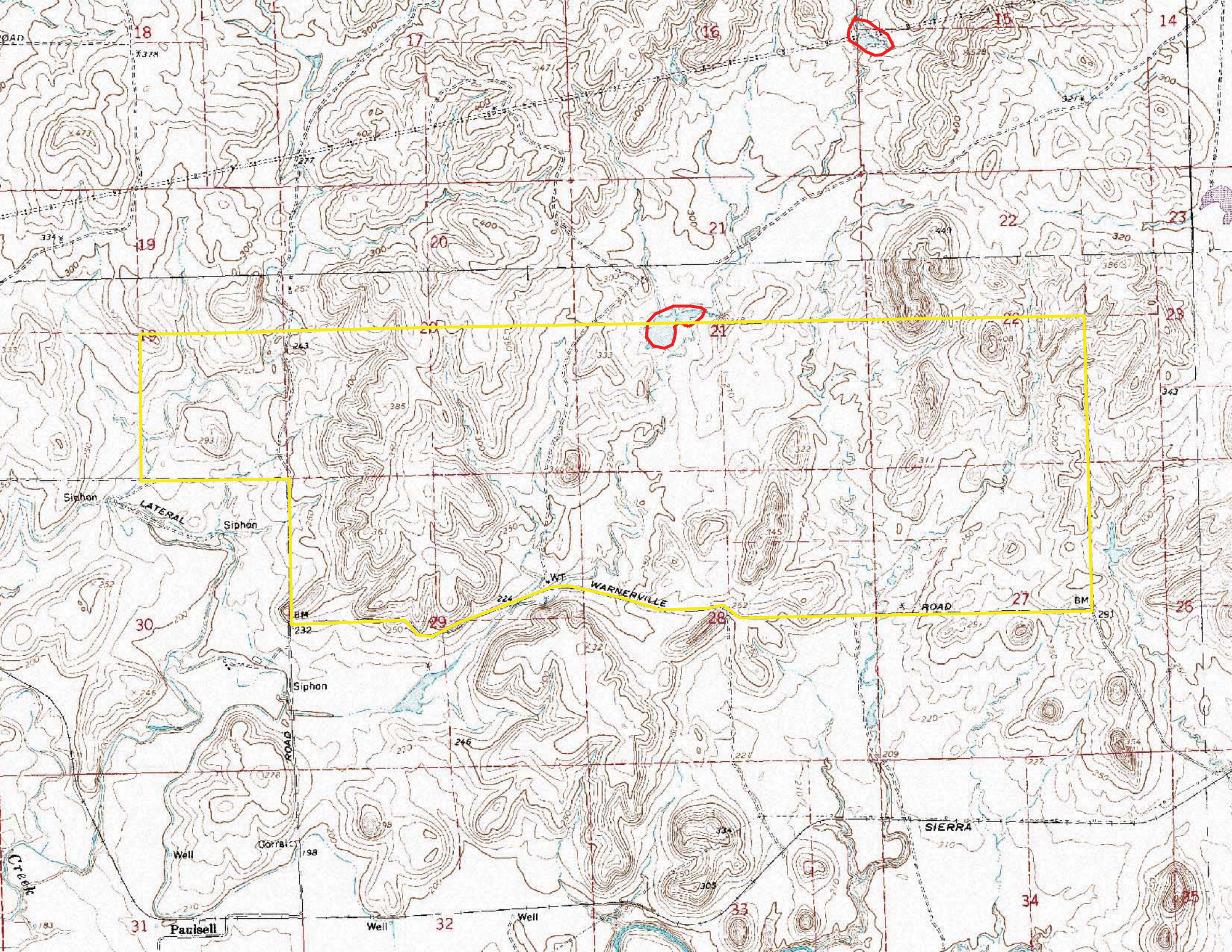
I may be reached at the above number and email address if you have any questions.

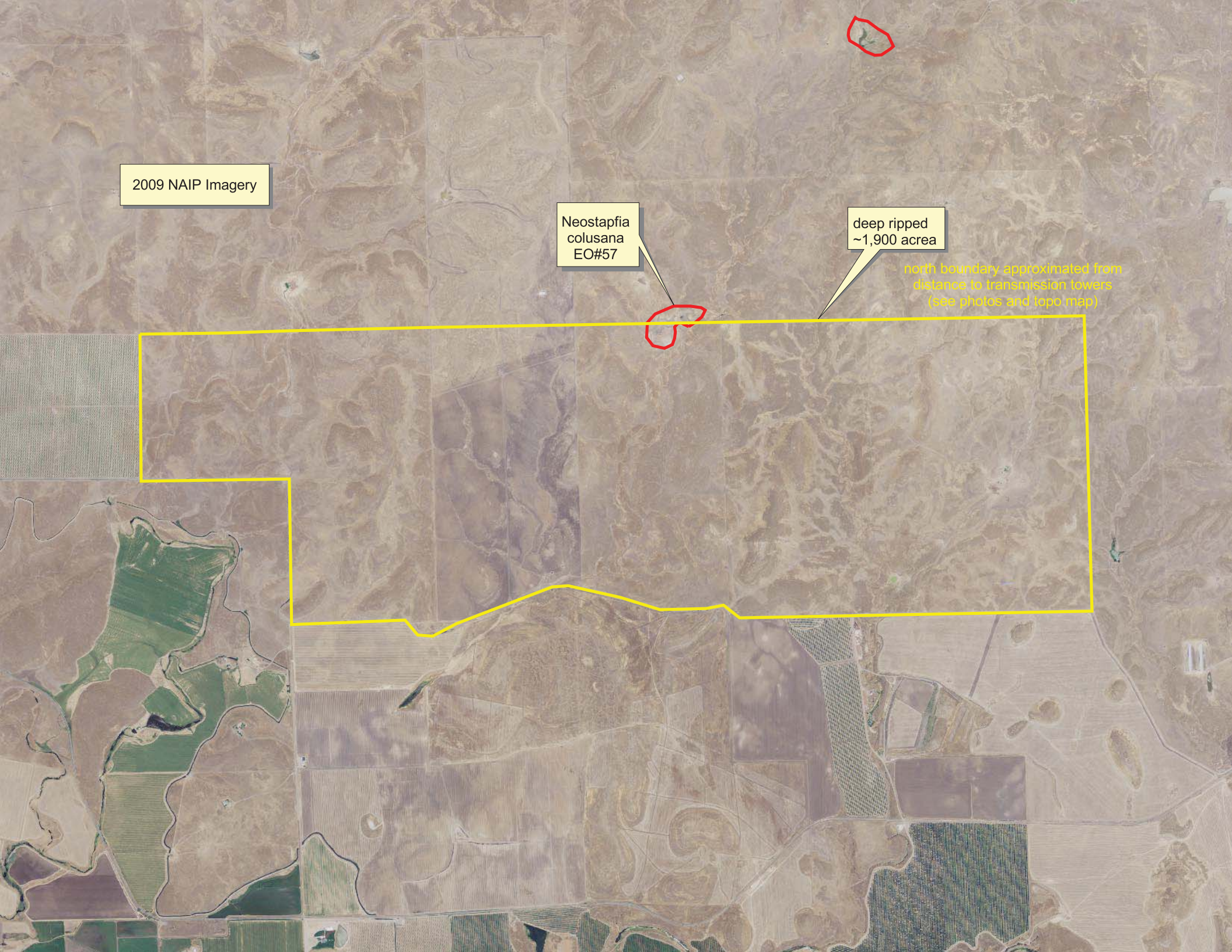
Sincerely,

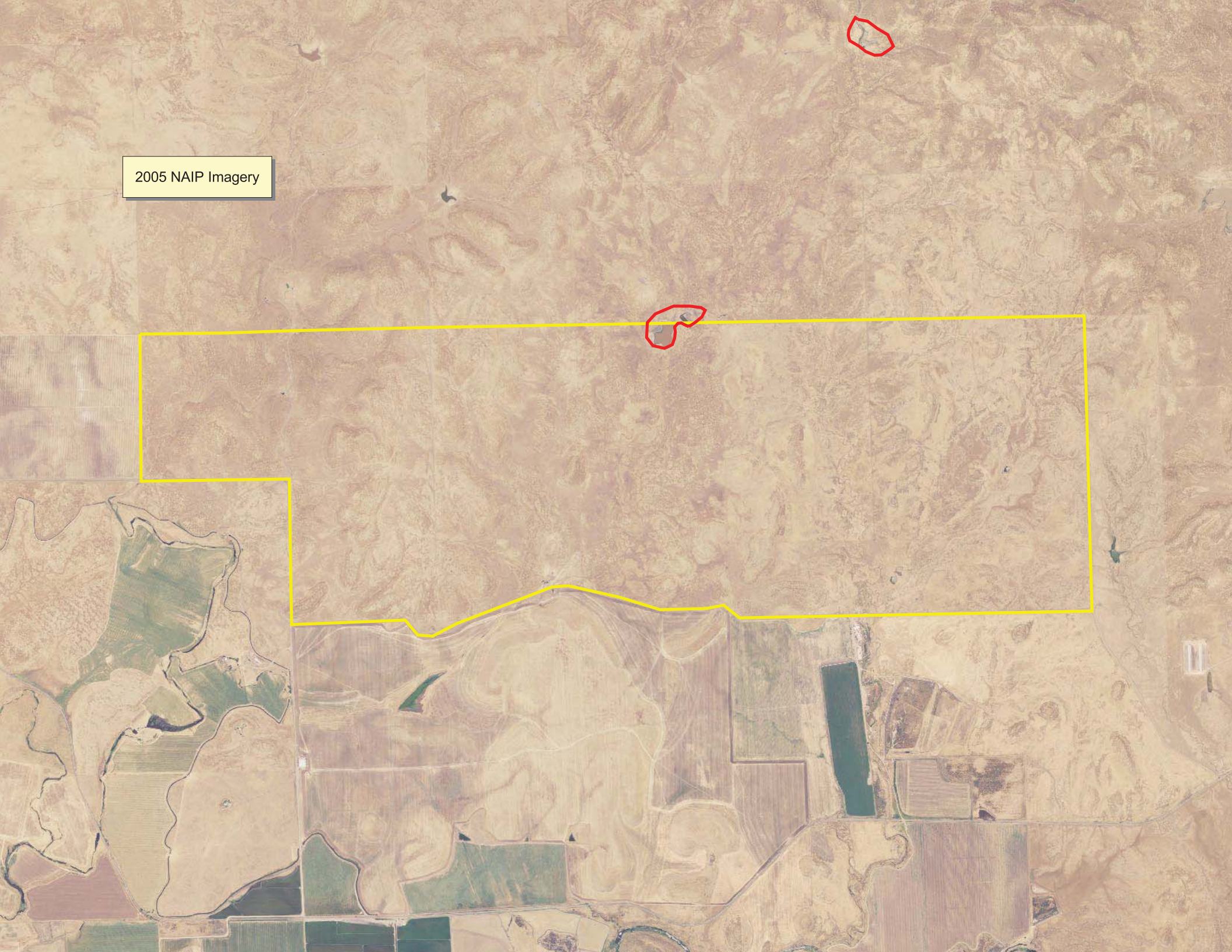
Carol W. Witham

Encl: 7 pp aerials, map and photographs

Cc: Interested parties


Siphon
LATERAL
Siphon
WARNERVILLE
ROAD
BM
232
Siphon
ROAD
Well
Corral
Paulsell
Well
Well
SIERRA
Creek


2009 NAIP Imagery
Neostapfia colusana EO#57
deep ripped ~1,900 acrea
north boundary approximated from distance to transmission towers (see photos and topo map)


2005 NAIP Imagery

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September 21, 2010

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Zachary Simmons
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Ken Sanchez
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Ellen Cypher
Department of Fish and Game, Central Region
ecypher@dfg.ca.gov VIA EMAIL

RE: Potential 404/401/ESA/CESA Violation – STANISLAUS COUNTY (Dienstag Road)

Violation Location:	Stanislaus County, South of Madera Reservoir East of Dienstag Road, north of Highway 132
Location Description:	Former vernal pool grasslands; appears to be preparation for orchard conversion.
Violation Description:	30 acres of disked and leveled (probably deep ripped) area Known occurrence of *Neostapfia colusana* (EO#11)
Date Observed:	September 3, 2010
Date of Violation:	Unknown (post 2009 aerial imagery)
Responsible Party:	Unknown

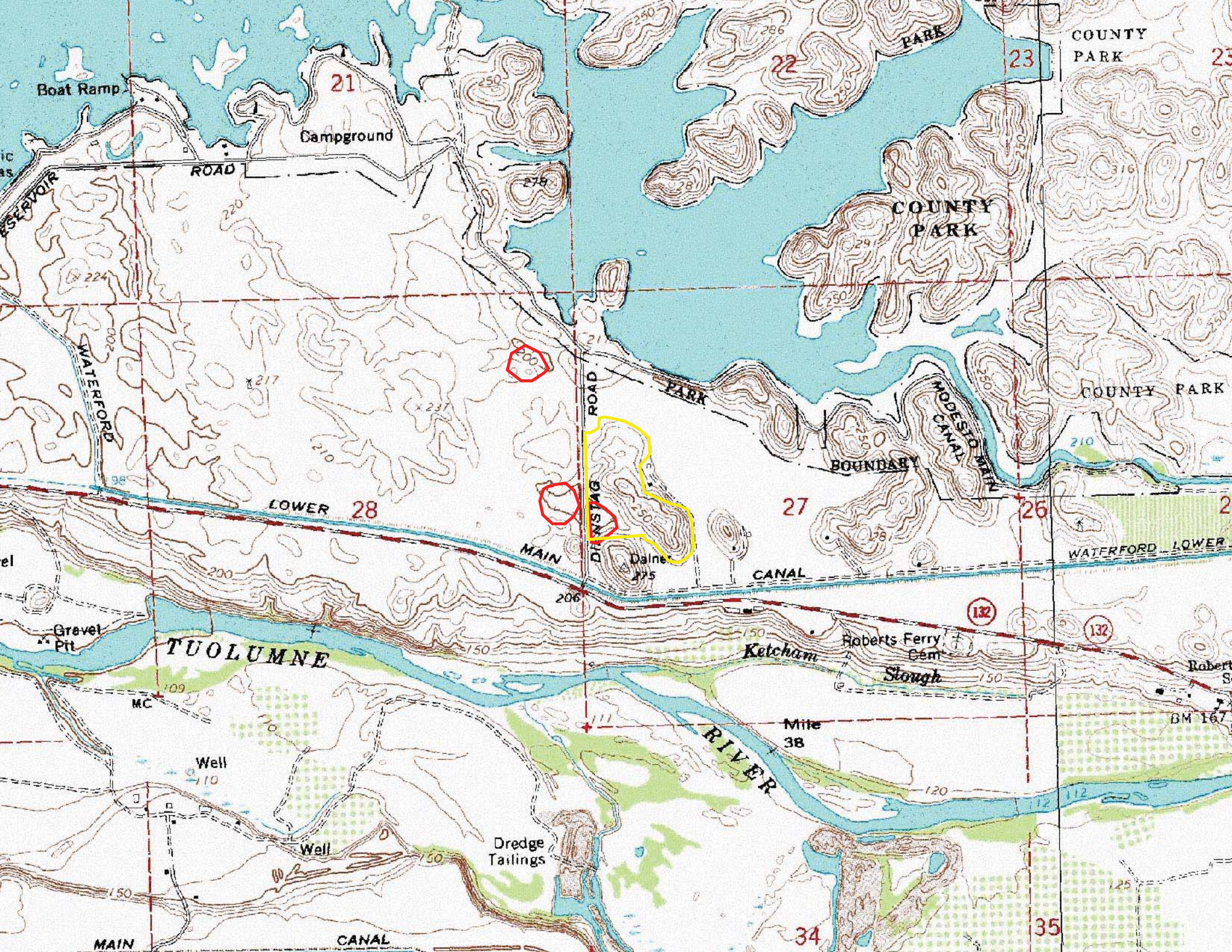
I may be reached at the above number and email address if you have any questions.

Sincerely,

Carol W. Witham

Encl: 2 pp aerials and maps

Cc: Interested parties


Boat Ramp
Campground
ROAD
COUNTY PARK
COUNTY PARK
COUNTY PARK
PARK
WATERFORD
ROAD
PARK
MODESTO CANAL
BOUNDARY
LOWER
MAIN
CANAL
DINSTAG
Daine
WATERFORD LOWER
Gravel Pit
TUOLUMNE
RIVER
Ketcham
Stough
Roberts Ferry
Mile 38
Well
Well
Dredge Tailings
MAIN
CANAL
21
22
23
26
27
28
34
35
132
206


2009 NAIP Imagery
deep ripped
30 acres
Neostapfia
colusana
EO#11

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September 21, 2010

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Ellen Cypher
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RE: Potential 404/401/ESA/CESA Violation – STANISLAUS COUNTY (Turlock Reservoir)

Violation Location:	Stanislaus County, North of Turlock Reservoir North of Lake Road, South of Tuolumne River
Location Description:	Former large vernal pool filled; appears to be preparation for conversion to irrigated pasture.
Violation Description:	~14 acres filed and being covered in geotextile fabric Known occurrence of *Neostapfia colusana* (EO#20)
Date Observed:	September 2, 2010
Date of Violation:	Unknown (post 2009 aerial imagery)
Responsible Party:	Unknown

I may be reached at the above number and email address if you have any questions.

Sincerely,

Carol W. Witham

Encl: 3 pp aerial, map and photograph

Cc: Interested parties

132
Grave
Mile 46
32
33
34
DREDGE
TAILINGS
Mile 46
RIVER
33
34
32
BM 252
LAKE
233
MAIN
BM 248
ROAD
339
304
5
Ford
4
3
TURLOCK
Footbridge
354
BM 260
LAKE
266
305
C K


2009 NAIP Imagery
Neostapfia colusana EO#20

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September 21, 2010

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Zachary Simmons
U.S. Army Corps of Engineers, Sacramento District
Zachary.m.simmons@usace.army.mil VIA EMAIL

W. Dale Harvey
Central Valley RWQCB (5F), Fresno Office
dharvey@waterboards.ca.gov VIA EMAIL

Ken Sanchez
U.S. Fish and Wildlife Service, Sacramento Field Office
Kenneth_Sanchez@fws.gov VIA EMAIL

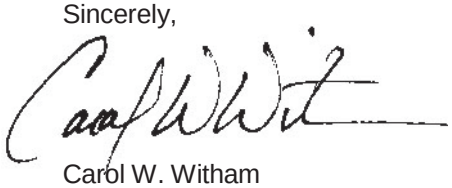
Ellen Cypher
Department of Fish and Game, Central Region
ecypher@dfg.ca.gov VIA EMAIL

RE: Potential 404/401/ESA/CESA Violation – MADERA COUNTY (Avenue 15)

Violation Location:	Madera County, just east of the city of Madera Along both sides of Avenue 15, just east of the RR tracks
Location Description:	Former vernal pool grasslands with a significant nexus to Cottonwood Creek
Violation Description:	1,525 acres of recently planted orchard north of Avenue 15, and 875 acres of disked and leveled (probably deep ripped) area south of Avenue 15 Known occurrences of *Orcuttia pilosa* (EO#19) on both sides of Avenue 15
Date Observed:	August 8, 2010
Date of Violation:	Unknown (post 2005 aerial imagery north of road, post 2009 imagery south of road)
Responsible Party:	Unknown

I may be reached at the above number and email address if you have any questions.

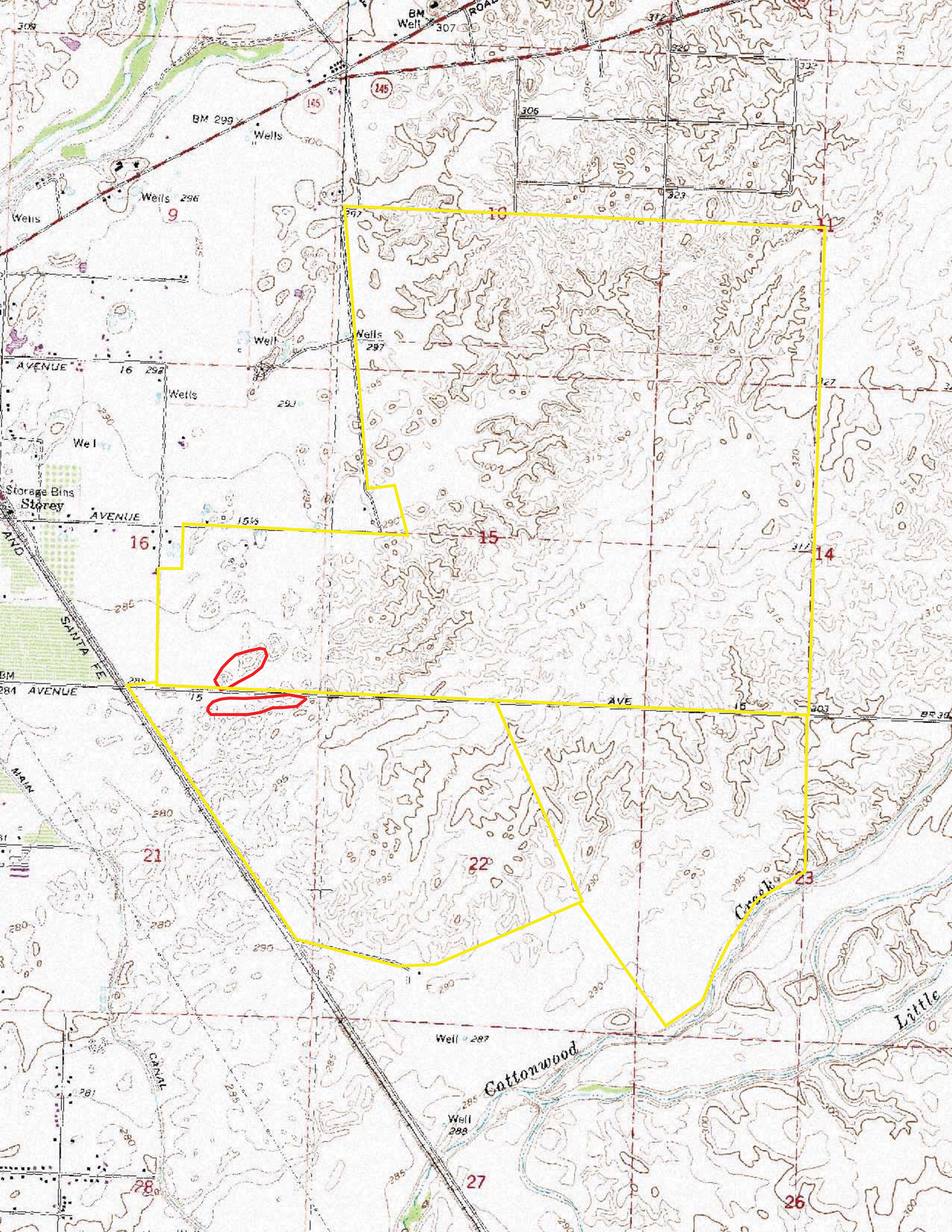
Sincerely,



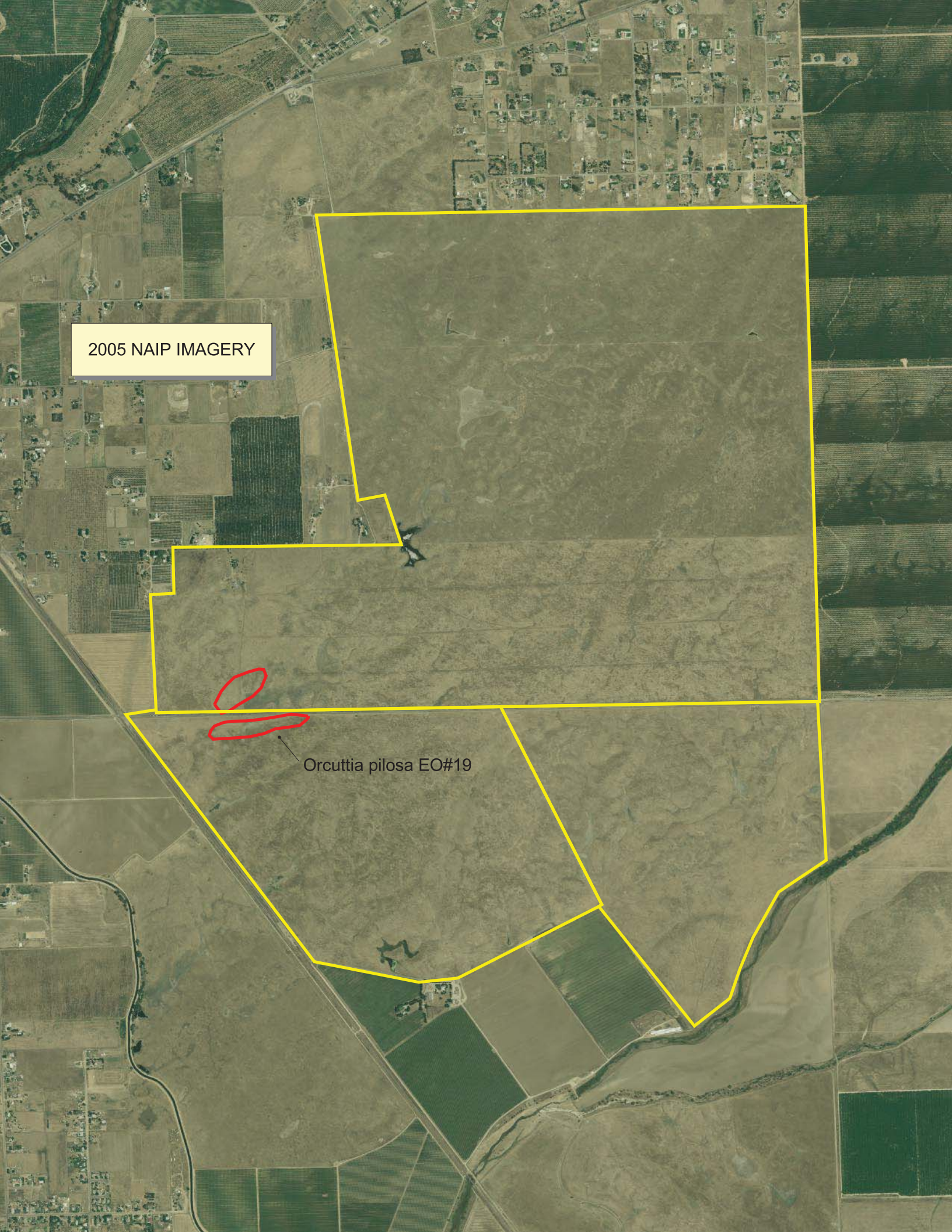
Carol W. Witham

Encl: 6 pp aerials, maps and photographs

Cc: Interested parties


BM
Well
307
ROAD
145
BM 299
Wells
Wells 296
9
Wells
10
11
306
323
297
Wells
297
Well
AVENUE
16 292
Wells
Wel
Storage Bins
Storey
AVENUE
15½
15
16
14
SANTA FE
AND
BM
284 AVENUE
15
AVE
15
303
MAIN
21
22
23
Creek
Little
Cottonwood
Well 287
Well
288
CANAL
27
28
26


2009 NAIP IMAGERY
ORCHARDS
1525 acres
PLOWED &
LEVELED
500 acres
PLOWED &
LEVELED
375 acres


2005 NAIP IMAGERY
Orcuttia pilosa EO#19

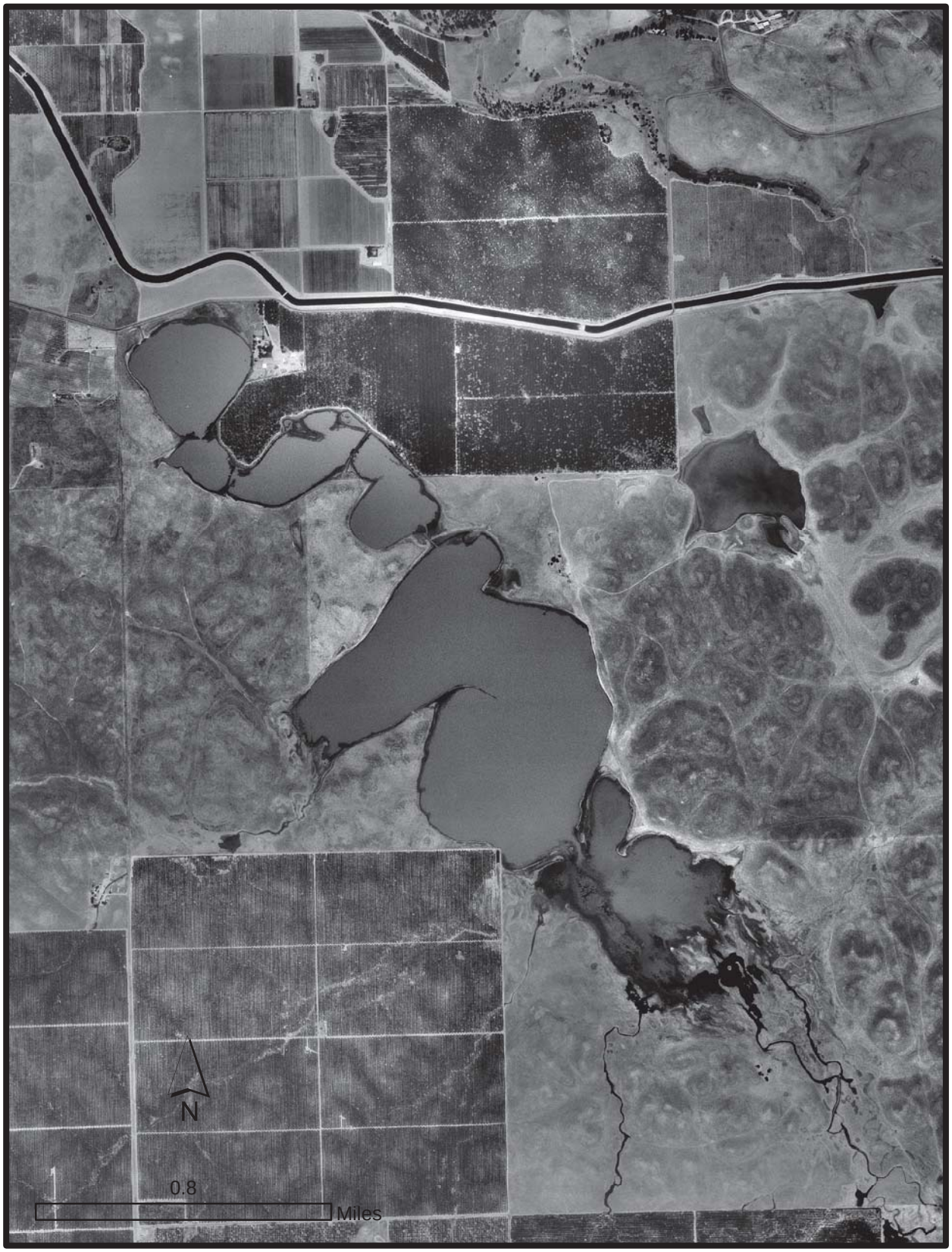

1990s DOQ IMAGERY

Status Surveys for Seven Federally Listed Vernal Pool Grasses and *Chamaesyce hooveri* in the Sacramento and San Joaquin Valleys (Great Valley), California, USA

