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PSEUDOBAHIA BAHIIIFOLIA & PSEUDOBAHIA PEIRSONII 2010 STATUS SURVEY REPORT

Eastern San Joaquin Valley, California

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The continued preservation of California's unique flora depends on the passion of individual botanists and other plant and nature enthusiasts. May they continue to explore, discover and help protect the unique botanical wealth of our state.

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REPORT ACRONYMS

CNDDDB	California Natural Diversity Database
DEM	Digital Elevation Model
E.O. Number	Element Occurrence Number (in CNDDDB)
GIS	Geographic Information Systems
GPS	Global Positioning Systems
SSURGO Data	Soil Survey Geographic Data
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

GLOSSARY OF TERMS

Adaptive Radiation. The rapid speciation of a single or a few species to fill many ecological niches.

Alluvium. Eroded rock material carried down and deposited along a stream course.

Annual. Pertaining to a plant that germinates, flowers, and dies in a single season

Caldera. A large, basin-like depression resulting from the explosion or collapse of the center of a volcano.

California Floristic Province. The portion of California west of the Sierra-Cascade range and Mojave Desert.

Endemic. Pertaining to a species that is only found in a specific region, location or habitat type.

Endemism. The state of being endemic.

Escarpment. A vertical rock outcrop.

Extant. Still in existence.

Extirpated. Pertaining to a species or population that has been locally eliminated.

Mima Mound. An individual mound within a unique topography consisting of closely-spaced large soils mounds with intervening depressions or swales.

Monotypic. Having only one species in a genus.

Perennial. Pertaining to a plant that lives more than a single year.

Tuff. Rock type composed of consolidated volcanic ash.

Pumice. Rock type composed of light, porous acid volcanic rock.

ABSTRACT

This report documents the current status, trends and threats to the known occurrences of two endangered, locally endemic California native plant species: Pseudobahia bahiifolia (Hartweg's golden sunburst) and Pseudobahia peirsonii (San Joaquin adobe sunburst). Both species are soil endemics restricted to narrow, though geographically separate, bands situated along the eastern edge of the San Joaquin Valley. Dr. John Stebbins conducted the first comprehensive status surveys of these species in 1990. His report was used by the U.S. Fish and Wildlife Species as the basis for federally listing P. bahiifolia as endangered and P. peirsonii as threatened in 1997. Both species had previously been listed as state endangered in 1987. Since that time, new occurrences have been documented, some occurrences have been extirpated or heavily disturbed and new threats have emerged to previously stable occurrences. Also, thinking has evolved in regards to how the species can best be managed, especially in relation to livestock grazing and preserve establishment and management. This report provides a comprehensive update to Dr. Stebbins original study. The information presented was gathered through review of existing documents and records, discussions with expert botanists familiar with the species and site visits to those occurrences where access could be obtained.

The genus Pseudobahia is taxonomically placed within the subtribe Eriophyllinae of the sunflower family (Asteraceae). This subtribe is considered to have originated and evolved in western North America. It includes perennials and annuals with the annuals thought to have evolved from the perennial taxa or related ancestors. This evolution is an elegant expression of the response of plants, through adaptive radiation, to the gradual shift to a drier, hotter climate within the California Floristic Province and adjacent areas over the past 60 million years. There are currently 19 annual species in four genera identified in the subtribe. These species occur primarily within arid environments of the southern Sierra foothills, San Joaquin Valley, southern Coast Ranges and Mojave Desert regions. All 19 of these species are restricted and sporadic in their distribution and typically inhabit unique or specialized microhabitats. Six of the 19 are identified as rare, threatened or endangered (List 1B) by the California Native Plant Society (CNPS) and another is on the CNPS Watch List (List 4). Four have federal or state listing status as threatened or endangered - Eriophyllum congdonii, Monolopia congdonii and two Pseudobahia species.

While closely related, P. bahiifolia and P. peirsonii inhabit very different soil types. P. bahiifolia is associated with acidic loam and sandy loam soils derived from weathering of volcanic tuff or pumice formations. In contrast, P. peirsonii is associated with heavy clay soils derived from weathered or eroded volcanic basalts or marine sedimentary and metamorphic rocks. This difference in soil association between such closely related species is emblematic of the fine nuances of adaptive radiation that have occurred among plants in the California Floristic Province. The local distributions of the two species are also related to soil moisture which may reflect their adaptation within an increasingly arid environment. P. bahiifolia occurs almost exclusively on north and east facing slopes with thin soils and typically blooms in early spring, presumably before the soil moisture becomes depleted. P. peirsonii occurs on heavy clay soils that are wetter than the surrounding soils and retain moisture longer into spring. While both species were likely rare historically, their distribution and abundance undoubtedly declined with the introduction and competition from non-native annual grasses. At present, both species are restricted to very limited microhabitats where competition with the non-native annual grasses is very low.

This study identified 43 occurrences of P. bahiifolia including extant, uncertain and extirpated occurrences. Of these, 36 (84%) are either confirmed or presumed to be extant, three (7%) are of uncertain status and four (9%) have become extirpated. Among the extant occurrences, 31 were determined to be stable and 5 were determined to be declining. A total of 16 new occurrences were discovered as part of this study and are among the 'stable' occurrences. Among the uncertain occurrences, two of the three are from the 1930s with non-specific mapping precision and have not been rediscovered since the original records. The other uncertain occurrence is a fragmented site that presumably used to be part of a larger population. Among the extirpated occurrences, one was originally documented in 1848 and hasn't been observed since (the type specimen in Yuba County) and the other was originally documented in 1939 and also has not been observed since. Both of these records may be erroneous or incorrectly mapped occurrences. The other two are more recently documented occurrences (1975 and 1980) and seemed to have been genuinely extirpated.

Overall, P. bahiifolia has experienced remarkably few extirpations or declines among well substantiated occurrences. This is due to the fact that most occurrences are still east of areas significantly impacted by

agricultural conversion, residential or ranchette subdivision, or other developments. The two extirpated occurrences with a specific known historic location were lost to orchard conversion and mining. The one uncertain occurrence with a specific known historic location was impacted as a result of habitat fragmentation from mining. The loss or decline as a result of mining is due to the fact that the underlying or nearby parent material is pumiceous or tuffaceous rock with commercial value. Some of the currently extant occurrences in stable condition are threatened by future potential mining. The large majority of extant occurrences are on large, unfragmented cattle ranches with active grazing. For the most part, these occurrences appear to be secure for the near future, provided active ranching continues. However, the edge of development for new subdivisions or ranchettes continues to press eastward towards the eastern edge of the San Joaquin Valley and this encroachment will likely pose a significant threat to *P. bahiifolia* over the coming decades.

This study identified 50 occurrences of *P. peirsonii* including extant, uncertain and extirpated occurrences. Of these, 37 (74%) are either confirmed or presumed to be extant, two (4%) are of uncertain status and 11 (22%) have become extirpated. Among the extant occurrences, 24 were determined to be stable and 13 were determined to be declining. A total of six new occurrences were discovered as part of this study and are among the 'stable' occurrences. According to Dr. Stebbins, two of the extant occurrences (CNDDDB E.O. 40 and 43) and perhaps some of others in the vicinity of these occurrences may be misidentified as *P. heermannii* based on his knowledge of the area. These sites were not accessible during the 2010 surveys to verify this. Among the uncertain occurrences, both are recently documented occurrences that have been impacted by the construction and operation of Lake Success. Among the extirpated occurrences, ten have been lost as a result of intensive agricultural conversion or other surface disturbance and one was lost as a result of the flooding of Lake Success.

Overall, *P. peirsonii* has experienced a significant number of extirpated and declining populations among well substantiated occurrences. The causes include conversion to intensive agriculture, site disking for fire control or general site maintenance, overgrazing and habitat fragmentation with subsequent lack of grazing. In contrast to *P. bahiifolia*, many occurrences of *P. peirsonii* are quite close to or surrounded by agricultural conversion, residential developments or other modified lands. The species is thus experiencing a higher level of extirpation and disturbance.

Currently, there is only one *P. bahiifolia* occurrence and one *P. peirsonii* occurrence protected and appropriately managed under some form of protective easement. Though no specific research has been conducted, the authors and other botanists have observed and concur that some level of livestock grazing is important for maintaining these species, especially for those occurrences that occur within introduced annual grasslands (as compared with occurrences on cliff or creek edges). Prior to European arrival, these species existed within a matrix of native annual wildflowers and perennial bunchgrasses. The introduction of non-native annual grasses completely changed the plant community context, with the native species facing a high level of competition from the introduced species. Also, the native large grazers that previously inhabited the San Joaquin Valley, including pronghorn antelope (*Antilocapra americana*) and tule elk (*Cervus canadensis nannodes*), were hunted out and replaced by domestic livestock. Under these new conditions, livestock grazing appears to be important for preventing the build-up of heavy growth and thatch from the non-native grasses which tend to reduce or eliminate *Pseudobahia* and other native wildflowers. The level of grazing can vary widely provided the site is not severely overgrazed or undergrazed. The level of grazing that typically occurs on most well-maintained cattle ranches in the eastern San Joaquin Valley appears to be favorable for long-term conservation of both *P. bahiifolia* and *P. peirsonii*. Future research would be useful to more precisely determine appropriate grazing levels for maintaining the species.

Developments may result in the fragmentation and isolation of *Pseudobahia* occurrences and the establishment of mitigation preserves. These preserves are often poorly maintained as habitat for native forbs compared to large, unfragmented active ranches. This is especially true for preserves less than 1,000 acres or so in total area, where ranching is no longer economically viable and the on-going grazing is part of a 'management plan' rather than an active ranching operation. Very small preserves less than 100 acres in total area are even less functional, with grass management very expensive and perhaps achieved by means of mowing rather than grazing, a high level of deleterious 'edge effects' from surrounding developed lands and poor long-term attention to site management. Given these circumstances, on-going efforts to conserve and maintain extant occurrences of *P. bahiifolia* and *P. peirsonii* should focus on working with landowners to place the large, viable cattle ranches where most occurrences are currently found under permanent conservation easements. Mitigation banks can also be effective for conserving the species provided they are large enough to have a viable, on-going ranching operation.

1.0 INTRODUCTION

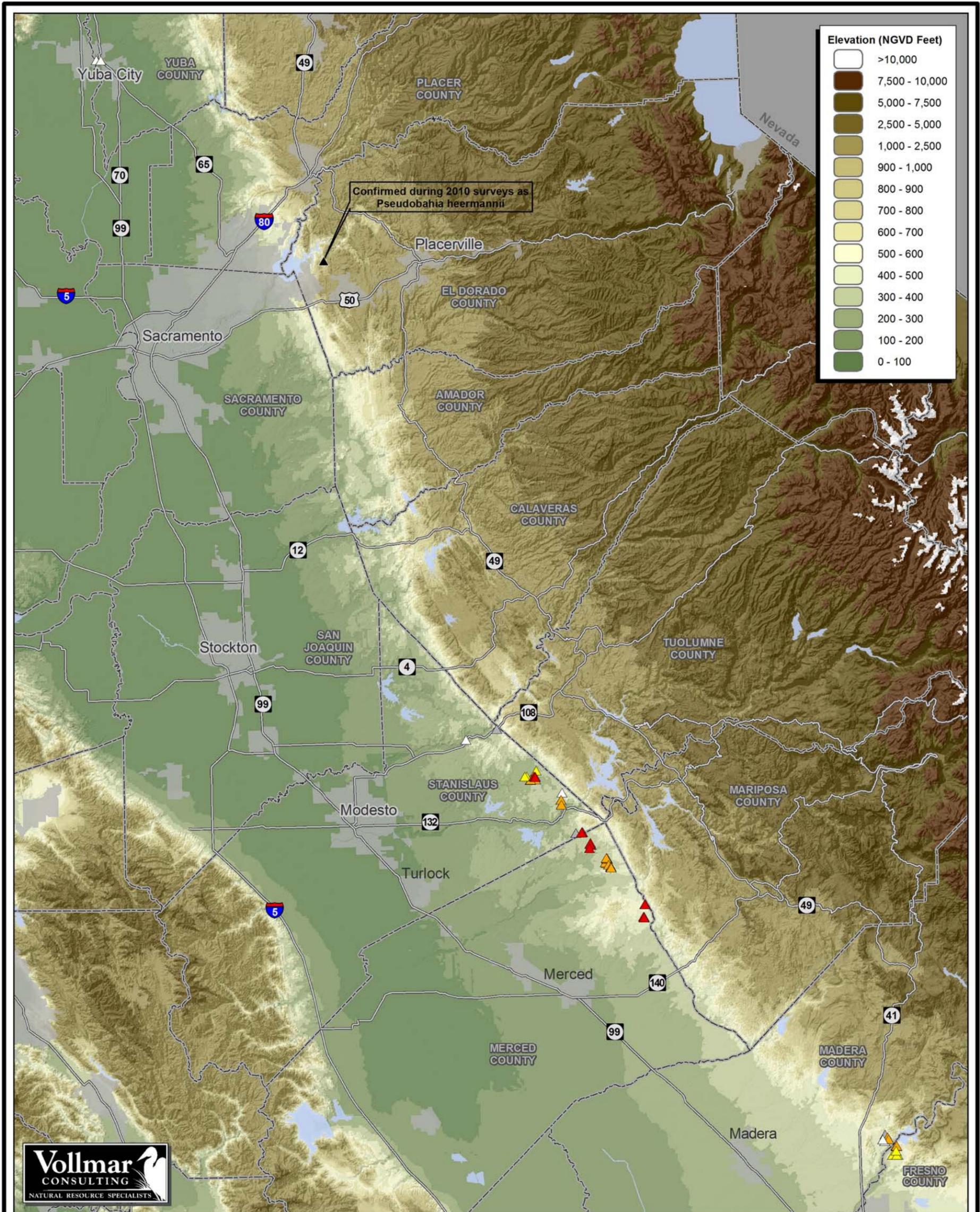
This report documents the current status, trends and threats to the known occurrences of two endangered, locally endemic California native plant species: *Pseudobahia bahiifolia* (Hartweg's golden sunburst) and *Pseudobahia peirsonii* (San Joaquin adobe sunburst). The *Pseudobahia* genus, part of the sunflower family (Asteraceae), includes only one other species - *P. heermannii* (Heermann's golden sunburst). All three species are small, annual herbs with bright yellow flowers (see representative photographs in **Appendix E**) that are limited in their distribution. *P. bahiifolia* and *P. peirsonii*, however, are considerably more limited, as these soil endemics are restricted to narrow, though geographically separate, bands situated along the eastern edge of the San Joaquin Valley (**Figures 1** and **2**). Interestingly, though the species are closely related, they inhabit very different soil types. *P. bahiifolia* is associated primarily with acidic loam and sandy loam soils derived from weathered or eroded ancient volcanic tuff or pumice geologic formations. In contrast, *P. peirsonii* is associated with heavy clay soils derived from materials eroded from volcanic basalts or marine sedimentary and metamorphic rocks.

All three *Pseudobahia* species are part of the broad suite of species that evolved *in-situ* through adaptive radiation within the California Floristic Province during the past approximately 20 million years as the region became progressively drier and warmer, transitioning to a Mediterranean climate (Raven and Axelrod 1978, Johnson 1978). The degree of speciation through adaptive radiation was fueled by the great geomorphic diversity of the region, reflecting the complex geologic history.

While both species were most likely very restricted prior to European arrival based on their current narrow microhabitat affinities, the introduction of non-native annual grasses undoubtedly contributed to their decline. Nonetheless, both species continued to persist within the open, mostly unfragmented grasslands used primarily for cattle ranching. However, in the recent past, new threats have been growing due to the continued expansion of farming, residential housing, reservoir projects and other developments into the eastern San Joaquin Valley and southern Sierra foothills. At present, six (14%) of the 43 known occurrences of *P. bahiifolia* and 13 (26%) of the 50 known occurrences of *P. peirsonii* have been extirpated or have an uncertain status and a significant number of additional occurrences, especially for *P. peirsonii*, are under threat from proposed or potential land conversion. Furthermore, only a few occurrences of either species are currently protected under permanent, well-managed preserves.

Dr. John Stebbins conducted the first comprehensive status surveys of these species in 1990. His report (Stebbins 1991) was used by the U.S. Fish and Wildlife Species (USFWS) as the basis for federally listing *P. bahiifolia* as endangered and *P. peirsonii* as threatened in 1997. Both species had previously been listed as state endangered in 1987. Since that time, new occurrences have been documented, some occurrences have been extirpated or heavily disturbed and new threats have emerged to previously secure occurrences. Also, thinking has evolved in regards to how the species can be best managed, especially in relation to livestock grazing and preserve establishment and management.

This report provides a comprehensive update to Dr. Stebbins original study. The report format largely follows that developed by Dr. Stebbins for continuity. It also includes some language taken directly from the report pertaining to classification, nomenclature and plant descriptions. As part of this study, we compiled information on all currently known occurrences of the species including all new occurrences discovered since 1990; visited most of these occurrences to collect site-specific data on distribution, ecology and microhabitat preferences, current habitat condition and potential threats; conducted surveys of additional potential habitat, resulting in the discovery of 16 new occurrences (and a significant local range extension) of *P. bahiifolia* and six new occurrences of *P. peirsonii*; and analyzed all survey data to assess the current status, threats and trends in relation to Dr. Stebbins' original findings.



Legend

Status of *Pseudobahia bahiifolia*, 2010

- ▲ New Occurrence Identified During 2010 Surveys
- ▲ Confirmed Extant
- ▲ Presumed Extant
- ▲ Status Uncertain
- △ Presumed or Confirmed Extirpated

Reference Features

- River
- Highway
- Major Water Body
- Urban Area
- County Boundary

Data Sources: Vollmar Consulting, 2010 | Stebbins, 1991
 CNDDDB, 01/2010 | USGS, Various | TIGER, 2000
 Gap, 1998 | DWR, 2001
 GIS/Cartography by Jake Schweitzer, December 2010
 Map File: Vicinity-PSBA_211_B-P_2010-1207.mxd

FIGURE 1
Regional Vicinity and Elevation
Pseudobahia bahiifolia Status Surveys
 Central Valley, California



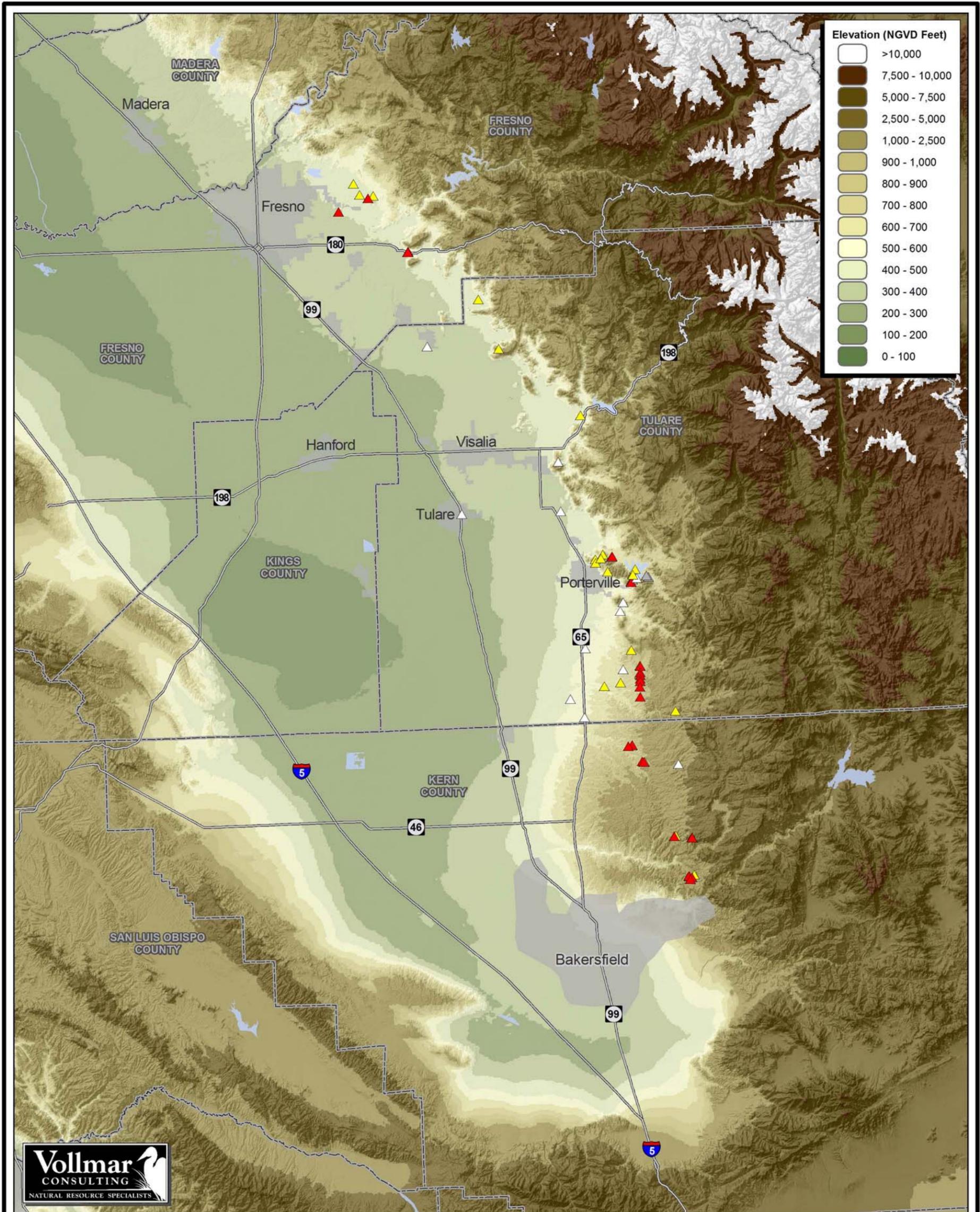
1:823,680

(1 inch = 13 miles at tabloid layout)

0 6.5 13 26 KM

0 6.5 13 26 Miles





Legend

Status of *Pseudobahia peirsonii*, 2010

- ▲ New Occurrence Identified During 2010 Surveys
- ▲ Confirmed Extant
- ▲ Presumed Extant
- ▲ Status Uncertain
- △ Presumed or Confirmed Extirpated

Reference Features

- Highway
- Major Water Body
- Urban Area
- County Boundary

FIGURE 2
Regional Vicinity and Elevation
***Pseudobahia peirsonii* Status Surveys**
 San Joaquin Valley, California



1:823,680

(1 inch = 13 miles at tabloid layout)

0 6.5 13 26 KM

0 6.5 13 26 Miles



Data Sources: Vollmar Consulting, 2010 | USDA, Prism, 1998
 TIGER, 2000 | Gap, 1998 | DWR, 2001 | USGS, Various
 GIS/Carography by Jake Schweitzer, December 2010
 Map File: Vicinity-PSPE_211_B-P_2010-1202.mxd

2.0 METHODS AND MATERIALS

The information presented in this study was gathered through review of existing documents, discussions with expert botanists familiar with the species and site visits to those occurrences where access could be obtained. This information was then compiled and analyzed to produce the final study. The methods used are summarized below. Section 2.5 summarizes the project funding and expenditures.

2.1 Review of Existing Documents

Available information was compiled and reviewed to develop an initial list of known occurrences of the two target species and information on their potential current status and habitat conditions. Sources of information included Dr. Stebbins' original status survey report for *P. bahiifolia* and *P. peirsonii* (Stebbins 1991), CNDDDB records and various technical project reports and studies that provided information on the two species. Geographic information systems (GIS) data were compiled for the entire ranges of both species, including digital ortho-rectified aerial photography, geologic formations, U.S. Department of Agriculture (USDA) SSURGO soil GIS data and various other reference data. U.S. Geological Survey (USGS) 10-meter digital elevation models (DEM) data were compiled and converted to slope, aspect and shaded relief grids to facilitate navigation and topographic analysis.

2.2 Discussion with Expert Botanists

Dr. Rob Preston of ICF International (Sacramento, CA) and Dave Hartesfeldt of Live Oak Associates (Oakhurst, CA) were contacted to obtain information on recently discovered or documented occurrences of the target species not yet included in the CNDDDB. In addition to these experts, Dr. Stebbins and John Vollmar brought extensive past field survey experience with the species and provided guidance on areas likely to support new occurrences.