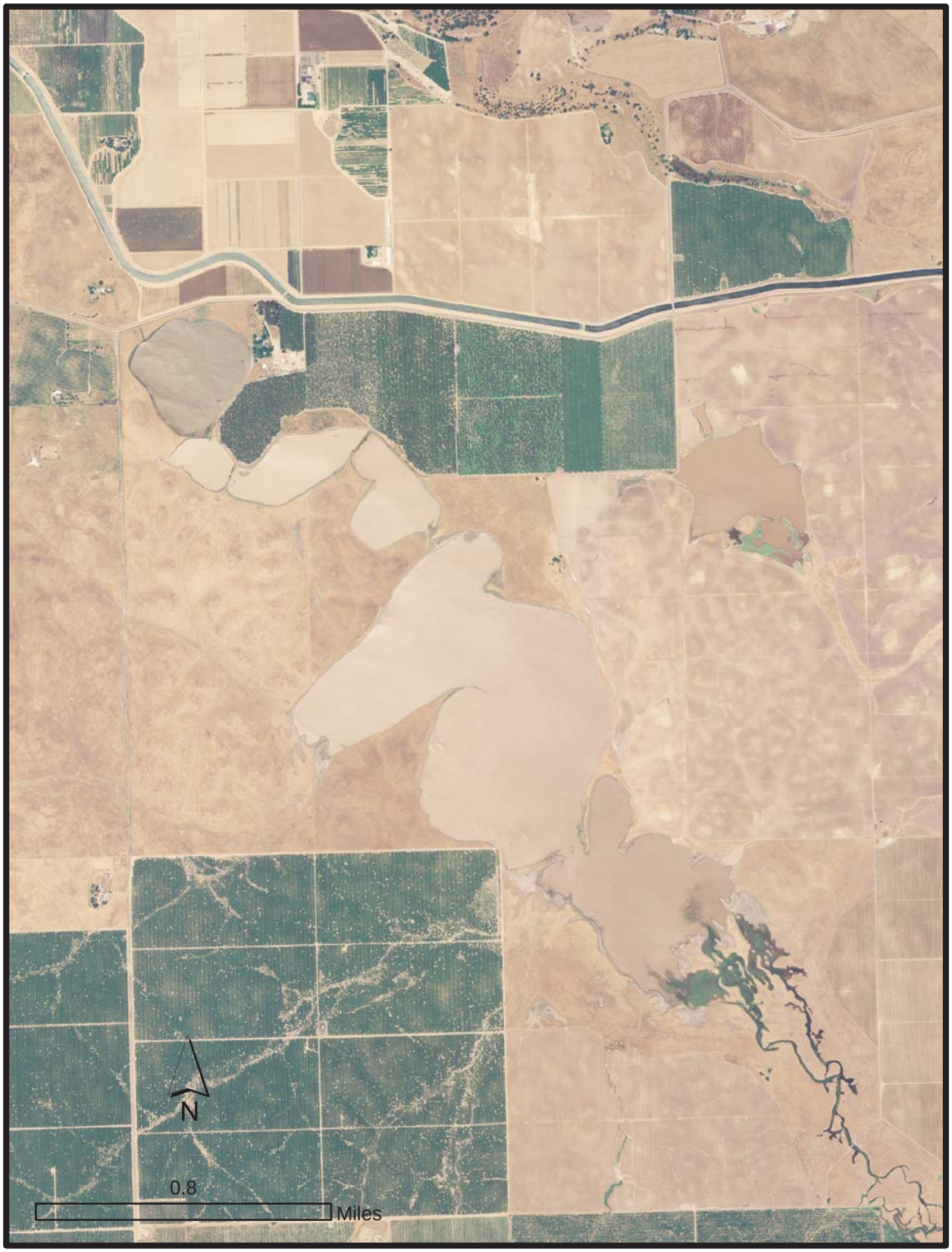
Grant Agreement: 80270-8-G137

APPENDIX C:

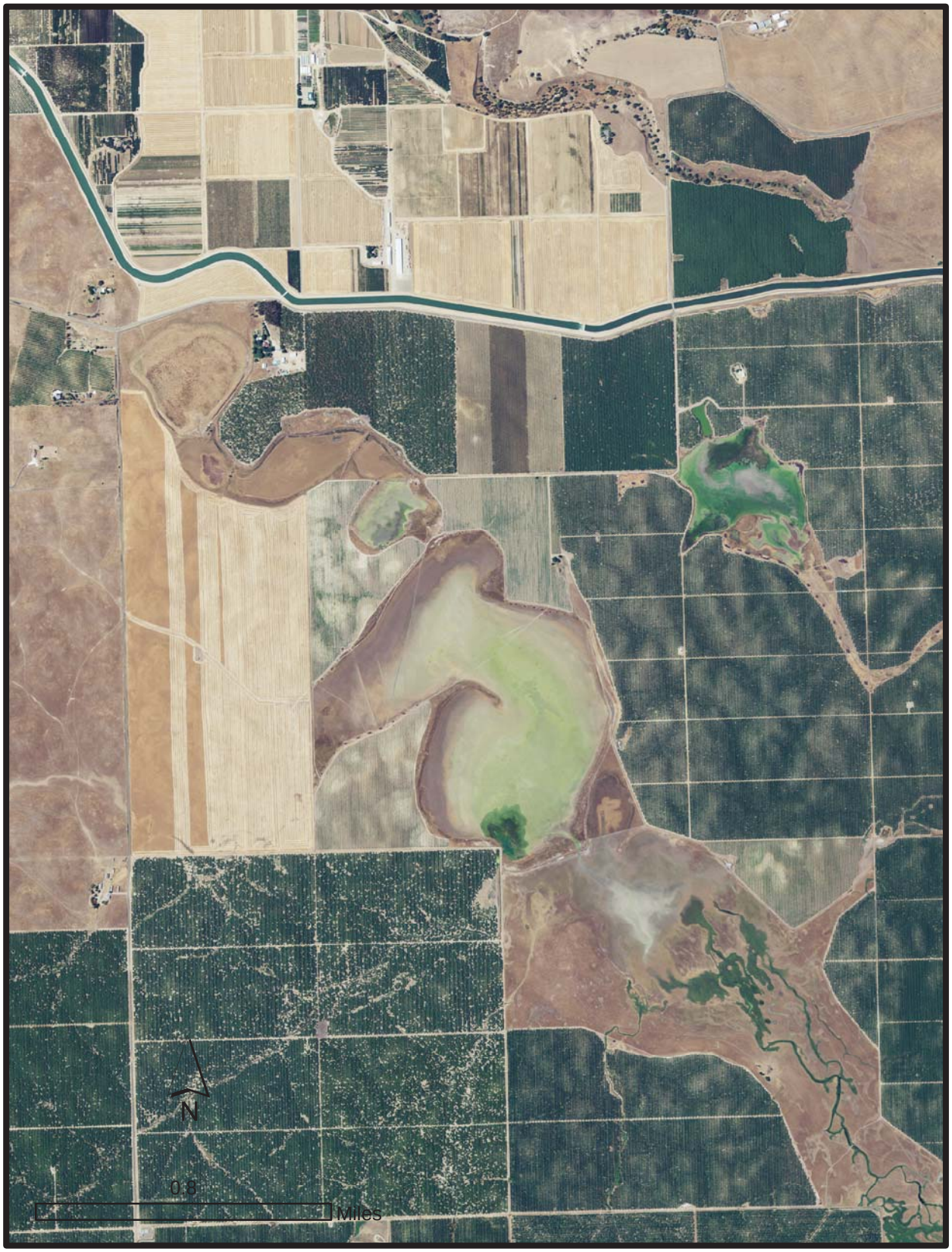
AERIAL PHOTOGRAPHS OF HICKMAN VERNAL POOLS



Hickman Vernal Pools, ca. 1999
Stanislaus County



Hickman Vernal Pools, 2005
Stanislaus County



Hickman Vernal Pools, 2009
Stanislaus County

Hickman Vernal Pools, 2010
Stanislaus County

Hickman Vernal Pools, 2012
Stanislaus County

Status Surveys for Seven Federally Listed Vernal Pool Grasses and *Chamaesyce hooveri* in the Sacramento and San Joaquin Valleys (Great Valley), California, USA

Grant Agreement: 80270-8-G137

APPENDIX D:

SURVEY FORMS FOR NEW POPULATIONS

Appendix D

Table of Contents

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 05/01/2003

For Office Use Only

Source Code _____ Quad Code _____

Elm Code _____ Occ. No. _____

EO Index No. _____ Map Index No. _____

CVPIA 80270-8-G-137 Field Survey Form

Scientific Name: *Chamaesyce hooveri*

Common Name: Hoover's Spurge

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals 1 Subsequent Visit? ☐ yes ☑ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☑ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Carol W. Witham

Address: 1141 37th Street
Sacramento, CA 95816-5415

E-mail Address: cwitham@ncal.net

Phone: (916) 452-5440

Plant Information

Phenology: _____% vegetative 100 % flowering _____% fruiting

Additional Survey Notes

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

ONE FORM WITH TWO MAPS. Laniger Lakes. Surveyed in 2003 (early May but exact date unknown) with LSA Associates staff. Population is documented in mitigation banking proposal. Attached map is from that proposal. Also see N1 on the attached 2012 NAIP aerial image.

County: Tehama Landowner / Mgr.: Private/Hamilton Ranch

Quad Name: _____ Elevation: 250 ft

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): ArcView

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ GPS Make & Model _____

DATUM: **NAD27** ☐ **NAD83** ☑ **WGS84** ☐ Horizontal Accuracy _____ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☐ ***OR*** Geographic (Latitude & Longitude) ☑

Coordinates: -122.036 39.974

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*

One of a series of large playa pools known as Laniger Lakes. Plant occurred in bare area. Orcuttia tenuis was also observed in the pool.

I was denied access to this proposed mitigation bank in 2010 and 2011, so could not update occurrence information.

Please fill out separate form for other rare taxa seen at this site. Orcuttia tenuis (OE 43), 1000's of plants observed in 2003

Site Information Overall site/occurrence quality/viability (site + population): ☑ Excellent ☐ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: Seasonal cattle grazing lands, immediate proposed for bank, surrounding under conservation easement.

Visible disturbances: None observed.

Threats: None observed.

Comments: My personal recollection is that the CHHO occurred in the second large pool from the northeast, however the LSA map has the occurrence in the first lake. Reviewing the aerials, there is a unmapped playa northeast of the first Laninger Lake. So I believe the map is correct.

Determination: *(check one or more, and fill in blanks)*

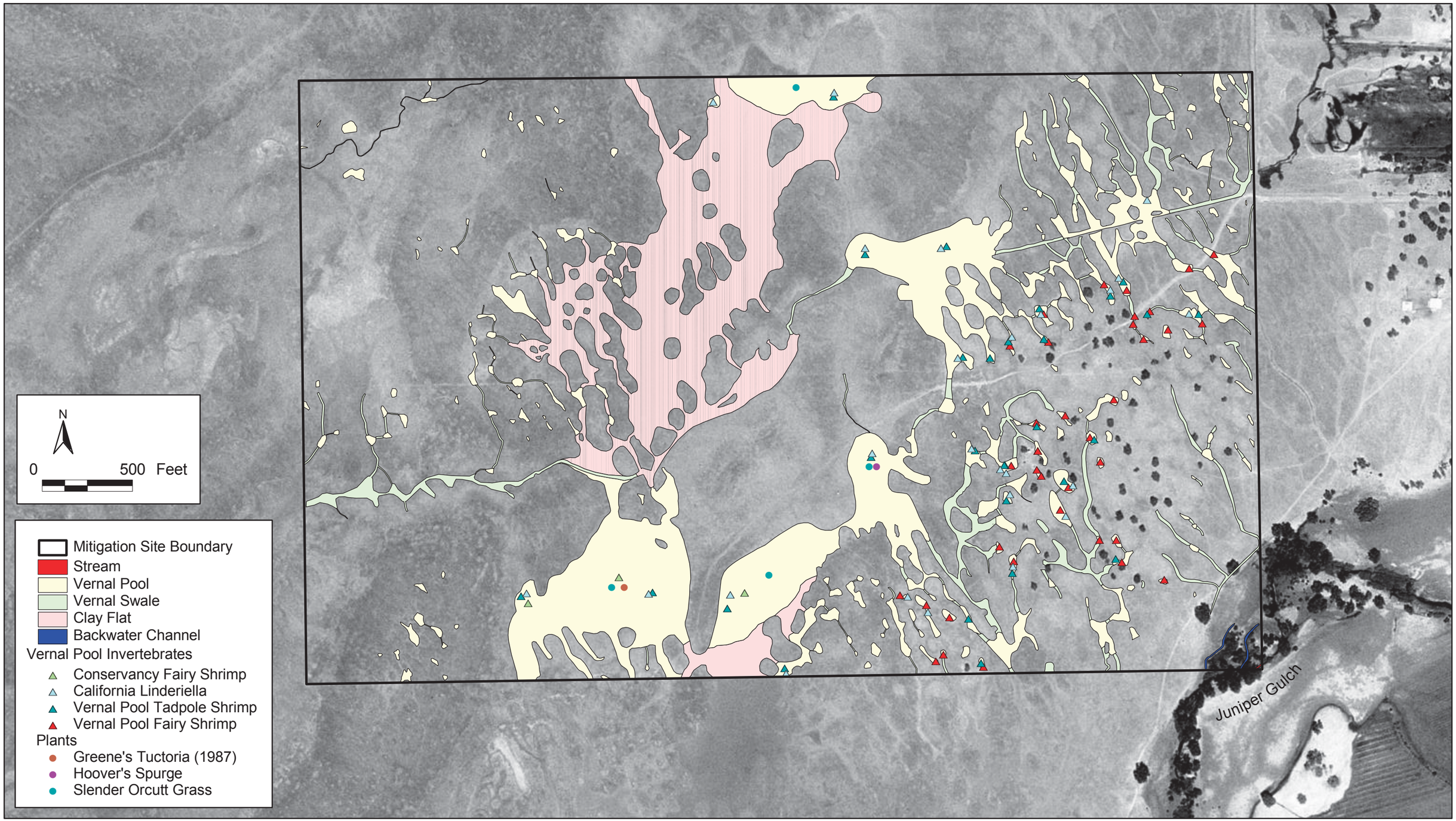
- ☑ Keyed (cite reference): The Jepson Manual
- ☐ Compared with specimen housed at: _____
- ☐ Compared with photo / drawing in: _____
- ☐ By another person (name): _____
- ☑ Other: Personal knowledge of taxon

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☐ no ☐

DFG/BDB/1747 Rev. 6/16/09



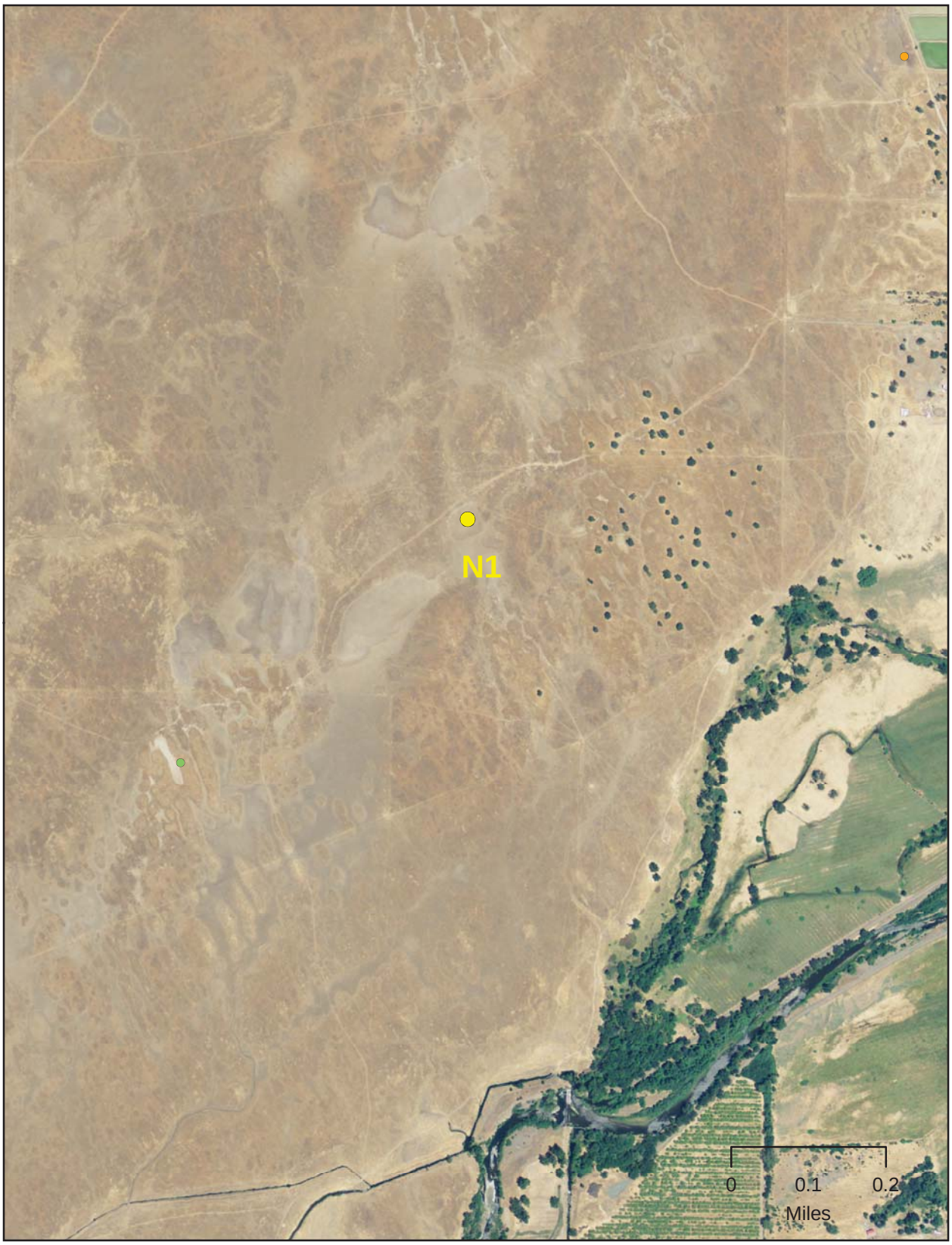
LSA

Figure 5

Hamilton Ranch Mitigation Site
Special Status Species Locations

SOURCE: USGS Digital Orthophotoquad, Vina NE, CA 1998

I:\EVI730\GIS\delin.apr (9/16/03)



Chamaesyce hooveri N1
Tehama County

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 08/05/2010

For Office Use Only

Source Code _____ Quad Code _____

Elm Code _____ Occ. No. _____

EO Index No. _____ Map Index No. _____

CVPIA 80270-8-G-137 Field Survey Form

Scientific Name: *Chamaesyce hooveri*

Common Name: Hoover's Spurge

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals 100s Subsequent Visit? ☐ yes ☑ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☑ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Carol W. Witham

Address: 1141 37th Street
Sacramento, CA 95816-5415

E-mail Address: cwitham@ncal.net

Phone: (916) 452-5440

Plant Information

Phenology: _____% vegetative 100 % flowering _____% fruiting

Additional Survey Notes

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

Tulare County, along abandoned RR tracks 0.4-0.6 miles northwest of its intersection with Highway 201. See N2 on the attached 2012 NAIP aerial imagery. Extends ~0.2 miles along the RR tracks and into the new orchard to the northwest.

County: Tulare Landowner / Mgr.: Private/RR right-of-way and other

Quad Name: _____ Elevation: _____

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): ArcView

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ GPS Make & Model _____

DATUM: **NAD27** ☐ **NAD83** ☑ **WGS84** ☐ Horizontal Accuracy _____ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☐ ***OR*** Geographic (Latitude & Longitude) ☑

Coordinates: -119.233 36.490 to approximately -119.235 36.493 and then east to approximately -119.233 36.492

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*

Plants are actually growing on the crown of the RR berm and in irrigated orchards to the northeast. Occurring with Chamaesyce ocellata, Centaurea solstitialis and Crypsis.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☑ Excellent ☐ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: Mostly disturbed. RR berm with orchards to the east and some natural habitat to the west.

Visible disturbances: This entire population is disturbed my land use modifications.

Threats: Herbicides are probably the biggest threat to this population.

Comments: This is just a really weird (that is a technical term) population. I suspect that the lack of competition has allowed the plants to flourish in the short term. In the long term, this population will probably not persist.

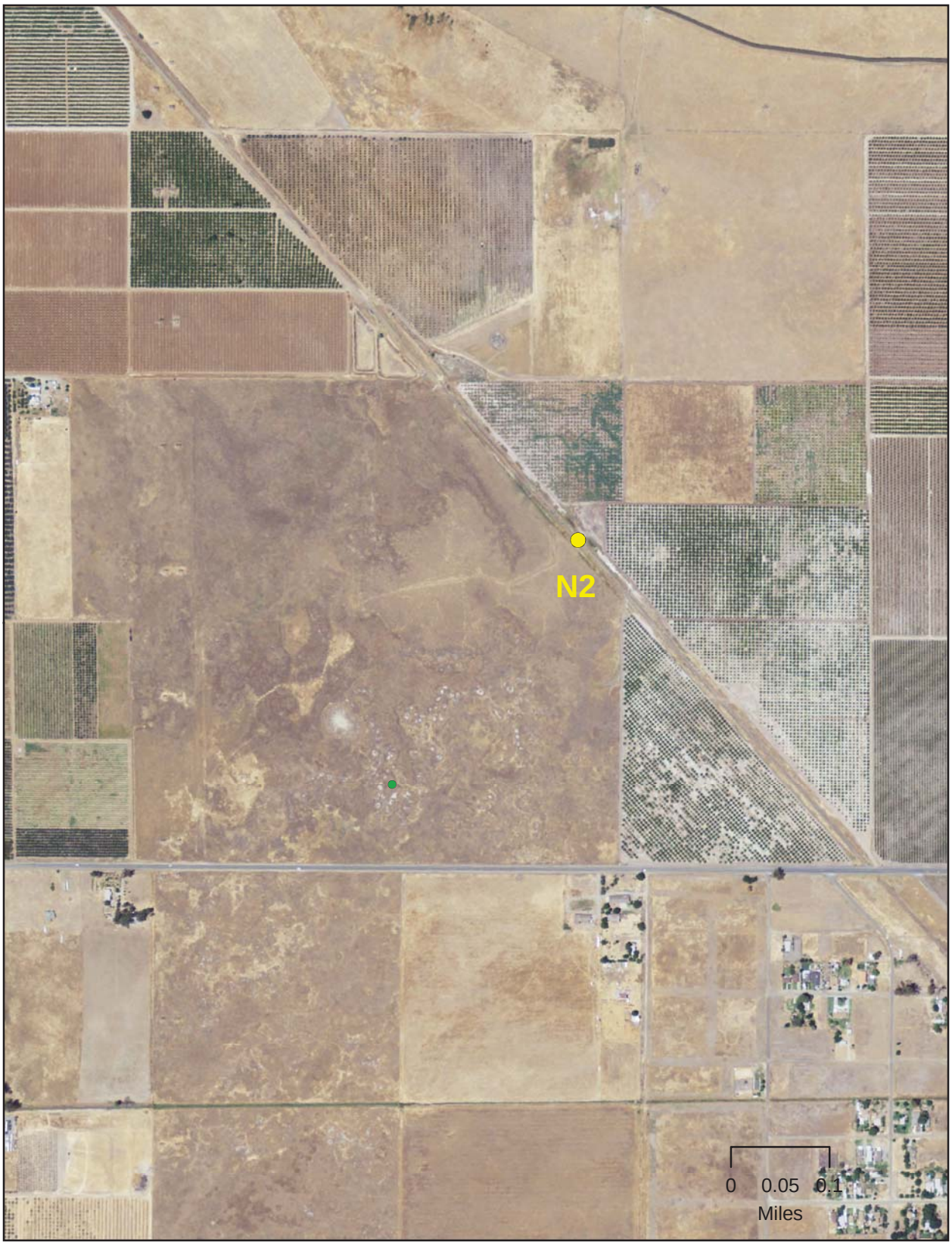
Determination: *(check one or more, and fill in blanks)*

- ☑ Keyed (cite reference): The Jepson Manual
- ☐ Compared with specimen housed at: _____
- ☐ Compared with photo / drawing in: _____
- ☐ By another person (name): _____
- ☑ Other: Personal knowledge of taxon

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☐ no ☐



Chamaesyce hooveri N2
Tulare County

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 09/05/2010

For Office Use Only

Source Code _____ Quad Code _____

Elm Code _____ Occ. No. _____

EO Index No. _____ Map Index No. _____

CVPIA 80270-8-G-137 Field Survey Form

Scientific Name: *Neostapfia colusana*

Common Name: Colusa Grass

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals 2 Subsequent Visit? ☑ yes ☐ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☑ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Carol W. Witham

Address: 1141 37th Street
Sacramento, CA 95816-5415

E-mail Address: cwitham@ncal.net

Phone: (916) 452-5440

Plant Information

Phenology: _____% vegetative _____% flowering 100% fruiting

Additional Survey Notes

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

FOUR FORMS WITH ONE MAP. Just west of Jepson Prairie Preserve, 0.8 miles southwest of where Cook Road crosses the Southern Pacific RR tracks. On the west side of the tracks. N1 on the attached 2012 NAIP image.

County: Solano Landowner / Mgr.: Private/Thompson Ranch

Quad Name: Dozier Elevation: 35 feet

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): ArcView

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ GPS Make & Model Trimble GeoXT 2005

DATUM: **NAD27** ☐ **NAD83** ☑ **WGS84** ☐ Horizontal Accuracy _____ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☐ ***OR*** Geographic (Latitude & Longitude) ☑

Coordinates: -121.833 38.269

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*

A natural extension of Olcott Lake across the tracks. Natural playa pool associated with Cressa truxelensis and Frankenia salina. Used as winter/spring cattle grazing, but was high intensity horse grazing in early 1990s. 2 plants observed in 2010. This was once probably part of Olcott Lake before the Northern Pacific RR.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☑ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: Used as winter/spring cattle grazing, but was high intensity horse grazing in early 1990s.

Visible disturbances:

Threats: The parcel has been for sale on-and-off for years. There have been rumors of ill-conceived mitigation plantings occurring on the parcel.

Comments: I observed dozens of plants in this location back in the early 2000s, and thought someone else was submitting the data.

Determination: *(check one or more, and fill in blanks)*

- ☑ Keyed (cite reference): The Jepson Manual
- ☐ Compared with specimen housed at: _____
- ☐ Compared with photo / drawing in: _____
- ☐ By another person (name): _____
- ☑ Other: Personal knowledge of taxon

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☐ no ☐

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 09/05/2010

For Office Use Only
Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

CVPIA 80270-8-G-137 Field Survey Form

Scientific Name: *Neostapfia colusana*

Common Name: Colusa Grass

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals 109 Subsequent Visit? ☑ yes ☐ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☑ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Carol W. Witham
Address: 1141 37th Street
Sacramento, CA 95816-5415
E-mail Address: cwitham@ncal.net
Phone: (916) 452-5440

Plant Information

Phenology: _____% vegetative _____% flowering 100% fruiting

Additional Survey Notes

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

FOUR FORMS WITH ONE MAP. 1.0 miles southwest of where Cook Road crosses the Southern Pacific RR tracks. Population in in a pool 0.2 miles west of the RR tracks. N2 on the attached 2012 NAIP image.

County: Solano Landowner / Mgr.: Private/Thompson Ranch

Quad Name: Dozier Elevation: 35 feet

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ GPS Make & Model Trimble GeoXT 2005

DATUM: **NAD27** ☐ **NAD83** ☑ **WGS84** ☐ Horizontal Accuracy _____ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☐ ***OR*** Geographic (Latitude & Longitude) ☑

Coordinates: -121.837 38.267
Shapefile with population boundaries in SpeciesPolygons.mdb/Witham2013New.