2.3 Field Surveys

Field surveys for *P. bahiifolia* were conducted March 4 through April 22, 2010. John Vollmar, Jake Schweitzer and Steven Santos conducted most of the surveys for this species. Field surveys for *P. peirsonii* were conducted April 11 through April 30, 2010. Dr. John Stebbins, Russell Kokx, John Barbella and Chris Winchell conducted most of the surveys for this species. The 2010 field season proved to be an exceptional bloom and growth year for *P. peirsonii*. This species was documented in abundance at most extant sites as well as many new sites and individual plants were of larger stature than most years. It was also a good season for *P. bahiifolia*. The likely causes of these good to exceptional conditions are discussed under the Results section below.

The team made an effort to visit all known occurrences but some sites could not be accessed due to lack of landowner permission. At each site that was accessed, we checked for the presence of the target species, mapped any occurrences using a professional GPS unit or by hand-drawing onto hardcopy USGS topographic maps. Occurrences that were 100 ft² or less in size were mapped as point locations. Larger occurrences were mapped as polygons. For each population, we also collected data on soil type, slope and aspect, associated plant species, microhabitats, site and surrounding land uses and threats and other site characteristics.

Several thousand acres of additional potential habitat were surveyed for both species. John Vollmar and Jake Schweitzer surveyed several thousand acres of Amador soils on Valley Springs Formation in Sacramento, Amador, San Joaquin, Stanislaus and Merced Counties for *P. bahiifolia* as described in

Section 3.2.4 below. Dr. Stebbins and his associates also surveyed extensive additional habitat from Fresno to Kern County for *P. peirsonii*, targeting areas that he had previously identified as high quality potential habitat.

2.4 Data Analysis and Reporting

Field and other data were compiled into individual occurrence accounts with site maps following the approach used by Dr. Stebbins in his original study (Stebbins 1991). These accounts provide information on past and current documentation, past and current site conditions, trends and threats. Regional scale maps were also produced to show the locations of occurrence clusters and their relationships to key soil types, land conversion and other features.

2.5 Summary of Project Expenditures

The total project budget was \$70,840.00 including \$62,880.00 for labor and \$7,900.00 for direct project expenses. Of this budget, USFWS provided \$53,620.00 in direct funds (\$49,620.00 for labor and \$4,300.00 for direct project expenses) and the remainder (\$17,220.00) was provided as in-kind contributions from Vollmar Consulting through a 15% reduction of hourly labor rates from the company's standard rates (\$120/hr for senior botanists and GIS analysts, \$90/hr for staff botanists) and donated use of professional GPS units and ATVs used during the field work (standard fee of \$100/unit/day).

The project work involved at total of 224 hours for senior botanists (\$120/hr), 280 hours for staff botanists (\$90/hr) and 90 hours for a senior GIS analyst (\$120/hr). The project work was divided among five tasks including review existing data (Task 1), develop survey maps (Task 2), gain site access (Task 3), conduct field surveys (Task 4) and prepare progress, draft and final reports (Task 5).

Project expenses included vehicle mileage (\$2,000.00), ATV use fees (\$2,400.00 or 24 use days at \$100/day), GPS use fees (\$1,200.00 or 12 use days at \$100/day), field lodging and meals for overnight stays (\$1,900.00 total with a total allowable per diem of \$110/day), and miscellaneous office and field costs (\$400.00 total).

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3.0 RESULTS

3.1 Overview

This study identified 43 occurrences of *P. bahiifolia* and 50 occurrences of *P. peirsonii* including extant, uncertain and extirpated occurrences. These determinations were made through direct site visits or, where access could not be obtained, review of available site information including results of past surveys, current aerial photography and observations that could be made from nearby locations. The key accomplishments of the project included: 1) gaining access to, surveying and assessing the current status of the large majority of known occurrences of the two target species; 2) surveying several thousand acres of new additional potential habitat resulting in the discovery of 16 new occurrences of *P. bahiifolia* and 6 new occurrences of *P. peirsonii*, and 3) developing a comprehensive understanding of the likely maximum range and abundance of the two target species to enable more certain future conservation planning and protection efforts for the species.

The study results are presented in three sections. **Section 3.2** discusses the taxonomy and evolution of the *Pseudobahia* genus to provide a framework for the more specific discussions presented in **Section 3.3** covering *P. bahiifolia* and **Section 3.4** covering *P. peirsonii*. **Sections 3.3 and 3.4** include an annotated table of the known occurrences of the respective species and vicinity maps covering the range of the species highlighting relationships to climate and soils. **Appendix A** includes intermediate-scale maps of clusters *P. bahiifolia* in relation to regional geography and associated soils. **Appendix B** includes individual accounts and maps of each occurrence of *P. bahiifolia*. **Appendix C** and **Appendix D** include the same information, respectively, for *P. peirsonii*. **Appendix E** includes representative photographs of the species and their habitat settings.

Among the *P. bahiifolia* occurrences, 36 (84%) are either confirmed or presumed to be extant, three (7%) are of uncertain status and four (9%) have become extirpated. Among the extant occurrences, 31 were determined to be stable with good to moderate habitat conditions and five were determined to be declining in terms of population number and/or habitat conditions. The 16 new occurrences were discovered as part of this study are among the ‘stable’ occurrences. Some of these are within a ¼ mile of each other and may be grouped into a fewer number of CNDDDB Element Occurrence (E.O.) Numbers. Among the uncertain occurrences, two are from the 1930s with non-specific mapping precision and have not been rediscovered since the original records. The other uncertain occurrence is a fragmented site that presumably used to be part of a larger population. Among the extirpated occurrences, one was originally documented in 1848 and hasn’t been observed since (the type specimen in Yuba County) and the other was originally documented in 1939 and also has not been observed since. Both of these records may be erroneous or incorrectly mapped occurrences. The other two are more recently documented occurrences (1975 and 1980) and seemed to have been genuinely extirpated.

Among the *P. peirsonii* occurrences, 37 (74%) are either confirmed or presumed to be extant, two (4%) are of uncertain status and 11 (22%) have become extirpated. Among the extant occurrences, 24 were determined to be stable with generally good to moderate habitat conditions and 13 were determined to be declining in terms of number and/or habitat conditions. The six new occurrences discovered as part of this study are among the ‘stable’ occurrences. Two of these are within a ¼ mile of each other and may be grouped into a single CNDDDB E.O. Number. According to Dr. Stebbins, two of the extant occurrences (CNDDDB E.O. 40 and 43) and perhaps some of others in the vicinity may be misidentified as *P. heermannii* based on his knowledge of the area. These sites were not accessible during the 2010 surveys. Among the uncertain occurrences, both are recently documented occurrences that have been impacted by the construction and operation of Lake Success. Among the extirpated occurrences, ten have been lost due to agricultural conversion or disturbance and one was lost as a result of the flooding of Lake Success.

3.2 Taxonomy and Evolution of the *Pseudobahia* Genus

The genus *Pseudobahia* is taxonomically placed within the subtribe Eriophyllinae of the tribe Helenieae within the sunflower family (Asteraceae). The subtribe Eriophyllinae is considered to have originated and evolved in western North America (Raven and Axelrod 1978) and includes the widespread *Eriophyllum* genus as well as the more restricted or rare genera *Pseudobahia*, *Syntrichopappus*, *Monolopia* and (former) *Lembertia*. Johnson (1978) identifies two main evolutionary groups within the Eriophyllinae based on morphological and chromosomal characteristics: 1) an ‘eriophylloid’ line comprising *Eriophyllum*, *Pseudobahia* and *Syntrichopappus*; and 2) a ‘monolopioid’ line comprising *Monolopia* and *Lembertia*. The monotypic *Lembertia condongii* has recently been changed to *Monolopia congdonii* thereby eliminating the *Lembertia* genus (Jepson Online Herbarium 2010). Of these, *Pseudobahia* and *Monolopia* (including the former *Lembertia* species) are endemic to the California Floristic Province.

The Eriophyllinae subtribe includes perennials (some members of the *Eriophyllum* species) and annuals (all species within other genera and the remainder of *Eriophyllum* species), with annuals thought to have evolved from the perennial taxa or related ancestors (Johnson 1978, Raven and Axelrod 1978). This evolution is an elegant expression of the response of plants to California’s changing climate and geography. Over the past 60 million years, the California region has experienced a gradual shift to a drier, hotter climate due to a combination of global climate change and, more recently, the uplift of the Coast Range and Sierra Nevada Mountains causing rain shadow effects and isolation from continental climatic conditions. These changes have shifted the climate of California and surrounding regions to the east and southeast from tropical and temperate, favoring perennial tree and shrub species, to Mediterranean and desert, favoring or promoting annual species (Raven and Axelrod 1978). In addition, the geologic and topographic complexity of the region, resulting in a broad array of different microhabitats, combined with more global cyclic climate changes related to the glacial-interglacial periods, rendered an environment that promoted on-going isolation and diversification of plant species. The result has been an exceptional level of speciation through adaptive radiation, especially among annual flowering plants, with the California Floristic Province having a very high percentage of both endemic species (47%) and annual species (27%) as compared with other continental regions of the world (Raven and Axelrod 1978).

The annual species of Eriophyllinae epitomize the adaptive radiation, endemism and microhabitat specialization characteristic of the California Floristic Province. There are a total of 19 annual species in four genera in the subtribe (*Pseudobahia* - 3 species, *Syntrichopappus* - 2 species, *Monolopia* - 5 species and the annual *Eriophyllum* - 9 species). These species occur primarily within arid environments of the southern Sierra foothills, San Joaquin Valley, central and southern Coast Ranges and Mojave Desert regions. All 19 of these species are restricted and sporadic in their distribution and typically inhabit unique or specialized microhabitats. Six of the 19 are identified as Rare, Threatened or Endangered (List 1B) by CNPS (2010) and another is on the CNPS Watch List (List 4). Four have federal or state listing status as Rare, Threatened or Endangered (*Eriophyllum congdonii*, *Monolopia congdonii* and two *Pseudobahia* species).

P. bahiifolia and *P. peirsonii* are both soil endemics with very narrow, disjunct ranges along the eastern edge of the San Joaquin Valley. However, while these species are closely related, they inhabit very different soil types. *P. bahiifolia* is associated primarily with acidic loam and sandy loam soils derived from weathering of ancient volcanic tuff or pumice formations. In contrast, *P. peirsonii* is associated with heavy clay soils derived from materials eroded from volcanic basalts or marine sedimentary and metamorphic rocks. This difference in soil association is emblematic of the fine nuances of adaptive radiation that have occurred among plants in the California Floristic Province.

The distributions of *P. bahiifolia* and *P. peirsonii* are closely related to the distribution of their associated soils types, which in turn are related to the distribution of the parent rocks from which these soils derive. The eastern San Joaquin Valley/lower Sierra foothill region is composed of a series of geologic formations that reflect the evolution of the regional landscape and greater Central California. The primary formations, from oldest to youngest, include:

- Ancient metamorphosed marine sedimentary rocks deposited prior to the formation of the Central Valley (Mariposa and Calaveras formations; 180 million years ago (mya));
- Consolidated beach sands and lagoon muds deposited along the former continental margin near the current base of the Sierra Nevada mountains (Ione formation; 60 mya);
- Volcanic ash (Valley Springs Formation; 45 mya), mudflow (Mehrten formation (15-30 mya) and lavaflow (10 mya) that erupted along the former continental margin following subduction of the oceanic Farallon Plate under the continental North American Plate;
- Several pulses of granitic and other alluvium from glacial scouring in the high Sierras and erosion along lower elevation creeks (Laguna, Turlock Lake, Riverbank and Modesto formations; 5 mya-50,000 years ago);

These formations were deposited sequentially on top of each other and then uplifted with the rising of the Sierra Nevada range. Subsequent erosion exposed these formations in sequential bands along the base of the range and the eastern terraces of the San Joaquin Valley. In addition, the relatively recent (roughly 780 thousand years ago) eruption of the Long Valley Caldera near present-day Mammoth, California deposited volcanic ash and pumice over a wide area (as far east as present-day Nebraska) including the western slope the Sierra Nevada mountains. Some of this pumiceous material was carried down the San Joaquin River and deposited at the base of the Sierra Nevada foothills where it is presently exposed in the vicinity of Friant Dam below Millerton Lake.

Within this geological context, *P. bahiifolia* is restricted to soils derived from, or influenced by, the Valley Springs formation from Stanislaus County to Merced County and to local terraces composed of alluvium eroded from a the nearby pumiceous escarpment exposed along the San Joaquin River corridor near Friant Dam. *P. peirsonii* is restricted to heavy clay soils that derived primarily from locally weathered or transported material that eroded from the marine metamorphic Mariposa and Calaveras formations or volcanic basalt flows. The local distributions of the two *Pseudobahia* species also appear to be related to soil moisture which may reflect their adaptation within an increasingly arid environment. *P. bahiifolia* occurs almost exclusively on north and east facing slopes and typically blooms in early spring, presumably before the soil moisture becomes depleted. *P. peirsonii* occurs on heavy clay soils that are wetter than the surrounding soils and retain moisture longer into spring. While both species were likely rare historically, their distribution and abundance undoubtedly declined with the introduction of, and competition from, non-native annual grasses. At present, both species are restricted to very limited microhabitats where competition with the annual grasses is low. The microhabitat affinities of the two species are discussed further in **Sections 3.2.5** and **3.3.5** below.

The three species of *Pseudobahia* are distinguished morphologically on the basis of leaf structure as shown in the treatment below from the Jepson Manual (Hickman 1993):

Key to the species of the genus *Pseudobahia* (from Hickman 1993).

- 1. Largest leaves entire or 3-lobed*P. bahiifolia*
- 1' Largest leaves 1-2 pinnately lobed
 - 2. Largest leaves 1-pinnately lobed; phyllaries fused to ½ length*P. heermanii*
 - 2' Largest leaves 2- pinnately lobed (exc small plants); phyllaries fused only at base.....*P. peirsonii*

3.3 *Pseudobahia bahiifolia*

3.3.1 *Classification and Nomenclature*

Scientific Name: *Pseudobahia bahiifolia* (Bentham) Rydberg.

Note: Although it was published as *P. bahiaefolia*, article 73.8 of the International Code of Botanical Nomenclature, necessitates referring to the species as *P. bahiifolia* (Johnson 1978).

Bibliographic Citation: P. Rydberg. 1915. *Flora of North America*. 34:83.

Type Collection: USA: California: Yuba County, “on pastures of the upper Sacramento Valley, on Cordua’s farm at the junction of the Chuba (Yuba) with the Feather River”, 1-12 April 1847, T. Hartweg 208. Holotype K! (photograph UC), isotypes BM! CGE! GH! K! (photograph UC) NY! W!
Note: Although labels accompanying the holotype and some of the isotypes give the date of Hartweg’s collection as 1848, Hartweg collected 208 in 1847 in the vicinity of Cordua’s farm (McVaugh 1970).

Synonyms: *Monolopia bahiaefolia* (Bentham) Pl. Hartw. 317. 1849
Lasthenia bahiaefolia (Bentham) A. Gray, Proc. Amer. Acad. Arts 6:547.1865
Eriophyllum bahiaefolia (Bentham) Greene, Fl. Fran. 446.1897

Common Names: “Hartweg’s pseudobahia” (Smith and Berg 1988, Abrams 1960). In keeping with the more widely accepted practice of not using the genus in a common name, it is herein recommended that “Hartweg’s golden sunburst” be used. This name is descriptive of the bright yellow flower color of the species and also recognizes the contributions of Hartweg. Karl T. Hartweg (1812-1871) was a German botanist sent to Mexico and California by the London Horticultural Society in 1846 and 1847.

Taxonomic History: *Pseudobahia* was originally described as *Monolopia* (Bentham 1849), but was changed to *Eriophyllum* because it lacked a ventral lobe on the ray florets (Greene 1897). The genus *Pseudobahia* was later split off on the basis of leaf and floral morphology (Rydberg 1915). This taxonomic position was later supported with additional morphological and cytological evidence provided by Carlquist (1956) and Johnson (1978). *Pseudobahia* is currently considered to be a genus consisting of three species in the subtribe Eriophyllinae of the tribe Helenieae of the sunflower family (Asteraceae). The name means “false Bahia”, another heleniod genus. The specific epithet referred to the cursory resemblance to the foliage of that genus. The spelling of *bahiifolia* (previously *bahiaefolia*) was necessitated by article 73.8 of The International Code of Botanical Nomenclature (Johnson 1978). Article 73.8 states that “the use of a compounding form contrary to Rec. 73G in an adjectival epithet is treated as an error to be corrected”. Johnson (1978) treated the taxon as *P. bahiifolia* var. *bahiifolia*, treated *P. heermanii* as *P. bahiifolia* var. *pinnatifida* and annotated all the herbaria specimens he examined in this manner. He has since retracted the lumping of these two species (D. Johnson pers. comm. 1990).

3.3.2 *Legal Status*

International: None

Federal: Threatened. The species was listed in 1997 as Threatened under the federal Endangered Species Act (ESA) of 1973 by the USFWS (FR 1997). This classification means that there is evidence that the species is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Under the ESA with respect to listed plants, it is unlawful for any person subject to the jurisdiction of the United States to “remove and reduce to possession any such species from areas under Federal jurisdiction; maliciously damage or destroy any such species on any such area; or remove, cut, dig up, or damage or destroy any such species on any other area in knowing violation of any law or regulation of the State or in the course of any violation of a State criminal trespass”.

State: *Pseudobahia bahiifolia* was listed in 1987 as an Endangered species under the Native Plant Protection Act of the California Department of Fish and Game (CDFG). Listing of the species as Endangered (Chapter 10, Section 1900, California Fish and Game Code) under state law: 1) prohibits intentional take of listed species (except by landowners), 2) requires notification of landowners, 3) requires ten day notification of any intended development or change in land use that could detrimentally affect the species and 4) provides for entry and salvage of a population in the threat of extirpation due to proposed development or land use changes (Cochrane 1987). In addition, state and local permitting agencies may be forced to consult with the Department on any project or action that will affect Rare Threatened or Endangered plants, subject to the revisions of the California Environmental Quality Act (Cochrane 1987, Cummings 1987, Clausen 1989).

California Native Plant Society (CNPS): CNPS is a non-profit organization dedicated to education and conservation related to California native plants. CNPS maintains four separate 'lists' of species depending on level of threat. CNPS identifies *Pseudobahia bahiifolia* as a List 1B.1 species meaning that it is rare, threatened or endangered throughout its range (1B) and seriously threatened in California (.1). Species listed as CNPS 1B are generally afforded consideration under NEPA and CEQA.

3.3.3 Description

General, Non-Technical Description: Hartweg's golden sunburst is a 2-6 inch tall annual covered with white wooly hairs and with flower heads typical of the sunflower family. The narrow leaves are about one inch long. The bright yellow flowers, about 5/8 inches wide, are produced from March to April. The dry fruits are black. The plants grow in grassland communities and are often confused with goldfields (*Lasthenia* spp.). The two can be easily separated on the basis of their leaf arrangement. The leaves of Hartweg's golden sunburst are alternate, while the leaves of goldfields are opposite.

Technical Description: (adapted from Bentham 1849, Rydberg 1915, Munz 1959 and Johnson 1978). Slender, floccose-tomentose annual, Stems are simple or branched below the middle with ascending branches. Leaves linear to linear-spatulate, 3-lobed or entire with 3 blunt teeth at apex, 1-2 cm. long, narrowed to a petioliform base. Heads on slender peduncles 2-5 cm. long. Involucres hemispheric, 5-6 mm. high, nearly twice as broad. Phyllaries 6-8, narrowly ovate, united below the middle, herbaceous, the basal portion becoming indurated. Ray-flowers 6-8, oblong-elliptic, the tube slender, the ligule 5-10mm. long, obscurely toothed at apex, bright yellow. Disk-flowers about 2.5 mm long, tube slender, funnellform. Achenes black, 1.5 mm. long, narrowly ovoid, obcompressed. Pappus none. Chromosome number $2N = 8$.

Related Taxa: Morphologically, *P. bahiifolia* is similar to the two other species within the genus and to two other genera; *Eriophyllum* and *Lasthenia*. Refer to the key in **Section 3.2** above for the species distinguishing characteristics. *Pseudobahia* is separated from *Eriophyllum* by lacking a pappus and by having compressed achenes. It is easily distinguished from *Lasthenia* by the presence of alternate leaves.

3.3.4 Geographic Distribution

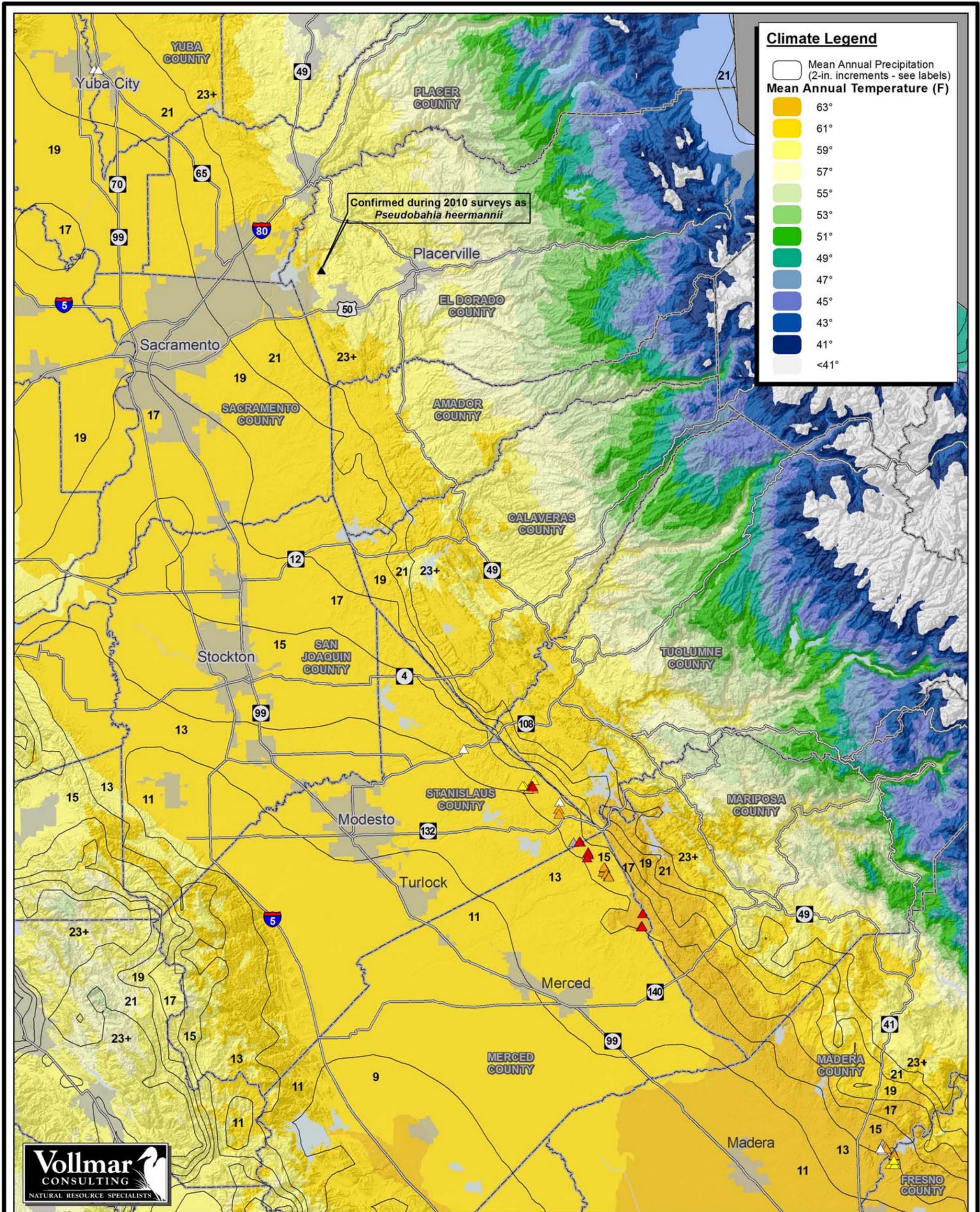
Figures 1, 3 and 4 are range-wide maps depicting the distribution and current status of the known *P. bahiifolia* occurrences in relation to elevation, climate and soils. **Appendix A** includes intermediate scale maps showing occurrence clusters in relation to the associated soils and surrounding geographic features. These occurrences include both extant and extirpated occurrences as well as occurrences of uncertain current status. As shown, the known occurrences are concentrated in two population centers. One is located along a narrow band from central eastern Stanislaus County to central eastern Merced County. The other is concentrated just north and south of the San Joaquin River below Friant Dam in eastern Madera and Fresno Counties. Historic outlier occurrences to the north are discussed below.