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*

Northernmost playa in the NW 1/4 of Section 23 on USGS topo map. Natural playa pool associated with Cressa truxelensis and Frankenia salina. Used as winter/spring cattle grazing, but was high intensity horse grazing in early 1990s. 109 plants observed in two clusters in 2010.

Please fill out separate form for other rare taxa seen at this site. Atriplex persistens occurs in this pool.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☑ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: Used as winter/spring cattle grazing, but was high intensity horse grazing in early 1990s.

Visible disturbances:

Threats: The parcel has been for sale on-and-off for years. There have been rumors of ill-conceived mitigation plantings occurring on the parcel.

Comments: I observed dozens of plants in this location back in the early 2000s, and thought someone else was submitting the data.

Determination: *(check one or more, and fill in blanks)*
- ☑ Keyed (cite reference): The Jepson Manual
- ☐ Compared with specimen housed at: _____
- ☐ Compared with photo / drawing in: _____
- ☐ By another person (name): _____
- ☑ Other: Personal knowledge of taxon

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☐ no ☐

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 09/05/2010

For Office Use Only
Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

CVPIA 80270-8-G-137 Field Survey Form

Scientific Name: *Neostapfia colusana*

Common Name: Colusa Grass

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals 51 Subsequent Visit? ☐ yes ☑ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☑ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Carol W. Witham
Address: 1141 37th Street
Sacramento, CA 95816-5415
E-mail Address: cwitham@ncal.net
Phone: (916) 452-5440

Plant Information

Phenology: _____% vegetative _____% flowering 100% fruiting

Additional Survey Notes

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

FOUR FORMS WITH ONE MAP. 1.2 miles southwest of where Cook Road crosses the Southern Pacific RR tracks. Population in in a pool 0.2 miles west of the RR tracks. N3 on the attached 2012 NAIP image.

County: Solano Landowner / Mgr.: Private/Thompson Ranch

Quad Name: Dozier Elevation: 35 feet

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ GPS Make & Model Trimble GeoXT 2005

DATUM: **NAD27** ☐ **NAD83** ☑ **WGS84** ☐ Horizontal Accuracy _____ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☐ ***OR*** Geographic (Latitude & Longitude) ☑

Coordinates: -121.839 38.265
Shapefile with population boundaries in SpeciesPolygons.mdb/Witham2013New.

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*

Southwest playa in the NW 1/4 of Section 23 on the USGS topo map. Natural playa pool associated with Cressa truxelensis and Frankenia salina. Used as winter/spring cattle grazing, but was high intensity horse grazing in early 1990s. 51 scattered plants observed in 2010.

Please fill out separate form for other rare taxa seen at this site. Atriplex persistens occurs in this pool.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☑ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: Used as winter/spring cattle grazing, but was high intensity horse grazing in early 1990s.

Visible disturbances:

Threats: The parcel has been for sale on-and-off for years. There have been rumors of ill-conceived mitigation plantings occurring on the parcel.

Comments:

Determination: *(check one or more, and fill in blanks)*

- ☑ Keyed (cite reference): The Jepson Manual
- ☐ Compared with specimen housed at: _____
- ☐ Compared with photo / drawing in: _____
- ☐ By another person (name): _____
- ☑ Other: Personal knowledge of taxon

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☐ no ☐

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 09/05/2010

For Office Use Only
Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

CVPIA 80270-8-G-137 Field Survey Form

Scientific Name: *Neostapfia colusana*

Common Name: Colusa Grass

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals >100 Subsequent Visit? ☐ yes ☑ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☑ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Carol W. Witham
Address: 1141 37th Street
Sacramento, CA 95816-5415
E-mail Address: cwitham@ncal.net
Phone: (916) 452-5440

Plant Information

Phenology: _____% vegetative _____% flowering 100% fruiting

Additional Survey Notes

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

FOUR FORMS WITH ONE MAP. 1.55 miles southwest of where Cook Road crosses the Southern Pacific RR tracks. Population is immediately west of the tracks. N4 on the attached 2012 NAIP image.

County: Solano Landowner / Mgr.: Private/Hamilton Ranch

Quad Name: Dozier Elevation: 35 feet

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ GPS Make & Model Trimble GeoXT 2005

DATUM: **NAD27** ☐ **NAD83** ☑ **WGS84** ☐ Horizontal Accuracy _____ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☐ ***OR*** Geographic (Latitude & Longitude) ☑

Coordinates: -121.840 38.259
Shapefile with population boundaries in SpeciesPolygons.mdb/Witham2013New.

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*

Southwestern most playa in Section 23 on the USGS topo map. Natural playa pool associated with Cressa truxelensis and Frankenia salina. Used as winter/spring cattle grazing and occasionally sheep. >100 plants in two clusters mapped in 2010. Scar from pipeline runs between the two clusters.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☑ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: Used as winter/spring cattle grazing and occasionally sheep.

Visible disturbances: Deep tractor tracks in pool in 2010. Appears that the tractor discing fire breaks became mired in the playa.

Threats:

Comments: Hamilton Ranch. In the playa where the original (not the 1993 realignment) PGE gas pipeline went under the RR tracks. Two clusters of plants.

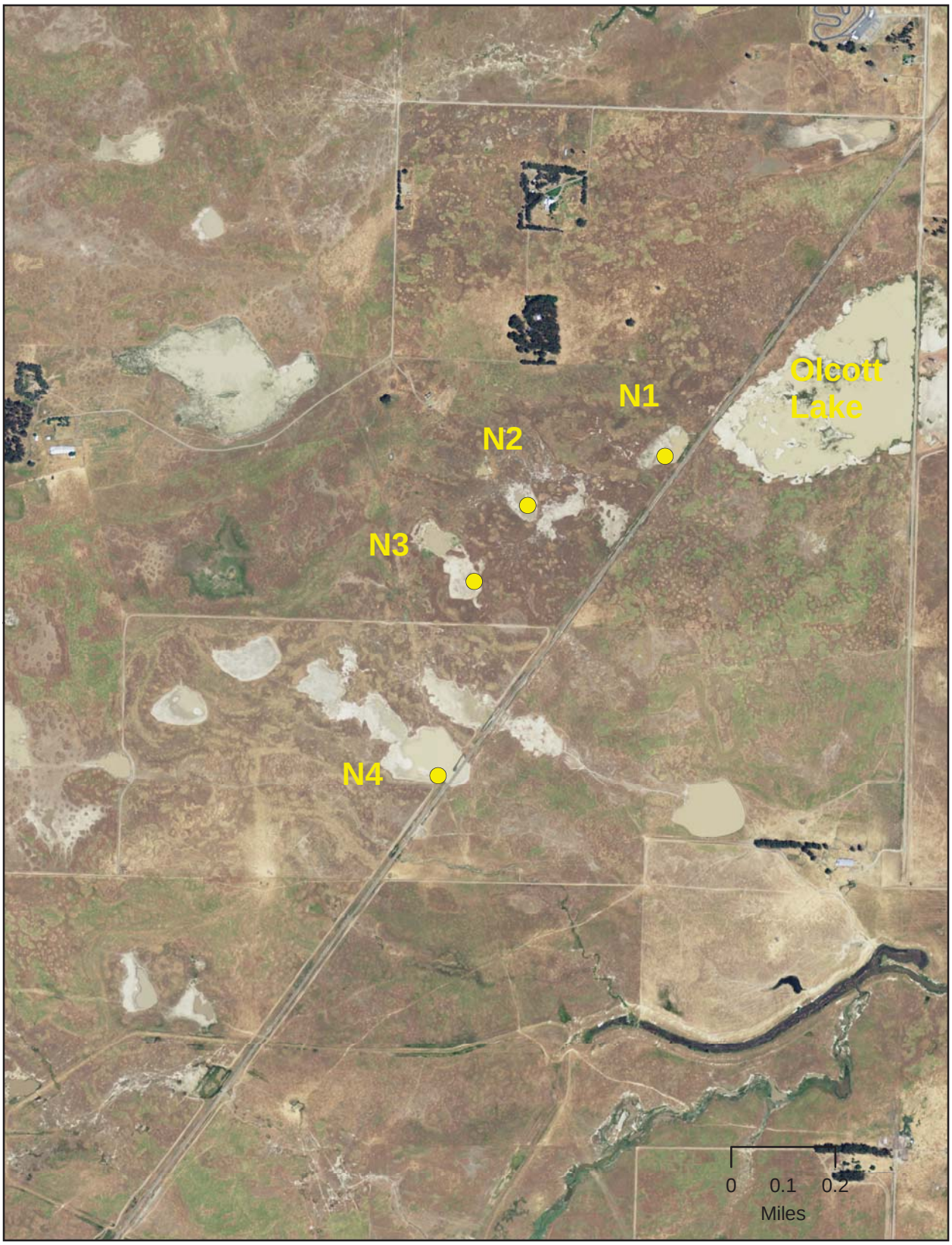
Determination: *(check one or more, and fill in blanks)*

- ☑ Keyed (cite reference): The Jepson Manual
- ☐ Compared with specimen housed at: _____
- ☐ Compared with photo / drawing in: _____
- ☐ By another person (name): _____
- ☑ Other: Personal knowledge of taxon

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☐ no ☐



Neostapfia colusana N1, N2, N3, N4
Solano County

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 09/22/2011

For Office Use Only
Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

CVPIA 80270-8-G-137 Field Survey Form

Scientific Name: *Neostapfia colusana*

Common Name: Colusa Grass

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals >100,000 Subsequent Visit? ☐ yes ☑ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☑ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Carol W. Witham
Address: 1141 37th Street
Sacramento, CA 95816-5415
E-mail Address: cwitham@ncal.net
Phone: (916) 452-5440

Plant Information

Phenology: _____% vegetative _____% flowering 100% fruiting

Additional Survey Notes

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

Merced County, 2.0 miles due east of Yosemite Lake Road and the Campus entrance. Located in the large playa on the Virginia Smith Trust (where the Branchinecta conservatio was found). N5 on the attached 2012 NAIP image.

County: Merced Landowner / Mgr.: UC Merced

Quad Name: _____ Elevation: _____

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ GPS Make & Model Trimble GeoXT 2005

DATUM: NAD27 ☐ NAD83 ☑ WGS84 ☐ Horizontal Accuracy _____ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☐ *OR* Geographic (Latitude & Longitude) ☑

Coordinates: -120.394 37.362
Shapefile with population boundaries in SpeciesPolygons.mdb/Witham2013New.

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*

Large natural playa pool NECO dominant in pool associated with Eryngium castrense, Lythrum hyssopifolia and Plagiobothrys stipitatus. On Raynor Clay. May not pond every year (was not observed by Stone et al (1988) or by EIP when they did the Virginia Smith Trust surveys).

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☑ Excellent ☐ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: Used as winter/spring cattle grazing.

Visible disturbances:

Threats: The biggest threat to this population is future research use by UC Merced.

Comments: Stone et al (1988) identified it as potential but unoccupied habitat for NECO and ORIN. EIP seems to have missed it entirely. Bob Holland says he has known about it for years. He also says that Orcuttia inaequalis also occurs here, but none found in 2011.

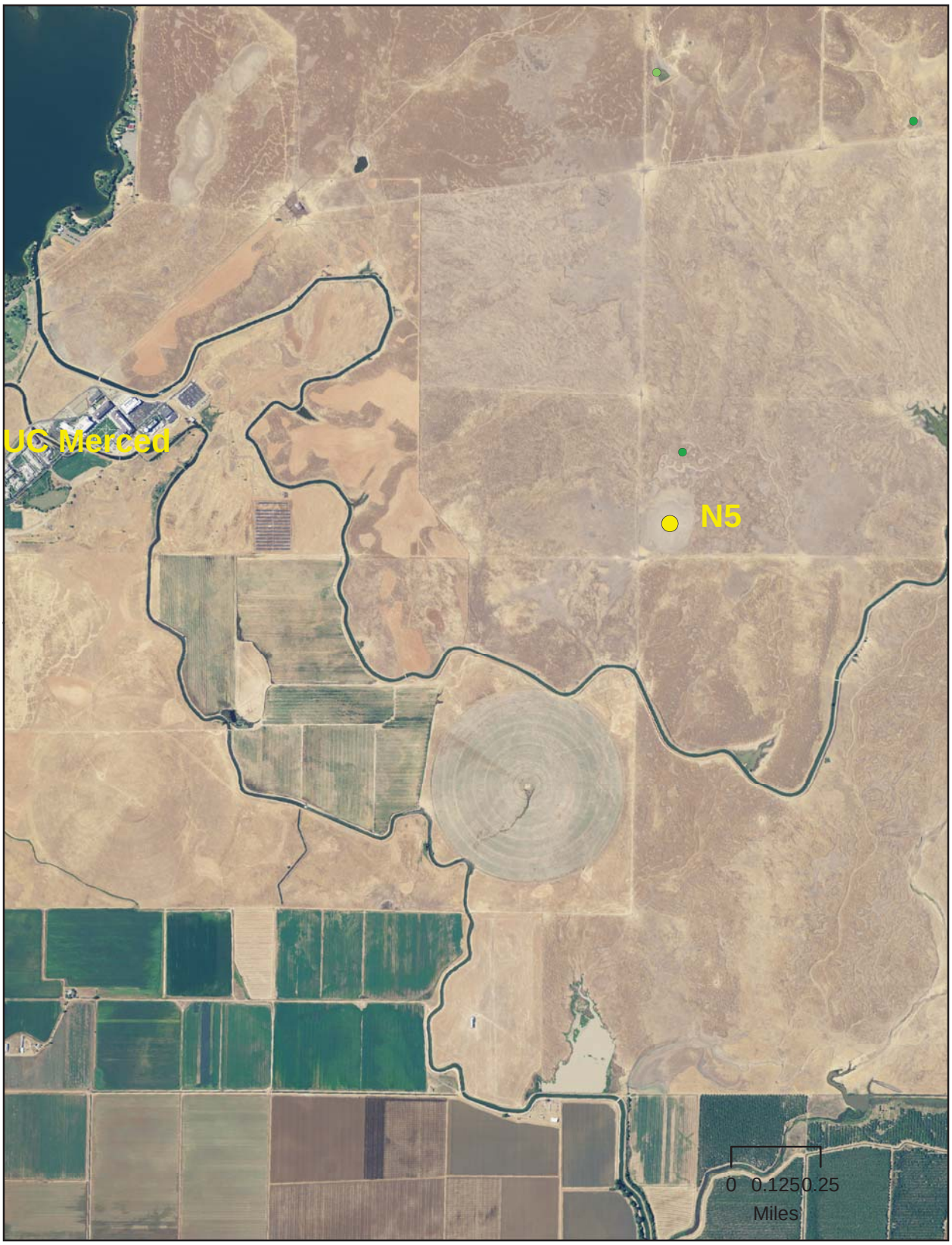
Determination: *(check one or more, and fill in blanks)*

- ☑ Keyed (cite reference): The Jepson Manual
- ☐ Compared with specimen housed at: _____
- ☐ Compared with photo / drawing in: _____
- ☐ By another person (name): _____
- ☑ Other: Personal knowledge of taxon

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☑
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☑ no ☐



Neostapfia colusana N5
Merced County

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 10/15/2011

For Office Use Only
Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

CVPIA 80270-8-G-137 Field Survey Form

Scientific Name: *Neostapfia colusana*

Common Name: Colusa Grass

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals ~50 Subsequent Visit? ☐ yes ☑ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☑ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Carol W. Witham
Address: 1141 37th Street
Sacramento, CA 95816-5415
E-mail Address: cwitham@ncal.net
Phone: (916) 452-5440

Plant Information

Phenology: _____% vegetative _____% flowering 100% fruiting

Additional Survey Notes

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

Yolo Grasslands Regional Park. Easternmost 2 of 3 created pools. Mostly bare ground. N5 on the attached 2012 NAIP image.

County: Yolo Landowner / Mgr.: Yolo County
Quad Name: _____ Elevation: _____
T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS
T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ GPS Make & Model Trimble GeoXT 2005
DATUM: **NAD27** ☐ **NAD83** ☑ **WGS84** ☐ Horizontal Accuracy _____ meters/feet
Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☐ ***OR*** Geographic (Latitude & Longitude) ☑
Coordinates: -121.688 38.494
Shapefile with population boundaries in SpeciesPolygons.mdb/Witham2013New.

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*

Easternmost 2 of 3 created pools. Mostly bare ground. New pools inoculated by John Gerlach. Actual census data should be obtained from John.

Please fill out separate form for other rare taxa seen at this site. Tuctoria mucronata also present in two of the created pools.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☐ Good ☑ Fair ☐ Poor

Immediate AND surrounding land use: Grazing management is an issue on this site. Passive recreation nearby.

Visible disturbances:

Threats: Some previous issues with mis-management of the area including grazing management and firebreak management.

Comments: Although within 1/4 mile of EO#49, being reported separately because these are introduced populations in created pools.

Determination: *(check one or more, and fill in blanks)*
☑ Keyed (cite reference): The Jepson Manual
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☐ By another person (name): _____
☑ Other: Personal knowledge of taxon

Photographs: *(check one or more)* Slide Print Digital
Plant / animal ☐ ☐ ☐
Habitat ☐ ☐ ☐
Diagnostic feature ☐ ☐ ☐

May we obtain duplicates at our expense? yes ☐ no ☐

DFG/BDB/1747 Rev. 6/16/09

Neostapfia colusana N6
Yolo County

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 05/01/2003

For Office Use Only
Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

CVPIA 80270-8-G-137 Field Survey Form

Scientific Name: *Orcuttia tenuis*

Common Name: Slender orcutt grass

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals 1,000 Subsequent Visit? ☐ yes ☑ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☑ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Carol W. Witham
Address: 1141 37th Street
Sacramento, CA 95816-5415
E-mail Address: cwitham@ncal.net
Phone: (916) 452-5440

Plant Information

Phenology: _____% vegetative 100 % flowering _____% fruiting

Additional Survey Notes

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

ONE FORM WITH TWO MAPS. Shallow playa approximately 1/2 mile north Laniger Lakes. Surveyed in 2003 (early May but exact date unknown) with LSA Associates staff. Population is documented in mitigation banking proposal. Attached map is from that proposal. See also N1 on aerial.

County: Tehama Landowner / Mgr.: Private/Hamilton Ranch

Quad Name: _____ Elevation: 250 ft

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): ArcView

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ GPS Make & Model _____

DATUM: **NAD27** ☐ **NAD83** ☑ **WGS84** ☐ Horizontal Accuracy _____ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☐ ***OR*** Geographic (Latitude & Longitude) ☑

Coordinates: -122.037 39.979

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*

A shallow playa pool approximately 1/2 mile north of Laninger Lakes.

I was denied access to this proposed mitigation bank in 2010 and 2011, so could not update occurrence information.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☑ Excellent ☐ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: Seasonal cattle grazing lands, immediate proposed for bank, surrounding under conservation easement.

Visible disturbances: None observed.

Threats: None observed.

Comments:

Determination: *(check one or more, and fill in blanks)*

- ☑ Keyed (cite reference): The Jepson Manual
- ☐ Compared with specimen housed at: _____
- ☐ Compared with photo / drawing in: _____
- ☐ By another person (name): _____
- ☑ Other: Personal knowledge of taxon

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☐ no ☐

N

0 500 Feet

Mitigation Site Boundary
Stream
Vernal Pool
Vernal Swale
Clay Flat
Backwater Channel

Vernal Pool Invertebrates
- Conservancy Fairy Shrimp
- California Linderiella
- Vernal Pool Tadpole Shrimp
- Vernal Pool Fairy Shrimp

Plants
- Greene's Tuctoria (1987)
- Hoover's Spurge
- Slender Orcutt Grass

Juniper Gulch

LSA

Figure 5

SOURCE: USGS Digital Orthophotoquad, Vina NE, CA 1998

I:\EVI730\GIS\delin.apr (9/16/03)

Hamilton Ranch Mitigation Site
Special Status Species Locations

Orcuttia tenuis N1
Tehama County

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 07/01/2009

For Office Use Only

Source Code _____ Quad Code _____

Elm Code _____ Occ. No. _____

EO Index No. _____ Map Index No. _____

CVPIA 80270-8-G-137 Field Survey Form

Scientific Name: *Orcuttia tenuis*

Common Name: Slender orcutt grass

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals 10,000s Subsequent Visit? ☐ yes ☑ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☑ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Carol W. Witham

Address: 1141 37th Street
Sacramento, CA 95816-5415

E-mail Address: cwitham@ncal.net

Phone: (916) 452-5440

Plant Information

Phenology: _____% vegetative 100 % flowering _____% fruiting

Additional Survey Notes

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

ONE FORM WITH TWO MAPS. 0.95 miles northeast of the northern tip of the runway of the Redding Municipal Airport. Attached map is from the City of Redding. See also N2 on the 2012 NAIP aerial.

County: Shasta Landowner / Mgr.: City of Redding?

Quad Name: _____ Elevation: 250 ft

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): ArcView

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ GPS Make & Model _____

DATUM: **NAD27** ☐ **NAD83** ☑ **WGS84** ☐ Horizontal Accuracy _____ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☐ ***OR*** Geographic (Latitude & Longitude) ☑

Coordinates: -122.279 40.528

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*

Large "horsershoe" shaped pond in Stillwater Business Park. Plants strongly associated with the Eryngium zone of the pond margin. 10,000s of plants seen in 2009 survey of the site. Apparently site was originally discovered in 2003.

Data and maps were obtained from Heather Kelly. No access.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☑ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use:

Visible disturbances:

Threats: The survey was associated with a proposed business park development.

Comments:

Determination: *(check one or more, and fill in blanks)*

- ☑ Keyed (cite reference): The Jepson Manual
- ☐ Compared with specimen housed at: _____
- ☐ Compared with photo / drawing in: _____
- ☐ By another person (name): _____
- ☑ Other: Personal knowledge of taxon

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☐ no ☐

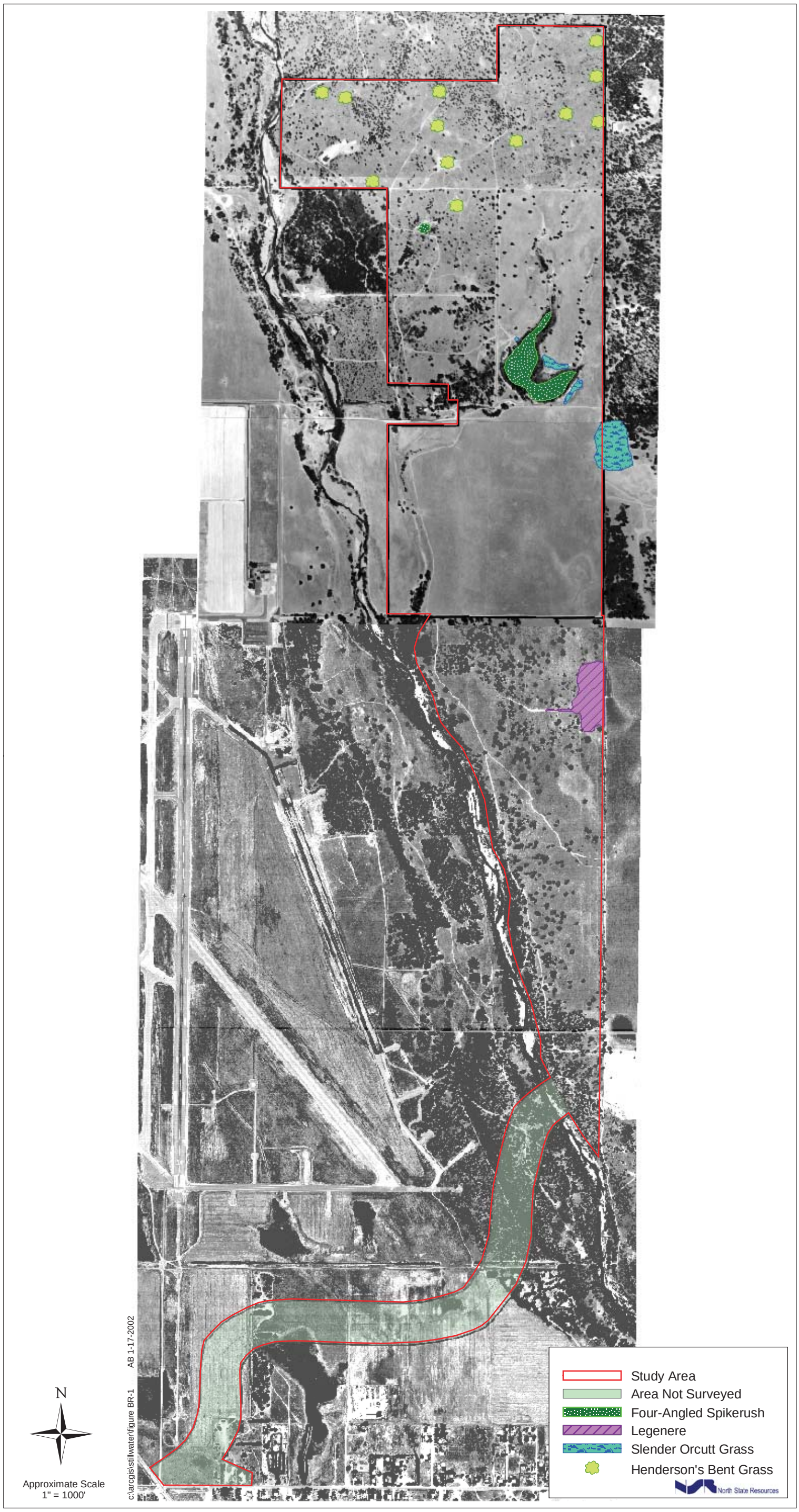
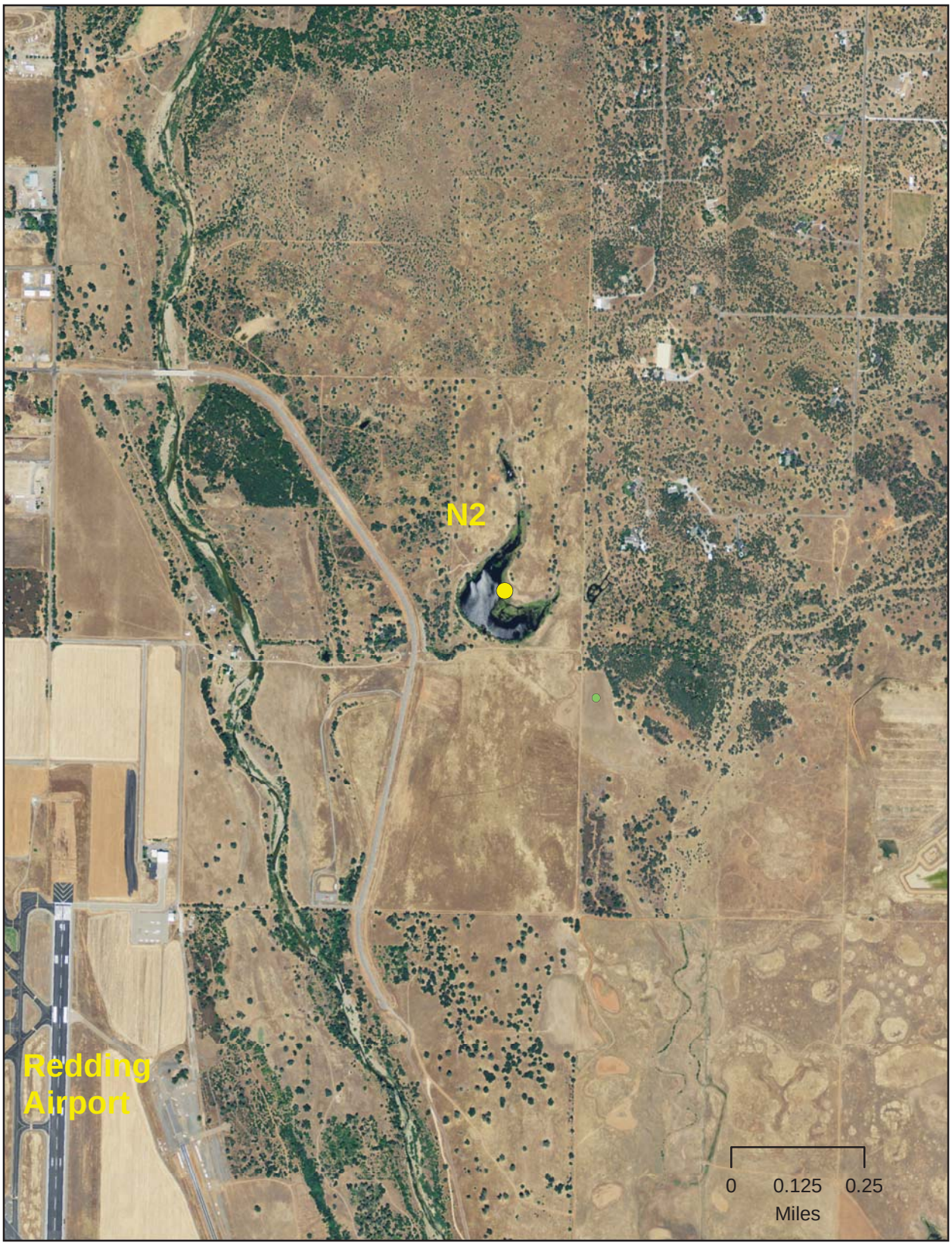


FIGURE BR-1
Special-Status Floral Species Within the Project Area



Orcuttia tenuis N2
Shasta County

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 07/01/2008

For Office Use Only
Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

CVPIA 80270-8-G-137 Field Survey Form

Scientific Name: *Orcuttia viscida*

Common Name: Sacramento orcutt grass

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals 1,000s Subsequent Visit? ☐ yes ☑ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☑ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Carol W. Witham
Address: 1141 37th Street
Sacramento, CA 95816-5415
E-mail Address: cwitham@ncal.net
Phone: (916) 452-5440

Plant Information

Phenology: _____% vegetative _____% flowering 100% fruiting

Additional Survey Notes

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

Rancho Cordova, approximately 1.44 air mi north of Douglas Blvd and 0.5 air mi west of Grant Line Road. In large pool on a Bluff south of White Rock Road. N1 on attached 2012 NAIP image.