As shown on **Figure 4** and **Appendix A**, the known occurrences are closely tied to specific acidic soil types derived from weathered volcanic tuff and pumice formations as discussed in **Section 3.2** above. Measurements taken from several sites with a soil meter (Kelway soil pH and moisture meter) yielded pH levels generally between 6.2 and 6.6. The northern occurrences (Stanislaus and Merced Counties) are typically associated with Amador loam and sandy loam of the Valley Springs formation while the southern occurrences (Madera and Fresno Counties) are associated with Rocklin loam, pumiceous variant. These soils occur within a narrow band along the base of the Sierra foothills, tied directly to the geologic history of the region as discussed in **Section 3.2**. Due to the specific locations of these soils, all the known occurrences also occur within narrow elevation and climate ranges (**Figures 1** and **3**, respectively). The occurrences are within 300-500 feet elevation, are within areas with a mean annual temperature of 61-63 °F and are subject to a mean of 13-17 inches annual precipitation (most occurrences are subject to 15 inches mean annual precipitation). Some of the northern occurrences are mapped on other soil types, especially Hornitos soils of the Ione formation. This may be a result of imprecise soil mapping or influence on the soil from nearby Valley Springs formation since this formation is stratigraphically on top of and often closely enmeshed with the Ione formation.

The gap between the two population centers has extensive areas mapped as Amador loam soils (**Figure 4**). In 2001, Mr. Vollmar directed surveys for *P. bahiifolia* on most of these soil areas (Flying M Ranch, Butler Ranch, Crookham Ranch and Nelson Ranch) (Vollmar 2002). No *P. bahiifolia* was observed during these surveys. However, there appeared to be suitable habitat and it is likely occurrences will eventually be discovered within this gap. During the surveys conducted for this study, Mr. Vollmar discovered the first known occurrences south of the Merced River, reducing the gap by roughly 10 miles (**Figures 3** and **4**).

Amador loam and sandy loam soils also extend well north of the current known occurrences (**Figure 4**). Mr. Vollmar conducted targeted surveys of some of these areas as part of this study, including several thousand acres around Highway 104 in eastern Sacramento/western Amador County (Howard Ranch and Rancho Arroyo Seco), at various roadside areas traversing Amador soils in eastern San Joaquin County and Stanislaus County and on the 2,500-acre Orvis Ranch around Highway 4 in eastern Stanislaus County. No *P. bahiifolia* were observed during any of these surveys. Interestingly, Mr. Vollmar observed an apparent subtle shift in the surface topography of Amador soils just south of Highway 108/120, with areas to south showing a more distinctive development of large, well-defined 'mima mounds'. This shift corresponded closely to where *P. bahiifolia* is first encountered in northeast Stanislaus County. Given this observation and the lack of any occurrences found to the north, it is probable that the Stanislaus River-Highway 108/120 corridor represents the approximate northern limit of the species' distribution.

Rocklin loam soils occur on terraces and are derived from mixed alluvium. Though Rocklin soils are fairly widespread along the eastern San Joaquin Valley, the pumiceous variant occurs only very locally in the vicinity of Friant Dam below escarpments cut by the San Joaquin River. These escarpments are composed primarily of pumiceous sediments erupted from the Long Valley Caldera and transported down the San Joaquin River as discussed in **Section 3.2** above. These sediments have contributed a large portion of the alluvium that makes up the local Rocklin soils. Apparently, these soils are similar enough to Amador soils to provide suitable habitat for *P. bahiifolia*. Interestingly, in some locations these soils have developed large, closely-spaced mima mounds similar to those that often occur on the Amador soils known to support *P. bahiifolia*. Dr. Stebbins does not expect the species to occur south of the currently documented occurrences around Friant Dam due to a lack of suitable soils.



Legend

Status of *Pseudobahia bahiifolia*, 2010

- ▲ New Occurrence Identified During 2010 Surveys
- ▲ Confirmed Extant
- ▲ Presumed Extant
- ▲ Status Uncertain
- △ Presumed or Confirmed Extirpated

Reference Features

- Highway
- Urban Area
- County Boundary

Data Sources: Vollmar Consulting, 2010 | Stebbins, 1991
 CNDDb, 01/2010 | USDA Prism, 1998 | TIGER, 2000
 Gap, 1998 | DWR, 2001 | USGS, Various
 GIS/Carography by Jake Schweitzer, December 2010
 Map File: Climate-PSBA_211_B-P_2010-1207.mxd

FIGURE 3
Regional Temperature and Precipitation
Pseudobahia bahiifolia Status Surveys
 Central Valley, California



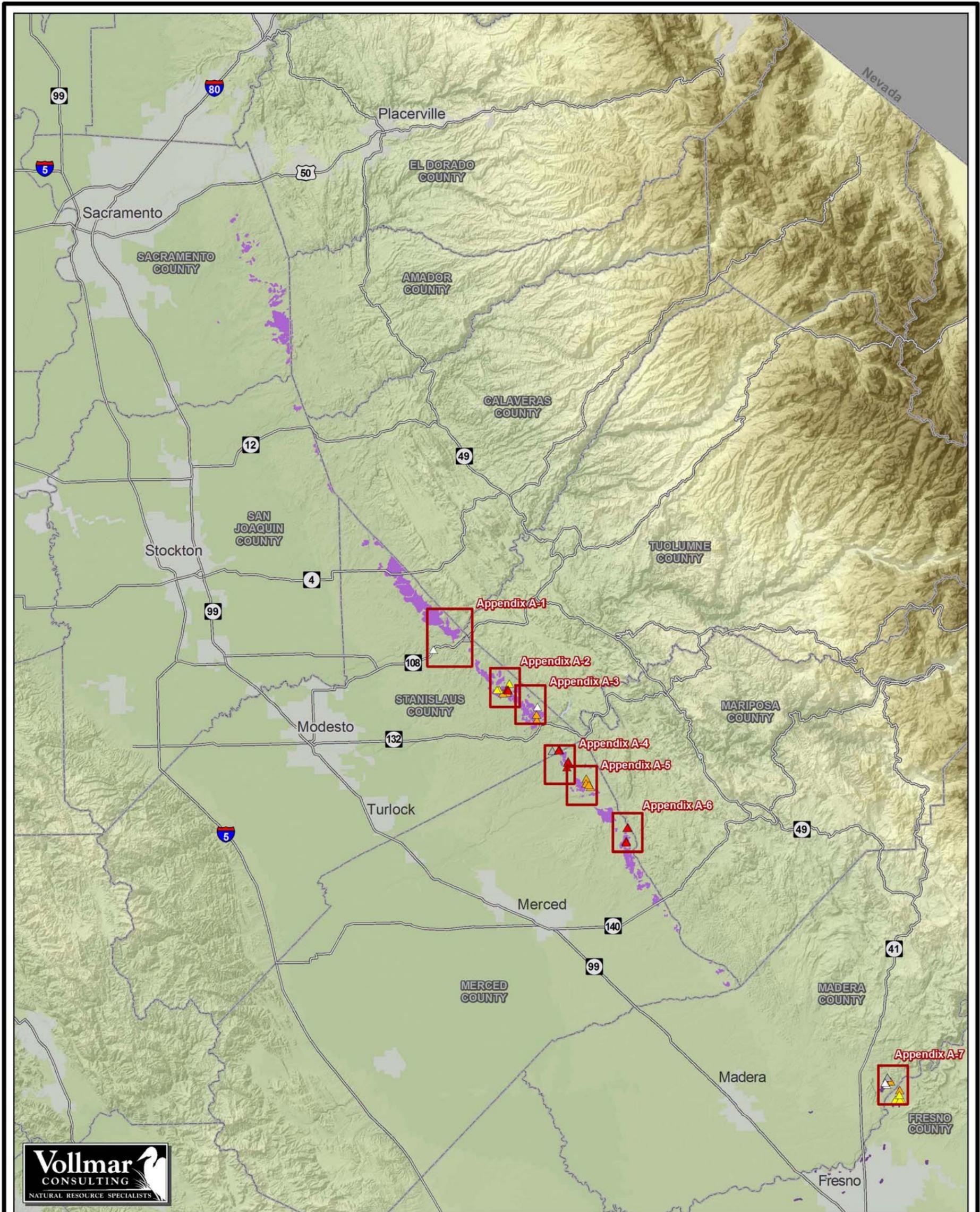
1:823,680

(1 inch = 13 miles at tabloid layout)

0 6.5 13 26 KM

0 6.5 13 26 Miles





Legend

-  Amador Loam Soil Series*
-  Rocklin Sandy Loam Soil Series
- Status of *Pseudobahia bahiifolia*, 2010**
-  New Occurrence Identified During 2010 Surveys
-  Confirmed Extant
-  Presumed Extant
-  Status Uncertain
-  Presumed or Confirmed Extirpated
-  Extents of Appendix A
- Reference Features**
-  River
-  Highway
-  Urban Area
-  County Boundary

*Data for Calaveras and Tuolumne Counties not available

Data Sources: Vollmar Consulting, 2010 | Stebbins, 1991 | USDA SSURGO
 CNDDDB, 01/2001 | Gap, 1998 | DWR, 2001 | USGS, Various
 Map Produced by Jake Schweitzer, Dec. 2010
 Map File: Soils-PSBA_211_B-P_2010-1207.mxd

FIGURE 4
Regional Vicinity and Associated Soils
Pseudobahia bahiifolia Status Surveys
 San Joaquin Valley, California



1:760,320

(1 inch = 12 miles at tabloid layout)

0 6 12 24 KM

0 6 12 24 Miles



There are four anomalous historic outlier occurrences including two along the Stanislaus River near the Stanislaus/San Joaquin County line, one far to the north in Yuba County which happens to be the type locality for the species and one also north in El Dorado County within the lower Sierra foothills (**Figure 1**). Dr. Stebbins visited the two occurrences along the Stanislaus River in 1990 and Mr. Schweitzer revisited them in 2010 as part of this study. *P. bahiifolia* was not found at either site during any of these visits. Both occurrences are old records (1937) with the species not observed since the original documentation and are considered to be ‘non-specific’ in terms of CNDDDB mapping precision (within five miles). The general mapping shows both occurrences along Highway 108/120 within the upper terrace of the Stanislaus River. Mr. Schweitzer found no suitable habitat for the species in these locations, though there are large areas with Amador loam soils and apparently suitable habitat on the bluffs both north and south of the river corridor. It is likely that the species was documented in the area but that the current mapped locations are inaccurate. Surveys of the bluff areas were not conducted as part of this study. Dr. Stebbins visited the Yuba County occurrence during his 1990 study and also viewed the specimen purportedly collected from this site. He found that the collected specimen is, indeed, *P. bahiifolia*. The identified location is near the junction of the Yuba and Feather Rivers near Marysville in an area that does not appear to have any suitable habitat for the species (e.g., lack of suitable soils). Also, there are no suitable soils in the general vicinity and no other records of the species anywhere in the region. As such, Dr. Stebbins considers it likely that the actual location of the collection was erroneously recorded and that *P. bahiifolia* likely did not occur at or in the vicinity of the site. Nonetheless, the occurrence record is being maintained in this report since it is the type locality, which gives it historic importance and interest. Mr. Vollmar and Mr. Schweitzer visited the El Dorado County occurrence as part of this study. They found *P. heermanii* in the mapped location, which was dominated by riparian and dense chaparral habitats (i.e., habitats not associated with *P. bahiifolia*). As such, we consider this to be an erroneous identification and have dropped this occurrence from the record.

In summary, based on the results of past and current surveys and an analysis of regional soils, the geographic distribution of *P. bahiifolia* is probably limited to two geographic areas along the eastern edge of the San Joaquin Valley: one associated with Amador soils from northeast Stanislaus County to central or perhaps south eastern Merced County; the other associated with Rocklin soils, pumiceous variant, just north and south of the San Joaquin River in Madera and Fresno Counties in the immediate vicinity of Friant Dam. The species probably does not occur north of Hwy 108/120 and is not expected to occur south of the current southernmost distribution. Additional occurrences representing range extensions for the species may be discovered during future surveys within the ‘gap’ in central and south eastern Merced County and perhaps to the north of the Stanislaus River in limited numbers. Some additional occurrences will undoubtedly also be discovered in the near vicinity of currently known occurrences as additional lands with suitable habitat are surveyed.

3.3.5 Environment and Habitat

P. bahiifolia only occurs on specific, highly restricted microhabitats within its preferred soils. As such, it is not abundant on these soils but only occurs in highly sporadic locations, with most occurrences consisting of only a small number of plants (often less than 100). Nearly all occurrences are on north to east-facing, generally steep (20 percent to near vertical) slopes in areas with thin soils. These microhabitats appear to provide a suitable level of soil moisture combined with reduced competition from introduced annual grasses. Due to its restricted microhabitat and small stature, finding occurrences of the species within a vast grassland landscape can be challenging. Biologists conducting surveys for the species need to have a strong understanding of the regional geology, soils and geomorphology as well as the specific habitat preferences of the species.

During the surveys conducted for this study, we found *P. bahiifolia* occurred primarily in four very specific geomorphic settings within the appropriate soils: 1) north to east-facing upper convex slopes of

large mima mounds, hillocks or bluffs; 2) north to east-facing upper rims of volcanic tuff escarpments; 3) north to east-facing upper portions of cut banks along seasonal and ephemeral streams; and 4) undulating terrain with thin soils where *P. bahiifolia* occurs more frequently on north to east facing slopes but also occurs on other aspects. Representative photos of these different settings are provided in **Appendix E**. Each of these settings provides the protective north to east facing slopes preferred by the species. Also, each setting has very thin, often sandy soils which limit colonization and competition from introduced annual grasses. In most cases, only the most extreme areas within these settings are occupied by *P. bahiifolia* as discussed below.

There are extensive areas with large mima mounds throughout eastern Stanislaus and Merced Counties. Yet, *P. bahiifolia* only occurs in a small number of sites with the largest of mounds formed across north to east facing topography. The upper convex slopes of these mounds are areas of soil weathering and erosion as compared with the lower slopes which are areas of soil deposition. This erosion has left fairly thin soils with a low cover of introduced annual grasses on the upper slopes of the largest mounds. On site in northeast Merced County, *P. bahiifolia* occurs in an unusual setting where there are several small hillocks underlain by Valley Springs bedrock (CNDDDB E.O. Numbers 33 and 30). These hillocks mimic very large mima mounds and *P. bahiifolia* has come to inhabit the northern upper slopes of some of these hillocks.

There are numerous hilltops with exposed Valley Springs escarpments in eastern Stanislaus and Merced Counties, yet only a few are inhabited by *P. bahiifolia*. At one site in northeast Merced County (VC 7), there is a continuous, exposed rim around the north side of one such escarpment but *P. bahiifolia* is concentrated along an approximately ten foot long section of the rim where suitable thin soils have developed. Other areas have marginally deeper soils right up to the edge of the escarpment that support a higher cover of introduced annual grasses that apparently exclude *P. bahiifolia*.

P. bahiifolia tends to inhabit only those cut stream banks that have both the correct north to east-facing orientation and the correct degree of habitat stability to allow the development of a thin soil over the cut bank. If the site is prone to continual disturbance from stream flows, there is not enough soil to support *P. bahiifolia*. If the site is not steep enough or too stable, it develops deeper soils that become colonized by introduced annual grasses which exclude *P. bahiifolia*. The appropriate habitat conditions occur only rarely and typically in very small areas along the ephemeral and seasonal creeks within the species' range, leading to a very sporadic distribution of occurrences as exemplified by occurrences VC 8-10.

There are two occurrences of *P. bahiifolia* on undulating terrain, one on Valley Springs formation with Amador loam soils and the other on Rocklin loam, pumiceous variant (ST 18 and CNDDDB E.O. 26, respectively). At both sites, there are several thousands of plants spread over many contiguous acres. In addition, these are the only two sites where significant numbers of plants occur on more exposed slope aspects (southeast to northwest). Perhaps these sites maintain more prolonged soil moisture on all aspects combined with low competition from non-native annual grasses, allowing *P. bahiifolia* to occur more broadly across the landscape.

The associated plant species that are diagnostic of *P. bahiifolia* habitat include those that can also colonize areas with thin, vernal mesic soils. These associates include *Erodium botrys*, *Vulpia microstachys*, *Plantago erecta*, *Thysanocarpus curvipes* and *Hypochaeris glabra*. Mosses also commonly occur in immediate association with *P. bahiifolia*. The total plant cover within *P. bahiifolia* stands typically varies from 30-80%, with patches of bare soil common, reflecting the low level of plant competition.

3.3.6 Status, Trends and Threats

This study identifies a total of 43 known occurrences of *P. bahiifolia*, including those that are considered extant, uncertain or extirpated. **Table 1** provides a summary of these occurrences. **Appendix A** provides intermediate scale maps of occurrence clusters in relation to specific soils and surrounding geographic features. **Appendix B** provides an individual account and map of each occurrence.

These occurrences include all the current CNDDDB records (E.O. Numbers) and some previous Stebbins (1991) occurrences that were not or inaccurately included in the CNDDDB, as well as new occurrences discovered through this and other surveys that have not yet been entered into the CNDDDB. The historic record from Yuba County is most likely erroneous but is retained due to its historic significance as the type specimen (CNDDDB E.O. 11, ST 11).

Among the *P. bahiifolia* occurrences, 36 (84%) are either confirmed or presumed to be extant, three (7%) are of uncertain status and four (9%) have become extirpated. Among the extant occurrences, 31 were determined to be stable with good to moderate habitat conditions and five were determined to be declining in terms of population number and/or habitat conditions. A total of 16 new occurrences were discovered as part of this study and are among the 'stable' occurrences. Some of these are within a ¼ mile of each other and may be grouped into a fewer number of CNDDDB E.O. Numbers when they are assigned. Among the uncertain occurrences, one of the three is from the 1930s with general mapping precision and hasn't been rediscovered since the original records. Another uncertain occurrence is found on a fragmented site that presumably used to be part of a larger population, while the third occurrence is located within a small horse pasture where the habitat is relatively degraded. Among the confirmed extirpated occurrences, one was originally documented in 1848 and hasn't been observed since (the type specimen in Yuba County) and the other was originally documented in 1939 and likewise hasn't been observed since. Both of these records may represent erroneous or incorrectly mapped occurrences. The two presumed extirpated are more recently documented occurrences (1975 and 1980) but seemed to have been genuinely extirpated.

There are several historic records that were determined through this study or Dr. Stebbins' original study to be erroneous and have been dropped. These include: an historic record from El Dorado County that was visited as part of this study and determined to be *P. heermannii* (CNDDDB E.O. Number 36); an historic record from Mariposa County that Stebbins previously determined to be *P. heermannii* (CNDDDB E.O. 4, ST 4); an historic record from Kern County that Stebbins previously determined to be *Eriophyllum ambiguum* (CNDDDB E.O. 9, ST 9), an historic record from Tulare County that Stebbins previously determined to be *P. peirsonii* (CNDDDB E.O. 12, ST 12); and an historic occurrence from the Cooperstown quadrangle in Stanislaus County considered to be an inaccurately mapped location by Stebbins and part of CNDDDB E.O. 19 (CNDDDB E.O. 20, ST 20).

Overall, *P. bahiifolia* has experienced remarkably few extirpations or declines among well documented occurrences. This is due to the fact that most occurrences are still east of areas significantly impacted by agricultural conversion, residential or ranchette subdivision, or other developments. The two extirpated occurrences with a specific historic location were lost to orchard conversion and mining. The one uncertain occurrence with a specific historic location was impacted as a result of habitat fragmentation from mining. The loss or decline as a result of mining is due to the fact that the underlying or nearby parent material is pumiceous or tuffaceous rock with commercial value. Some of the currently extant occurrences in stable condition are threatened by future potential mining.

The large majority of extant occurrences are on large, unfragmented cattle ranches with active grazing. For the most part, these occurrences appear to be secure for the near future, provided active ranching continues. However, the edge of development for new subdivisions or ranchettes continues to press

Table 1. Summary of *Pseudobahia bahiifolia* (PSEBAH) Known Occurrences. Compiled by Vollmar Consulting, November 2010.

Species	CNDDB EO#	Other Pop. #	County	Plants Last Seen	Last Site Visit	Status	Current Habitat Condition	Trend	Threats	Notes
PSEBAH	1	ST 1, ST 2	Madera	1980	1990	Presumed Extirpated	Presumed Extirpated	Presumed Extirpated	N/A	Two separate Stebbins locations included in E.O. 1. ST1 south of Road 205 was extirpated when the site was converted to an orchard; ST2 north of Road 205 has been heavily disturbed by past mining and overgrazing and is presumed extirpated but according to Stebbins (1991) some potential remains for the species to be present under more favorable conditions.
PSEBAH	3	ST 3	Stanislaus	1990	1990	Presumed Extant	Good	Presumed Stable	Site within area recently subdivided as 20-acre ranchettes	No site access in 2010. Stebbins observed approximately 160 plants in four separate areas in 1990. No apparent changes in land use so occurrence presumed extant.
PSEBAH	5	ST 5	Stanislaus	1975	2010	Presumed Extirpated	Presumed Extirpated	Presumed Extirpated	N/A	Site visited in 1986, 1990, 1997 and 2010 with no plants observed. Current (2010) habitat conditions marginal and altered with no current grazing and no clear Amador soils. Low potential for the species to occur under favorable management conditions.
PSEBAH	6	ST 6	Stanislaus	2010	2010	Extant	Good	Stable	Site within area recently subdivided into 20-acre parcels	46 plants observed in 1990. Thousands of plants observed in 2006 and 2010. Though area has been subdivided, most plants are on cliff faces which would likely be undisturbed by ranchette development.
PSEBAH	7	ST 7	Stanislaus	2010	2010	Extant	Good	Stable	Site within area recently subdivided into 20-acre parcels	120 plants observed in 1990. 3,500 plants observed in 2006. Tens of thousands of plants observed in 2010. Though area has been subdivided, most plants are on cliff faces which would likely be undisturbed by ranchette development.
PSEBAH	8	ST 8	Stanislaus	1990	2010	Uncertain	Poor	Declining	Subdivision and orchard conversion increasing in the area	Plant observed in 1974, 1986 and 1990. Not observed in 1997 by Bruce Baldwin or during several site visits from 2001-2010 by John Vollmar. Site is within a small horse pasture. Better quality habitat to the north but no plants observed during 2001-2010 visits.
PSEBAH	10	ST 10	Yuba	1848	1990	Extirpated	Extirpated	Extirpated	N/A	Historic type locality for species. Stebbins visited the site in 1990 and found no plants or any suitable habitat within five miles of the mapped location and he considers it likely that location of the collection was erroneously recorded.
PSEBAH	11	ST 11	Stanislaus	1939	2010	Presumed Extirpated	Presumed Extirpated	Presumed Extirpated	N/A	Historic 1939 occurrence. Mapped site adjacent to Highway 108/120. Upper floodplain terrace habitat of the Stanislaus River. Orchard and mining development on and around mapped site. Some marginal natural habitat remains but no Amador soils mapped or observed. Presumed extirpated.
PSEBAH	(13)	ST 13	Stanislaus	1990	2010	Presumed Extant	Good	Declining?	None apparent	Stebbins observed a very small population on a bluff overlooking Dry Creek in 1990. Schweitzer visited the site in 2010 and found good suitable habitat but no PSBA.
PSEBAH	(14)	ST 14	Stanislaus	1990	1990	Presumed Extant	Good	Presumed Stable	None apparent	Stebbins observed 27 plants on a small bluff east of Dry Creek in 1990. Site not visited in 2010 but habitat conditions in surrounding areas remain good.
PSEBAH	15	ST 15, ST 16	Stanislaus	2010	2010	Extant	Good	Stable	None apparent	E.O. 15 includes three separate occurrences all within ¼ mile of each other. No plants were observed in 2010 at the E.O. mapped location (NW occurrence) or the S occurrence (Stebbins Pop. 16). Schweitzer documented the NE occurrence in 2010 with more than 1,000 plants but did not observe plants at other locations without finding PSBA though CNDDB mapped locations may be erroneous. Additional occurrences in the near vicinity to be expected.
PSEBAH	17	ST 17	Stanislaus	1990	2010	Presumed Extant	Good	Declining?	None apparent	Stebbins observed 16 plants on a bluff overlooking Dry Creek in 1990. Schweitzer visited the site in 2010 and found good suitable habitat but no PSBA.
PSEBAH	(18)	ST 18	Stanislaus	2001	2010	Presumed Extant	Good	Presumed Stable	None apparent	Record included in E.O. 17 though more than 0.6 miles away. Stebbins observed 15,000+ plants spread over approximately 5 acres of undulating terrain in 1990. Vollmar visited the site in 2001 and found similar conditions. More predominant on N and E facing slopes but also occurs on other aspects. Site not visited in 2010 due to lack of access.
PSEBAH	(19)	ST 19	Stanislaus	1990	2010	Presumed Extant	Good	Declining?	None apparent	Record included in E.O. 15 though more than 0.4 miles away. Stebbins observed four small populations on a series of NE facing bluffs in 1990. Santos visited the site in 2010 and found good suitable habitat but no PSBA.
PSEBAH	21	ST 21	Fresno	2010	2010	Extant	Good	Stable	Proposed development in southern portion of site	Area A and B on map under conservation easements. Area C is a portion of a privately owned cattle ranch currently proposed for development as the Friant Ranch Community. More than 1,000 plants observed in 1990 and 2010.
PSEBAH	23	ST 22	Fresno	2009	2009	Presumed Extant	Good	Presumed Stable	Proposed development site	Stebbins observed approximately 600 plants in 1990. Live Oak Associates conducted surveys in 2007-2009 and documented plants. Site not visited in 2010 for this project due to lack of access.
PSEBAH	24	-	Fresno	1992	2009	Presumed Extant	Good	Presumed Stable	Proposed development site	Stebbins observed plants on the site in 1992. Live Oak Associates conducted surveys in 2007-2009 and documented plants. Site not visited in 2010 for this project due to lack of access.
PSEBAH	25	ST 23	Madera	1995	2010	Uncertain	Poor	Declining	Undergrazing , road widening, mining and other quarry activities	Stebbins observed 80 plants in 1990 and 1995. No plants were observed in 2010 and the habitat quality is poor. This site is likely fragmented from the larger site to the south by the quarry development and consists of a narrow, unmaintained parcel between Road 145 and the Friant Quarry.
PSEBAH	26	ST 24	Madera	2010	2010	Extant	Good	Stable	Potential future mining	More than 10,000 plants observed in 1989, 1990, 1991 and 2010 across roughly 13 acres of undulating terrain with thin soils. More predominant on N and E facing slopes but also occurs on other aspects. There is a large quarry to the north and a portion of the historic population was probably extirpated by the mining.

Species	CNDDB EO#	Other Pop. #	County	Plants Last Seen	Last Site Visit	Status	Current Habitat Condition	Trend	Threats	Notes
PSEBAH	27	-	Stanislaus	2010	2010	Extant	Good	Stable	None apparent	Observed by P. Allen in 1977, not visited by Stebbins in 1990. Schweitzer observed approximately 200 plants on north-facing slope in 2010.
PSEBAH	28	ST 25	Stanislaus	1990	2010	Presumed Extant	Good	Declining?	None apparent	Stebbins observed 26 plants in 1990. Schweitzer visited the site in 2010 and found good suitable habitat but no PSBA.
PSEBAH	29	-	Merced	2001	2010	Extant	Good	Stable	None apparent	Kelsey Ranch. Vollmar, Dittes and Guardino observed 65 plants in 2001. Schweitzer visited the site in 2010 and found four plants.
PSEBAH	30	-	Merced	2010	2010	Extant	Good	Stable	None apparent	Richards Ranch. Vollmar, Dittes and Guardino observed plants in several locations on N facing slopes and banks of seasonal drainages in 2001. Schweitzer observed approximately 700 plants in similar settings in 2010.
PSEBAH	31	-	Merced	2001	2010	Presumed Extant	Good	Declining?	None apparent	Richards Ranch. Vollmar, Dittes and Guardino observed plants in 2001. Schweitzer visited the site in 2010 and found good suitable habitat but no PSBA. Atypical habitat conditions for PSBA with cobbly soils and different plant associates.
PSEBAH	32	-	Merced	2001	2001	Extant	Good	Stable	None apparent	Kelsey Ranch. Vollmar, Dittes and Guardino observed less than 25 plants in 2001. Schweitzer observed approximately 100 plants in 2010. CNDDB E.O. location appears mis-mapped.
PSEBAH	33	-	Merced	2001	2001	Extant	Good	Stable	None apparent	Kelsey Ranch. Vollmar, Dittes and Guardino observed plants in 2001. Schweitzer observed approximately 350 plants in 2010.
PSEBAH	34	-	Stanislaus	1937	1937	Uncertain	Poor	Unknown	None apparent	1937 record, non-specific. Site mapped on dark rocky, volcanic soils, not Valley Springs formation. Possibly mis-mapped with actual historic location to the south beyond Wildcat Creek in an area with Valley Springs Formation.
PSEBAH	-	VC 1	Stanislaus	2010	2010	Extant	Good	Stable	None apparent	Private ranch. New occurrence discovered in 2010. Schweitzer observed 1,000s of plants on north-facing slope.
PSEBAH	-	VC 2	Stanislaus	2010	2010	Extant	Good	Stable	None apparent	Private ranch. New occurrence discovered in 2010. Schweitzer observed approximately 600 plants on north-facing slope.
PSEBAH	-	VC 3	Stanislaus	2010	2010	Extant	Good	Stable	None apparent	Private ranch. New occurrence discovered in 2010. Schweitzer observed 1,000s of plants on north-facing slopes on top of a seasonal creek bank.
PSEBAH	-	VC 4	Stanislaus	2010	2010	Extant	Good	Stable	None apparent	JCR Ranch. New occurrence discovered in 2010. Schweitzer observed approximately 100 plants on north-facing slope.
PSEBAH	-	VC 5	Stanislaus	2010	2010	Extant	Good	Stable	None apparent	JCR Ranch. New occurrence discovered in 2010. Schweitzer observed approximately 80 plants on north-facing slope.
PSEBAH	-	VC 6	Stanislaus	2010	2010	Extant	Good	Stable	None apparent	JCR Ranch. New occurrence discovered in 2010. Schweitzer observed approximately 50 plants on north-facing slope.
PSEBAH	-	VC 7	Merced	2010	2010	Extant	Good	Stable	None apparent	JCR Ranch. New occurrence discovered in 2010. Schweitzer observed approximately 75 plants in localized area on the top of a Valley Springs escarpment.
PSEBAH	-	VC 8	Merced	2010	2010	Extant	Good	Stable	None apparent	JCR Ranch. New occurrence discovered in 2010. Vollmar observed approximately 30 plants on a 2-foot tall, northeast-facing cut bank along a small ephemeral creek.
PSEBAH	-	VC 9	Merced	2010	2010	Extant	Good	Stable	None apparent	JCR Ranch. New occurrence discovered in 2010. Vollmar observed approximately 200 plants on north-facing 6-foot tall cut bank along a seasonal creek.
PSEBAH	-	VC 10	Merced	2010	2010	Extant	Good	Stable	None apparent	Private ranch. New occurrence discovered in 2010. Vollmar observed approximately 30 plants on north-facing 7-foot tall cut bank along a seasonal creek.
PSEBAH	-	VC 11	Merced	2010	2010	Extant	Good	Stable	None apparent	Hopkins Ranch. New occurrence discovered in 2010. Vollmar observed approximately 100 plants on upper north side of large mima mounds on north-facing slope.
PSEBAH	-	VC 12	Merced	2010	2010	Extant	Good	Stable	None apparent	Hopkins Ranch. New occurrence discovered in 2010. Vollmar observed approximately 95 plants on upper north side of large mima mounds on north-facing slope.
PSEBAH	-	VC 13	Merced	2010	2010	Extant	Good	Stable	None apparent	Hopkins Ranch. New occurrence discovered in 2010. Vollmar observed approximately 280 plants on upper north side of large mima mounds on north-facing slope.
PSEBAH	-	VC 14	Merced	2010	2010	Extant	Good	Stable	None apparent	Matthes Ranch. New occurrence discovered in 2010. Vollmar observed approximately 270 plants on upper north side of large mima mounds on north-facing slope.
PSEBAH	-	VC 15	Merced	2010	2010	Extant	Good	Stable	None apparent	Matthes Ranch. New occurrence discovered in 2010. Vollmar observed approximately 400 plants on upper north side of large mima mounds on north-facing slope.
PSEBAH	-	VC 16	Merced	2010	2010	Extant	Good	Stable	None apparent	Matthes Ranch. New occurrence discovered in 2010. Vollmar observed approximately 2580 plants on upper north side of large mima mounds on north-facing slope.

eastward towards the eastern edge of the San Joaquin Valley and this encroachment will likely pose a significant threat to *P. bahiifolia* over the coming decades. One example of a recently approved development is the Friant Ranch Planned Community to be constructed on a large ranch southeast of Friant Dam. This ranch supports a large population of *P. bahiifolia*. While the development plan includes avoidance and conservation of most if not all of the *P. bahiifolia* population on the site, it is unclear what the long-term effects of habitat fragmentation and isolation will be on the population.

3.3.7 Conservation and Management

Currently, there is only one *P. bahiifolia* occurrence protected under a permanent conservation easement (the northern portion of CNDDDB E.O. 21). Three of the large ranches in southeast Stanislaus/northeast Merced County are currently pursuing conservation easement funding for the portions of the ranches that include *P. bahiifolia*. The funding that has been obtained to date has been provided by the Central Valley Project Improvement Act Habitat Restoration Program or the USFWS/CDFG Section 6 Program. Other funding is being sought through the State Wildlife Conservation Board and other programs. Conservation organizations and the state and federal agencies should continue working with interested landowners throughout the range of *P. bahiifolia* to conserve extant populations before they are under imminent threat of disturbance or extirpation. The southern portion of CNDDDB E.O. 21 and all of CNDDDB E.O. Numbers 23 and 24 are on a ranch proposed for development as a residential community (Friant Ranch Community Plan). As currently proposed, all or most of these occurrences are being avoided as part of the plan and are to be included within a permanently protected on-site preserve. The long-term survival of these occurrences depends on the on-going site management within the context of the size and level of preserve isolation.

Though no specific research has been conducted, the authors and other botanists have observed and concur that some level of livestock grazing is important for maintaining *P. bahiifolia*, especially for those occurrences that occur within introduced annual grasslands (as compared with occurrences on cliff or creek edges). Prior to European arrival, *P. bahiifolia* existed within a matrix of native annual wildflowers and perennial bunchgrasses. The introduction of non-native annual grasses completely changed the plant community context, with the native species facing a high level of competition from the introduced species. Also, the native large grazers that previously inhabited the San Joaquin Valley, including pronghorn antelope (*Antilocapra americana*) and tule elk (*Cervus canadensis nannodes*), were hunted out and replaced by domestic livestock. Under these new conditions, livestock grazing appears to be important for preventing the build-up of heavy growth and thatch from the non-native grasses which tend to reduce or eliminate *P. bahiifolia* and other annual native wildflowers. The level of grazing can vary widely provided the site is not severely overgrazed or undergrazed. The level of grazing that typically occurs on most well-maintained cattle ranches in the eastern San Joaquin Valley appears to be favorable for long-term conservation of *P. bahiifolia*. Future research would be useful to more precisely determine appropriate grazing levels for maintaining the species.

Developments such as the proposed Friant Ranch Community Plan may result in the fragmentation and isolation of *P. bahiifolia* occurrences and the establishment of mitigation preserves. Such preserves are often poorly maintained as habitat for native forbs compared to large, unfragmented ranches. This is especially true for smaller preserves less than 1,000 acres or so in total area, where ranching is no longer viable and the on-going grazing is part of a 'management plan' rather than an active ranching operation. Very small preserves less than 100 acres in total area are even less functional, with grass management very expensive and perhaps achieved by means of mowing rather than grazing, thus contributing to a high level of deleterious 'edge effects' from surrounding developed lands and poor long-term attention to site management (Vollmar 2009).

Given these circumstances, on-going efforts to conserve and maintain *P. bahiifolia* should focus on working with landowners to place the large, viable cattle ranches where most occurrences are currently found under permanent conservation easements. Mitigation banks can also be effective for conserving the species provided they are large enough to have a viable, on-going ranching operation.

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3.4 *Pseudobahia peirsonii*

3.4.1 *Classification and Nomenclature*

Scientific Name: *Pseudobahia peirsonii* Munz.

Bibliographic Citation: Phillip A. Munz. 1949. *Aliso* 2:84

Type Collection: USA, California, Tulare County, “grassy flat, Ducor”. 20 March, 1925, P.A. Munz 9038. Holotype POM! (photographs MO, NY, UC, US), isotype LL!

Synonyms: None, although earlier collected specimens had been variously included in *P. hermanii* (Durand) Rydb., or *Monolopia heermanii* (Durand) or *Eriophyllum heermanii* (Durand) Greene, depending on the generic position given that species.

Common Names: “Tulare pseudobahia” (Smith and Berg 1988, Abrams 1960). In keeping with the more widely accepted practice of not using the genus in a common name, it is recommended herein that “San Joaquin adobe sunburst” be utilized. This name is descriptive of the bright yellow flower color of the species as well as the geographic and edaphic distribution.

Taxonomic History: Refer to **Section 1** for a descriptive account of the taxonomic history of the genus *Pseudobahia*. *P. peirsonii* was first described as a distinct species by Dr. P.A. Munz on 1949. The type (Munz #9038, RSA) specimens were collected in 1925 in the company of Frank W. Peirson of Altadena, California. Munz based his species description on the larger flowers, coarser stems, longer leaves and the fact that the largest leaves are also bipinnatifid. Also, the phyllaries are united only at the base as opposed to half their length in *P. heermanii*. This taxonomic separation was later supported with additional morphological and cytological evidence by Carlquist (1956) and Johnson (1978). Munz names the species in honor of his friend, Frank W. Peirson. Refer to **Table 3** in **Section 1** for the Key to the Species of the Genus *Pseudobahia*.

3.4.2 *Legal Status*

International: None

Federal: Threatened. The species was listed in 1997 as Threatened under the federal Endangered Species Act (ESA) of 1973 by the USFWS (FR 1997). This classification means that there is evidence that the species is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Under the ESA with respect to listed plants, it is unlawful for any person subject to the jurisdiction of the United States to “remove and reduce to possession any such species from areas under Federal jurisdiction; maliciously damage or destroy any such species on any such area; or remove, cut, dig up, or damage or destroy any such species on any other area in knowing violation of any law or regulation of the State or in the course of any violation of a State criminal trespass”.

State: *Pseudobahia peirsonii* was listed in 1987 as an Endangered species under the Native Plant Protection Act of the California Department of Fish and Game. Listing of the species as Endangered (Chapter 10, Section 1900, California Fish and Game Code) under state law: 1) prohibits intentional take of listed species (except by landowners), 2) requires notification of landowners, 3) requires ten day notification of any intended development or change in land use that could detrimentally affect the species and 4) provides for entry and salvage of a population in the threat of extirpation due to proposed development or land use changes (Cochrane 1987). In addition, state and local permitting agencies may be forced to consult with the CDFG on any project or action that will affect rare, threatened, or

endangered plants, subject to the provisions of the California Environmental Quality Act (Cochrane 1987, Cummings 1987, Clausen 1989).

California Native Plant Society (CNPS): CNPS is a non-profit organization dedicated to education and conservation related to California native plants. CNPS maintains four separate ‘lists’ of species depending on level of threat. CNPS identifies *P. bahiifolia* as a List 1B.1 species meaning that it is rare, threatened or endangered throughout its range (1B) and seriously threatened in California (.1). Species listed as CNPS 1B are generally afforded consideration under NEPA and CEQA.

3.4.3 Description

General, Non-Technical Description: San Joaquin Adobe Sunburst is a 4-18 inch annual, loosely covered with white, woolly hairs and with flower heads typical of the sunflower family. The leaves are 1-2 ½ inches long, triangular in outline and usually twice subdivided. The bright yellow, about ¾ inch wide, flowers are produced from March to April. The dry fruits are black.

Technical Description: (adapted from Munz 1949, Abrams 1960 and Johnson 1978). Annual somewhat woolly, divaricately branched above, 1-6 dm tall. Stems erect; 1.5-4.2 mm thick, the branched green to somewhat reddish, often becoming glabrate. Leaves alternate, triangular ovate, reduced up to stem. The petioles are 0.5-4.0 cm long and somewhat flattened. The blades are 1-4 cm long and almost as wide, grayish-tomentose or floccose, sometimes glabrate above. Blades are usually bipinnatifid into linear-oblong obtuse segments 1-5 mm wide, except in depauperate specimens. Heads solitary, on peduncles 2-10 cm long. Involucres hemispheric, 6-9 mm high, 10-22 mm wide, tomentose. Phyllaries about 8, lance-ovate and free essentially to the base. Ray-flowers about 8, the tube slender, the ligule 8-14 mm long, almost as wide, yellow, broadly ovate entire or notched at the apex. Disk-flowers orange-yellow, about 3 mm long, with a hairy slender corolla tube. Achenes black, about 3 mm long, obovoid, somewhat compressed. Pappus none. Chromosome number $2n = 16$.

Related Taxa: Morphologically, *Pseudobahia peirsonii* is similar to the other two species within the genus and to two other genera; *Eriophyllum* and *Lasthenia*. Refer to **Table 3** for the species distinguishing characteristics. *Pseudobahia* is separated from *Eriophyllum* by lacking a pappus and by having compressed achenes. It is easily distinguished from *Lasthenia* by the presence of alternate leaves.

3.4.4 Geographic Distribution

Figures 2, 5 and 6 are maps depicting the distribution and current status of the known *P. peirsonii* occurrences. **Appendix C** includes intermediate scale maps showing occurrence clusters in relation to the associated soils and surrounding geographic features. These include both extant and extirpated occurrences as well as occurrences of uncertain current status. As shown, the known occurrences are scattered from central eastern Fresno County to central eastern Kern County along the eastern edge of the southern San Joaquin Valley.

As shown on **Figure 6** and **Appendix C**, the known occurrences are primarily associated with certain heavy clay or adobe soils that occur within a narrow band along the base of the Sierra foothills, tied directly to the geologic history of the region as discussed in **Section 3.2** above. The primary soil types include Porterville clay, Centerville clay, Cibo clay and Mt. Olive clay though the species also occurs on other heavy clay soil types. Due to the specific locations of these soils, all the known occurrences also occur within generally narrow elevation and climate ranges (**Figures 2 and 5**, respectively). The occurrences are within 400-2,000 feet elevation (the highest occurrence is mapped at approximately 2,600

feet), are most commonly within areas with a mean annual temperature of 61-65 F and a mean of 9-15 inches annual precipitation (most occurrences are subject to 11-13 inches mean annual precipitation).

The soil types on which the species occurs are also mapped to the north and south of the current known range of *P. peirsonii* (Figure 6). It is unclear why the species does not occur more widely on these soils though it may be related to climate. The amount and period of annual rainfall decreases and the annual summer temperature increases, as one proceeds south along the eastern San Joaquin Valley. The specific climate within the range of the species may provide the most suitable conditions in terms of competition with other species and the needs of the species itself. Based on his extensive past survey experience, Dr. Stebbins does not believe *P. peirsonii* will be found significantly north or south of the current range of the species though some new occurrences will undoubtedly be found within the range as new lands are surveyed.

3.4.5 Environment and Habitat

Virtually all of the historic and recent population records for this annual plant strongly indicate that it is an edaphically restricted species to certain soils in the southeastern San Joaquin Valley. The type locality near Ducor and the earliest records often referred to “heavy clay or adobe” soils. All of the extirpated and extant populations that can be precisely mapped occur on heavy clay soils. The most commonly mapped soils, in order of degree of association with *P. peirsonii*, are Porterville clay, Centerville clay, Cibo clay and Mt. Olive clay (Stebbins 1991). Even in some of the areas within the range that are not as accurately mapped, it is found on similar heavy clay soils. Analyses have shown that these clay soils are either about neutral or slightly alkaline. It has been hypothesized (Stebbins pers. obs.) that the species favors these clay soils because of their water retention properties in a region of limited annual rainfall. This is consistent with the many observations of dramatically increased population numbers in years when late winter/early spring rainfall amounts and patterns are above average, such as during 2010. The species has been cultivated under controlled conditions by Dr. Stebbins and Dr. Dale Johnson (Stebbins pers. obs.) on common loam to even somewhat sandy loam soils and the plants have set viable seed, so the affinity for the natural clay soils is evidently not a nutritional restriction.

P. peirsonii now only occurs in what is currently described as introduced annual grasslands (historically scattered bunch grass/forb dominated plains) in the eastern San Joaquin Valley although some of the southernmost populations in Kern County are near the lowest foothill woodland habitats dominated by blue oaks and live oaks. Many of the current grasslands where the species is still extant can also be classified as degraded or “ruderal” due to various past and present land uses and disturbances. These impacted sites support a much higher percentage of introduced non-native associates than the less modified sites within the species range and yet *P. peirsonii* has persisted, albeit in much lower numbers than on less disturbed sites.

The most common plant associates of the species in decreasing order of frequency are: *Achyraea mollis*, *Lepidium nitidum*, *Erodium cicutarium*, *Bromus hordeaceus*, *Avena barbata*, *Bromus madritensis rubens*, *Amsinckia menziesii*, *A. intermedia*, *Dichellostemma pulchellum*, *Gilia tricolor*, *Vulpia myuros*, *Agoseris heterophylla*, *Hypochaeris glabra* and *Erodium botrys*. The almost universally associated presence of *Achyraea mollis*, another native herbaceous annual in the Asteraceae family, has been noted in many of the historic and recent records for most sites. In the more disturbed “modified habitat sites”, aggressive “weedy” non-native annuals such as *Lactuca serriola*, *Hirschfeldia incana*, *Sisymbrium altissimum*, *Avena barbata* and *Silybum marianum* are often the dominant associates. Examples of such sites include the Quail Lakes “Preserve” and Highway 180 sites in Fresno County, as well as the site north of Fountain Springs in Tulare County. When these large, aggressive species are sporadically reduced or eliminated by grazing, mowing or summer wildfires, *P. peirsonii* often “rebounds” from the

persistent seed bank for the next few seasons, until the competition again becomes excessive and it gradually declines in numbers and vigor.

The most commonly observed microhabitat settings of this species are somewhat difficult to describe. The largest and most viable current populations are usually characterized by a sparser cover (as often observed from a distance) of tall dense annual grasses (e.g., *Avena*, *Bromus*) than surrounding areas, and a higher percentage of less competitive native and non-native forbs (*Achyrocheana*, *Erodium*, *Gilia*, *Dichelostemma*). In addition, the reduced plant cover at these sites exposes some of the characteristic cracked surface clay soils that are described from the earliest historic collections (see photographic examples in **Appendix E** of these phenomena from the Pyramid Hill and Rag Gulch populations in Kern County, two of the highest quality, most diverse and stable populations, as further described in this report). Without question, the extensive Pyramid Hill populations (CNDDDB E.O. Number 18) are the largest and most ecologically diverse ensemble of not just this rare species, but several other San Joaquin Valley native plants of limited distribution (e.g., *Fritillaria striata*, *California macrophylla* and *Delphinium hansenii* ssp. *ewanianum*). **Appendix E** provides representative photographs of the species and its typical habitat settings.

3.4.6 Status, Trends and Threats

This study identifies a total of 50 known occurrences of *P. peirsonii*, including those that are considered extant, uncertain or extirpated. **Table 2** provides a summary of these occurrences. **Appendix C** provides intermediate scale maps of occurrence clusters in relation to specific soils and surrounding geographic features. **Appendix D** provides an individual account and map of each occurrence.

These occurrences include all the current CNDDDB records (E.O. Numbers) and some previous Stebbins (1991) occurrences that were not, or inaccurately, included in the CNDDDB, as well as new occurrences discovered through this and other surveys that have not yet been entered into the CNDDDB.

Among the *P. peirsonii* occurrences, 37 (74%) are either confirmed or presumed to be extant, two (4%) are of uncertain status and 11 (22%) have become extirpated. Among the extant occurrences, 24 were determined to be stable with generally good to moderate habitat conditions and 13 were determined to be declining in terms of number and/or habitat conditions. A total of 6 new occurrences were discovered as part of this study and are among the 'stable' occurrences. Two of these are within a one-quarter mile of each other and may be grouped into a single CNDDDB E.O. Number when they are assigned. According to Dr. Stebbins, two of the extant occurrences (CNDDDB E.O. 40 and 43) and perhaps some of others in the vicinity of these occurrences may be misidentified as *P. heermannii* based on his knowledge of the area. These sites were not accessible during the 2010 surveys to verify this. Among the uncertain occurrences, both are recently documented occurrences that have been impacted by the construction and operation of Lake Success. Among the extirpated occurrences, ten have been lost as a result of intensive agricultural conversion or other surface disturbance and one was lost as a result of the flooding of Lake Success.