County: Sacramento Landowner / Mgr.: Private/Proposed Heritage Falls Project

Quad Name: _____ Elevation: _____

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): ArcView

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ GPS Make & Model _____

DATUM: **NAD27** ☐ **NAD83** ☑ **WGS84** ☐ Horizontal Accuracy _____ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☐ ***OR*** Geographic (Latitude & Longitude) ☑

Coordinates: -121.196 38.580

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*

Large pool within a proposed development. Orcuttia viscida was dominant species in photographs from which I verified its identification.

Mapped location was inferred from a conversation with the photographer. There may be more than one occupied pool on the site.

I have not been able to obtain permission to access the site to very the population status during 2010-2012 field seasons. However, from the 2008 photograph, I believe the population may be persistent and large.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☑ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: Currently seasonal cattle grazing.

Visible disturbances:

Threats: Within the City of Rancho Cordova, Sunrise Douglas Community Plan, and a proposed development project called: Heritage Falls.

Comments: Source of information on this site was through verifying the plant's identity via photographs. 1,000s of plants evident in photos from 2008. Exact date the site was visited is unknown, but occurred in July of 2008.

Determination: *(check one or more, and fill in blanks)*

- ☑ Keyed (cite reference): The Jepson Manual
- ☐ Compared with specimen housed at: _____
- ☐ Compared with photo / drawing in: _____
- ☐ By another person (name): _____
- ☑ Other: Personal knowledge of taxon

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☑
Habitat	☐	☐	☑
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☐ no ☐

Orcuttia viscida N1
Sacramento County

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 07/12/2011

For Office Use Only

Source Code _____ Quad Code _____

Elm Code _____ Occ. No. _____

EO Index No. _____ Map Index No. _____

CVPIA 80270-8-G-137 Field Survey Form

Scientific Name: *Tuctoria greenei*

Common Name: Greene's Tuctoria

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals 100s Subsequent Visit? ☐ yes ☑ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☑ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Carol W. Witham

Address: 1141 37th Street
Sacramento, CA 95816-5415

E-mail Address: cwitham@ncal.net

Phone: (916) 452-5440

Plant Information

Phenology: _____% vegetative 100 % flowering _____% fruiting

Additional Survey Notes

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

ONE FORM WITH TWO MAPS. Llano Seco Unit of USFWS Sacramento NWR. 0.8 miles SSW of the visitors entrance on 7 Mile Road. Pools #4 and #6 may constitute a single EO. See attached Google Earth map and 2012 NAIP aerial image.

County: Butte Landowner / Mgr.: USFWS, Sacramento NWR

Quad Name: _____ Elevation: _____

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): ArcView

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ GPS Make & Model _____

DATUM: **NAD27** ☐ **NAD83** ☐ **WGS84** ☑ Horizontal Accuracy _____ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☐ ***OR*** Geographic (Latitude & Longitude) ☑

Coordinates: Pool 4: -121.918 39.594; Pool 6: -121.917, 39.593; and Pool 11: -121.915 39.585

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*

Created vernal pools. Seeded in 2010 as part of a Masters project by Erin Gottschalk Fisher. Plants present in 2011 and 2012 in all three seeded pools.

2012 data courtesy of Erin Gottschalk Fisher: Pool 4: 2,009 plants; Pool 6: 51 plants; and Pool 11: 110 plants.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☑ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: National Wildlife Refuge

Visible disturbances: Site had been ungrazed for some time when I visited in 2011. Eventually grazing needs to be returned.

Threats:

Comments: Site visited 07-12-2011. Data from 2012 courtesy of Erin Gottschalk Fisher. She only counted reproductive plants, and not seedlings that perished before reaching maturity.

Determination: *(check one or more, and fill in blanks)*

- ☑ Keyed (cite reference): The Jepson Manual
- ☐ Compared with specimen housed at: _____
- ☐ Compared with photo / drawing in: _____
- ☐ By another person (name): _____
- ☑ Other: Personal knowledge of taxon

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☐ no ☐

DFG/BDB/1747 Rev. 6/16/09


Pool 4
Pool 6
Pool 11
© 2012 Google
7 Mile Rd
1899 ft
Imagery Date: 6/26/2011
1998
39°35'13.15" N 121°54'20.89" W elev 107 ft
Eye alt 8324 ft
Google earth

Tuctoria greenei N1, N2, N3
Butte County

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 10/15/2011

For Office Use Only

Source Code _____ Quad Code _____

Elm Code _____ Occ. No. _____

EO Index No. _____ Map Index No. _____

CVPIA 80270-8-G-137 Field Survey Form

Scientific Name: *Tuctoria mucronata*

Common Name: Solano Grass

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals ~50 Subsequent Visit? ☐ yes ☑ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☑ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Carol W. Witham

Address: 1141 37th Street
Sacramento, CA 95816-5415

E-mail Address: cwitham@ncal.net

Phone: (916) 452-5440

Plant Information

Phenology: _____% vegetative _____% flowering 100% fruiting

Additional Survey Notes

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

Yolo Grasslands Regional Park. Westernmost 2 of 3 created pools. Mostly bare ground. N1 on the attached 2012 NAIP image.

County: Yolo Landowner / Mgr.: Yolo County

Quad Name: _____ Elevation: _____

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ GPS Make & Model Trimble GeoXT 2005

DATUM: **NAD27** ☐ **NAD83** ☑ **WGS84** ☐ Horizontal Accuracy _____ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☐ ***OR*** Geographic (Latitude & Longitude) ☑

Coordinates: -121.689 38.495
Shapefile with population boundaries in SpeciesPolygons.mdb/Witham2013New.

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*

Westernmost 2 of 3 created pools. Mostly bare ground. New pools inoculated by John Gerlach. Actual census data should be obtained from John.

Please fill out separate form for other rare taxa seen at this site. Neostapfia colusana also present in two of the created pools.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☐ Good ☑ Fair ☐ Poor

Immediate AND surrounding land use: Grazing management is an issue on this site. Passive recreation nearby.

Visible disturbances:

Threats: Some previous issues with mis-management of the area including grazing management and firebreak management.

Comments: Although within 1/4 mile of EO#3, being reported separately because these are introduced populations in created pools.

Determination: *(check one or more, and fill in blanks)*

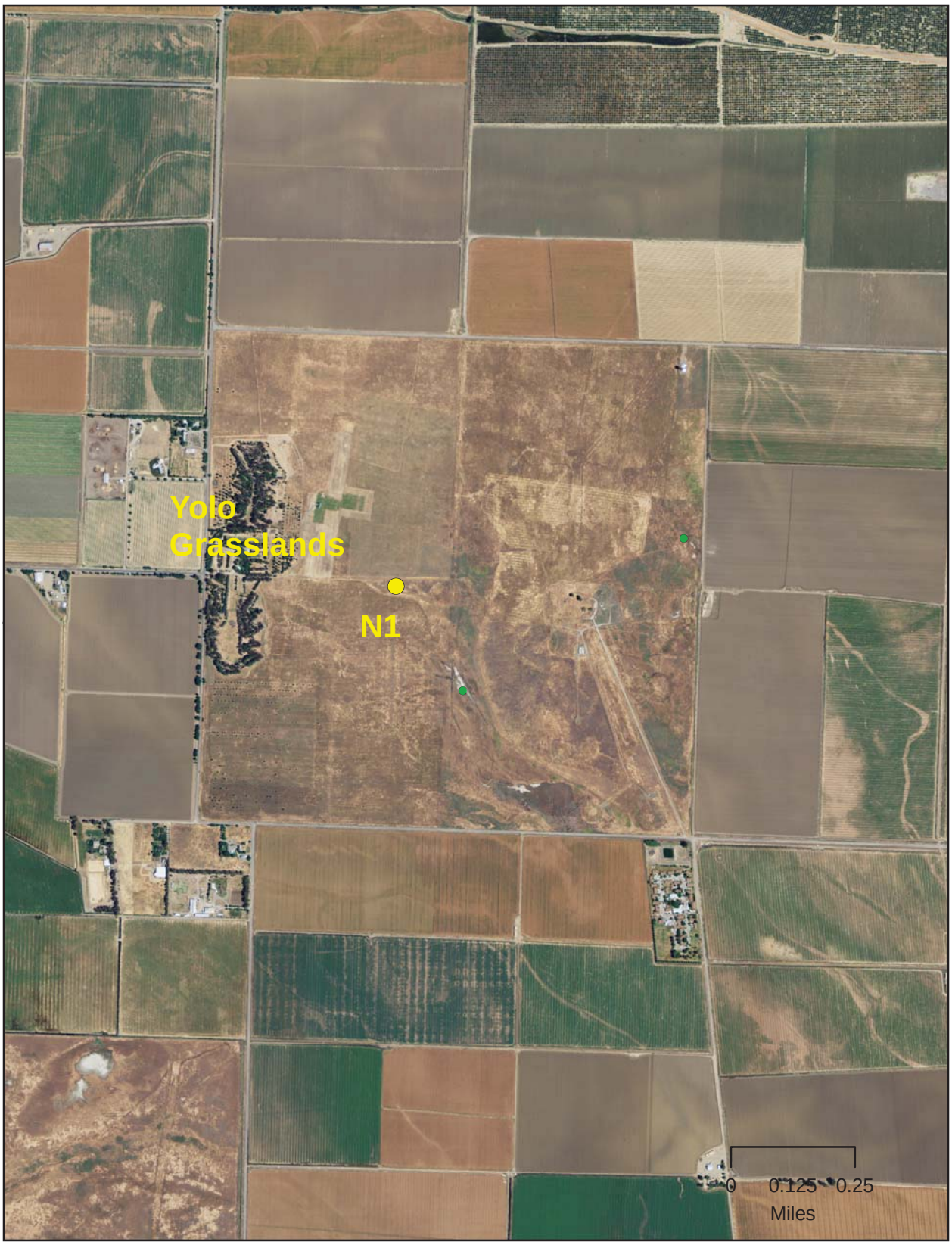
- ☑ Keyed (cite reference): The Jepson Manual
- ☐ Compared with specimen housed at: _____
- ☐ Compared with photo / drawing in: _____
- ☐ By another person (name): _____
- ☑ Other: Personal knowledge of taxon

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☐ no ☐

DFG/BDB/1747 Rev. 6/16/09



Tuctoria mucronata N1
Yolo County

Status Surveys for Seven Federally Listed Vernal Pool Grasses and *Chamaesyce hooveri* in the Sacramento and San Joaquin Valleys (Great Valley), California, USA

Grant Agreement: 80270-8-G137

APPENDIX E:

MAPS OF KEY REGIONS

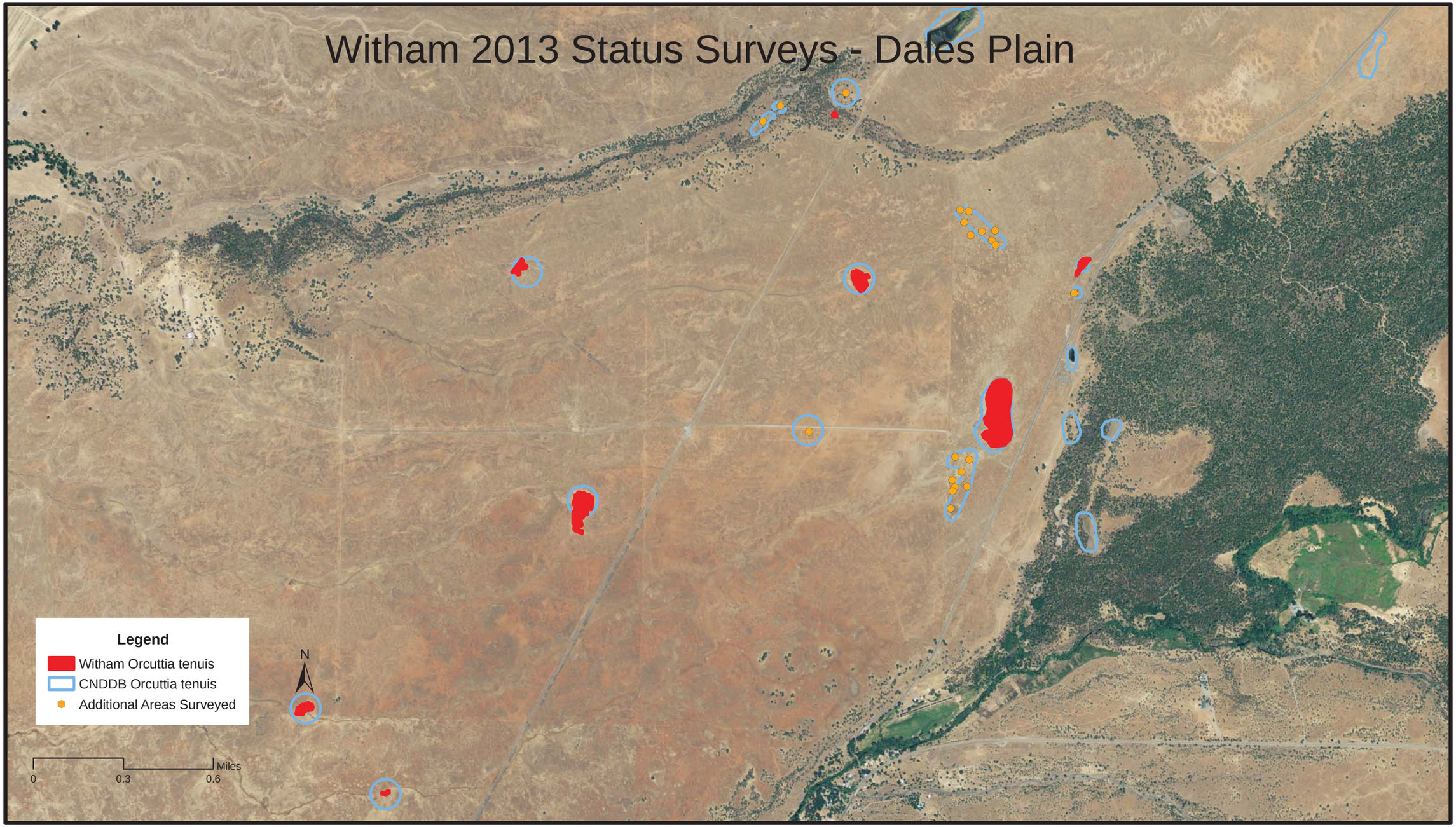
Appendix E

Notes

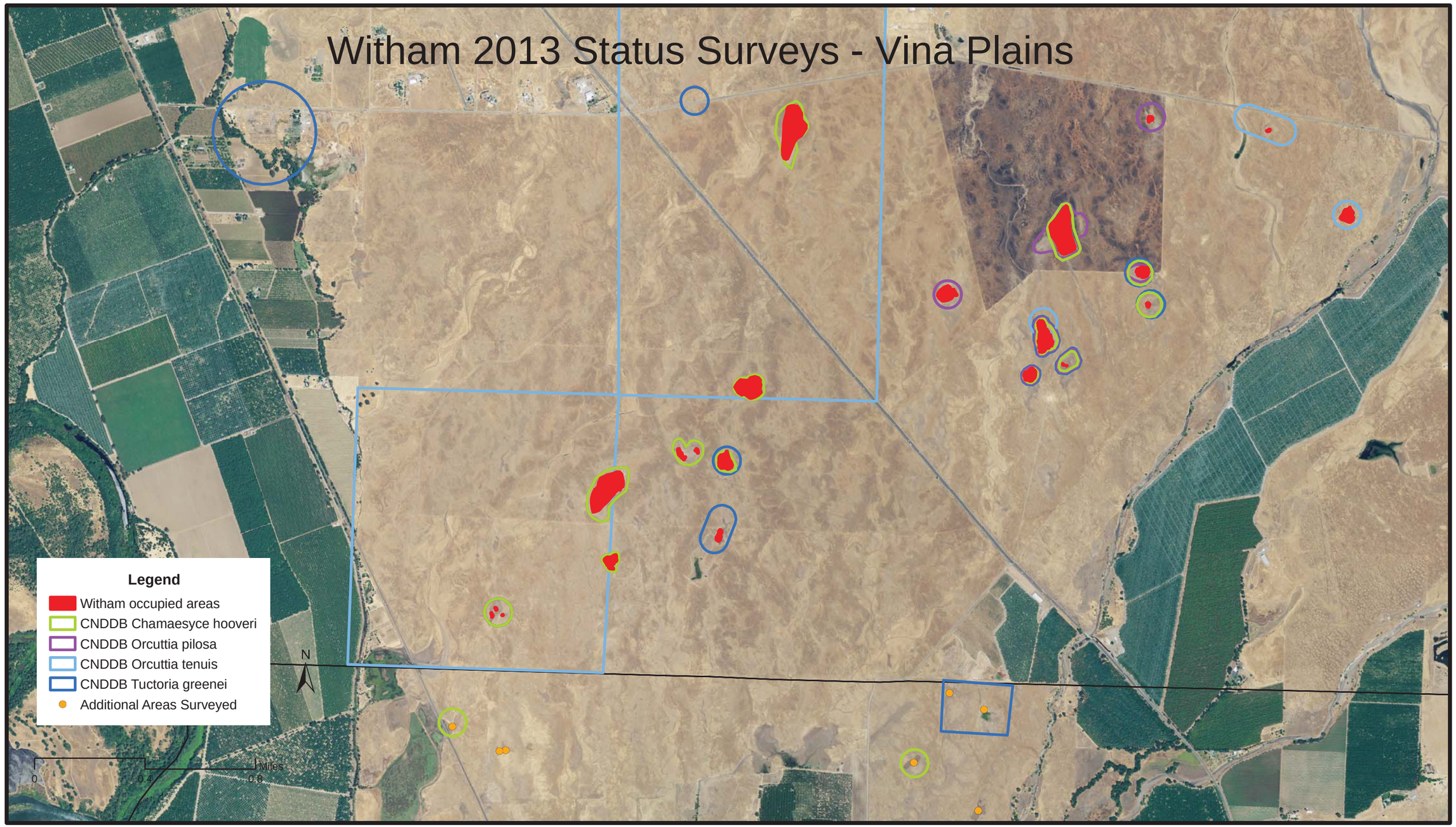
The following maps (actually GIS polygons depicted on 2012 NAIP aerial imagery) are intended to illustrate the vast amount of data collected and processed during this project. Individuals wishing to view other areas of interest, or individual records, should utilize the GIS data that accompany this report (also available at www.vernalpools.org). Descriptions of the geodatabase and other data files may be found Appendix I.

Table of Contents

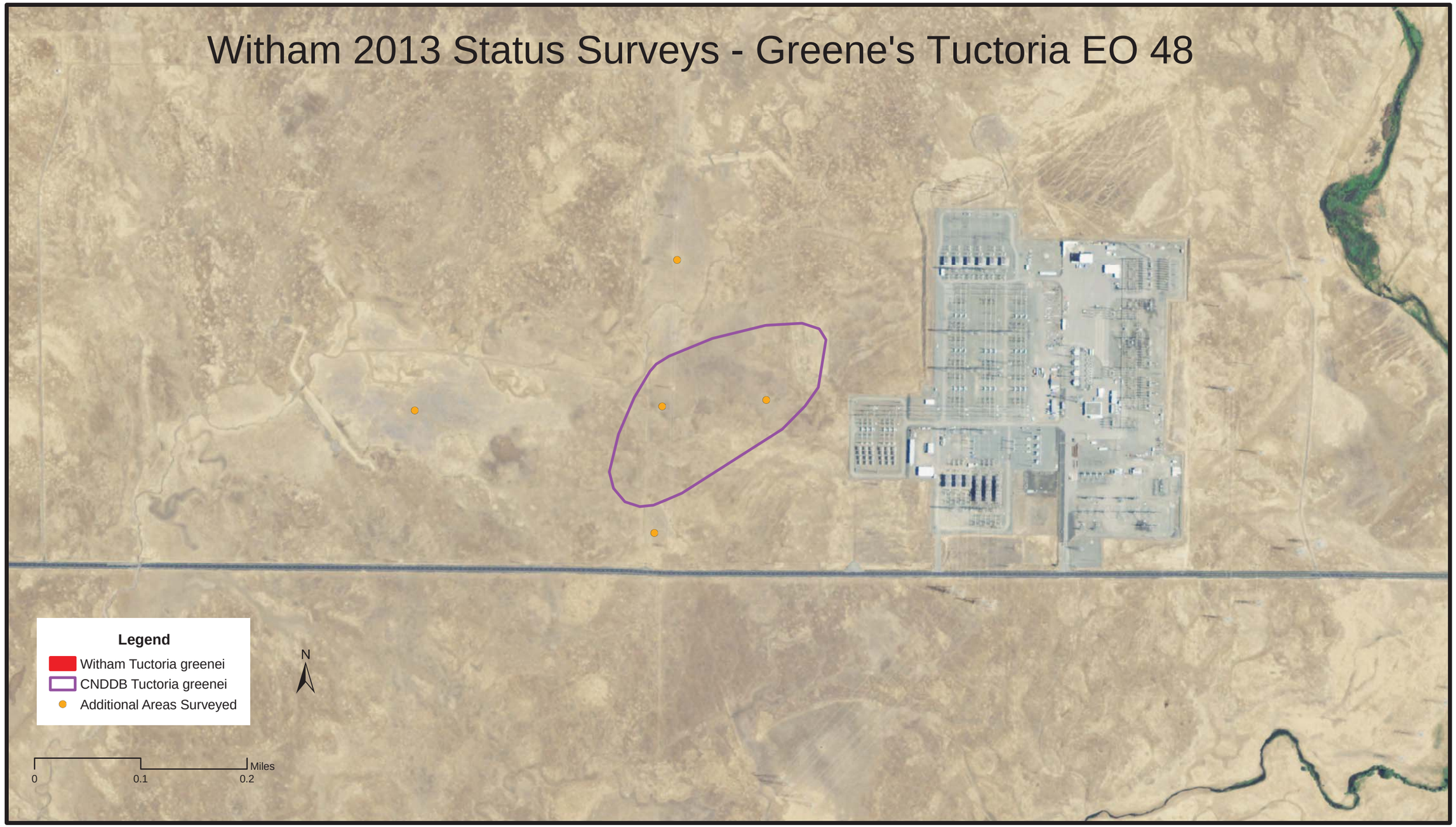
Slender Orcutt Grass (EO 2) on private property in the City of Redding in Tehama County. Outline shows CNDDB mapping. Solid Red shows occupied area in 2010. Odd signatures (created pools?) south of the mapped occurrence were not present at the time of the field survey and were not inspected.



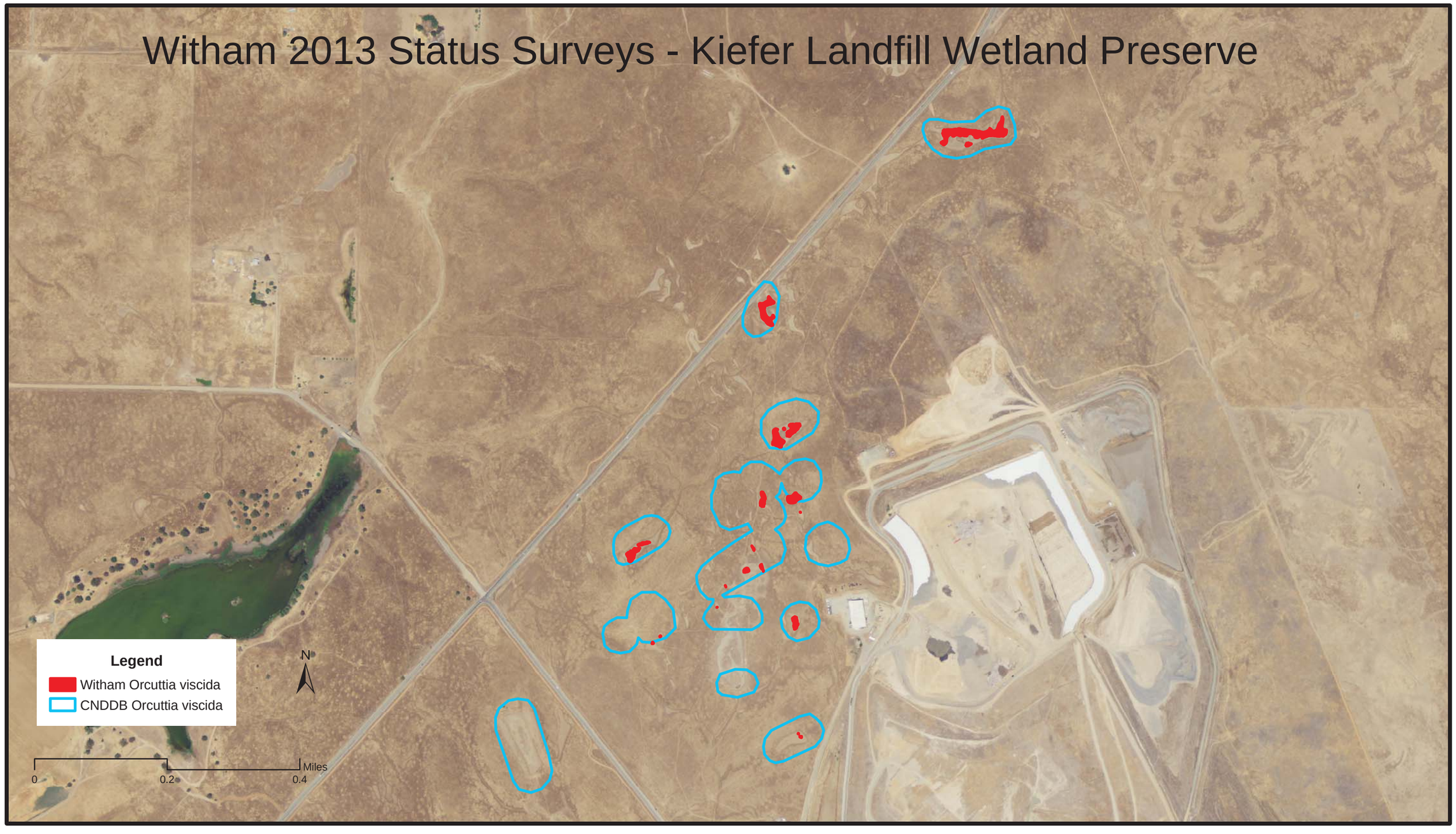
Slender Orcutt Grass (various EOs) on the DFW Dales Lake ER, BLM and private property in Tehama County. Outline shows CNDDB mapping. Solid Red shows occupied area in 2010.



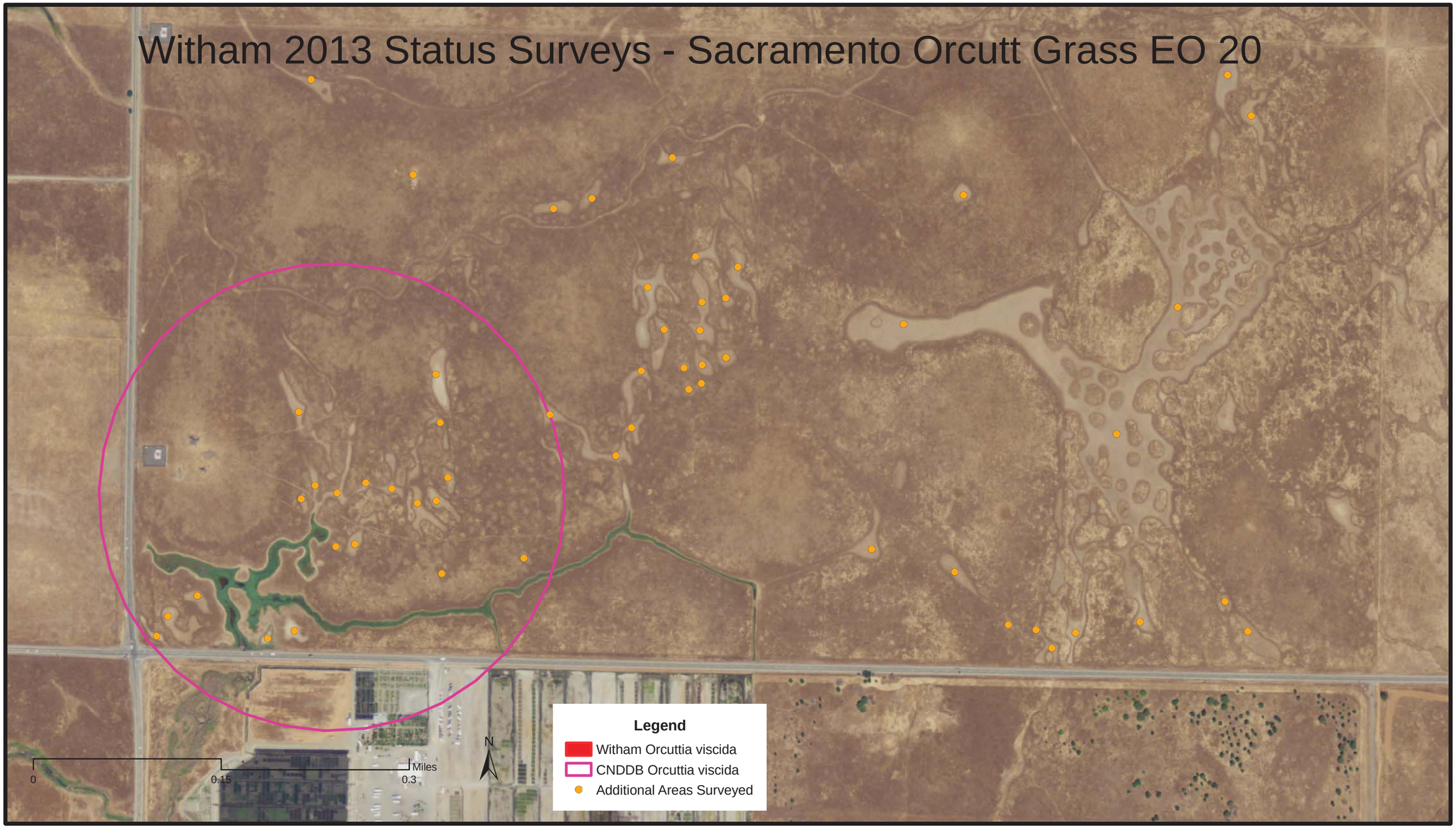
Hoover's Spurge, Hairy Orcutt Grass, Spender Orcutt Grass and Greene's Tuctoria (all various EOs) on the Vina Plains of Butte and Tehama County. Outlines are CNDDB polygons. Solid red shows occupied habitat (of the various species) as mapped during the 2011 survey.