Overall, *P. peirsonii* has experienced a significant number of extirpated and declining populations among well documented occurrences. The causes include conversion to intensive agriculture, site disking for fire control or general site maintenance, overgrazing and habitat fragmentation with subsequent lack of grazing. In contrast to *P. bahiifolia*, many occurrences of *P. peirsonii* are quite close to or surrounded by agricultural conversion, residential developments or other modified lands. The species is thus experiencing a higher level of extirpation and disturbance.

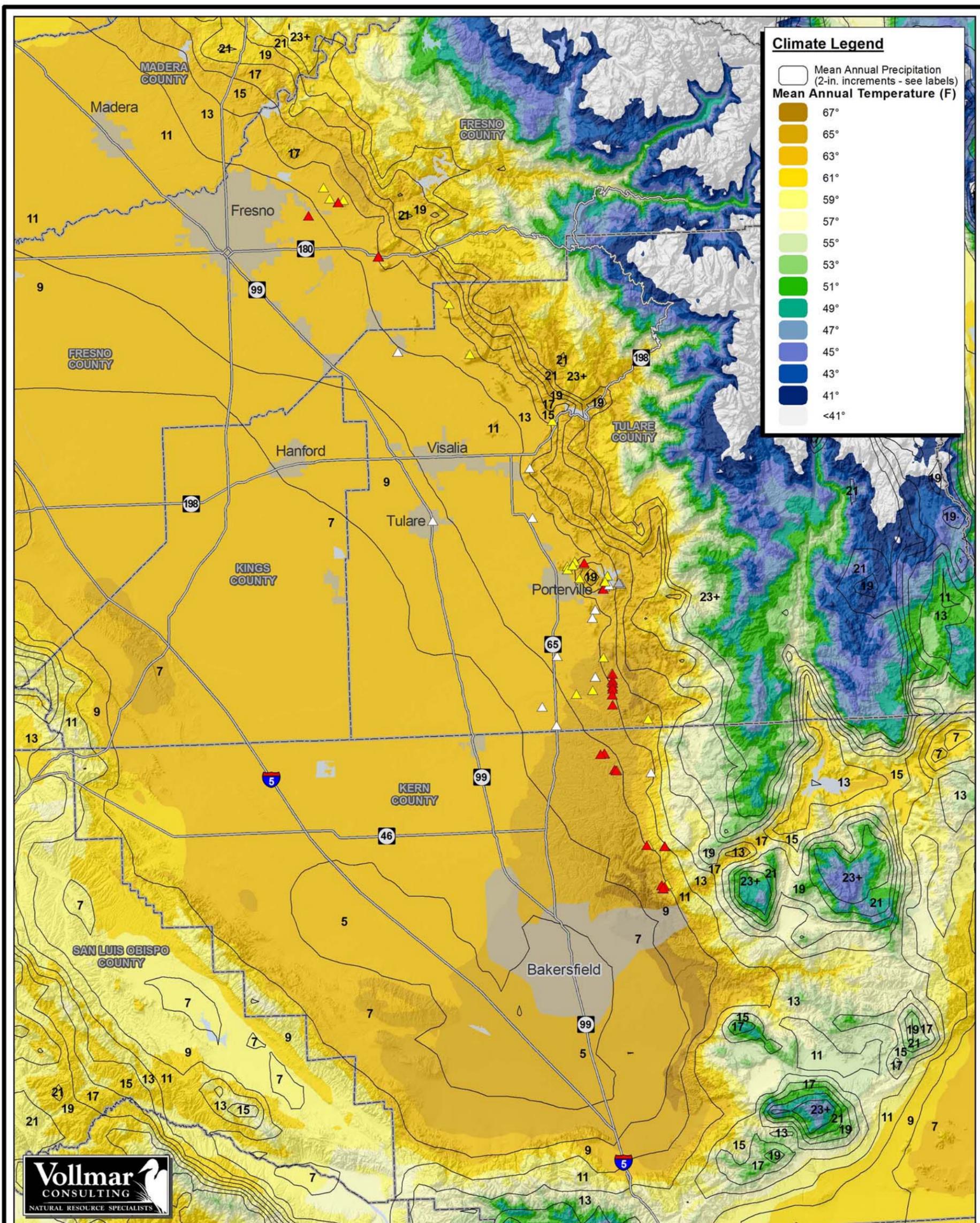


FIGURE 5
Regional Temperature and Precipitation
Pseudobahia peirsonii Status Surveys
 San Joaquin Valley, California

Legend

Status of *Pseudobahia peirsonii*, 2010

- ▲ New Occurrence Identified During 2010 Surveys
- ▲ Confirmed Extant
- ▲ Presumed Extant
- ▲ Status Uncertain
- △ Presumed or Confirmed Extirpated

Reference Features

- Highway
- Urban Area
- County Boundary

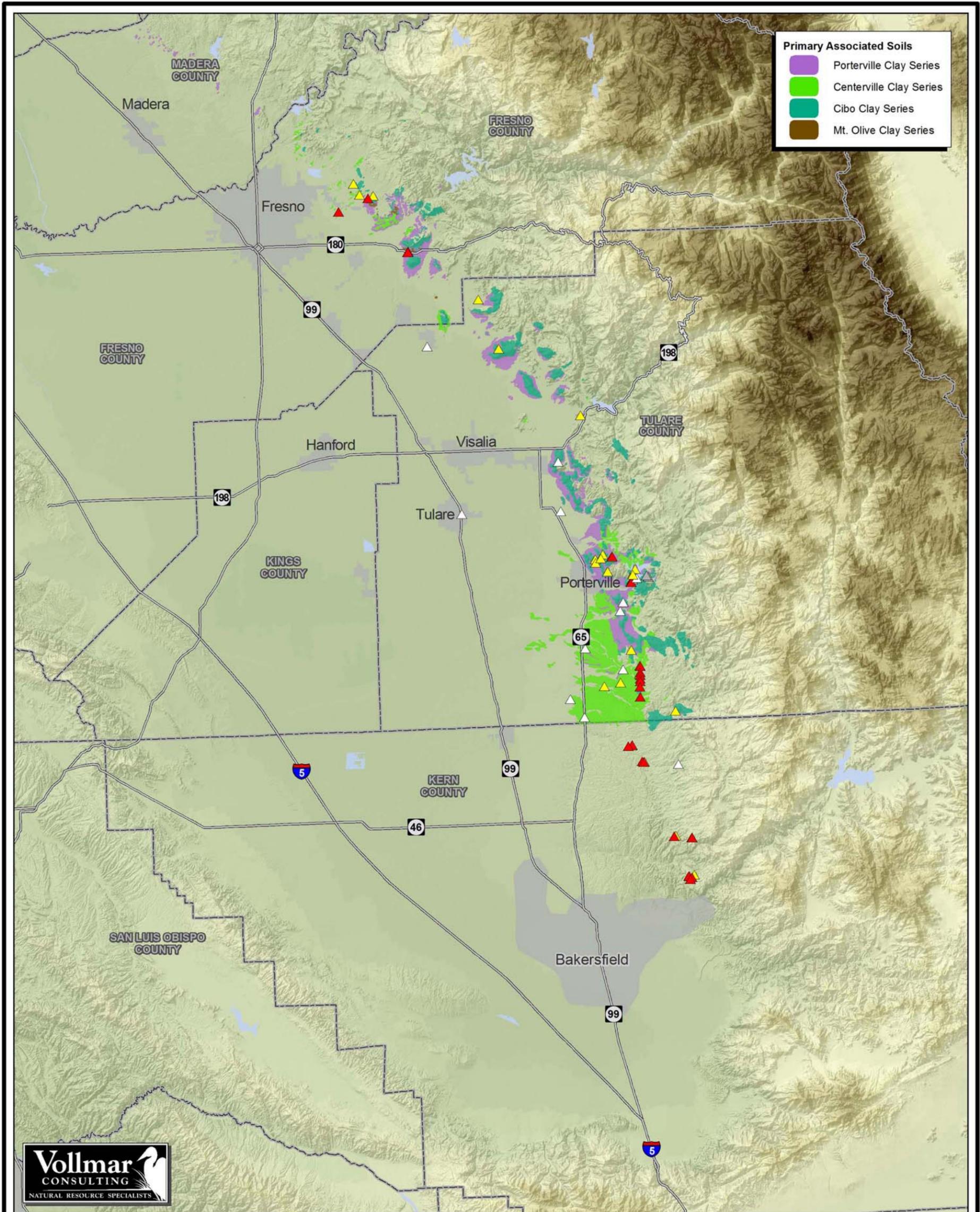
Data Sources: Vollmar Consulting, 2010 | USDA, Prism, 1998
 TIGER, 2000 | Gap, 1998 | DWR, 2001 | USGS, Various
 GIS/Carography by Jake Schweitzer, December 2010
 Map File: Climate-PSPE_211_B-P_2010-1202.mxd



1:823,680

(1 inch = 13 miles at tabloid layout)





Legend

Status of *Pseudobahia peirsonii*, 2010

- ▲ New Occurrence Identified During 2010 Surveys
- ▲ Confirmed Extant
- ▲ Presumed Extant
- ▲ Status Uncertain
- △ Presumed or Confirmed Extirpated

Reference Features

- Highway
- Major Water Body
- Urban Area
- County Boundary

FIGURE 6
Regional Vicinity and Associated Soils
Pseudobahia peirsonii Status Surveys
 San Joaquin Valley, California



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(1 inch = 13 miles at tabloid layout)

0 6.5 13 26 KM

0 6.5 13 26 Miles



Data Sources: Stebbins, 2010 | Vollmar Consulting, 2010
 CNDDB, 01/2010 | USDA SSURGO | TIGER, 2000
 Gap, 1998 | DWR, 2001 | USGS, Various
 GIS/Carography by Jake Schweitzer, December 2010
 Map File: Vicinity-PSPE_211_B-P_2010-1202.mxd



Table 2. Summary of *Pseudobahia peirsonii* (PSEPEI) Known Occurrences. Compiled by Vollmar Consulting, November 2010.

Species	CNDDDB EO#	Other Pop. #	County	Plants Last Seen	Last Site Visit	Status	Current Habitat Condition	Trend	Threats	Notes
PSEPEI	1	ST 1	Kern	1990	2010	Presumed Extant	Poor	Declining	Excessive livestock trampling	Area is used as cattle corral and is subject to excessive trampling. Suitable habitat persists in surrounding areas. No plants observed in 2010.
PSEPEI	2	ST 2	Kern	1963	1991	Presumed Extant	Good	Presumed Stable	Unknown	Site was not accessible in 2010. Plants have not been observed since 1963, but habitat appears suitable.
PSEPEI	3	ST 3	Kern	1974	1990	Presumed Extirpated	Presumed Extirpated	Presumed Extirpated	Presumed Extirpated	Plants have not been observed since 1974.
PSEPEI	4	ST 4	Kern	2010	2010	Extant	Good	Stable	Potential road widening and herbicide spraying	350 plants observed just north of CNDDDB record. No plants observed at original CNDDDB location but habitat appears in good condition. However, area is sprayed by CalTrans.
PSEPEI	5	ST 5	Tulare	1952	2010	Extirpated	Extirpated	Extirpated	Extirpated	Area has been converted to intensive agriculture.
PSEPEI	6	ST 6	Tulare	1965	2010	Extirpated	Moderate	Extirpated	Extirpated	Plants have not been observed since 1965. However, 2010 surveys identified potential habitat in the general vicinity.
PSEPEI	7	ST 7	Tulare	1974	1992	Extirpated	Extirpated	Extirpated	Extirpated	Area has been converted to intensive agriculture.
PSEPEI	8	ST 8	Tulare	1974	1992	Extirpated	Extirpated	Extirpated	Extirpated	Area has been converted to intensive agriculture.
PSEPEI	(9)	ST 9	Tulare	1952	2010	Extirpated	Extirpated	Extirpated	Extirpated	Location has been flooded and is currently at the bottom of Lake Success.
PSEPEI	10	ST 10	Tulare	1990	2010	Extant	Moderate	Stable	Roadside maintenance, spraying, scraping	Original CNDDDB location extirpated by parking lot, new population identified immediately west along roadside right of way.
PSEPEI	11	ST 11	Tulare	1897	1990	Extirpated	Extirpated	Extirpated	Extirpated	Area has been converted to intensive agriculture and housing.
PSEPEI	12	ST 12	Tulare	1953	2010	Presumed extirpated	Presumed extirpated	Presumed Extirpated	Presumed extirpated	No suitable habitat on site. Some potential suitable in surrounding areas. Plants have not been observed since 1953.
PSEPEI	13	ST 13	Tulare	1927	1990	Extirpated	Extirpated	Extirpated	Extirpated	Area has been converted to intensive agriculture and housing.
PSEPEI	14	ST 14	Fresno	2010	2010	Extant	Poor	Declining?	Road projects, gravel removal	Populations occur on both side of Hwy 180. Both have potential threats from gravel removal and road widening projects.
PSEPEI	15	ST 15	Fresno	2010	1994	Presumed Extant	Poor	Presumed Declining	Development, disking and cattle pasture	Site has been disked previously, plants were not observed in 2010 survey. Population is threatened by agricultural and residential development, road widening and aggressive ruderal species.
PSEPEI	16	ST 16	Fresno	2010	2010	Extant	Good	Stable	Possible flooding	Population of 5,000 observed on approximately 40 acres in 2010. Site is owned by Fresno Flood Control District and stable and protected, with the exception of potential flooding by Fancher Creek Reservoir.
PSEPEI	17	ST 17	Tulare	1986	2010	Extirpated	Extirpated	Extirpated	Extirpated	Area has been converted to intensive agriculture (wheat).
PSEPEI	18	ST 18	Kern	2010	2010	Extant	Good	Stable	Road alignment project	Considered 'best' population, over 10,000 plants observed in 2010. Area is used for cattle grazing.
PSEPEI	19	ST 19	Tulare	2006	2010	Presumed Extant	Poor	Presumed Declining	Land leveling, recreation, dam overflow	Site is adjacent to Lake Success (dam), and is subject to potential water-level rise and recreation. Area is also subject to overgrazing and competition from ruderal species.
PSEPEI	21	ST 20	Tulare	1985	1990	Uncertain	Poor	Presumed Declining	Recreation and dam overflow	Site is adjacent to Lake Success (dam), and is subject to potential water-level rise and recreation. Area is also subject to overgrazing and competition from ruderal species. Site conditions recorded as very ruderal in previous surveys.
PSEPEI	22	ST 21	Kern	2010	2010	Extant	Good	Stable	Road maintenance, grazing, trampling	Approximately 500 plants were observed in 2010, habitat is no longer threatened by road development (relocated). Original location supported 300 plants; new population of approximately 200 plants discovered just north. Population was presumed extirpated in 1990.
PSEPEI	23	ST 22	Tulare	2010	2010	Extant	Good	Stable	Powerline maintenance	Populations were recorded as 3,000 in 1986, 1,000 in 1990 and 400 in 2010. However, site conditions appear to support good quality habitat.
PSEPEI	24	ST 23	Tulare	2010	2010	Extant	Poor	Stable	Ruderal species, disking, powerline maintenance	Approximately 150 plants observed in 2010, which is an increase from 15 plants observed in 1990, but a decrease from the 500 observed in 1986. Habitat is dominated by dense, tall, ruderal species.
PSEPEI	25	ST 24	Kern	2010	2010	Extant	Good	Stable	Overgrazing, trampling, erosion	Approximately 900 plants (600 and 300) observed in two areas in 2010, good quality habitat.
PSEPEI	26	-	Tulare	2001	2001	Presumed Extant	Poor?	Declining?	Excessive grazing, disking and tilling	Approximately 100 plants observed in 2001 and 70 in 1988. Site has not been visited since 2001.

Species	CNDDB EO#	Other Pop. #	County	Plants Last Seen	Last Site Visit	Status	Current Habitat Condition	Trend	Threats	Notes
PSEPEI	28	ST 28	Tulare	1988	1990	Presumed Extant	Poor?	Declining?	Excessive grazing and competition from ruderal species	Site was not accessible in 2010. No plants observed in 1990. Approximately 300 plants observed in 1988. Area has been subjected to heavy grazing but status is presumed extant.
PSEPEI	29	-	Kern	1992	1992	Presumed Extant	Good	Presumed Stable	Road maintenance	Site has not been visited since 1992, but general conditions in vicinity have remained constant.
PSEPEI	30	ST 25	Fresno	1990	2010	Presumed Extant	Moderate	Declining?	Excessive grazing and trampling	Plants were not observed in 2010, Potential habitat is available but is very heavily grazed. Moderate to low population numbers during previous surveys (1987- 50 plants; 1990 – 26 plants).
PSEPEI	31	ST 30	Fresno	2010	2010	Extant	Poor	Declining	Intensive surrounding development, lack of thatch management	Approximately 50 plants observed in 2010 on 5-acre preserve, area is completely surrounded by intensive development and appears to be declining. Site is covered in dense thatch and non-native plants. Prior to development, site supported approximately 5,000 plants.
PSEPEI	32	26	Tulare	1990	1990	Presumed Extant	Good?	Presumed Stable	Excessive grazing or trampling	Population was not accessible in 2010, but general vicinity appeared unmodified.
PSEPEI	33	26	Tulare	2010	2010	Extant	Moderate	Declining	Excessive grazing, trampling, ag conversion	Approximately 200 plants were observed in 2010, population appears to be declining; 500 were observed in 1990 and over 5,000 in 1988.
PSEPEI	34	-	Tulare	1988	1988	Presumed Extant	Good?	Presumed Stable	Excessive grazing or agriculture conversion	Site was not accessible in 2010. Threats include potential conversion to agriculture or residential development.
PSEPEI	35	27	Tulare	1990	1990	Presumed Extant	Poor	Declining?	Excessive grazing or land conversion	Site was not accessible in 2010. Area is subject to the potential expansion of the city of Porterville.
PSEPEI	36	-	Fresno	2008	2008	Presumed Extant	Poor?	Declining?	Ruderal competition	Site was not accessible in 2010. Historically, site appeared to be declining and was dominated by dense, ruderal species and was disked for firebreak.
PSEPEI	37	29	Tulare	1928	1990	Extirpated	Extirpated	Extirpated	Extirpated	All areas in vicinity have been converted to residential or agricultural uses.
PSEPEI	38	-	Tulare	1992	1992	Presumed Extant	Good	Presumed Stable	Excessive grazing or ruderal competition	Site was not accessible in 2010. Presence is presumed due to conditions of general vicinity. Area remains largely unchanged. Approximately 500 plants observed in 1992.
PSEPEI	39	-	Tulare	1992	1992	Presumed Extant	Good	Presumed Stable	Excessive grazing	Site was not accessible in 2010. Presence is presumed due to conditions of general vicinity. Area remains largely unchanged. Unknown number of plants observed in 1992.
PSEPEI	40	-	Tulare	1992	1992	Presumed Extant	Good	Presumed Stable	Roadside maintenance	Site was not accessible in 2010. Stebbins believes this population may be misidentified <i>P. heermanii</i> .
PSEPEI	41	-	Tulare	1992	1992	Presumed Extant	Good	Presumed Stable	Roadside maintenance	Site was not accessible in 2010.
PSEPEI	42	-	Tulare	1992	1992	Presumed Extant	Good	Presumed Stable	Overgrazing	Site was not accessible in 2010, however conditions of vicinity appear unchanged. Approximately 100 plants were observed in 1992.
PSEPEI	43	-	Tulare	1992	1992	Presumed Extant	Good	Presumed Stable	Overgrazing	Site was not accessible in 2010, however conditions of vicinity appear unchanged. However, there is a possibility species was mis-identified in 1992 and is actually <i>P. heermanii</i> . Only two plants were observed in 1992.
PSEPEI	44	-	Tulare	1992	1992	Presumed Extant	Good	Presumed Stable	Overgrazing and trampling	Site was not accessible in 2010, however conditions of vicinity appear unchanged. Location occurs between two chain-link cisterns.
PSEPEI	45	-	Tulare	2006	2006	Presumed Extant	Poor	Declining	Rising water levels and recreation	Site occurs on an island in Lake Success. Area is prone to heavy disturbance from rising water levels and recreation.
PSEPEI	46	-	Tulare	2006	2010	Uncertain	Unknown	Presumed Declining	Rising water levels	No plants were observed in 2010. Site has been heavily modified by activities associated with Lake Success. Approximately 120 plants were observed in 2006.
PSEPEI	-	VC 1	Tulare	2010	2010	Extant	Good	Stable	Powerline construction and maintenance	Approximately 600 plants observed on moderately grazed clay soils. Distribution spans approximately five acres. Habitat conditions appear to be good.
PSEPEI	-	VC 2	Tulare	2010	2010	Extant	Good	Stable	Overgrazing, construction, and maintenance	Approximately 200 plants observed on heavily grazed clay soils. Distribution spans approximately two acres. Habitat conditions appear to be good.
PSEPEI	-	VC 3	Tulare	2010	2010	Extant	Moderate	Stable	Overgrazing, maintenance, and road work	Approximately 400 plants observed on grazed clay soils. Distribution spans approximately two acres. Habitat conditions appear to be fair.
PSEPEI	-	VC 4	Tulare	2010	2010	Extant	Moderate	Stable	Overgrazing, construction, and maintenance	Approximately 100 plants observed on heavily grazed clay soils. Habitat conditions appear to be fair.
PSEPEI	-	VC 5	Kern	2010	2010	Extant	Good	Stable	Ag. conversion and rural development	Approximately 2,000 plants observed grazed non-native annual grassland. Habitat conditions appear to be good.
PSEPEI	-	VC 6	Kern	2010	2010	Extant	Good	Stable	No apparent threats	Approximately 200 plants observed in non-native annual grassland on gentle north facing slope. Habitat conditions appear to be good.

3.4.7 Conservation and Management

There is currently very little protection for extant occurrences of *P. peirsonii*. The occurrence at Round Mountain (CNDDDB E.O. 16) is on property owned by the Fresno Metropolitan Flood Control District. This property is unlikely to be developed or otherwise converted in the future since it is used as a flood control basin. As a condition of site permitting, the District was required to develop and implement a management plan for *P. peirsonii* and other associated rare plants. However, it is unclear if any on-going active management is taking place. The occurrence to the northeast of Round Mountain (CNDDDB E.O. 30) is also under a type of protective easement, having been established as mitigation for a nearby development project. It does not appear that any management for *P. peirsonii* is occurring at this site. The only other “protected” occurrence is with a small, fenced preserve within the Quail Lakes residential development (CNDDDB E.O. 31). This site is completely unmanaged and has dense non-native grasses and thatch build-up. Surprisingly, *P. peirsonii* is persisting at this site, albeit in low numbers. As far as we are aware, there are no efforts to protect additional extant occurrences aside from some expressed interest on the part of Southern California Edison to place some of the occurrences under its transmission lines under protective easements and to manage them as part of stewardship efforts on its lands.

As with *P. bahiifolia*, the authors and other botanists have observed and concur that some level of livestock grazing is important for maintaining *P. peirsonii*. Nearly all occurrences of the species are found within a matrix of introduced, highly competitive annual grasses. Prior to European arrival, *P. peirsonii* existed within a matrix of native annual wildflowers and perennial bunchgrasses. The introduction of non-native annual grasses completely changed the plant community context with the native species facing a high level of competition from the introduced species. Also, the native large grazers that previously inhabited the San Joaquin Valley, including pronghorn antelope (*Antilocapra americana*) and tule elk (*Cervus canadensis nannodes*), were hunted out and replaced by domestic livestock. Under these new conditions, livestock grazing appears to be important for preventing the build-up heavy growth and thatch from the non-native grasses which tend to reduce or eliminate *P. peirsonii* and other annual native wildflowers. The level of grazing can vary widely provided the site is not severely overgrazed or undergrazed. The level of grazing that typically occurs on most well-maintained cattle ranches in the eastern San Joaquin Valley appears to be favorable for the long-term viability of *P. peirsonii*. Future research would be useful to more precisely determine appropriate grazing levels for maintaining the species.

Developments such as Quail Lakes, even with associated preserves, may result in the fragmentation and isolation of *P. peirsonii* occurrences and the establishment of mitigation preserves. Such preserves are often much more poorly maintained than large, unfragmented ranches. This is especially true for smaller preserves less than 1,000 acres in total area, where ranching is no longer viable and the on-going grazing is part of a “management plan” rather than an active ranching operation. Very small preserves less than 100 acres in total area are even less functional, with grass management very expensive and perhaps achieved through mowing rather than grazing, thus contributing to a high level of deleterious ‘edge effects’ from surrounding developed lands and poor long-term attention to site management (Vollmar 2009). These problems are exemplified on the Quail Lakes Preserve.

Given these circumstances, on-going efforts to conserve and maintain *P. peirsonii* should focus on working with landowners to place the large, viable cattle ranches that support occurrences under permanent conservation easements. Mitigation banks can also be effective for conserving the species provided they are large enough to have a viable, on-going ranching operation.

4.0 SUMMARY AND CONCLUSIONS

P. bahiifolia and *P. peirsonii* are two unique, native California endemic plant species with very limited distributions and very specific microhabitat preferences. These characteristics reflect the complex geologic history and changing environmental conditions within the region presently called California and adjacent areas over the past 60 million years or so. While most likely historically rare, both species undoubtedly experienced declines with the arrival of Europeans and the introduction of non-native annual grasses and, more recently, with the continued conversion of native lands to agriculture and development. Recognizing both the rarity and threats to these species, California listed both species as endangered in 1987 and the federal government listed *P. bahiifolia* as endangered and *P. peirsonii* as threatened in 1997.

The federal listing was based on the original status surveys conducted by Dr. John Stebbins in 1990. Dr. Stebbins presented the best information available at the time though he was unable to access substantial areas providing potential habitat for the species. The work conducted for the current study built upon Dr. Stebbins' original work and involved more intensive analysis of regional distribution and microhabitat preferences and field surveys of several thousand acres of additional potential habitat. These surveys identified 16 new occurrences and a significant range extension for *P. bahiifolia*, and 6 new occurrences of *P. peirsonii*. Based on analyses conducted as part of this study, along with the results of the additional field surveys, it is concluded that the current known occurrences most likely demarcate the north-south range for both species. Additional new occurrences will undoubtedly be discovered within the ranges of the species as new lands with potential habitat become available for surveys. It is unknown how many new occurrences may be discovered but it is speculated by the authors, based on the results of this study, that there will likely be no more than a 20% increase in documented occurrences. Currently, there are 36 known extant occurrences of *P. bahiifolia* and 37 known extant occurrences of *P. peirsonii*. If the hypotheses outlined above hold, then it can be concluded that we are approaching having a comprehensive understanding of the full distribution and abundance of these two endangered species with a maximum of perhaps 45 extant occurrences expected for each species. This is an important and key accomplishment of this study as it provides a firm basis for government agencies and non-profit conservation organizations to develop a sound strategy to ensure the conservation of the species.

Apparently, no known occurrences have been extirpated since the time of federal listing. However, several occurrences, especially of *P. peirsonii*, are coming under increasing threat from encroaching development, conversion of land to intensive agriculture and loss of active ranching leading to an excessive build-up of grass thatch. These threats will undoubtedly continue to increase over the coming years and decades as development and intensive agriculture move towards the eastern edge of the San Joaquin Valley. Most of the known occurrences of these species (especially *P. bahiifolia*) currently occur on large, unfragmented private cattle ranches. The cost of purchasing conservations on these ranches is relatively low at this point and will only increase in the future as the encroachment of development and land conversion causes property values to rise. As such, efforts should be made in the near-term to identify key conservation lands and work cooperatively with the landowners to purchase conservation easements on these lands. Such efforts are currently being undertaken successfully for *P. bahiifolia* in northeast Merced County and southeast Stanislaus County. Similar efforts should be initiated for key occurrences of *P. peirsonii* within its range.

It appears that well-managed livestock grazing is a critical component for maintaining viable occurrences of both species. This is best accomplished on large, economically-viable ranches where grazing is conducted as part of an active ranching operation rather than as part of 'preserve management' activities. As such, conservation efforts should center on conserving large, unfragmented ranches through purchase of conservation easements. Research should also be conducted on the actual effects of the timing and intensity of grazing on the two species.

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PSEUDOBAHIA BAHIIFOLIA & PSEUDOBAHIA PEIRSONII 2010 STATUS SURVEY REPORT

EASTERN SAN JOAQUIN VALLEY, CALIFORNIA

APPENDICES A-E

Species Accounts, Maps and Photographs

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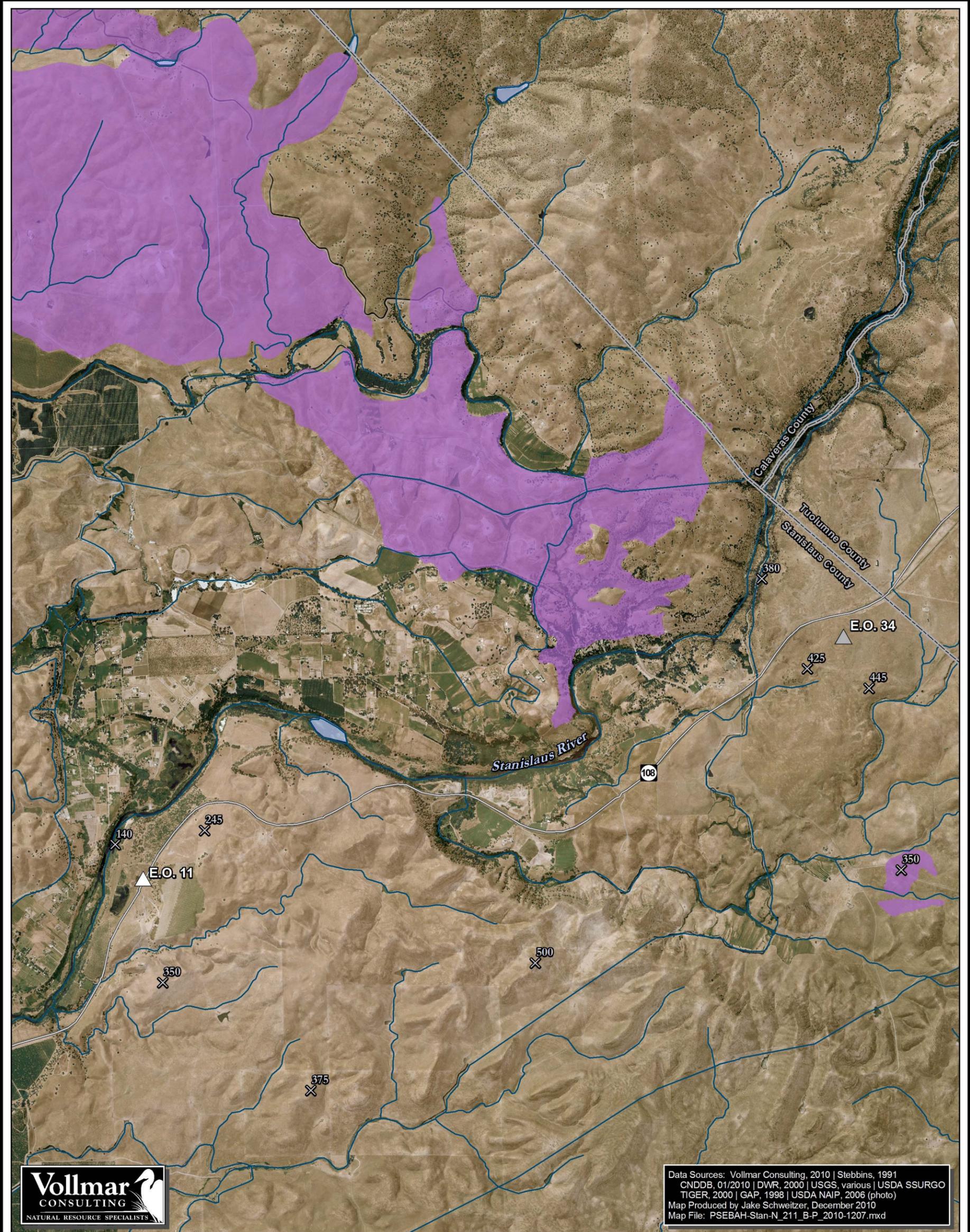
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November 2010

APPENDIX A

**INTERMEDIATE-SCALE MAPS OF
PSEUDOBAHIA BAHIIFOLIA
OCCURRENCE CLUSTERS**



Data Sources: Vollmar Consulting, 2010 | Stebbins, 1991
 CNDDDB, 01/2010 | DWR, 2000 | USGS, various | USDA SSURGO
 TIGER, 2000 | GAP, 1998 | USDA NAIP, 2006 (photo)
 Map Produced by Jake Schweitzer, December 2010
 Map File: PSEBAH-Stan-N_211_B-P_2010-1207.mxd

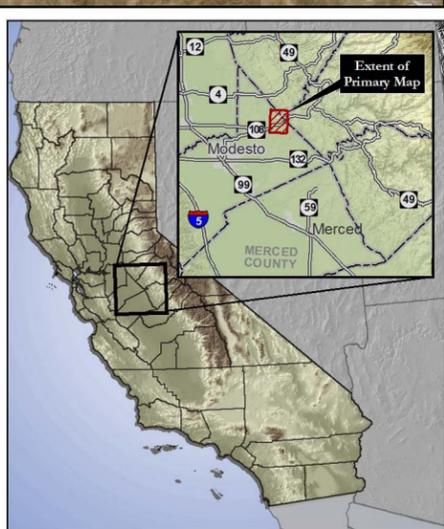
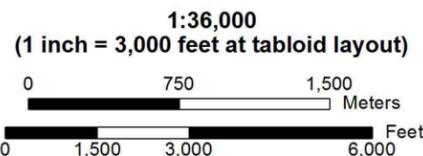
- Legend**
- Status of *Pseudobahia bahiifolia*, 2010***
- ▲ New Occurrence Identified During 2010 Surveys
 - ▲ Confirmed Extant
 - ▲ Presumed Extant
 - ▲ Status Uncertain
 - △ Presumed or Confirmed Extirpated
- Reference Features**
- Amador Loam Soil Series**
 - ⊗ Elevation Marker (feet)
 - County Boundary
 - Water Body
 - River or Creek

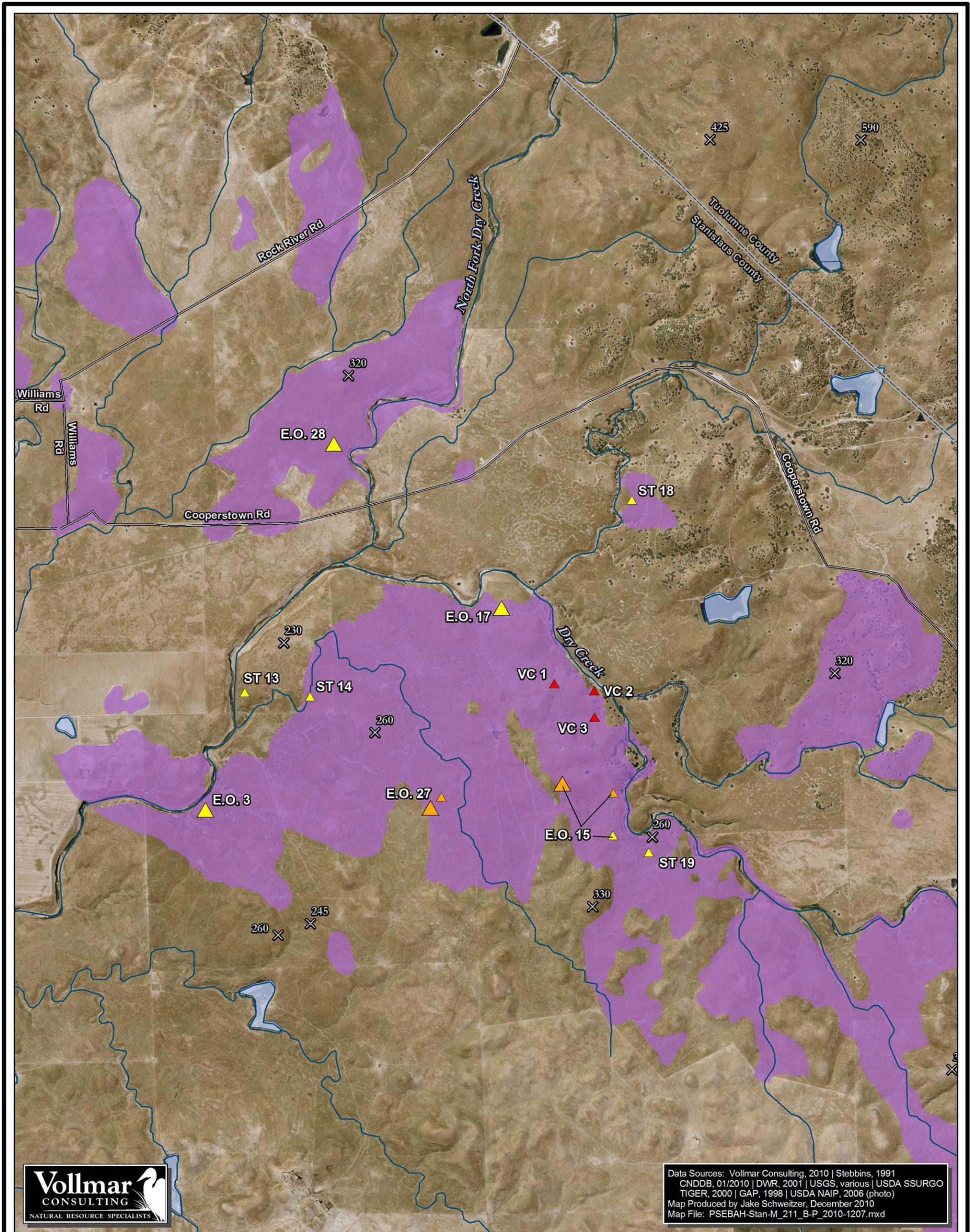
* Larger symbols represent 2010 CNDDDB location. "E.O." = CNDDDB ID
 ** "VC"=Vollmar Consulting ID, "ST"=Stebbins ID (no CNDDDB ID)
 ** Data for Calaveras and Tuolumne Counties not available

APPENDIX A-1

Central-Eastern Stanislaus County Occurrences of *Pseudobahia bahiifolia*

San Joaquin Valley, California





Data Sources: Vollmar Consulting, 2010 | Stebbins, 1991
 CNDDDB, 01/2010 | DWR, 2001 | USGS, various | USDA SSURGO
 TIGER, 2000 | GAP, 1998 | USDA NAIP, 2006 (photo)
 Map Produced by Jake Schweitzer, December 2010
 Map File: PSEBAH-Stan-M_211_B-P_2010-1207.mxd

Legend

Status of *Pseudobahia bahiifolia*, 2010*

- ▲ New Occurrence Identified During 2010 Surveys
- ▲ Confirmed Extant
- ▲ Presumed Extant
- ▲ Status Uncertain
- △ Presumed or Confirmed Extirpated

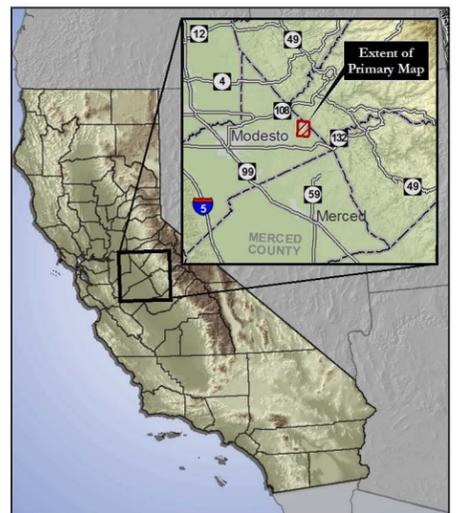
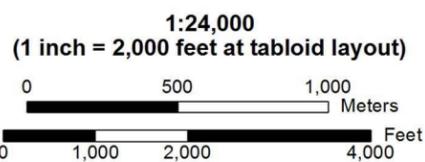
Reference Features

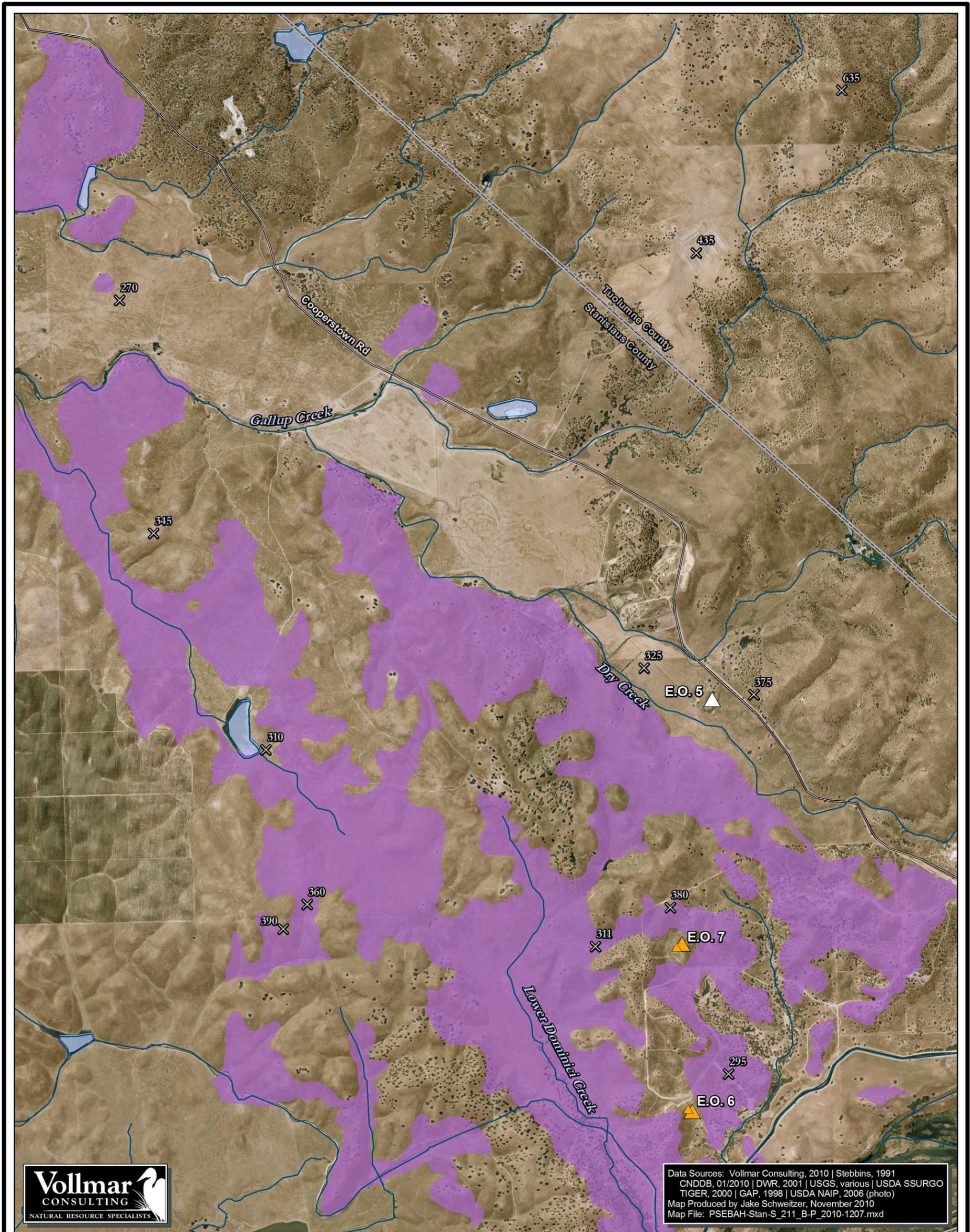
- Amador Loam Soil Series**
- Elevation Marker (feet)
- County Boundary
- Water Body
- River or Creek
- Major Road

* Larger symbols represent 2010 CNDDDB location. "E.O." = CNDDDB ID
 "VC"=Vollmar Consulting ID, "ST"=Stebbins ID (no CNDDDB ID)
 ** Data for Calaveras and Tuolumne Counties not available

APPENDIX A-2
Southeastern Stanislaus County
Occurrences of *Pseudobahia bahiifolia*

San Joaquin Valley, California





Data Sources: Vollmar Consulting, 2010 | Stebbins, 1991
 CNDDDB, 01/2010 | DWR, 2001 | USGS, various | USDA SSURGO
 TIGER, 2000 | GAP, 1998 | USDA NAIP, 2006 (photo)
 Map Produced by Jake Schweitzer, November 2010
 Map File: PSEBAH-Stan-S_211_B-P_2010-1207.mxd

Legend

Status of *Pseudobahia bahiifolia*, 2010*

- ▲ New Occurrence Identified During 2010 Surveys
- ▲ Confirmed Extant
- ▲ Presumed Extant
- ▲ Status Uncertain
- △ Presumed or Confirmed Extirpated

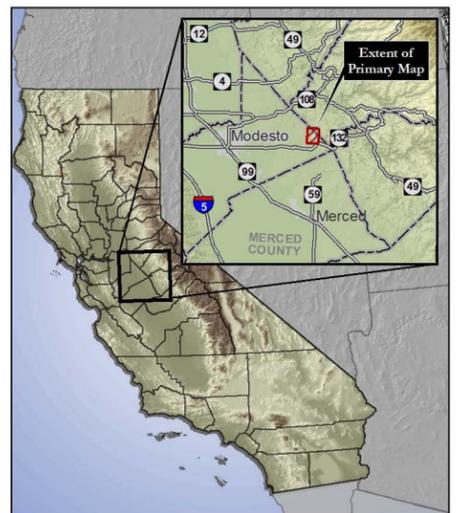
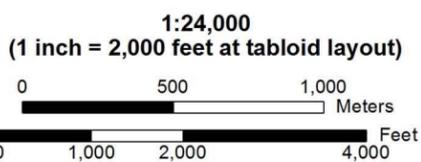
Reference Features

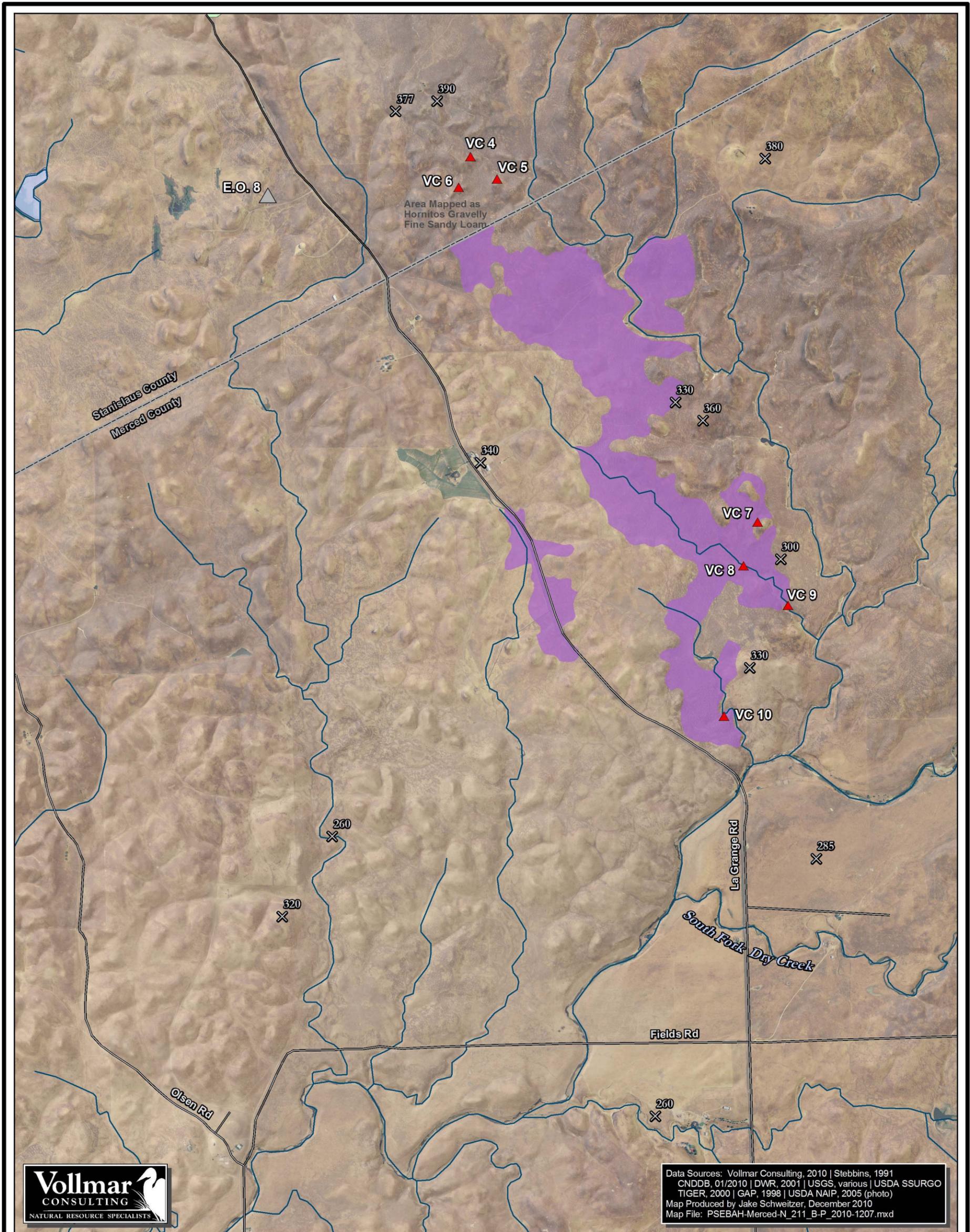
- Amador Loam Soil Series**
- ⊗ Elevation Marker (feet)
- County Boundary
- Water Body
- River or Creek
- Major Road