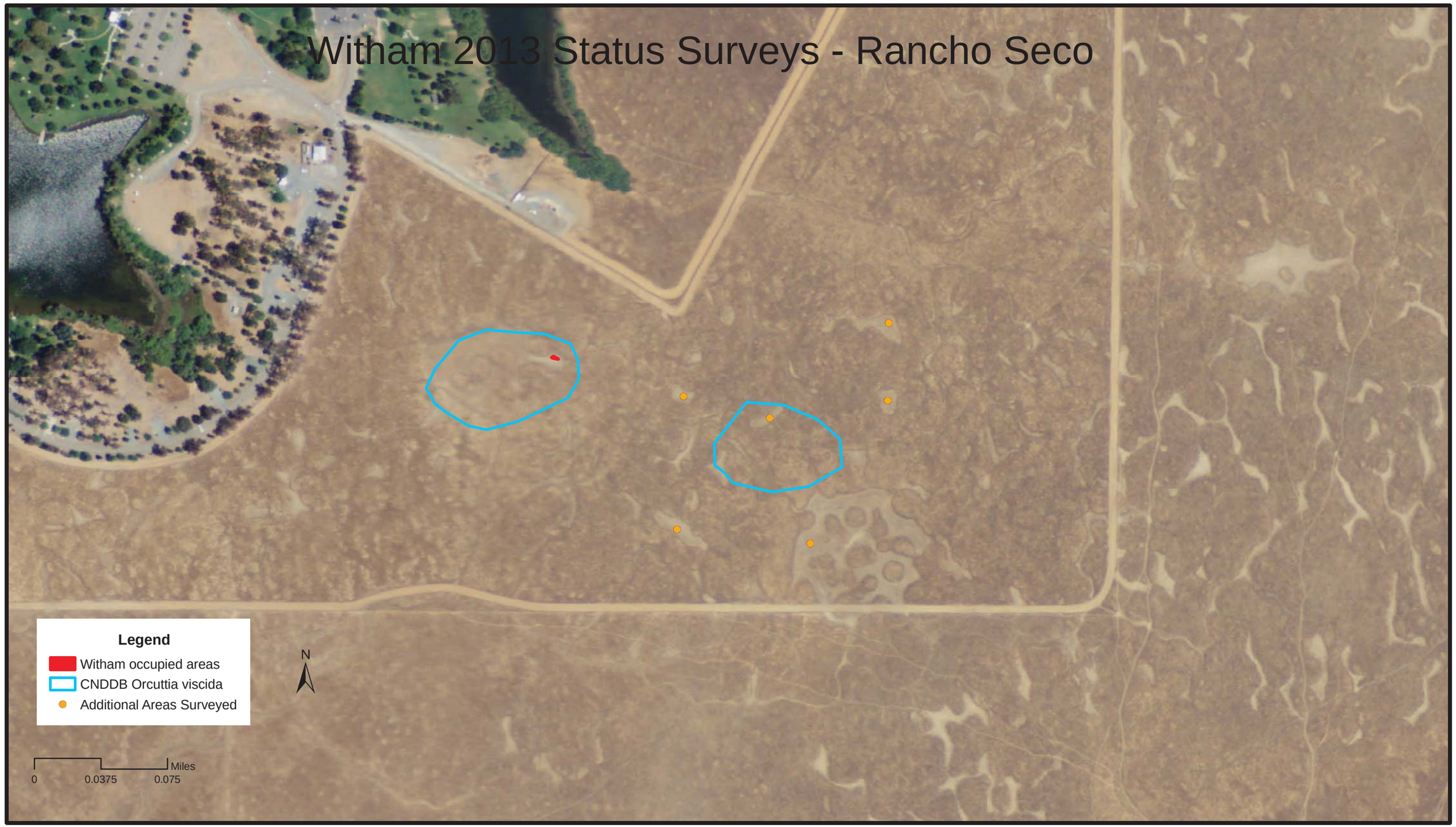
Greene's Tuctoria (EO 48) on private property along Cottonwood Road in Butte County. Outline shows CNDDB mapping. No plants observed in 2011.



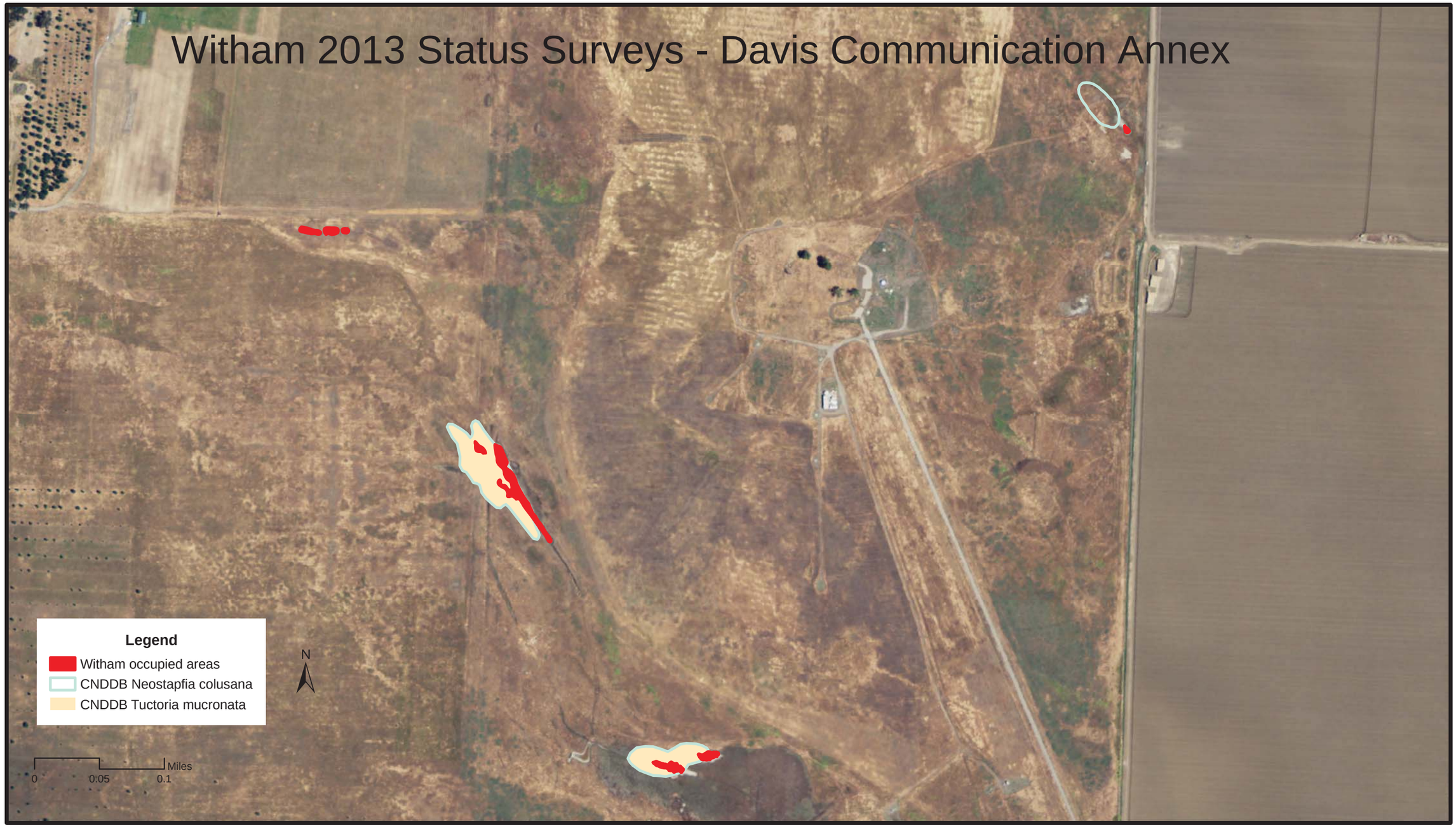
Sacramento Orcutt Grass (EOs 1 & 6) on the Keifer Preserve in Sacramento County. Outlines show how occurrence is mapped in the CNDDB. Solid Red shows occupied area in 2011.



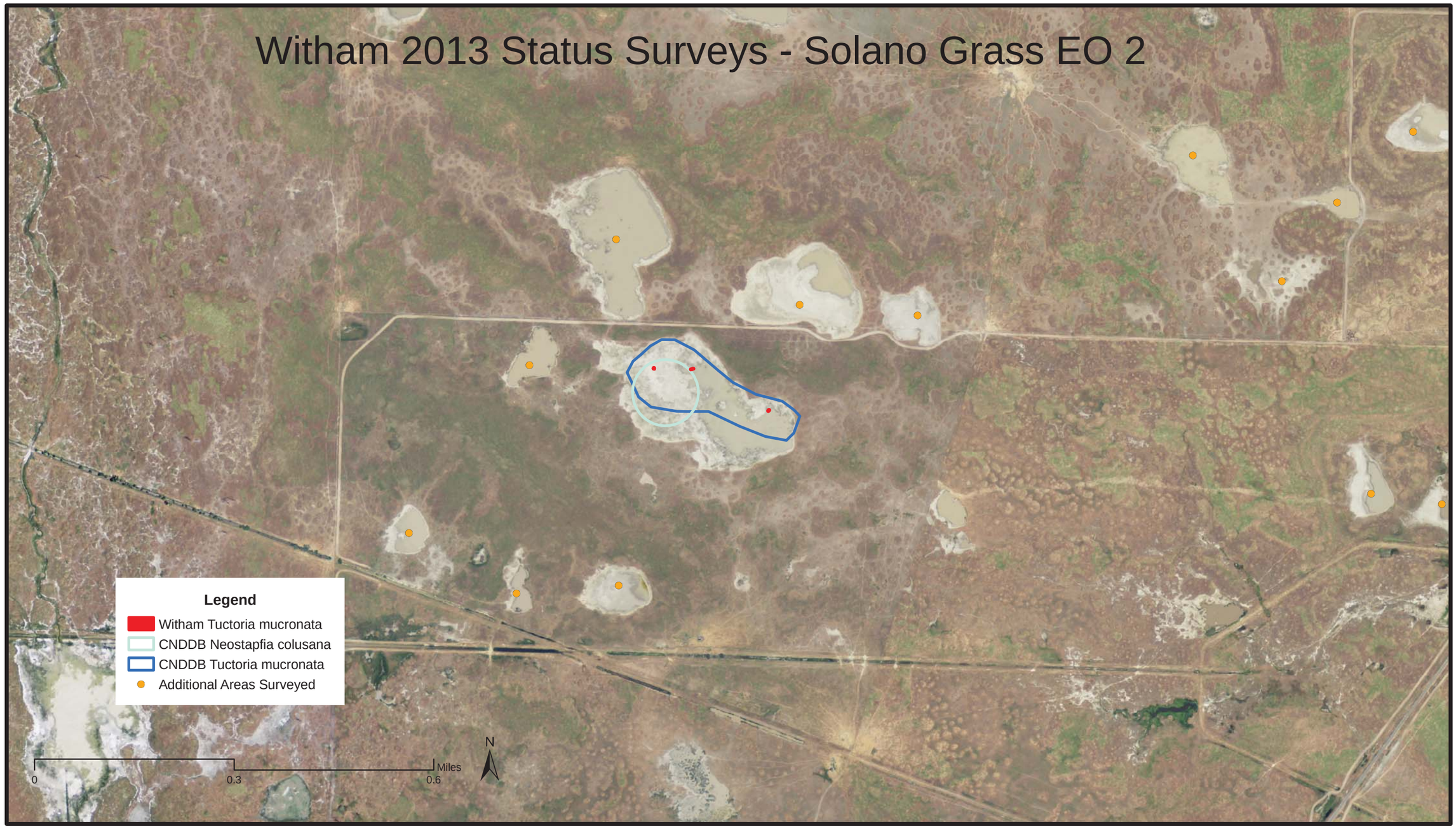
Sacramento Orcutt Grass (EO 20) on the Arroyo Seco Preserve in Sacramento County. Outlines show how occurrence is mapped in the CNDDB. No plants were found in 2010 and 2011.



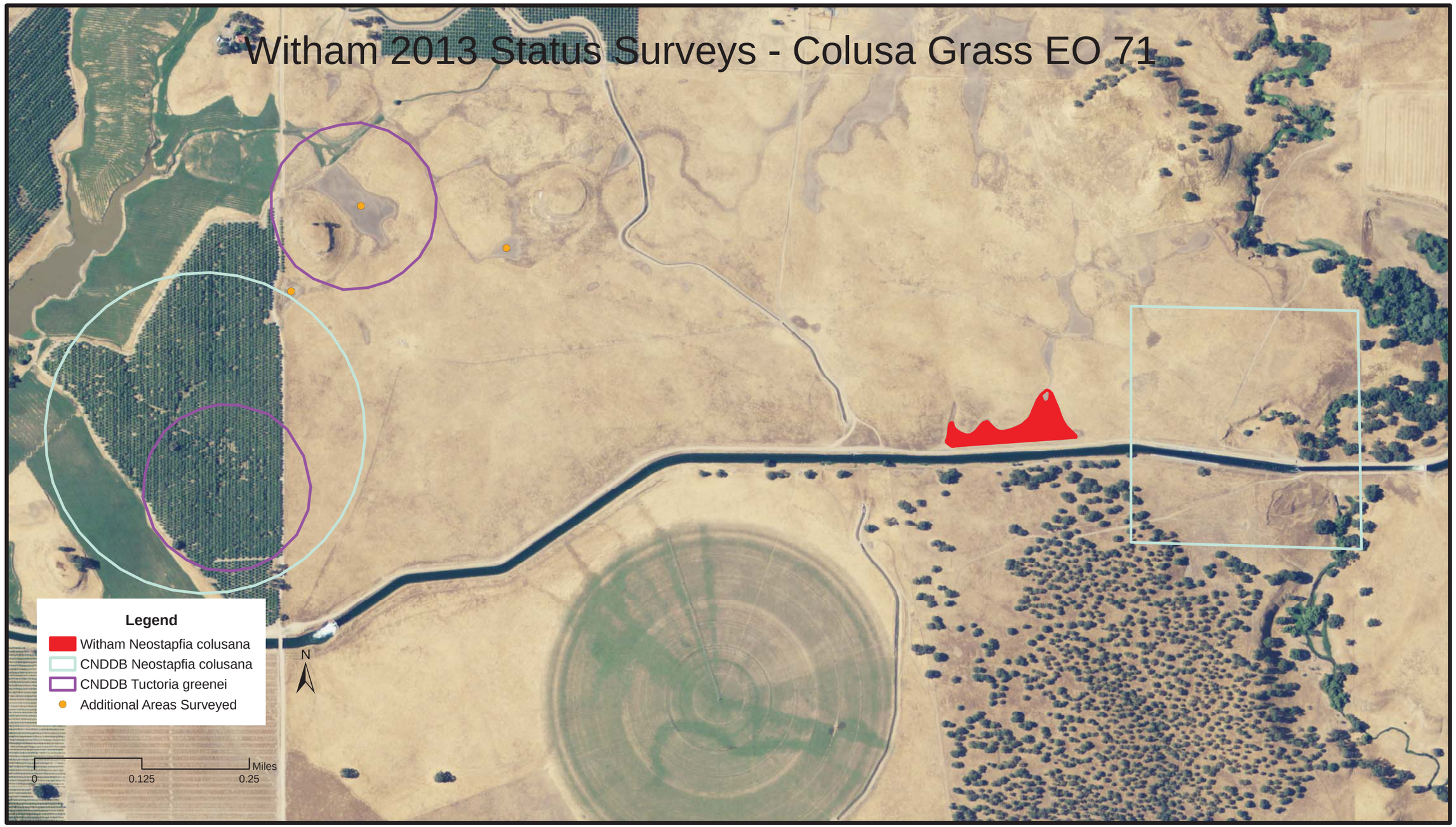
Sacramento Orcutt Grass (OE 16) at the Sacramento Municipal Unitiy District Rancho Seco in Sacramento County. Solid red indicates occupied areas. Southeastern most additional areas surveyed is also my best recollection of where plants were found in the past. Note that these are introduced populations.



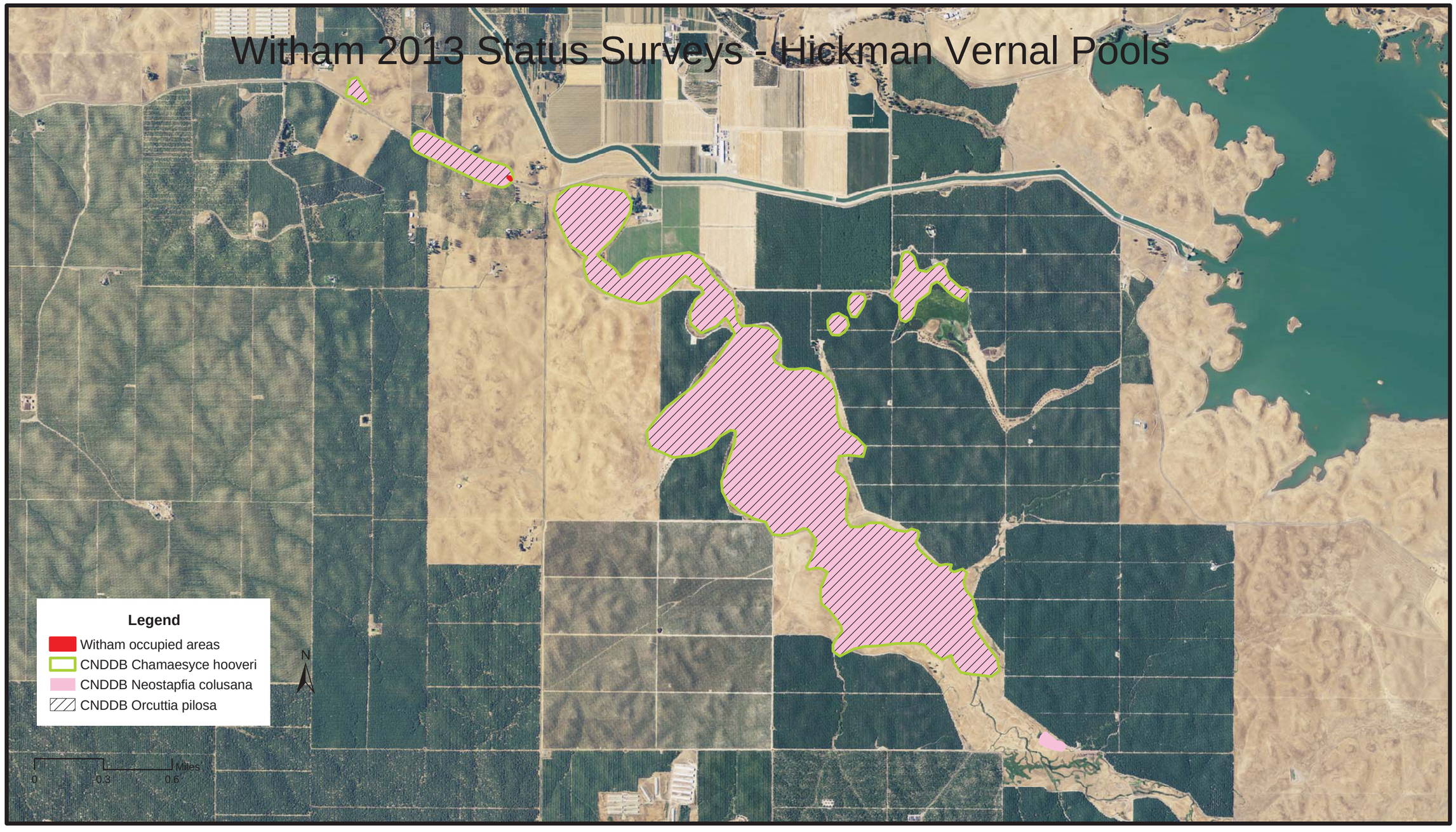
Solano Grass (OE 3) and Colusa Grass (EOs 49 & 58) at the Davis Communication Annex and Grasslands Park in Yolo County. Solid red indicates occupied areas. Westernmost occupied areas are three created pools which were seeded by John Gerlach. See Appendix A for more details.



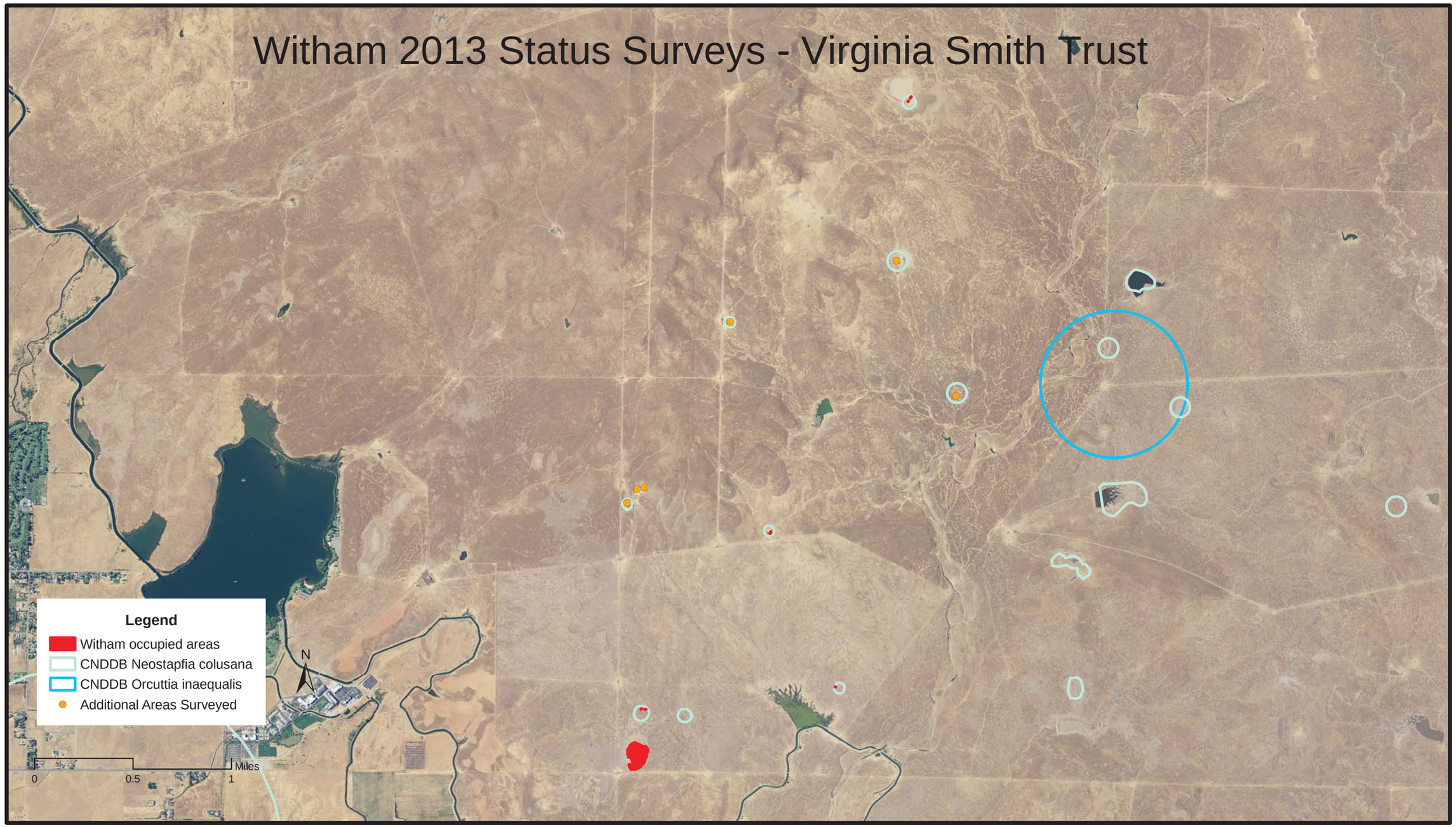
Solano Grass (EO 2) and Colusa Grass (EO 48) on private property in Solano County. Outlines show how occurrence is mapped in the CNDDB. Solid red shows occupied area in 2010.



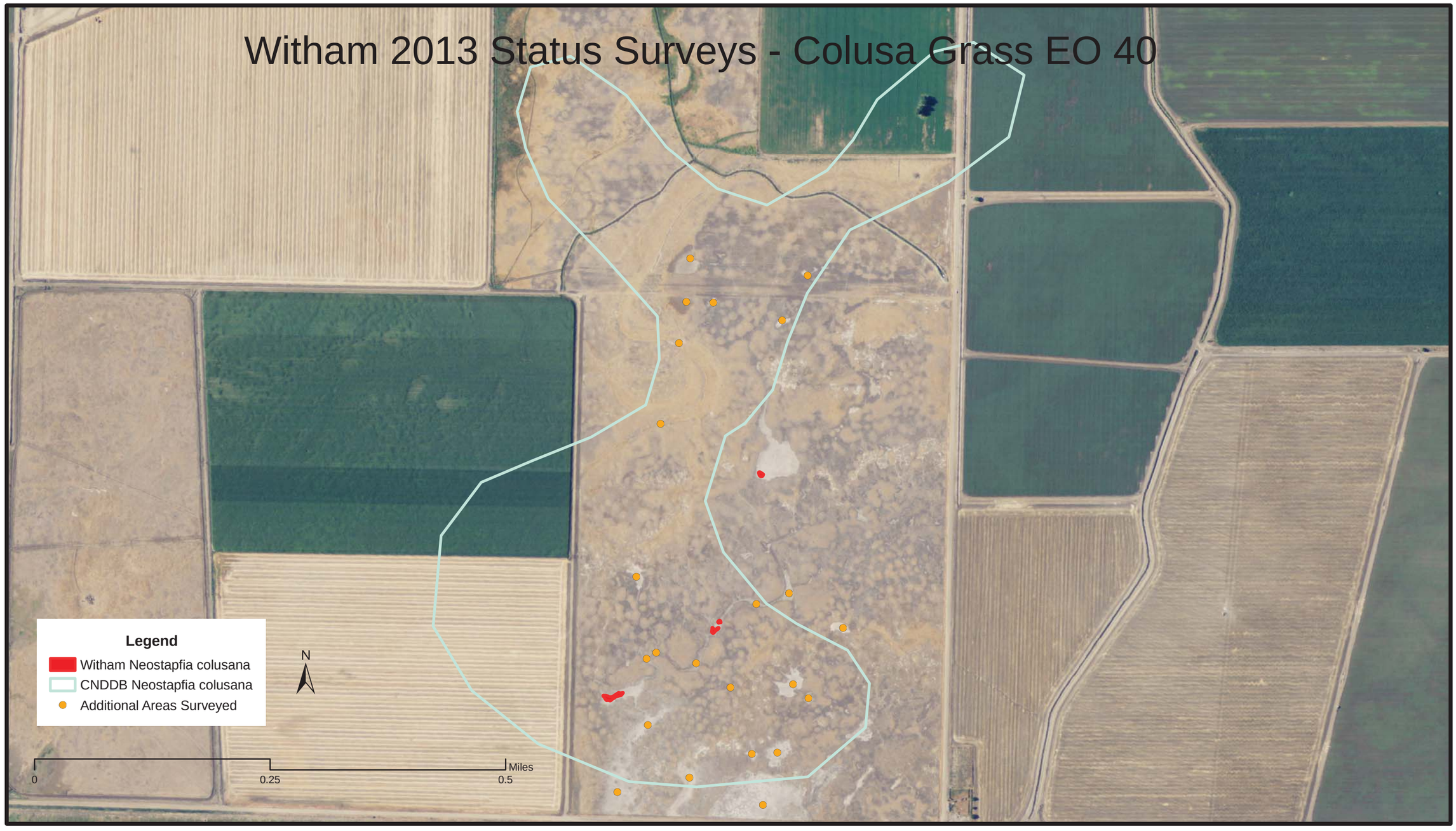
Colusa Grass (EOs 9 & 71) and Greene's Tuctoria (EO 21) on private property in Stanislaus County. Outline shows CNDDB mapping. Solid Red shows occupied area in 2010.