* Larger symbols represent 2010 CNDDDB location.
 ** "E.O." = CNDDDB ID, "VC" = Vollmar Consulting ID (no CNDDDB ID)
 ** Data for Calaveras and Tuolumne Counties not available

APPENDIX A-3
Southeastern Stanislaus County
Occurrences of *Pseudobahia bahiifolia*

San Joaquin Valley, California





Data Sources: Vollmar Consulting, 2010 | Stebbins, 1991
 CNDDDB, 01/2010 | DWR, 2001 | USGS, various | USDA SSURGO
 TIGER, 2000 | GAP, 1998 | USDA NAIP, 2005 (photo)
 Map Produced by Jake Schweitzer, December 2010
 Map File: PSEBAH-Merced-N_211_B-P_2010-1207.mxd

Legend

Status of *Pseudobahia bahiifolia*, 2010*

- ▲ New Occurrence Identified During 2010 Surveys
- ▲ Confirmed Extant
- ▲ Presumed Extant
- ▲ Status Uncertain
- ▲ Presumed or Confirmed Extirpated

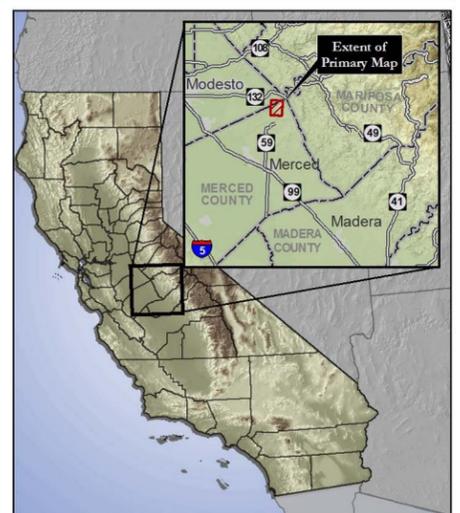
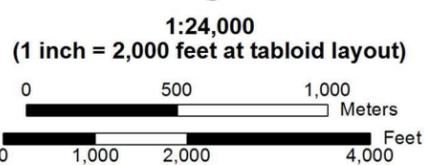
Reference Features

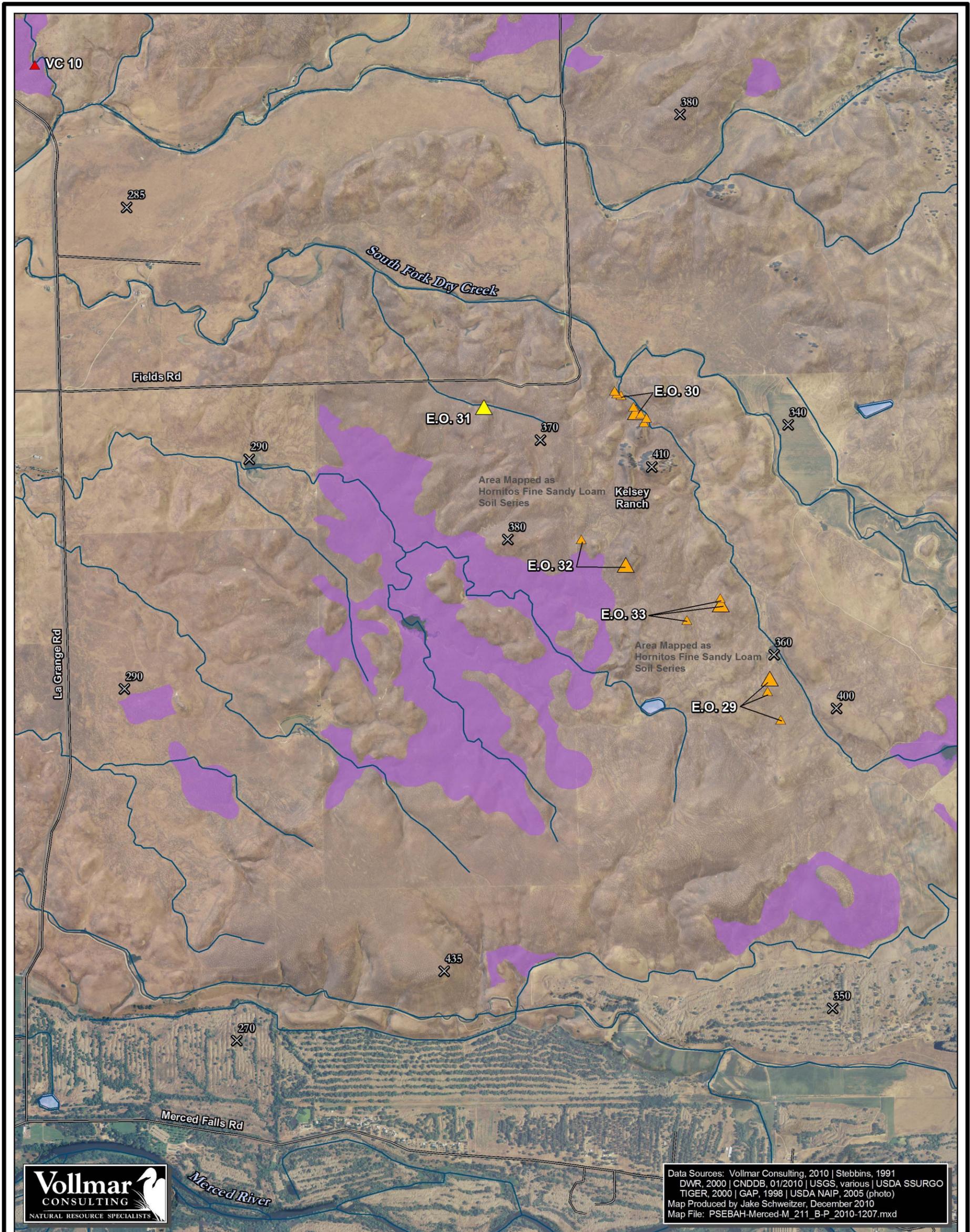
- Amador Loam Soil Series**
- ✕ Elevation Marker (feet)
- County Boundary
- Water Body
- River or Creek
- Major Road

* Larger symbols represent 2010 CNDDDB location.
 "E.O." = CNDDDB ID, "VC" = Vollmar Consulting ID (no CNDDDB ID)
 ** Data for Calaveras and Tuolumne Counties not available

APPENDIX A-4
Merced and Stanislaus Counties
Occurrences of *Pseudobahia bahiifolia*

San Joaquin Valley, California





Data Sources: Vollmar Consulting, 2010 | Stebbins, 1991
 DWR, 2000 | CNDDDB, 01/2010 | USGS, various | USDA SSURGO
 TIGER, 2000 | GAP, 1998 | USDA NAIP, 2005 (photo)
 Map Produced by Jake Schweitzer, December 2010
 Map File: PSEBAH-Merced-M_211_B-P_2010-1207.mxd

APPENDIX A-5 Northeastern Merced County Occurrences of *Pseudobahia bahiifolia* San Joaquin Valley, California



1:24,000
 (1 inch = 2,000 feet at tabloid layout)

Legend

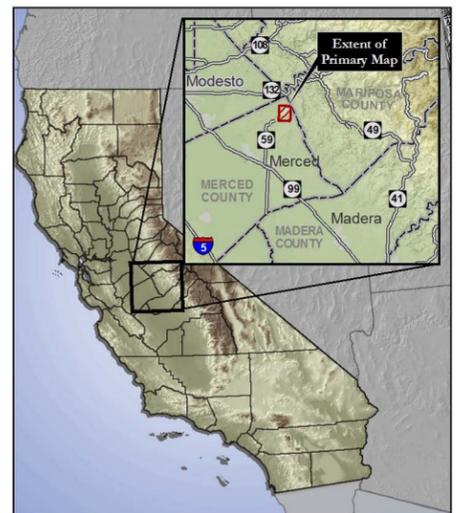
Status of *Pseudobahia bahiifolia*, 2010*

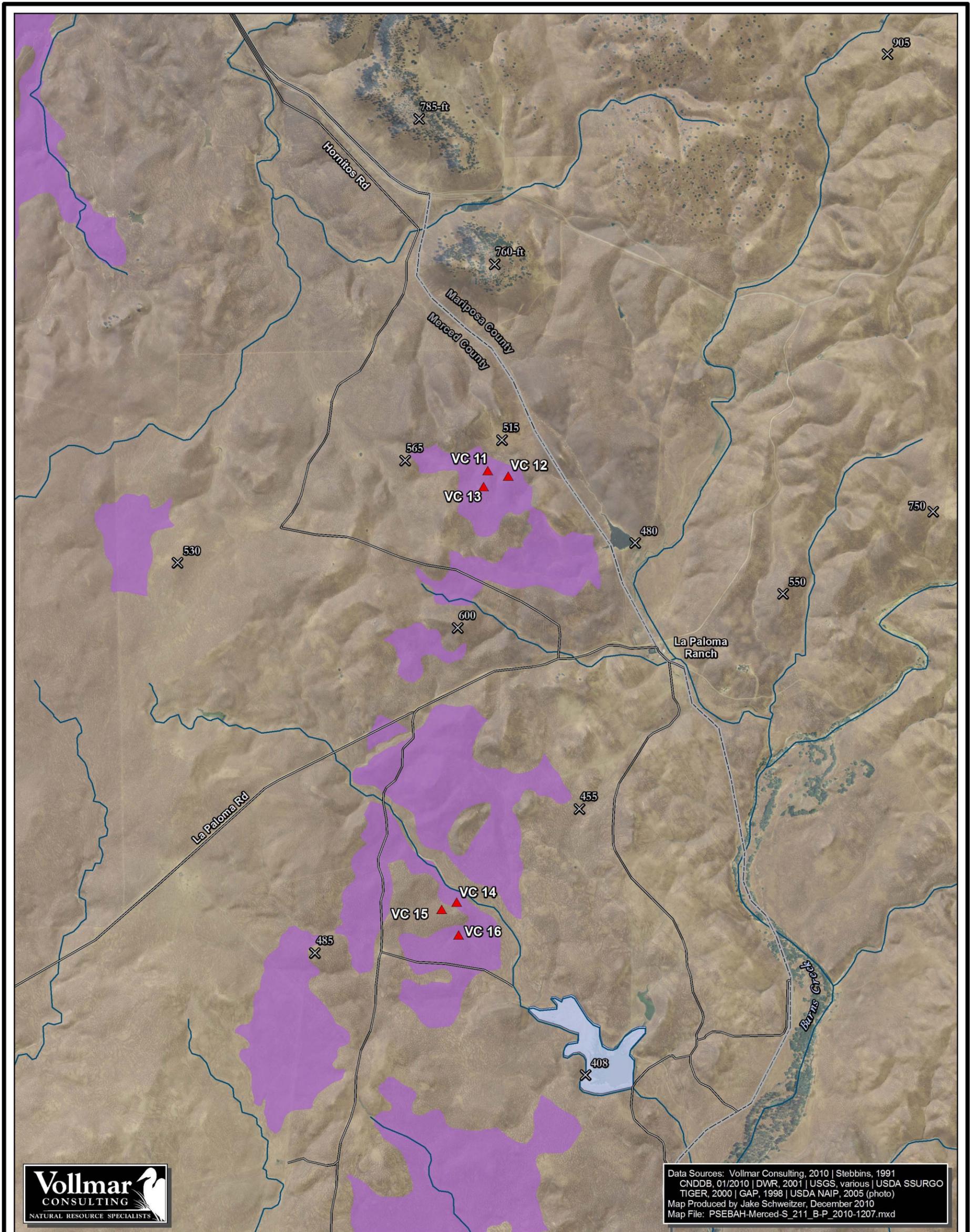
- ▲ New Occurrence Identified During 2010 Surveys
- ▲ Confirmed Extant
- ▲ Presumed Extant
- ▲ Status Uncertain
- Presumed or Confirmed Extirpated

Reference Features

- Amador Loam Soil Series**
- X Elevation Marker (feet)
- County Boundary
- Water Body
- River or Creek
- Major Road

* Larger symbols represent 2010 CNDDDB location.
 ** "E.O." = CNDDDB ID, "VC" = Vollmar Consulting ID (no CNDDDB ID)
 ** Data for Calaveras and Tuolumne Counties not available





Data Sources: Vollmar Consulting, 2010 | Stebbins, 1991
 CNDDDB, 01/2010 | DWR, 2001 | USGS, various | USDA SSURGO
 TIGER, 2000 | GAP, 1998 | USDA NAIP, 2005 (photo)
 Map Produced by Jake Schweitzer, December 2010
 Map File: PSEBAH-Merced-S_211_B-P_2010-1207.mxd

Legend

Status of *Pseudobahia bahiifolia*, 2010*

- ▲ New Occurrence Identified During 2010 Surveys
- ▲ Confirmed Extant
- ▲ Presumed Extant
- ▲ Status Uncertain
- △ Presumed and Confirmed Extirpated

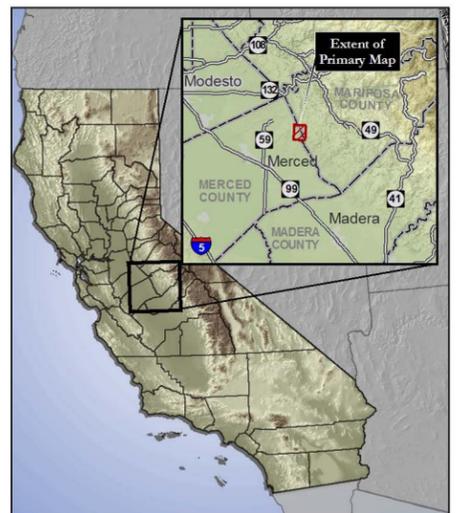
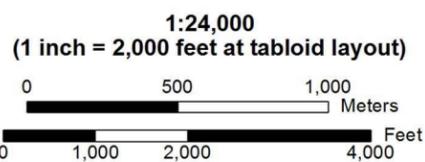
Reference Features

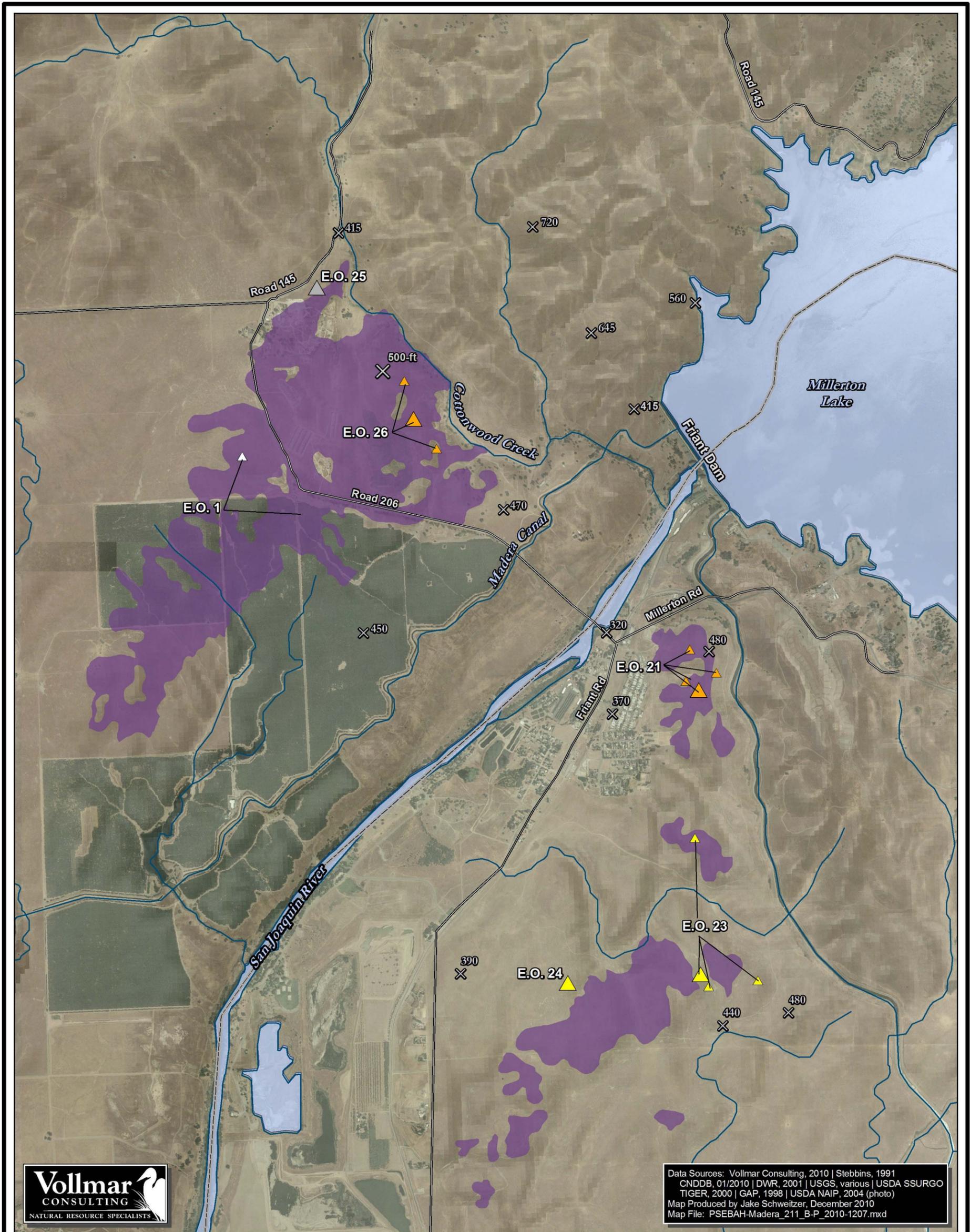
- Amador Loam Soil Series**
- Elevation Marker (feet)
- County Boundary
- Water Body
- River or Creek
- Major Road

* Larger symbols represent 2010 CNDDDB location.
 ** "E.O." = CNDDDB ID, "VC" = Vollmar Consulting ID (no CNDDDB ID)
 ** Data for Calaveras and Tuolumne Counties not available

APPENDIX A-6
Central-Eastern Merced County
Occurrences of *Pseudobahia bahiifolia*

San Joaquin Valley, California





Data Sources: Vollmar Consulting, 2010 | Stebbins, 1991
 CNDDDB, 01/2010 | DWR, 2001 | USGS, various | USDA SSURGO
 TIGER, 2000 | GAP, 1998 | USDA NAIP, 2004 (photo)
 Map Produced by Jake Schweitzer, December 2010
 Map File: PSEBAH-Madera_211_B-P_2010-1207.mxd

Legend

Status of *Pseudobahia bahiifolia*, 2010*

- ▲ New Occurrence Identified During 2010 Surveys
- ▲ Confirmed Extant
- ▲ Presumed Extant
- ▲ Status Uncertain
- △ Presumed or Confirmed Extirpated

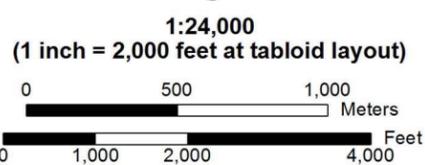
Reference Features

- Rocklin Sandy Loam Soil Series
- ⊗ Elevation Marker (feet)
- Fresno-Madera County Boundary
- Water Body
- River or Creek
- Major Road

* Larger symbols represent 2010 CNDDDB location.
 "E.O." = CNDDDB ID, "ST" = Stebbins ID (no CNDDDB ID)

APPENDIX A-7
Fresno and Madera Counties
Occurrences of *Pseudobahia bahiifolia*

San Joaquin Valley, California



APPENDIX B

**ACCOUNTS AND SITE MAPS OF INDIVIDUAL
PSEUDOBALIA BAHIIFOLIA
OCCURRENCES**

Species: *Pseudobahia bahiifolia*
Status: Presumed Extirpated
Trend: Presumed Extirpated

CNDDDB E.O. Number: 1
Last Site Visit: 2010
Plants Last Seen: 1980

Other Pop. Number: ST 1, ST 2
By: Jake Schweitzer
Mapping Precision: Specific

Past Documentation: “Madera County, on gentle slope adjacent to Road 205, 1.5 miles west of Friant Dam, and 0.5 miles south of Highway 145. With *Calandrina* and *Lepidium*, only a few plants of this species, John Weiler 66033, 20 March, 1966 (UC). Other Specimens: John Weiler 67002, 17 March, 1967” (Stebbins 1991).

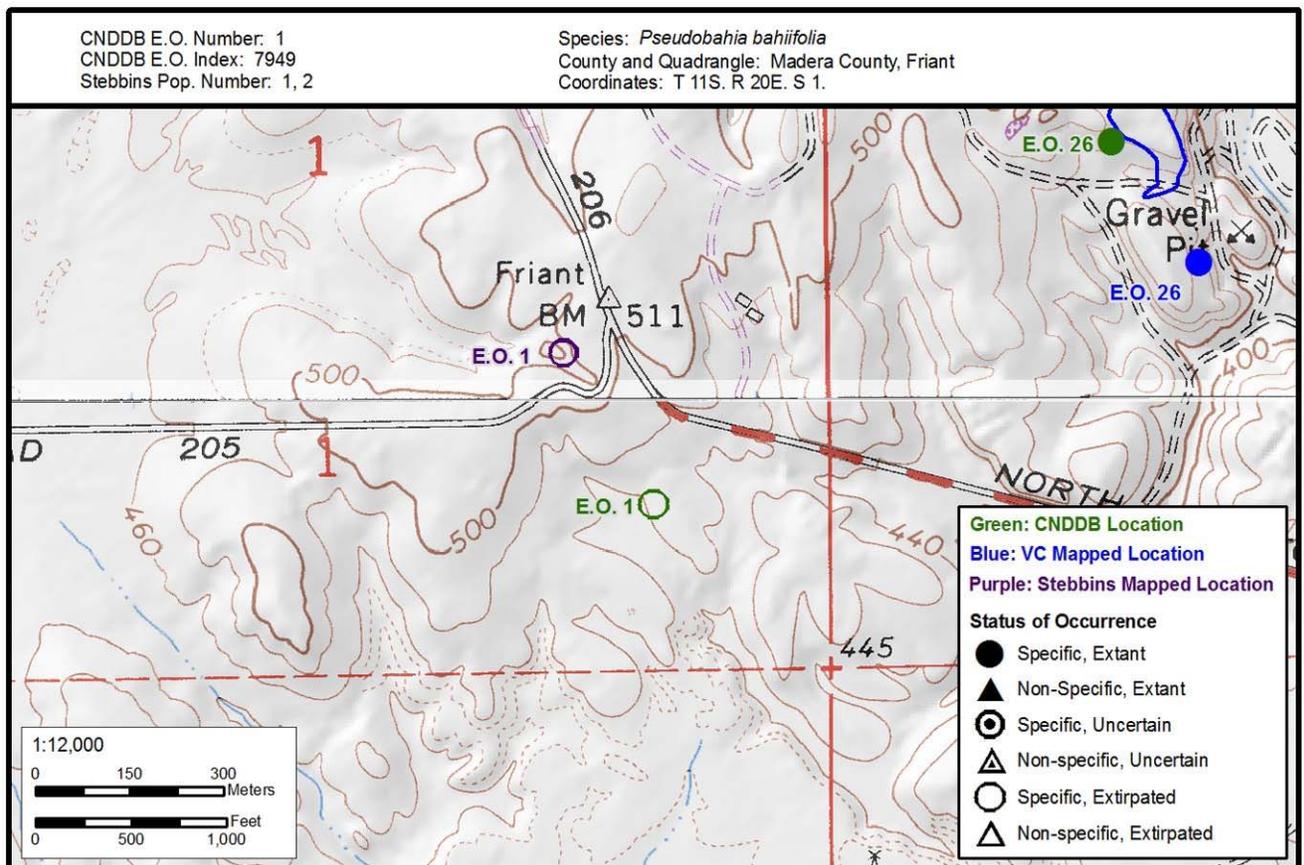
Past Status/Habitat Conditions: “This site has been converted to a pistachio orchard. J. Stebbins visited this site in the early 1970’s and therefore knew the exact location for the field survey performed on 24, March, 1990. A potential subdivision called ‘River Ranch’ is contemplated for the current orchard site” (Stebbins 1991). “Vernal pool...Not found in 1981 or 1986 searches. In 1990, site had been converted to a pistachio orchard. A potential subdivision is planned for the current orchard site” (CNDDDB 2010).