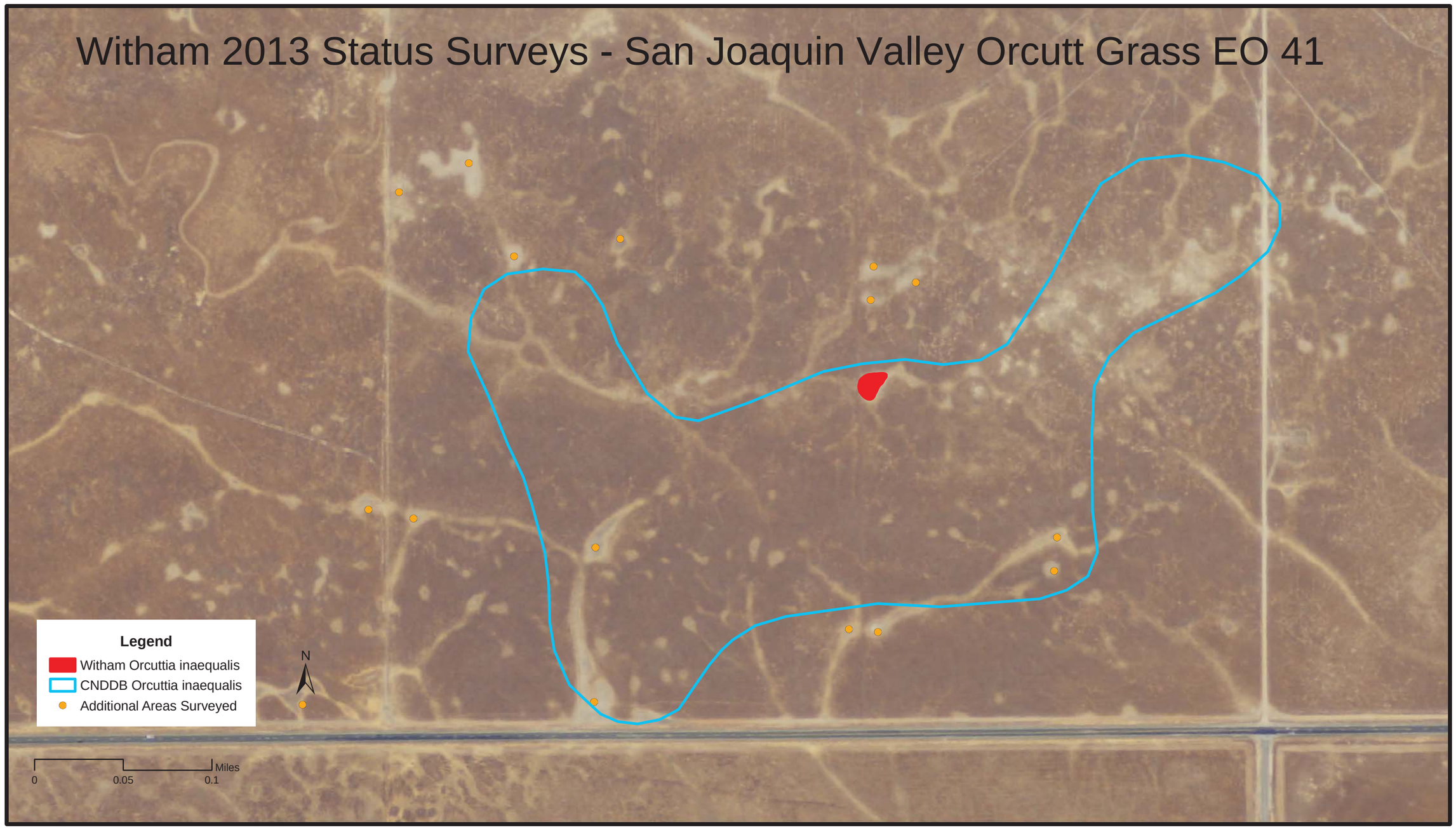
Hoover's Spurge (OE 9), Colusa Grass (EOs 2 & 24) and Hairy Orcutt Grass (EO 2) at the Hickman Vernal Pools in Stanislaus County. Solid red indicates occupied areas. While most of the site was inaccessible for survey, the pools were unseasonably inundated in the summers of 2010 and 2011. No Hoover's Spurge was observed. See also Appendix C.



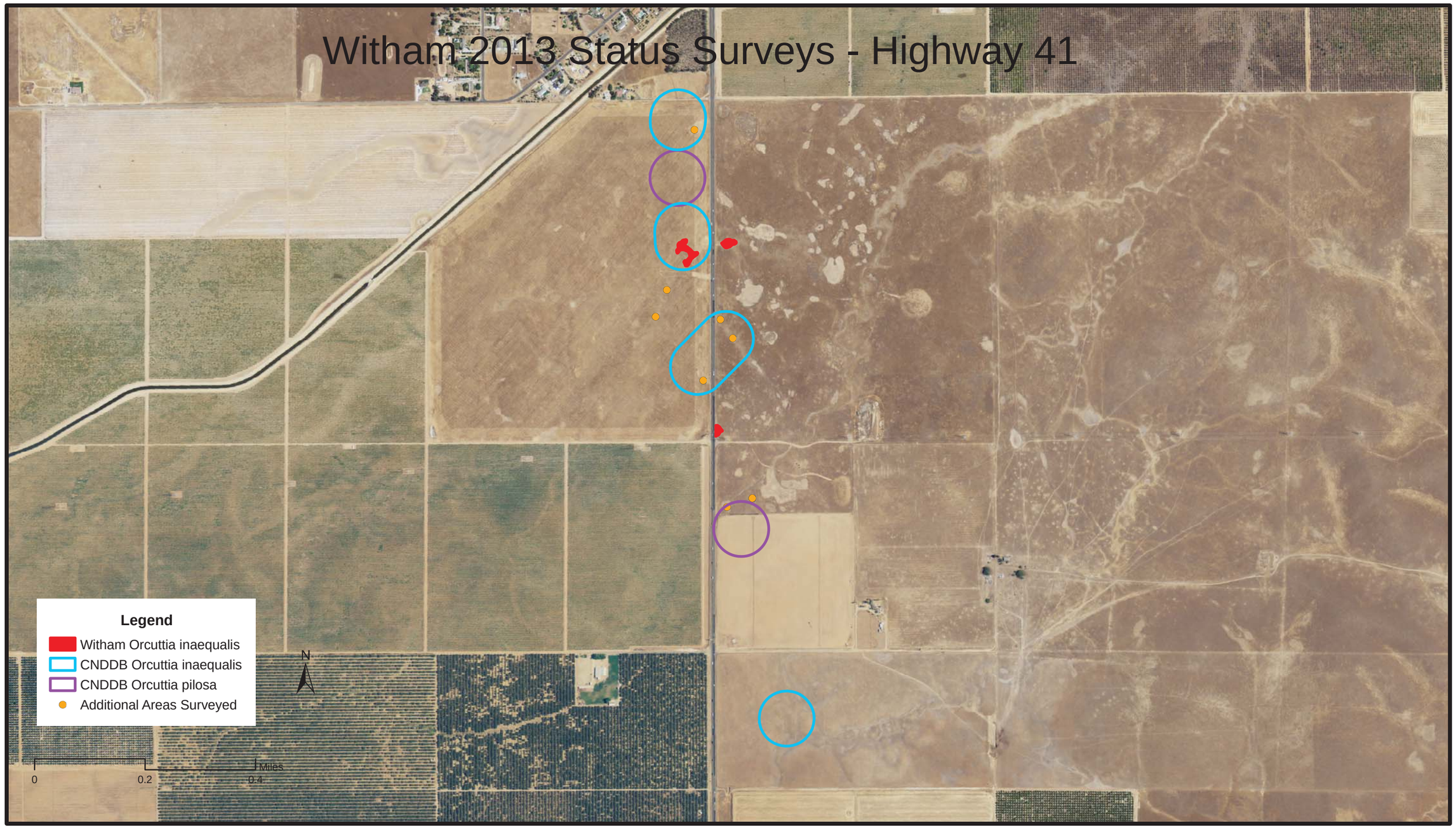
San Joaquin Valley Orcutt Grass (various EOs) and Colusa Grass (various EOs) in Merced County. Outline shows CNDDB mapping. Solid Red shows occupied area in 2011. Most areas indicated in the CNDDB were unoccupied, marginal stockpond habitat. One additional large population of Colusa Grass was identified during surveys.



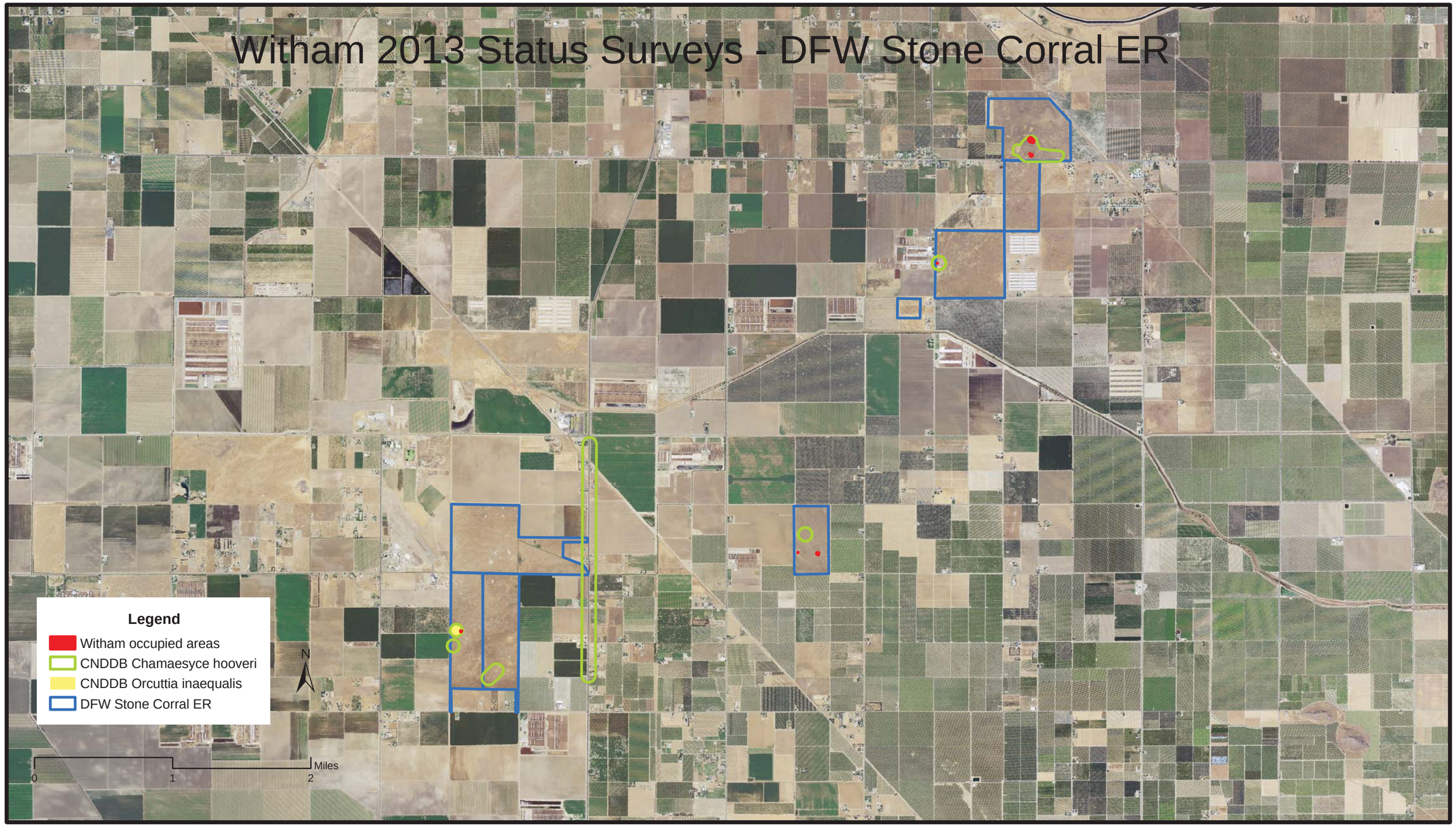
Colusa Grass (EO 40) on private property in Merced County. Outlines show how occurrence is mapped in the CNDDB. Solid Red shows occupied area in 2011.



San Joaquin Valley Orcutt Grass (EO 41) on private property in Madera County. Outline shows CNDDB mapping. Solid Red shows occupied area in 2010.



San Joaquin Valley Orcutt Grass (EOs 43 & 48) and Hairy Orcutt Grass (EOs 29 & 45) in Madera County. Outline shows CNDDB mapping. Solid Red shows occupied area in 2010. No Hairy Orcutt Grass was observed. Area to east of highway is a newly created CalTrans mitigation bank. This area was not surveyed.



Hoover's Spurge (var EOs) and San Joaquin Valley Orcutt Grass (EO 56) on the DFW Stone Corral Ecological Reserve in Tulare County. Solid Red shows occupied area in 2010 or 2011.

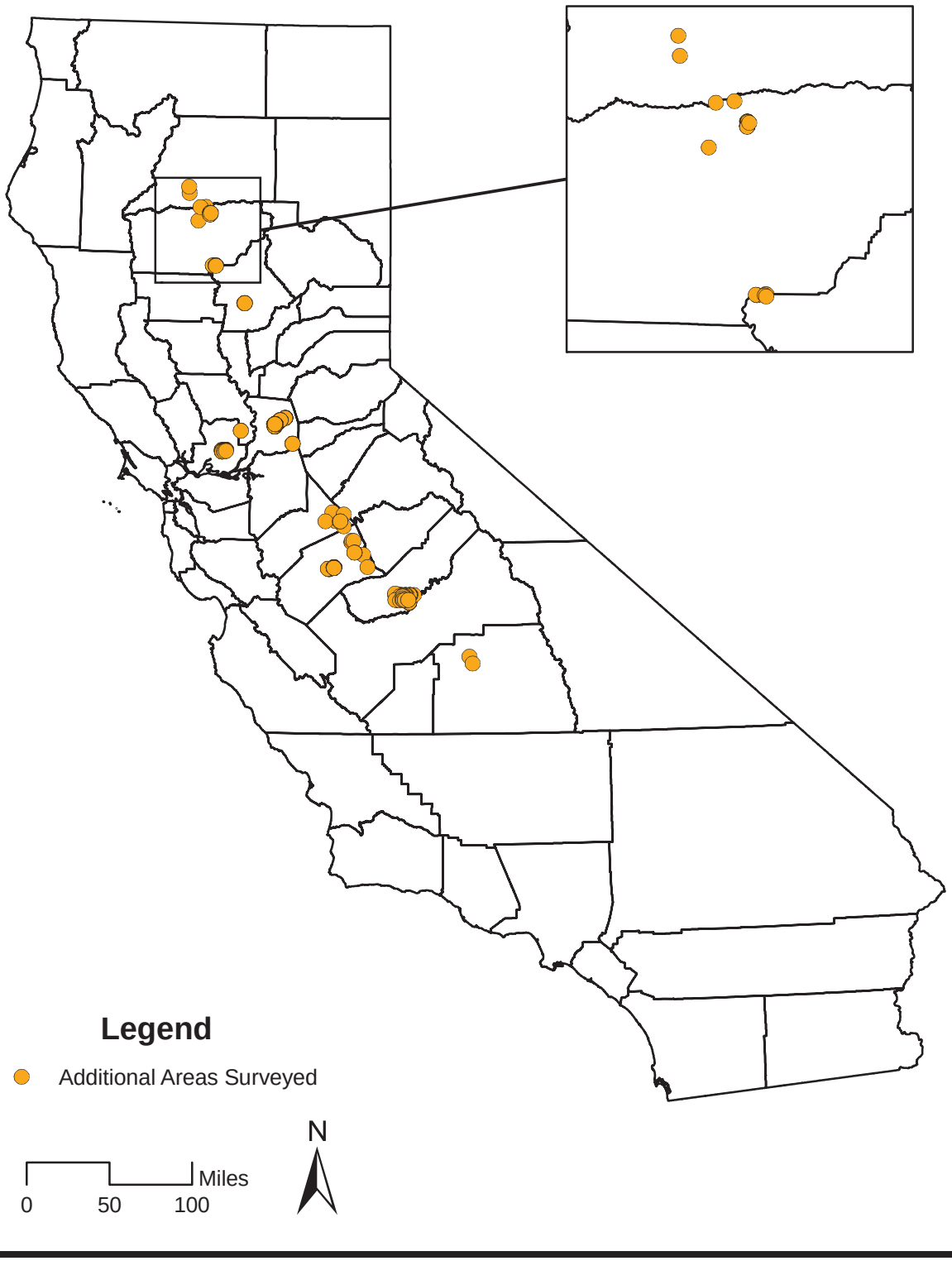
Status Surveys for Seven Federally Listed Vernal Pool Grasses and *Chamaesyce hooveri* in the Sacramento and San Joaquin Valleys (Great Valley), California, USA

Grant Agreement: 80270-8-G137

APPENDIX F:

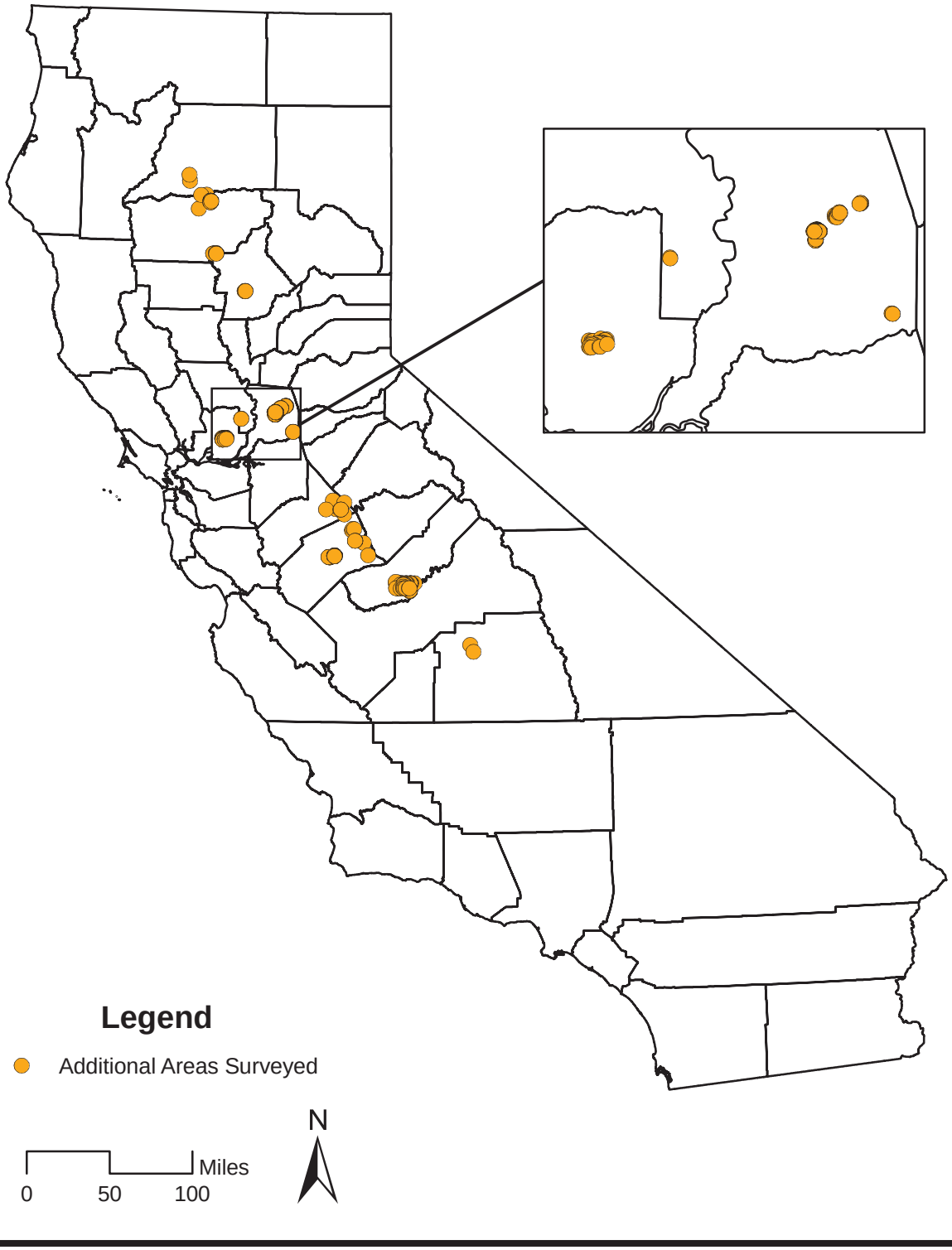
MAPS OF ADDITIONAL AREAS SURVEYED

Additional Areas Surveyed



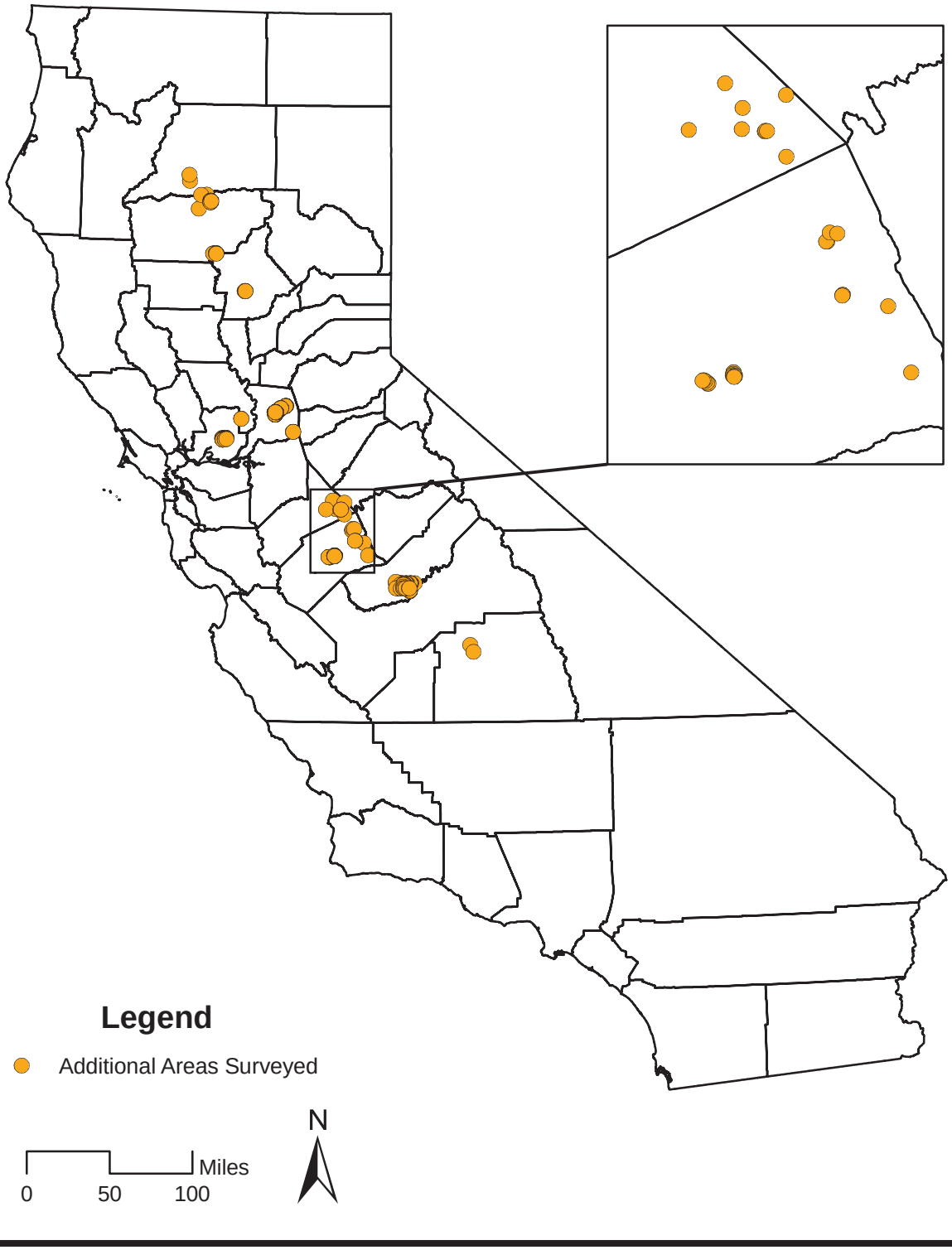
Shapefile for data points contained in SpeciesPolygons.mdb.

Additional Areas Surveyed



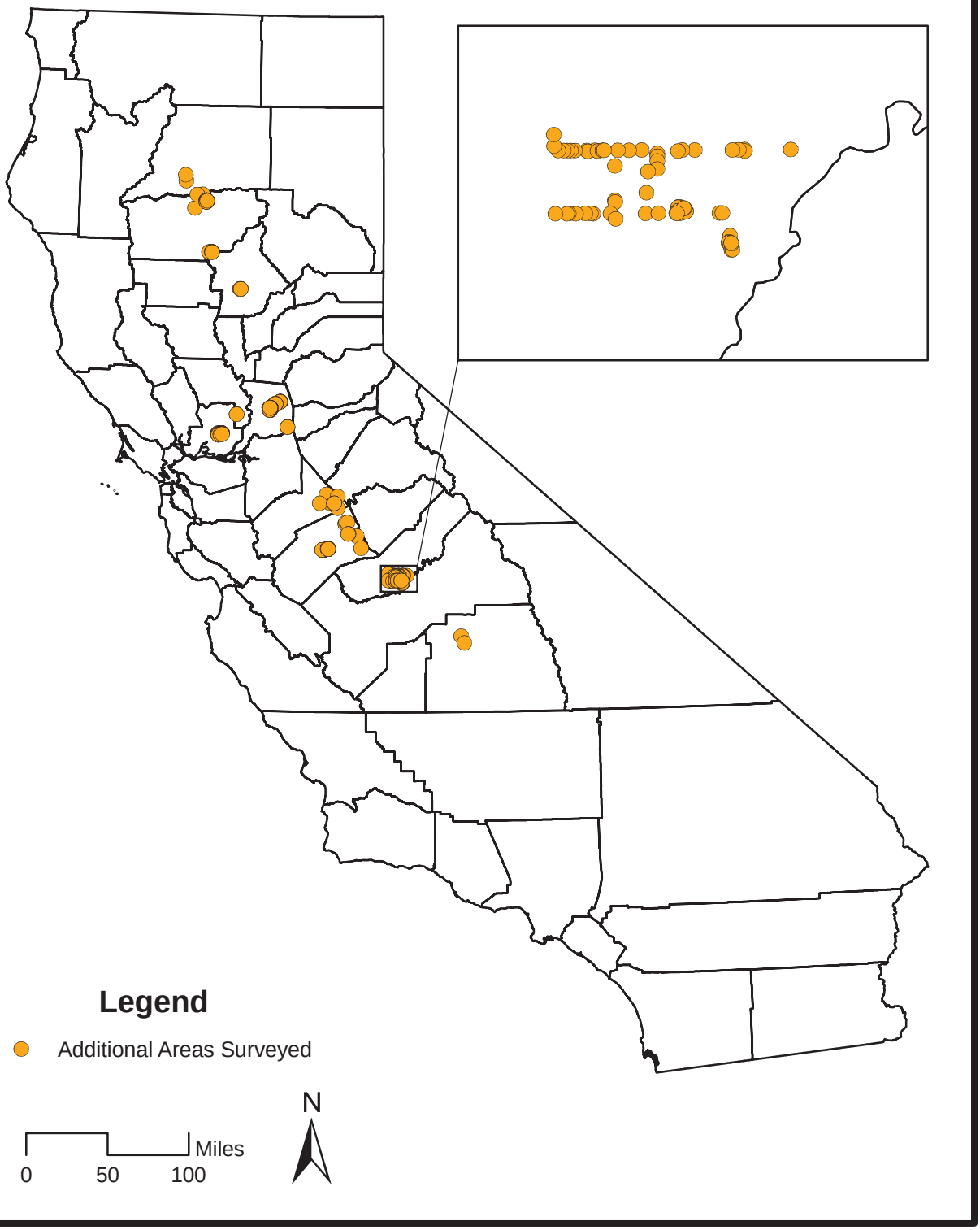
Shapefile for data points contained in SpeciesPolygons.mdb.

Additional Areas Surveyed



Shapefile for data points contained in SpeciesPolygons.mdb.

Additional Areas Surveyed



Shapefile for data points contained in SpeciesPolygons.mdb.

Status Surveys for Seven Federally Listed Vernal Pool Grasses and *Chamaesyce hooveri* in the Sacramento and San Joaquin Valleys (Great Valley), California, USA

Grant Agreement: 80270-8-G137

APPENDIX G:

OTHER RARE PLANTS AND ANIMALS OBSERVED

Appendix G

Table of Contents

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 06/24/2011

For Office Use Only

Source Code _____ Quad Code _____

Elm Code _____ Occ. No. 24

EO Index No. 7498 Map Index No. _____

CVPIA 80270-8-G-137 Field Survey Form

Scientific Name: *Gratiola heterosepala*

Common Name: Boggs Lake hedge hyssop

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals 1,000s Subsequent Visit? ☑ yes ☐ no

Is this an existing NDDB occurrence? 24 Yes, Occ. # ☐ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Carol W. Witham

Address: 1141 37th Street
Sacramento, CA 95816-5415

E-mail Address: cwitham@ncal.net

Phone: (916) 452-5440

Plant Information

Phenology: 5 % vegetative 85 % flowering 10 % fruiting

Additional Survey Notes

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

FOUR FORMS WITH ONE MAP. Inks Creek Ranch, Tehama County. See "GRAHET 24" on attached 2012 NAIP aerial image.

County: Tehama Landowner / Mgr.: PVT-Denny

Quad Name: _____ Elevation: _____

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ GPS Make & Model Trimble GeoXT 2005

DATUM: **NAD27** ☐ **NAD83** ☐ **WGS84** ☑ Horizontal Accuracy _____ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☐ ***OR*** Geographic (Latitude & Longitude) ☑

Coordinates: shapefile in SpeciesPolygons.mdb/Witham2013OtherPolys

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*

Volcanic vernal lake. Associated with Orcuttia tenuis, Isoetes orcuttii, Eryngium castrense and Downingia spp.

Please fill out separate form for other rare taxa seen at this site. Orcuttia tenuis reported separately.

Site Information Overall site/occurrence quality/viability (site + population): ☑ Excellent ☐ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: grazing

Visible disturbances: none observed

Threats: none observed

Comments:

Determination: *(check one or more, and fill in blanks)*

- ☑ Keyed (cite reference): The Jepson Manual
- ☐ Compared with specimen housed at: _____
- ☐ Compared with photo / drawing in: _____
- ☐ By another person (name): _____
- ☑ Other: Personal knowledge of taxon

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☑
Diagnostic feature	☐	☐	☑

May we obtain duplicates at our expense? yes ☑ no ☐

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 06/24/2011

For Office Use Only
Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

CVPIA 80270-8-G-137 Field Survey Form

Scientific Name: *Gratiola heterosepala*

Common Name: Boggs Lake hedge hyssop

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals 100s Subsequent Visit? ☑ yes ☐ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☑ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Carol W. Witham
Address: 1141 37th Street
Sacramento, CA 95816-5415
E-mail Address: cwitham@ncal.net
Phone: (916) 452-5440

Plant Information

Phenology: 5 % vegetative 85 % flowering 10 % fruiting

Additional Survey Notes

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

FOUR FORMS WITH ONE MAP. DFW Dales Lake Ecological Reserve, Tehama County. See "GRAHET new" on attached 2012 NAIP aerial image.

County: Tehama Landowner / Mgr.: Department of Fish and Wildlife

Quad Name: _____ Elevation: _____

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ GPS Make & Model Trimble GeoXT 2005

DATUM: **NAD27** ☐ **NAD83** ☐ **WGS84** ☑ Horizontal Accuracy _____ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☐ ***OR*** Geographic (Latitude & Longitude) ☑

Coordinates: shapefile in SpeciesPolygons.mdb/Witham2013OtherPolys

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*

Borrow pit. Associated with Orcuttia tenuis, Isoetes orcuttii, Eryngium castrense and Downingia spp.

Please fill out separate form for other rare taxa seen at this site. Orcuttia tenuis reported separately.

Site Information Overall site/occurrence quality/viability (site + population): ☑ Excellent ☐ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: grazing

Visible disturbances: none observed

Threats: none observed

Comments: I don't know why this is not in the CNDDB.

Determination: *(check one or more, and fill in blanks)*

- ☑ Keyed (cite reference): The Jepson Manual
- ☐ Compared with specimen housed at: _____
- ☐ Compared with photo / drawing in: _____
- ☐ By another person (name): _____
- ☑ Other: Personal knowledge of taxon

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☑
Diagnostic feature	☐	☐	☑

May we obtain duplicates at our expense? yes ☑ no ☐

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 08/09/2011

For Office Use Only

Source Code _____ Quad Code _____

Elm Code _____ Occ. No. 35

EO Index No. 6838 Map Index No. _____

CVPIA 80270-8-G-137 Field Survey Form

Scientific Name: *Sagittaria sanfordii*

Common Name: Sanford's arrowhead

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals 100s Subsequent Visit? ☑ yes ☐ no

Is this an existing NDDB occurrence? 35 Yes, Occ. # ☐ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Carol W. Witham

Address: 1141 37th Street
Sacramento, CA 95816-5415

E-mail Address: cwitham@ncal.net

Phone: (916) 452-5440

Plant Information

Phenology: 10 % vegetative 85 % flowering 5 % fruiting

Additional Survey Notes

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

FOUR FORMS WITH ONE MAP. Dales Lake, DFW Dales Lake Ecological Reserve, Tehama County. See "SAGSAN 35" on attached 2012 NAIP aerial image.

County: Tehama Landowner / Mgr.: Department of Fish and Wildlife

Quad Name: _____ Elevation: _____

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ GPS Make & Model Trimble GeoXT 2005

DATUM: **NAD27** ☐ **NAD83** ☐ **WGS84** ☑ Horizontal Accuracy _____ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☐ ***OR*** Geographic (Latitude & Longitude) ☑

Coordinates: shapefile in SpeciesPolygons.mdb/Witham2013OtherPolys

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*

Dales Lake. Associated with Orcuttia tenuis, Isoetes orcuttii, Eryngium castrense and Downingia spp.

Please fill out separate form for other rare taxa seen at this site. Orcuttia tenuis reported separately.

Site Information Overall site/occurrence quality/viability (site + population): ☑ Excellent ☐ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: grazing

Visible disturbances: none observed

Threats: none observed

Comments:

Determination: *(check one or more, and fill in blanks)*

- ☑ Keyed (cite reference): The Jepson Manual
- ☐ Compared with specimen housed at: _____
- ☐ Compared with photo / drawing in: _____
- ☐ By another person (name): _____
- ☑ Other: Personal knowledge of taxon

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☑
Diagnostic feature	☐	☐	☑

May we obtain duplicates at our expense? yes ☑ no ☐

DFG/BDB/1747 Rev. 6/16/09

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 08/09/2011

For Office Use Only
Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

CVPIA 80270-8-G-137 Field Survey Form

Scientific Name: *Sagittaria sanfordii*

Common Name: Sanford's arrowhead

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals 100s Subsequent Visit? ☑ yes ☐ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☑ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Carol W. Witham
Address: 1141 37th Street
Sacramento, CA 95816-5415
E-mail Address: cwitham@ncal.net
Phone: (916) 452-5440

Plant Information

Phenology: 10 % vegetative 85 % flowering 5 % fruiting

Additional Survey Notes

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

FOUR FORMS WITH ONE MAP. Inks Creek Ranch, Tehama County. See "SAGSAN new" on attached 2012 NAIP aerial image.

County: Tehama Landowner / Mgr.: PVT-Denny

Quad Name: _____ Elevation: _____

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ GPS Make & Model Trimble GeoXT 2005

DATUM: **NAD27** ☐ **NAD83** ☐ **WGS84** ☑ Horizontal Accuracy _____ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☐ ***OR*** Geographic (Latitude & Longitude) ☑

Coordinates: shapefile in SpeciesPolygons.mdb/Witham2013OtherPolys

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*

Small reservoir. Associated with Orcuttia tenuis, Isoetes orcuttii, Eryngium castrense and Downingia spp.

Please fill out separate form for other rare taxa seen at this site. Orcuttia tenuis reported separately.

Site Information Overall site/occurrence quality/viability (site + population): ☑ Excellent ☐ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: grazing

Visible disturbances: some minor feral pig damage

Threats: none observed

Comments:

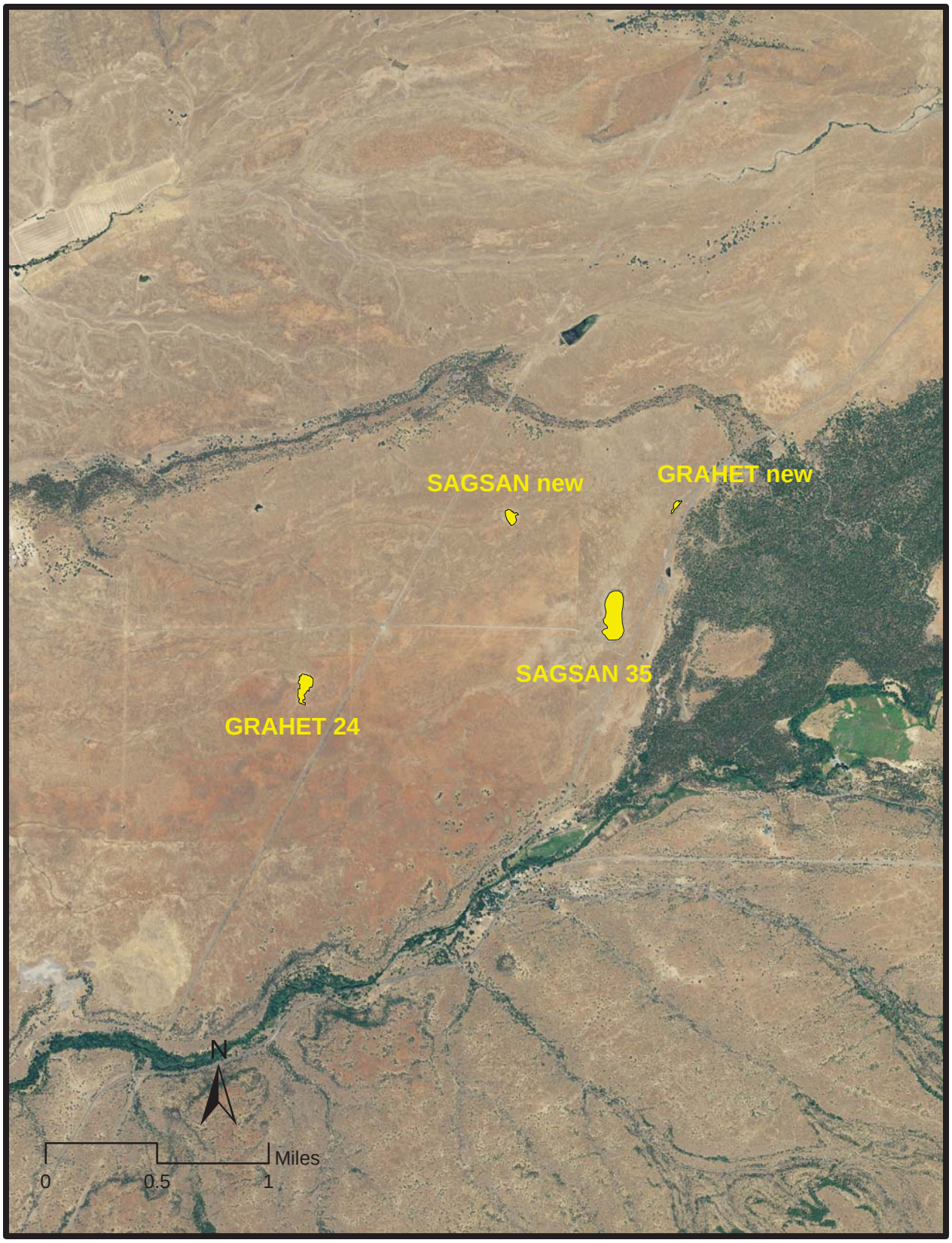
Determination: *(check one or more, and fill in blanks)*

- ☑ Keyed (cite reference): The Jepson Manual
- ☐ Compared with specimen housed at: _____
- ☐ Compared with photo / drawing in: _____
- ☐ By another person (name): _____
- ☑ Other: Personal knowledge of taxon

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☑
Diagnostic feature	☐	☐	☑

May we obtain duplicates at our expense? yes ☑ no ☐



Dales Lake / Inks Creek Ranch
Tehama County

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 06/24/2011

For Office Use Only

Source Code _____ Quad Code _____

Elm Code _____ Occ. No. 28

EO Index No. 7492 Map Index No. _____

CVPIA 80270-8-G-137 Field Survey Form

Scientific Name: *Gratiola heterosepala*

Common Name: Boggs Lake hedge hyssop

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals 1,000s Subsequent Visit? ☑ yes ☐ no

Is this an existing NDDB occurrence? 28 Yes, Occ. # ☐ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Carol W. Witham

Address: 1141 37th Street
Sacramento, CA 95816-5415

E-mail Address: cwitham@ncal.net

Phone: (916) 452-5440

Plant Information

Phenology: 5 % vegetative 85 % flowering 10 % fruiting

Additional Survey Notes

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

Tehama County, Seven Mile Lake. See attached 2012 NAIP aerial image.

County: Tehama Landowner / Mgr.: BLM

Quad Name: _____ Elevation: _____

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): Arcview

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ GPS Make & Model Trimble GeoXT 2005

DATUM: **NAD27** ☐ **NAD83** ☐ **WGS84** ☑ Horizontal Accuracy _____ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☐ ***OR*** Geographic (Latitude & Longitude) ☑

Coordinates: 40.27126, -122.12105
shapefile in SpeciesPolygons.mdb/Witham2013OtherPolys

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*

Volcanic vernal lake. Associated with Orcuttia tenuis, Isoetes orcuttii, Eryngium castrense and Downingia spp.

Please fill out separate form for other rare taxa seen at this site. Orcuttia tenuis reported separately.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☑ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: grazing, but fenced as an exclosure

Visible disturbances: none observed

Threats: none observed

Comments:

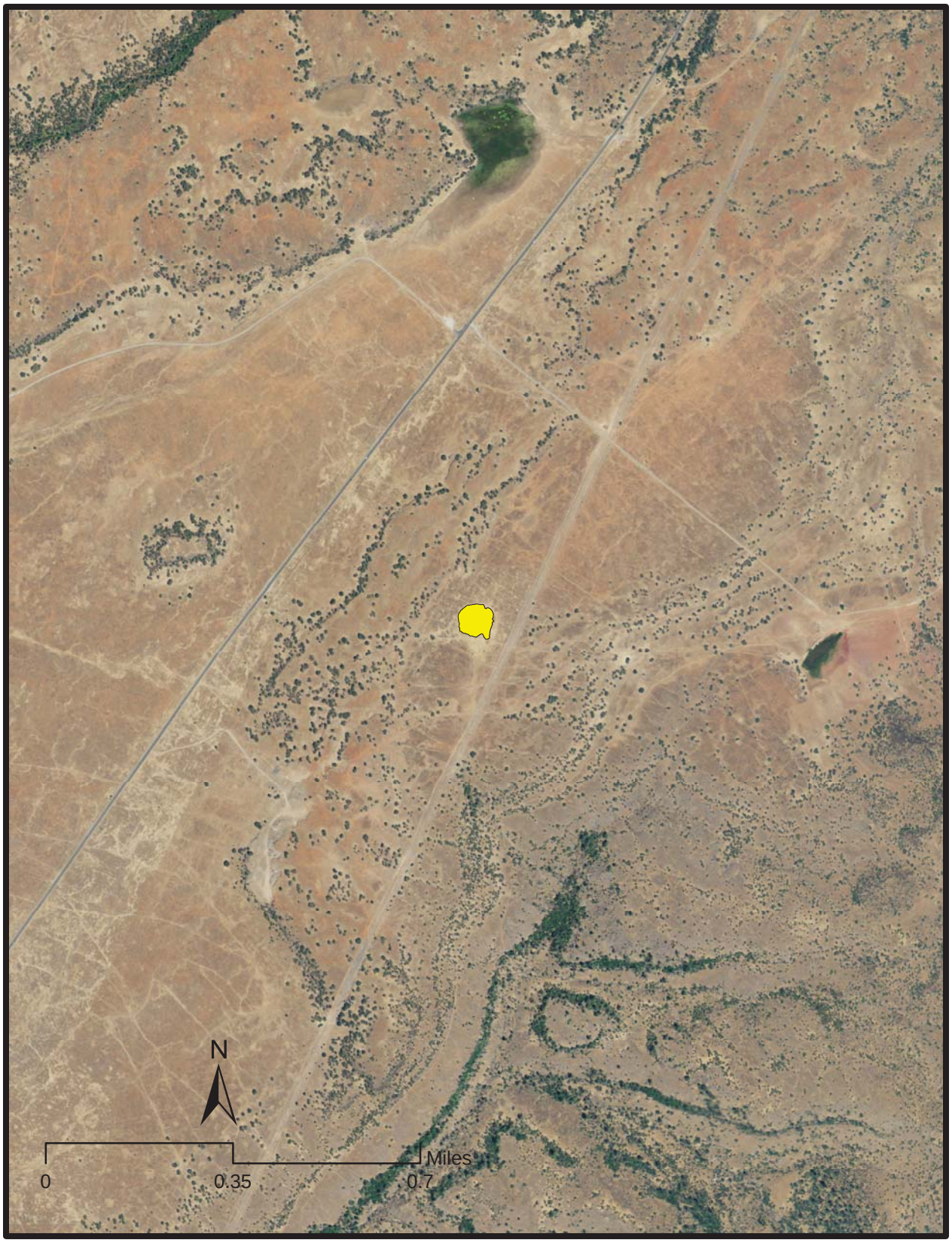
Determination: *(check one or more, and fill in blanks)*

- ☑ Keyed (cite reference): The Jepson Manual
- ☐ Compared with specimen housed at: _____
- ☐ Compared with photo / drawing in: _____
- ☐ By another person (name): _____
- ☑ Other: Personal knowledge of taxon

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☑
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☑ no ☐



Gratiola heterosepala EO 28
Tehama County

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 09/05/2010

For Office Use Only
Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

CVPIA 80270-8-G-137 Field Survey Form

Scientific Name: *Atriplex persistens*

Common Name: vernal pool small scale

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals 100s Subsequent Visit? ☐ yes ☑ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☑ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Carol W. Witham
Address: 1141 37th Street
Sacramento, CA 95816-5415
E-mail Address: cwitham@ncal.net
Phone: (916) 452-5440

Plant Information

Phenology: 0 % vegetative 85 % flowering 15 % fruiting

Additional Survey Notes

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

West of Jepson Prairie Preserve. N1 = 150 plants; N2 = 300 plants; N3 = 20 plants; N4 = 5 plants; N5 = 5 plants. Near EO 10, but no plants observed in that location.

County: Solano Landowner / Mgr.: PVT-Thompson/Hamilton

Quad Name: _____ Elevation: _____

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ GPS Make & Model Trimble GeoXT 2005

DATUM: **NAD27** ☐ **NAD83** ☐ **WGS84** ☑ Horizontal Accuracy _____ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☐ ***OR*** Geographic (Latitude & Longitude) ☑

Coordinates: shapefile in SpeciesPolygons.mdb/Witham2013OtherPoints

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*

Playa-like pools in alkaline area. Prominent species in N1 and N2. Associated with Distichlis spicata. Some scattered plants in mesic areas throughout the site.

Please fill out separate form for other rare taxa seen at this site. Neostapfia colusana, reported separately.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☑ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: grazing

Visible disturbances: none observed

Threats: none observed

Comments:

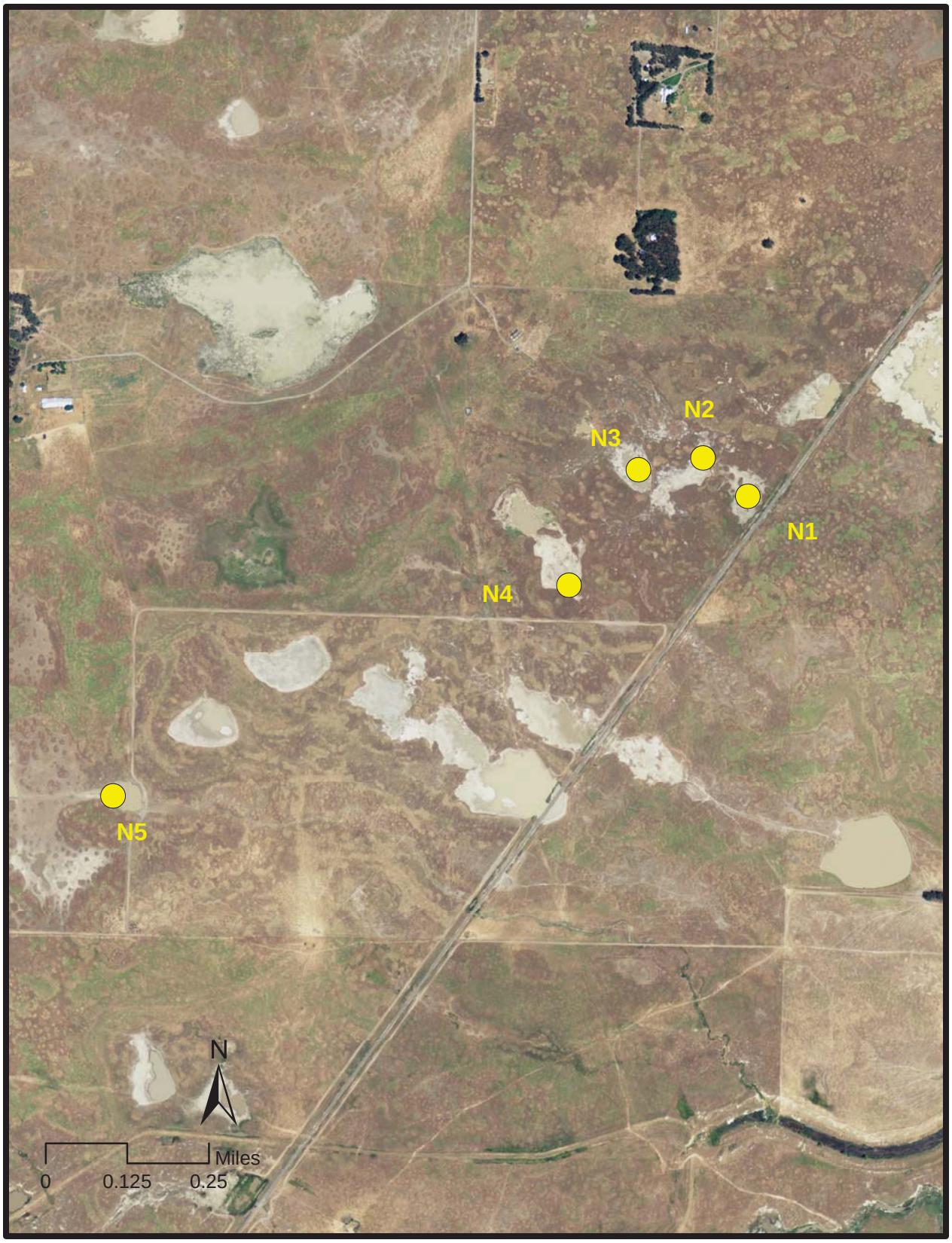
Determination: *(check one or more, and fill in blanks)*

- ☑ Keyed (cite reference): The Jepson Manual
- ☐ Compared with specimen housed at: _____
- ☐ Compared with photo / drawing in: _____
- ☐ By another person (name): _____
- ☑ Other: Personal knowledge of taxon

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☑
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☑ no ☐



Atriplex persistens NEW
Solano County

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 09/22/2011

For Office Use Only

Source Code _____ Quad Code _____

Elm Code _____ Occ. No. 31

EO Index No. 54538 Map Index No. _____

CVPIA 80270-8-G-137 Field Survey Form

Scientific Name: *Atriplex persistens*

Common Name: vernal pool small scale

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals 100,000s Subsequent Visit? ☐ yes ☑ no

Is this an existing NDDB occurrence? 31 Yes, Occ. # ☐ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Carol W. Witham

Address: 1141 37th Street
Sacramento, CA 95816-5415

E-mail Address: cwitham@ncal.net

Phone: (916) 452-5440

Plant Information

Phenology: 0 % vegetative 85 % flowering 15 % fruiting

Additional Survey Notes

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

Northwest of where Ventura Road goes from east-west to north-south, Merced County. See attached 2012 NAIP aerial image.

County: Merced Landowner / Mgr.: PVT

Quad Name: _____ Elevation: _____

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ GPS Make & Model Trimble GeoXT 2005

DATUM: **NAD27** ☐ **NAD83** ☐ **WGS84** ☑ Horizontal Accuracy _____ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☐ ***OR*** Geographic (Latitude & Longitude) ☑

Coordinates: shapefile in SpeciesPolygons.mdb/Witham2013OtherPoints

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*

Playa-like pools in alkaline area. Dominant species in the mapped pools. Associated with Crypsis scheonoides and Distichlis spicata. Some scattered plants in mesic areas throughout the site.

Please fill out separate form for other rare taxa seen at this site. Neostapfia colusana in several pools, reported separately.

Site Information Overall site/occurrence quality/viability (site + population): ☑ Excellent ☐ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: grazing

Visible disturbances: none observed

Threats: none observed

Comments: One of the most outstanding occurrences of Atriplex persistens.

Determination: *(check one or more, and fill in blanks)*

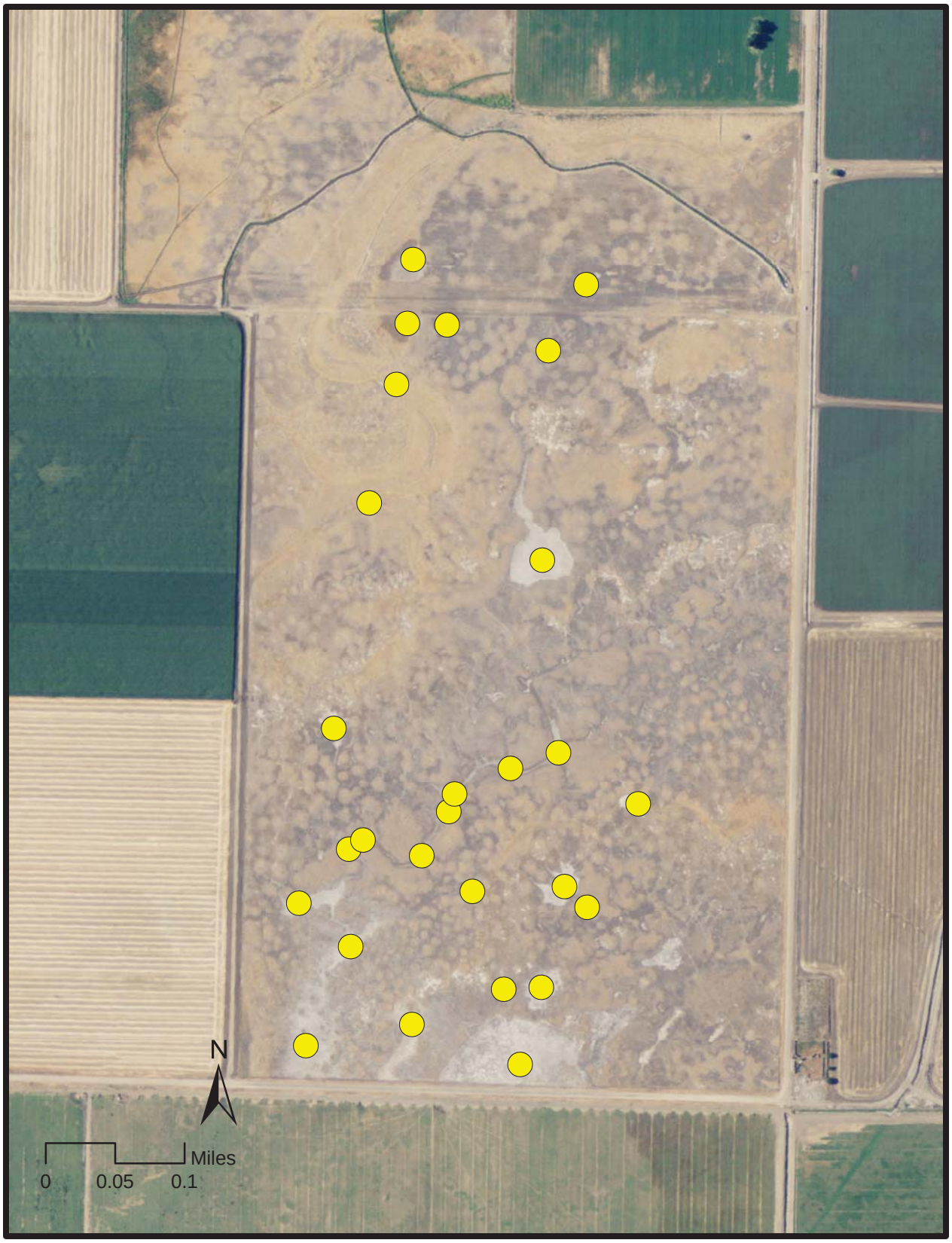
- ☑ Keyed (cite reference): The Jepson Manual
- ☐ Compared with specimen housed at: _____
- ☐ Compared with photo / drawing in: _____
- ☐ By another person (name): _____
- ☑ Other: Personal knowledge of taxon

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☑
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☑ no ☐

DFG/BDB/1747 Rev. 6/16/09



Atriplex persistens EO 4
Merced County

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 09/22/2011

For Office Use Only

Source Code _____ Quad Code _____

Elm Code _____ Occ. No. 31

EO Index No. 54538 Map Index No. _____

CVPIA 80270-8-G-137 Field Survey Form

Scientific Name: *Atriplex persistens*

Common Name: vernal pool small scale

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals 100s Subsequent Visit? ☐ yes ☑ no

Is this an existing NDDB occurrence? 31 Yes, Occ. # ☐ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Carol W. Witham

Address: 1141 37th Street
Sacramento, CA 95816-5415

E-mail Address: cwitham@ncal.net

Phone: (916) 452-5440

Plant Information

Phenology: 0 % vegetative 85 % flowering 15 % fruiting

Additional Survey Notes

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

West of Dan McNamara Road, Bert Crane Sunrise Ranch, Merced County. See attached 2012 NAIP aerial image.

County: Merced Landowner / Mgr.: PVT-Sunrise Ranch

Quad Name: _____ Elevation: _____

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ GPS Make & Model Trimble GeoXT 2005

DATUM: **NAD27** ☐ **NAD83** ☐ **WGS84** ☑ Horizontal Accuracy _____ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☐ ***OR*** Geographic (Latitude & Longitude) ☑

Coordinates: shapefile in SpeciesPolygons.mdb/Witham2013OtherPoints

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*

Playa-like pools in alkaline area. Prominent species in the mapped pools. Associated with Distichlis spicata. Some scattered plants in mesic areas throughout the site.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☑ Excellent ☐ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: grazing

Visible disturbances: none observed

Threats: none observed

Comments:

Determination: *(check one or more, and fill in blanks)*

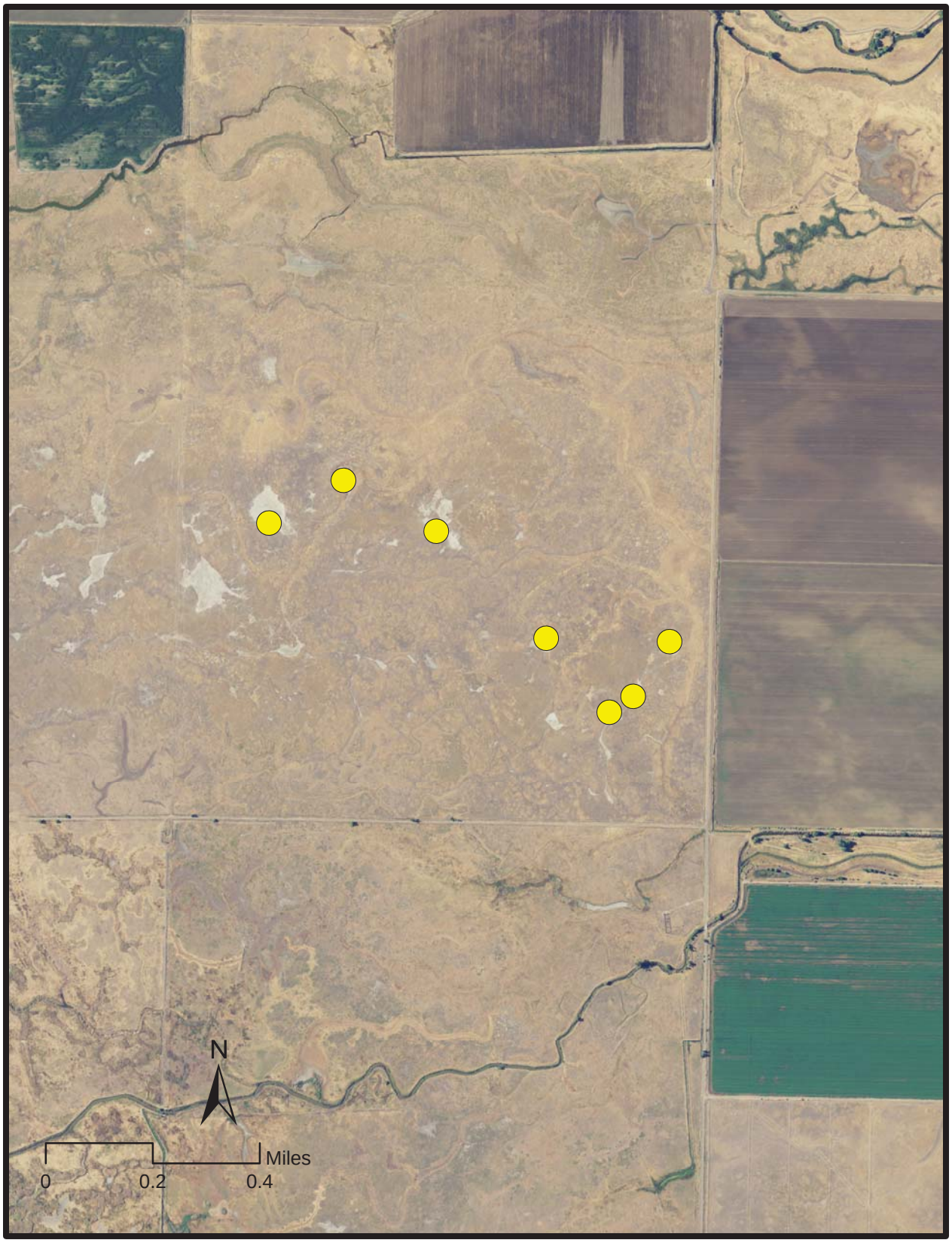
- ☑ Keyed (cite reference): The Jepson Manual
- ☐ Compared with specimen housed at: _____
- ☐ Compared with photo / drawing in: _____
- ☐ By another person (name): _____
- ☑ Other: Personal knowledge of taxon

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☑
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☑ no ☐

DFG/BDB/1747 Rev. 6/16/09



Atriplex persistens EO 31
Merced County

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 10/15/2011

For Office Use Only
Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

CVPIA 80270-8-G-137 Field Survey Form

Scientific Name: *Atriplex persistens*

Common Name: vernal pool small scale

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals 1,000s Subsequent Visit? ☐ yes ☑ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☑ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Carol W. Witham
Address: 1141 37th Street
Sacramento, CA 95816-5415
E-mail Address: cwitham@ncal.net
Phone: (916) 452-5440

Plant Information

Phenology: 0 % vegetative 85 % flowering 15 % fruiting

Additional Survey Notes

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

Southwest of the intersection of Highway 59 and Michael Road, Merced County. See attached 2012 NAIP aerial image.

County: Merced Landowner / Mgr.: PVT
Quad Name: _____ Elevation: _____
T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS
T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ GPS Make & Model Trimble GeoXT 2005
DATUM: **NAD27** ☐ **NAD83** ☐ **WGS84** ☑ Horizontal Accuracy _____ meters/feet
Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☐ ***OR*** Geographic (Latitude & Longitude) ☑
Coordinates: shapefile in SpeciesPolygons.mdb/Witham2013New

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*

Playa-like pools in alkaline area. Associated with Crypsis scheonoides and Distichlis spicata. Some scattered plants in mesic areas throughout the site. Ungrazed and really weedy.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☑ Excellent ☐ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: fallow

Visible disturbances: none observed

Threats: really weedy, some runoff from adjacent agriculture

Comments:

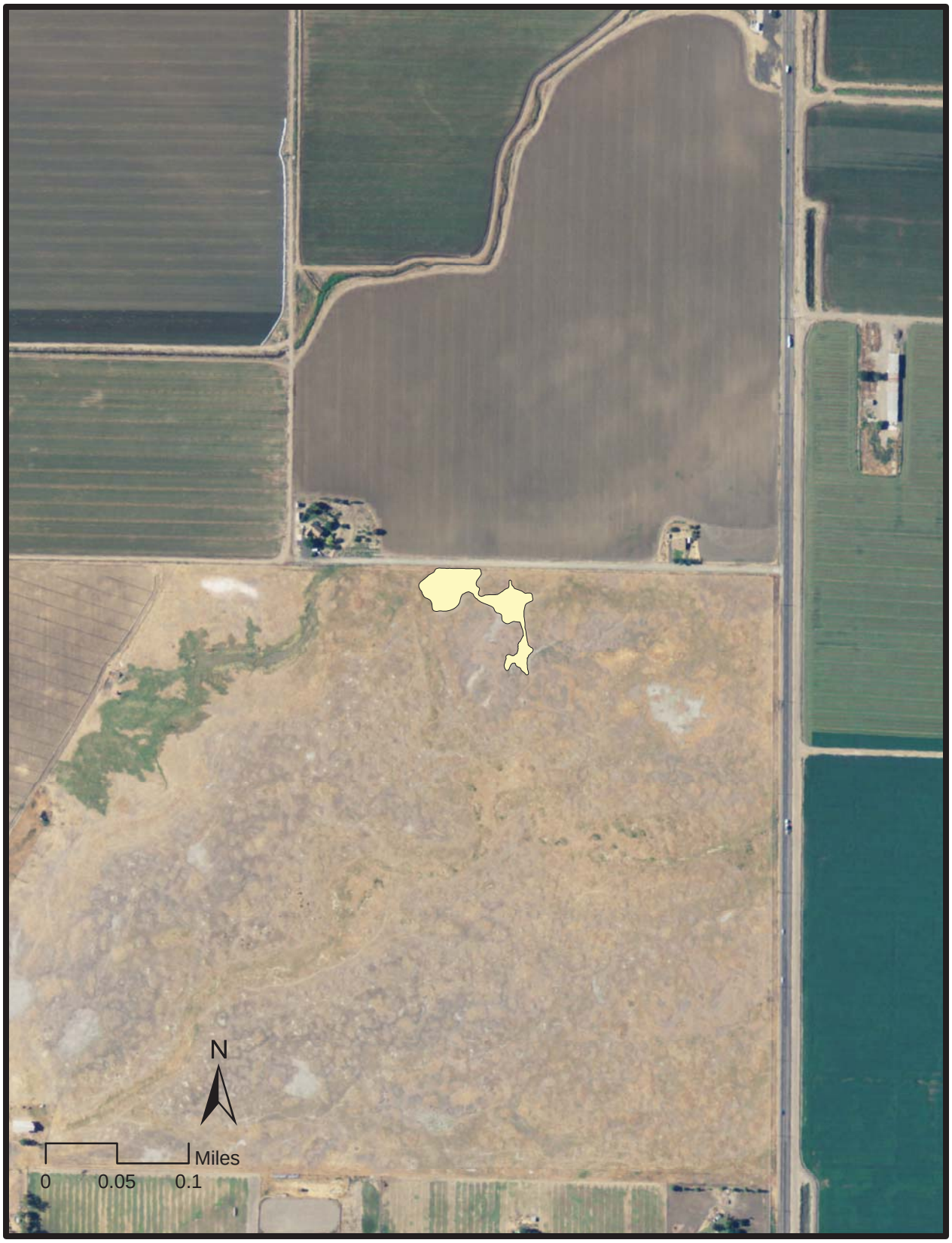
Determination: *(check one or more, and fill in blanks)*
- ☑ Keyed (cite reference): The Jepson Manual
- ☐ Compared with specimen housed at: _____
- ☐ Compared with photo / drawing in: _____
- ☐ By another person (name): _____
- ☑ Other: Personal knowledge of taxon

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☑
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☑ no ☐

DFG/BDB/1747 Rev. 6/16/09



Atriplex persistens NEW
Merced County

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 08/05/2010

For Office Use Only
Source Code _____ Quad Code _____
Elm Code _____ Occ. No. 26
EO Index No. 54533 Map Index No. _____

CVPIA 80270-8-G-137 Field Survey Form

Scientific Name: *Atriplex persistens*

Common Name: vernal pool small scale

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals 1,000s Subsequent Visit? ☐ yes ☑ no

Is this an existing NDDB occurrence? 26 Yes, Occ. # ☐ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Carol W. Witham
Address: 1141 37th Street
Sacramento, CA 95816-5415
E-mail Address: cwitham@ncal.net
Phone: (916) 452-5440

Plant Information

Phenology: 0 % vegetative 85 % flowering 15 % fruiting

Additional Survey Notes

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

TWO FORMS WITH ONE MAP. DFW Stone Corrals Ecological Reserve, Yettum Unit, Tulare County. See "ATRPER 26" on attached 2012 NAIP aerial image.

County: Tulare Landowner / Mgr.: Department of Fish and Wildlife
Quad Name: _____ Elevation: _____
T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS
T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ GPS Make & Model Trimble GeoXT 2005
DATUM: **NAD27** ☐ **NAD83** ☐ **WGS84** ☑ Horizontal Accuracy _____ meters/feet
Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☐ ***OR*** Geographic (Latitude & Longitude) ☑
Coordinates: shapefile in SpeciesPolygons.mdb/Witham2013OtherPolys

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*

Playa-like pools in alkaline area. Dominant species in the mapped pools. Associated with Crypsis scheonoides and Chamaesyce hooveri. Some scattered plants in mesic areas throughout the site.

Please fill out separate form for other rare taxa seen at this site. Chamaesyce hooveri reported separately.

Site Information Overall site/occurrence quality/viability (site + population): ☑ Excellent ☐ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: grazing

Visible disturbances: none observed

Threats: none observed

Comments:

Determination: *(check one or more, and fill in blanks)*
- ☑ Keyed (cite reference): The Jepson Manual
- ☐ Compared with specimen housed at: _____
- ☐ Compared with photo / drawing in: _____
- ☐ By another person (name): _____
- ☑ Other: Personal knowledge of taxon

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☑
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☑ no ☐

DFG/BDB/1747 Rev. 6/16/09

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 08/06/2010

For Office Use Only
Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

CVPIA 80270-8-G-137 Field Survey Form

Scientific Name: *Atriplex persistens*

Common Name: vernal pool small scale

Species Found? ☑ Yes ☐ No _____ If not, why?

Total No. Individuals 100s Subsequent Visit? ☐ yes ☑ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☑ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: Carol W. Witham
Address: 1141 37th Street
Sacramento, CA 95816-5415
E-mail Address: cwitham@ncal.net
Phone: (916) 452-5440

Plant Information

Phenology: 0 % vegetative 85 % flowering 15 % fruiting

Additional Survey Notes

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

TWO FORMS WITH ONE MAP. DFW Stone Corrals Ecological Reserve, Road 144 Unit, Tulare County. See "ATRPER NEW" on attached 2012 NAIP aerial image.

County: Tulare Landowner / Mgr.: Department of Fish and Wildlife

Quad Name: _____ Elevation: _____

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS

T____ R____ Sec ____, ____ ¼ of _____¼, Meridian: H☐ M☐ S☐ GPS Make & Model Trimble GeoXT 2005

DATUM: **NAD27** ☐ **NAD83** ☐ **WGS84** ☑ Horizontal Accuracy _____ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☐ ***OR*** Geographic (Latitude & Longitude) ☑

Coordinates: shapefile in SpeciesPolygons.mdb/Witham2013OtherPolys

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*

Playa-like pools in alkaline area. Dominant species in the mapped pools. Associated with Distichlis spicata. Some scattered plants in mesic areas throughout the site.

Please fill out separate form for other rare taxa seen at this site. Chamaesyce hooveri reported separately.

Site Information Overall site/occurrence quality/viability (site + population): ☑ Excellent ☐ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: grazing

Visible disturbances: none observed

Threats: none observed

Comments: I don't know why this isn't in the CNDDB. Plants are visible from the road.

Determination: *(check one or more, and fill in blanks)*

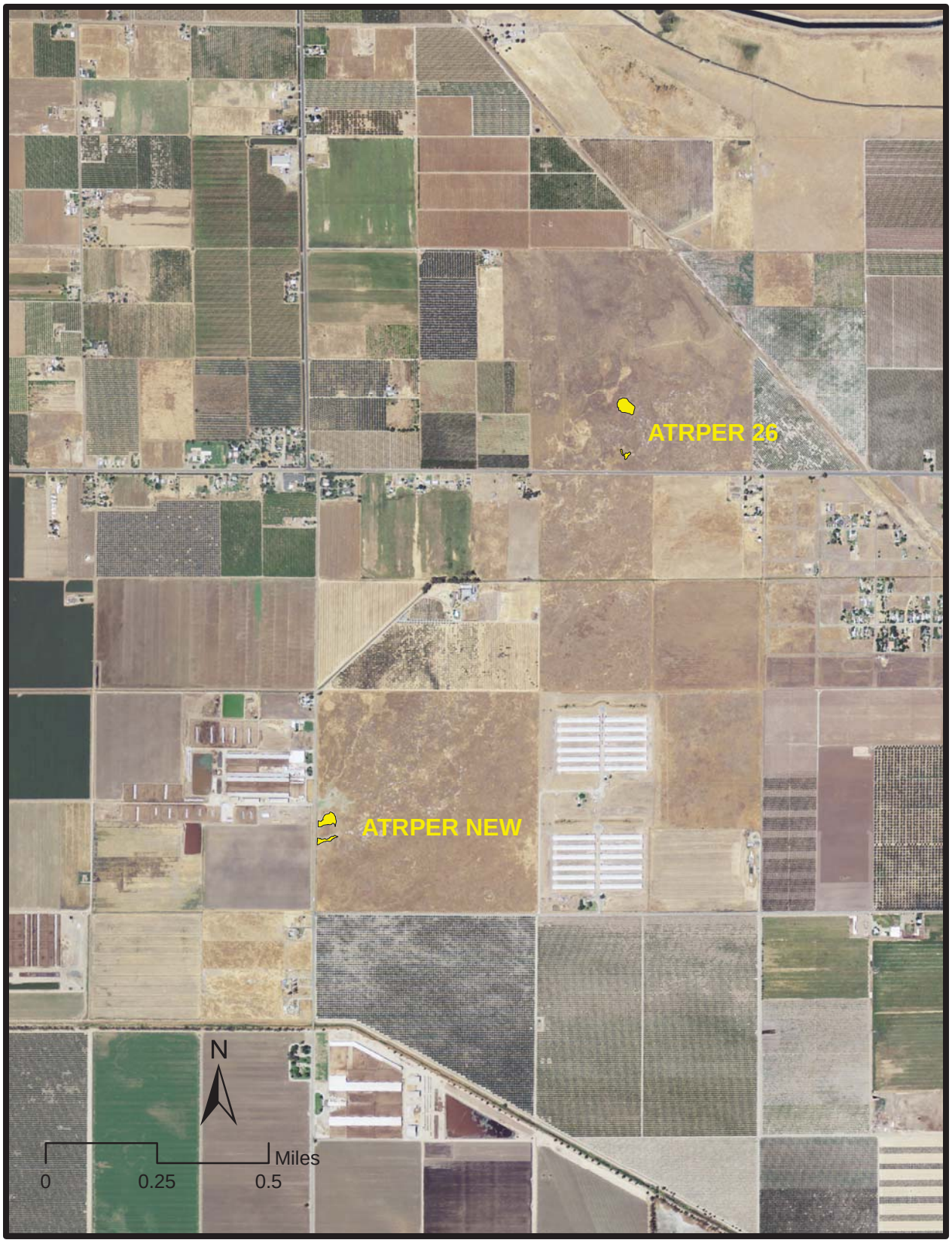
- ☑ Keyed (cite reference): The Jepson Manual
- ☐ Compared with specimen housed at: _____
- ☐ Compared with photo / drawing in: _____
- ☐ By another person (name): _____
- ☑ Other: Personal knowledge of taxon

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☑
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☑ no ☐

DFG/BDB/1747 Rev. 6/16/09



Atriplex persistens EO 26 & NEW
Tulare County

Status Surveys for Seven Federally Listed Vernal Pool Grasses and *Chamaesyce hooveri* in the Sacramento and San Joaquin Valleys (Great Valley), California, USA

Grant Agreement: 80270-8-G137

APPENDIX H:

POSTER PRESENTED JANUARY 24-25, 2013 AT NORTHERN CALIFORNIA BOTANIST CONFERENCE

Orcuttieae Grasses and *Chamaesyce hooveri*
Current Status in the Great Valley

Carol W. Witham
1141 37th Street, Sacramento, CA 95816-5415, cwitham@ncal.net

Introduction

The last comprehensive field surveys for eight federally listed vernal pool plant species were conducted in 1986-1987 by Biosystems Analysis (Stone et al. 1988). The majority of populations documented by Stone had not been visited in the intervening years. Also since that time, over 100,000 acres of vernal pool habitat have been lost to various types conversion (Holland 2009). This project updates our knowledge of the distribution and status for seven federally listed vernal pool grasses and Hoover's spurge in the Great Valley.

Methods

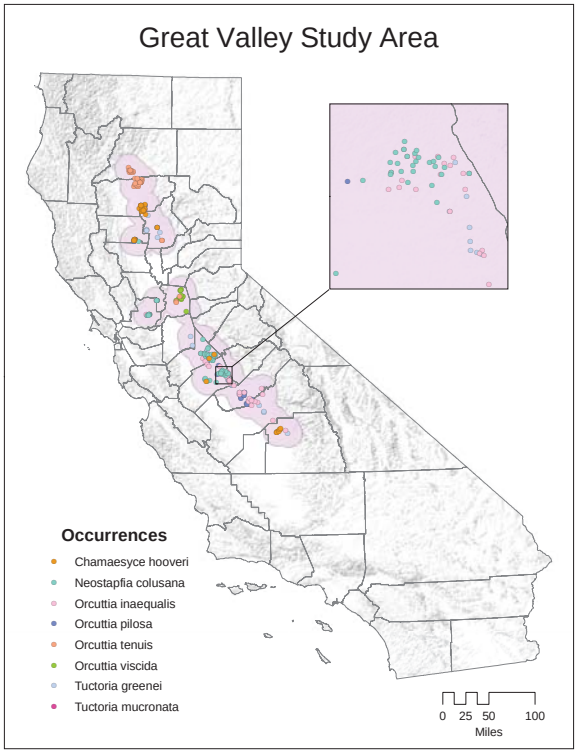
This project used a combination of aerial interpretation and field surveys to update the status of the eight target species. Shapefiles from the California Natural Diversity Database were superimposed on various georectified high-resolution aerial photographs. This review was used initially to determine if any suitable habitat still existed in the vicinity of populations presumed extirpated. Following field work, the aerial interpretation was used to determine likelihood of populations being extant for sites that could not be accessed.

The field survey portion of this project was hampered by lack of access to many sites. Most private land in the Great Valley is now behind clearly posted "no trespassing" signs. Even public trust lands owned by state and federal agencies were difficult to access. The agencies often required a written proposal and an appointment to visit the sites.

Results

Through a combination of field surveys and aerial photography interpretation, this project reports on the current status of 288 occurrences including 15 populations previously unreported and 11 erroneous or duplicate records. Of the 277 non-erroneous occurrences, 160 were visited during field surveys conducted in 2010-2011. The field work involved nearly 10,000 miles of windshield time and covered populations from just north of Redding in Shasta County to just north of Visalia in Tulare County.

Results from this study are presented in a report expected to be released in April 2013. The report includes status and findings by individual species. The report also takes a holistic approach to identifying regional issues by looking at the status of all species by vernal pool region and core recovery unit. A comprehensive table documenting the status of each of the 288 occurrences is included as an appendix to the report. Unfortunately, the report also documents numerous newly discovered extirpations, some of which took place during the field work.



Species Name	CNDDB Occurrences[c]	Erroneous Occurrences[d]	New Occurrences	Total Occurrences	Extirpated[e]	Possibly Extirpated[e]	Extant	Presumed Extant	
								Visited[f]	Not Visited[g]
Chamaesyce hooveri	29	0	2	31	2	3	12	6	8
Neostapfia colusana	59	0	6	65	13	4	17	10	21
Orcuttia inaequalis	47	-4	0	43	16	1	9	4	13
Orcuttia pilosa	35	-2	0	33	8	7	9	5	4
Orcuttia tenuis[a]	46	-4	2	44	3	2	21	1	17
Orcuttia viscida	11	0	1	12	2	0	8	0	2
Tuctoria greenei[b]	43	-1	3	45	15	2	13	5	10
Tuctoria mucronata	3	0	1	4	1	0	3	0	0
TOTALS	273	-11	15	277	60	19	92	31	75

[a] Only reports on the occurrences within the Great Valley; Orcuttia tenuis is also known from 49 occurrences outside the valley.
[b] Only reports on the occurrences within the Great Valley; Tuctoria greenei is also known from 1 occurrence outside the valley.
[c] CNDDB Occurrences assessed from California Natural Diversity Database RareFind 3.0, data set dated November 4, 2012.
[d] Erroneous Occurrences are more fully explained in the species by occurrence data presented in Appendix A.
[e] Approximately 37 of the Extirpated or Possibly Extirpated sites were visited; see additional information in Apppendix A.
[f] Sites where habitat was present, but no plants were found on the date of the field survey; possibly represents marginal habitat for the species.
[g] Sites were not visited for a variety of reasons including inability to access; this is more fully explained in the detailed data in Appendix A.

Summary & Conclusions

This was a fun, but long, large and data intensive, project. The sheer scope precludes any simple summary of results or recommendations. However, some general conclusions are provided below.

On the Negative Side: Unregulated and potentially illegal agricultural conversions continue to be a major concern, particularly in Stanislaus and Madera Counties. Both of these counties already boast high extirpation levels related to historic species occurrences. But the destruction of habitat continues at an alarming pace. Habitat destruction was witnessed and reported to the regulatory agencies during field work conducted under this project.

The Hickman Vernal Pools in southern Stanislaus County is a prime example of loss due to agricultural conversion issues. The pools themselves have not been converted, but their hydrology has been completely altered by irrigation of encroaching orchards. During the summers of 2010 and 2011, the primary habitat associated with this area was unseasonably inundated and appeared to have an excessive nutrient load. I believe that the previously large populations of three rare plants associated with the Hickman Vernal Pools are essentially lost. The magnitude of the damage here is not likely to be remediable.

On the Positive Side: Large tracks of vernal pool landscapes are under some form of protection. This is particularly true in the Dales and Vina Plains area of Tehama County and in eastern Merced County. Other areas also have a significant proportion of their vernal pool resources in a protected status: Sacramento National Wildlife Refuge in Glenn County, Jepson Prairie area in Solano County, and Stone Corral Ecological Area in Tulare County.

Literature Cited

Stone, R.D., W.B. Davilla, D.W. Taylor, G.L. Clifton and J.C. Stebbins. 1988. Status Survey of the Grass Tribe Orcuttieae and *Chamaesyce hooveri* (Euphorbiaceae) in the Central Valley of California. Sacramento, CA.

Holland, R.F. 2009. California's Great Valley Vernal Pool Habitat Status and Loss: Rephotorevised 2005. Auburn, CA.

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Status Surveys for Seven Federally Listed Vernal Pool Grasses and *Chamaesyce hooveri* in the Sacramento and San Joaquin Valleys (Great Valley), California, USA

Grant Agreement: 80270-8-G137

APPENDIX I:

DESCRIPTION OF DATA FILES TRANSMITTED

Appendix I

Description of Data Files Transmitted

No unmodified proprietary data are being transmitted. For example the polygon shape files from the California Department of Fish and Wildlife's California Natural Diversity Database (CNDDB) were used to prepare field packets, but those data were not modified and are not being transmitted. The CNDDB point shapefile was modified during the course of this project to include new information. Those data are being transmitted.

Note that the CNDDB uses the field EONDX as a unique identification code for all records. These have been maintained in all files being transmitted to allow for relational linking of tables and shapefiles.

Abbreviations Used

Many of the shapefiles use acronyms, abbreviations or codes to identify species. The following tables translate those to species names. They are also included in the data transmittal as Excel files.

ACRONYMN_Table.xlsx

ACRONYM	SNAME	CNAME
ATRPER	Atriplex persistens	vernal pool smallscale
CHAHOO	Chamaesyce hooveri	Hoover's spurge
GREHET	Gratiola heterosepala	Boggs Lake hedge-hyssop
NEOCOL	Neostapfia colusana	Colusa grass
ORCINA	Orcuttia inaequalis	San Joaquin Valley Orcutt grass
ORCPIL	Orcuttia pilosa	hairy Orcutt grass
ORCTEN	Orcuttia tenuis	slender Orcutt grass
ORCVIS	Orcuttia viscida	Sacramento Orcutt grass
SAGSAN	Sagittaria sanfordii	Sanford's arrowhead
TUCGRE	Tuctoria greenei	Greene's tuctoria
TUCMUC	Tuctoria mucronata	Solano grass

ELMCODE_Table.xlsx

ELMCODE	SNAME	CNAME
PDEUP0D150	Chamaesyce hooveri	Hoover's spurge
PMPOA4C010	Neostapfia colusana	Colusa grass
PMPOA4G060	Orcuttia inaequalis	San Joaquin Valley Orcutt grass
PMPOA4G040	Orcuttia pilosa	hairy Orcutt grass
PMPOA4G050	Orcuttia tenuis	slender Orcutt grass
PMPOA4G070	Orcuttia viscida	Sacramento Orcutt grass
PMPOA6N010	Tuctoria greenei	Greene's tuctoria
PMPOA6N020	Tuctoria mucronata	Solano grass

Appendix A (folder):

Contains description of fields used (*.docs) and Excel workbooks (*.xlsx) for each of the species. These files were used to generate Appendix A.

SpeciesPoints.mdb (geodatabase):

AllPoints: Original shapefile from CNDDB (November 4, 2012) modified to include abbreviated observational information contained in Appendix A, including new records, and then joined to County, Vernal Pool Region and Core Recovery Unit. This geodatabase was used to prepare the tables and figures contained in the report.

SpeciesPolygons.mdb (geodatabase):

These files were generated either from GPS data logger (Trimble GeoXT) or from heads-up digitizing based on field maps.

*Witham2013Poly*s: Polygon shapefile depicting the spatial extent of the target species population. Some of these are shown in Appendix E.

Witham2013New: Polygon shapefile depicting the spatial extent of newly discovered target species populations. Some of these are shown in Appendix E.

Witham2013OtherPolys: Polygon shapefile depicting the spatial extent of other rare species observed during the course of field work for this project. Shown in Appendix G.

Witham2013OtherPoints: Point shapefile depicting the spatial extent of other rare species observed during the course of field work for this project. Shown in Appendix G.

Witham2013AdditionalSurveyed: Point shapefile depicting additional areas surveyed in which none of the target species were found. In some cases these may duplicate Witham2013OtherPoints.

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