Current Status/Habitat Conditions: Agricultural

Trend/Threats: Presumed extirpated

Land Ownership: Private

Land Use: Agriculture



Species: *Pseudobahia bahiifolia*

CNDDDB E.O. Number: 3

Other Pop. Number: ST 3

Status: Presumed Extant

Last Site Visit: Apr. 11, 1990

By: John Stebbins

Trend: Presumed Stable

Plants Last Seen: Apr. 11, 1990

Mapping Precision: Specific

Past Documentation: “Stanislaus County, Barnett Ranch off Barnett Road; 1.4 miles south of Cooperstown Road, along bluffs east of Dry creek. CNDDDB report based upon observation by Perry Allen in 1977. No herbarium collection was made. The population (four closely spaced sub-populations) was verified by John Stebbins on 11 April, 1990. Other Documentation: John C. Stebbins 90-055, 11 April, 1990 (FSC, UC)” (Stebbins 1991).

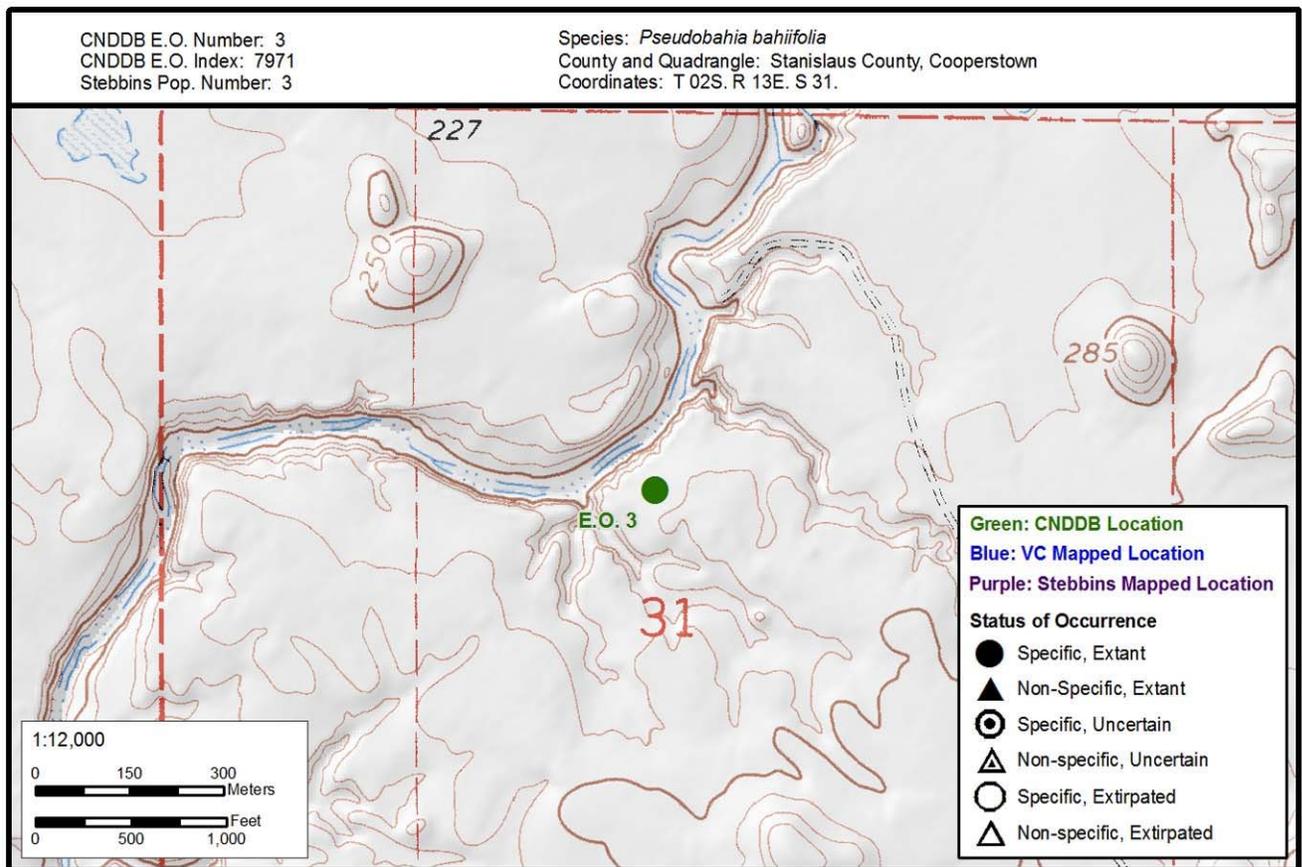
Past Status/Habitat Conditions: “Extant, four sub-populations (160 plants) observed on survey date... The four sub-populations were observed in non-native grassland located on northwest facing bluffs overlooking Dry Creek. Common associates included *Briza minor*, *Lasthenia fremontii*, *Erodium botrys*, *Lepidium nitidum*, and *Erodium cicutarium*. The soils are classified as acidic Amador loams (Arkley, 1964). Numerous rock outcrops and tuffs are present in the immediate vicinity of the sub-populations. Note: *Clarkia rostrata*, a rare species was observed at several locations due south of the site.” (Stebbins 1991). “Small colony seen in 1977. 196 plants in 3 subpopulations observed in 1990. This site includes former occurrences 13 and 14” (CNDDDB 2010).

Current Status/Habitat Conditions: Presumed extant by John Stebbins. Site not accessible in 2010, but includes high quality habitat that has not been significantly modified.

Trend/Threats: Trend is presumed stable. Threats include potential residential development.

Land Ownership: Rodden L. Finney et al., P.O. Box 6494, Modesto, CA 95355.

Land Use: Cattle ranching



Species: *Pseudobahia bahiifolia*
Status: Presumed Extirpated
Trend: Presumed Extirpated

CNDDDB E.O. Number: 5
Last Site Visit: 2010
Plants Last Seen: 1975

Other Pop. Number: ST 5
By: Jake Schweitzer
Mapping Precision: Specific

Past Documentation: “Stanislaus County, near La Grange; near trail heading to upper Domenici Creek from Cooperstown Rd., just east of Johnson Creek, 1.6 miles west of J-59, shallow grassy slope, Dale E. Johnson, 153, 9 March, 1975 (UC, JEPS). Other Documentation: ‘La Grange’, Robert F. Hoover 760, 17 March, 1936 (UC), ‘La Grange’, Robert F. Hoover 1710, 26 March, 1937 (UC)” (Stebbins 1991). “Baldwin, B. Field survey form for *Pseudobahia bahiifolia*. 1997-04-05” (CNDDDB 2010).

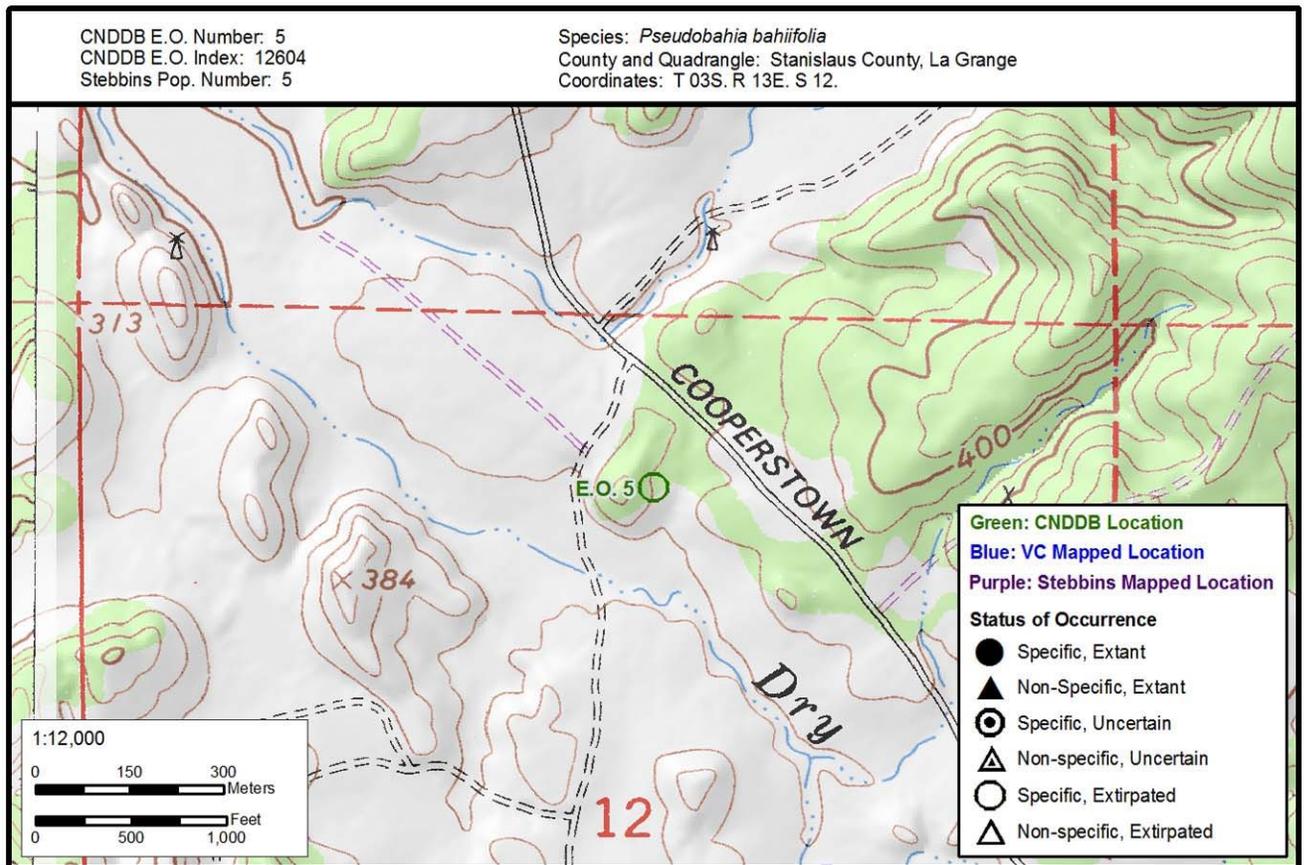
Past Status/Habitat Conditions: “Likely extirpated, habitat altered... This area has been altered by the recent construction of several new homes and the grading home sites in the immediate vicinity of Cooperstown Road and along the trail. Extensive surveys were performed by John Stebbins and William Clark in March, 1986 and again by John Stebbins on 11 April, 1990 without success. The area appears to be in the process of subdivision into 2 to 5 acre parcels based upon the numerous for sale signs present. The surrounding areas of suitable habitat, based upon soil conditions were also surveyed on the same dates, without success. Agriculture (oats) and a rock quarry are located 0.5 miles west of Johnson Creek” (Stebbins 1991). “About 100 plants in an area less than 100 square meters in 1975. No plants seen in 1986, 1990 or 1997. By 1990, area altered by construction related to housing tracts along Cooperstown Rd and along the trail” (CNDDDB 2010).

Current Status/Habitat Conditions: Presumed extirpated. Habitat is marginal, ungrazed habitat. No Amador soils mapped at site

Trend/Threats: Presumed extirpated. Area is threatened by additional development.

Land Ownership: Private

Land Use: Ranch type homes, cattle ranching



Species: *Pseudobahia bahiifolia*
Status: Extant
Trend: Stable

CNDDDB E.O. Number: 6
Last Site Visit: Apr. 8, 2010
Plants Last Seen: Apr 8, 2010

Other Pop. Number: ST 6
By: Jake Schweitzer
Mapping Precision: Specific

Past Documentation: "Stanislaus County, near west fork of Upper Domenici Creek, above waterfall, flowers yellow, Perry Allen s.n., 11 March, 1961 (JEPS). Other Documentation John C. Stebbins 90-053, 11 April, 1990 (FSC)" (Stebbins 1991).

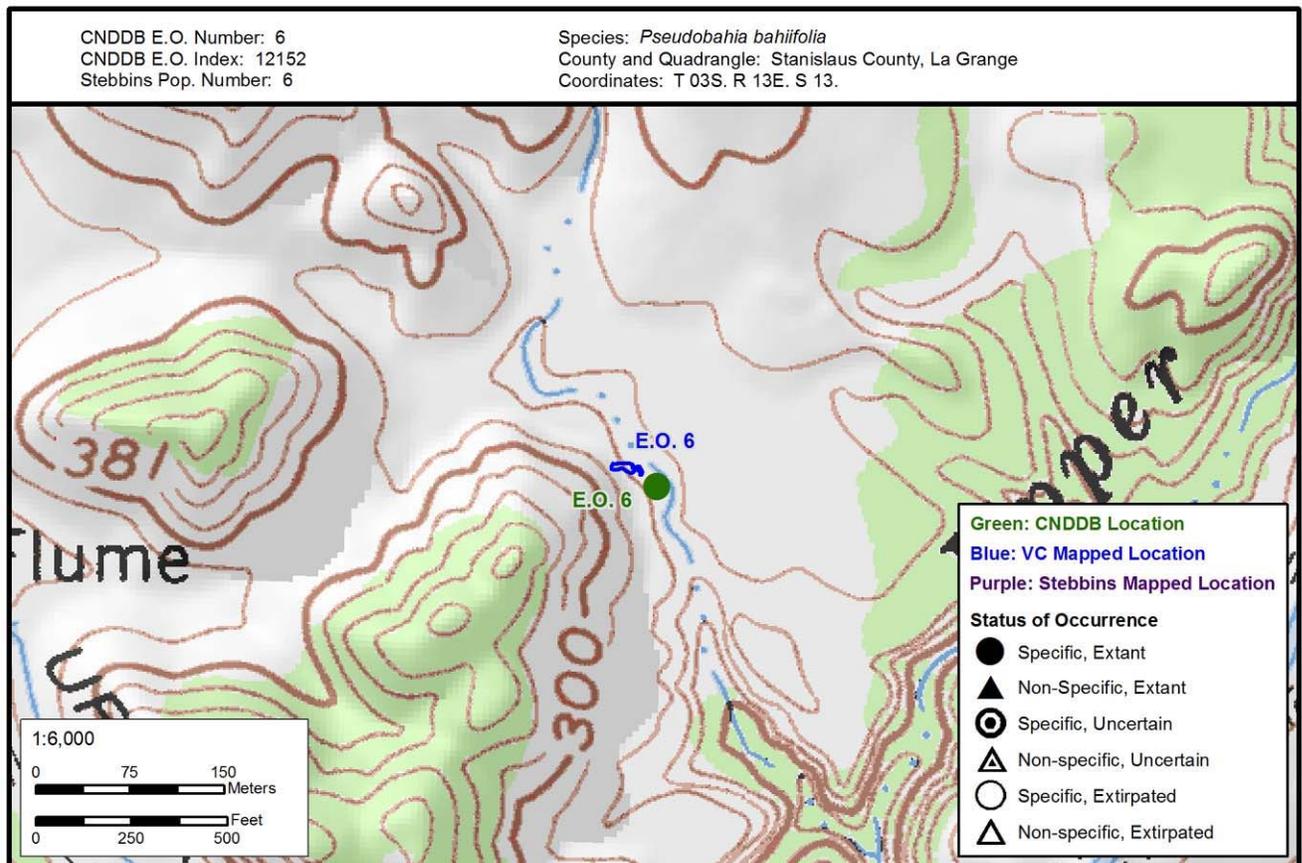
Past Status/Habitat Conditions: "Extant, habitat viable, 46 plants observed on survey date... North-facing slope in heavily grazed lower blue oak woodland. Plants were growing on a 6% slope of the Amador loam soil series (Arkley, 1964). The common associates observed were *Agoseris heterophylla*, *Gilia tricolor*, *Cerastium glomeratum*, and *Vulpia myuros*. Overall conditions appear stable due to relatively remote location of the small population. No other populations were observed in the vicinity." (Stebbins 1991). "Clay soil, west and north-facing on top of rocky, thin soil knoll in the north; north, west and east facing slopes in annual grassland on small hill; along canyon, banks and terraces of creek; scattered valley oak riparian woodland at southern end of occurrence... Approximately 46 plants seen in 1990; approximately 10,580 in 2006. Total acreage of occurrences #6 and #7 is 4.85 acres" (CNDDDB 2010).

Current Status/Habitat Conditions: Thousands of individuals were found on 30% to vertical northern and western slopes, on a cliff of mossy rock. On Amador loam, the population was associated with *Vulpia microstachys*, *Filago californica*, *Hesperex sparsiflora*, *Claytonia perfoliata*, *Trifolium willdenovii*, *Triphysaria eriantha*, and *Mimulus floribundus*.

Trend/Threats: Area is subdivided and fenced, but no construction activities apparent.

Land Ownership: William Rodden, P.O. Box 277, Oakdale, CA 95361

Land Use: Cattle ranching



Species: *Pseudobahia bahiifolia*
Status: Extant
Trend: Stable

CNDDDB E.O. Number: 7
Last Site Visit: Apr. 8, 2010
Plants Last Seen: Apr. 8, 2010

Other Pop. Number: ST 7
By: Jake Schweitzer
Mapping Precision: Specific

Past Documentation: “Stanislaus County, near headwaters of upper headwaters of upper Domenici Creek on north-facing bank, approximately 0.75 miles north of Modesto Main Canal, CNDDDB record based upon observation by Perry Allen in 1969; no herbarium collection was made at the time. Other Documentation: John C. Stebbins 90-054, 11 April, 1990 (FSC)” (Stebbins 1991). “Stewman, C. et al. Field Survey Form for *Pseudobahia bahiifolia*. 2006-03-22” (CNDDDB 2010).

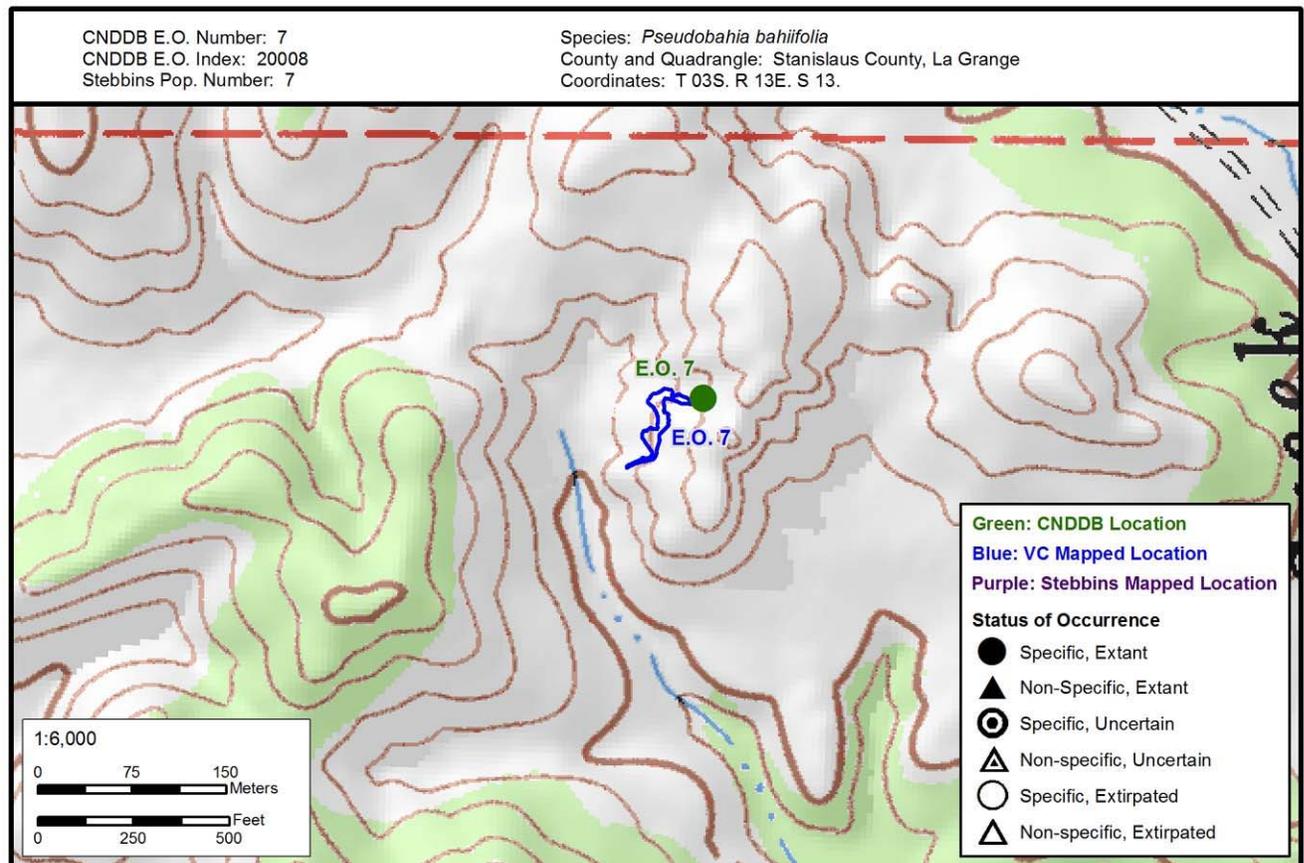
Past Status/Habitat Conditions: “Extant, habitat and 120 plants were observed on the survey date... Overall conditions appear favorable for the species at this site. The non-native grassland dominated by *Erodium obtusiplicatum*, *Lasthenia fremontii*, *Briza minor*, and *Bromus rubens* was only moderately grazed on the survey date. Population is located on an 8% slope above the creek channel in Amador loam soil. No other populations were located in the vicinity.” (Stebbins 1991). “Annual grassland on terraced rock ledges, ridgeline, and shelves on mostly west-facing slopes in typically thin, rocky soils; clay soils...Approximately 120 plants observed in 1990. 3,500 plants observed in 2006” (CNDDDB 2010).

Current Status/Habitat Conditions: Tens of thousands of individuals were found on mostly 5-10% northern slopes, although some occurred on western slopes and cliff faces. On Amador loam, the populations were associated with *Vulpia microstachys*, *Micropus californicus*, *Hesperexax sparsiflora*, *Claytonia perfoliata*, *Trifolium willdenovii*, *Triphysaria eriantha* and *Mimulus floribundus*.

Trend/Threats: Area is subdivided and fenced, but no construction activities apparent.

Land Ownership: William Rodden, P.O. Box 277, Oakdale, CA 95361

Land Use: Cattle ranching



Species: *Pseudobahia bahiifolia*
Status: Uncertain
Trend: Declining

CNDDDB E.O. Number: 8
Last Site Visit: Apr. 8, 2010
Plants Last Seen: 1990

Other Pop. Number: ST 8
By: Jake Schweitzer
Mapping Precision: Specific

Past Documentation: “Stanislaus County, 6 miles north of Snelling, 0.6 miles north of Merced County line approximately 50 meters west of Highway J59, J. Stebbins and W. Clark 86017, 14 March 1986 (FSC); Other Specimens: J.W. Congondon s.n., 30 March, 1894. Also observed in 1974 by Perry Allen (CNDDDB records). No specimen was collected due to the very small population observed J. Stebbins on 11 April, 1990” (Stebbins 1991). “Baldwin, B. Field Survey form for *Pseudobahia bahiifolia*. 1997-04-05” (CNDDDB 2010).

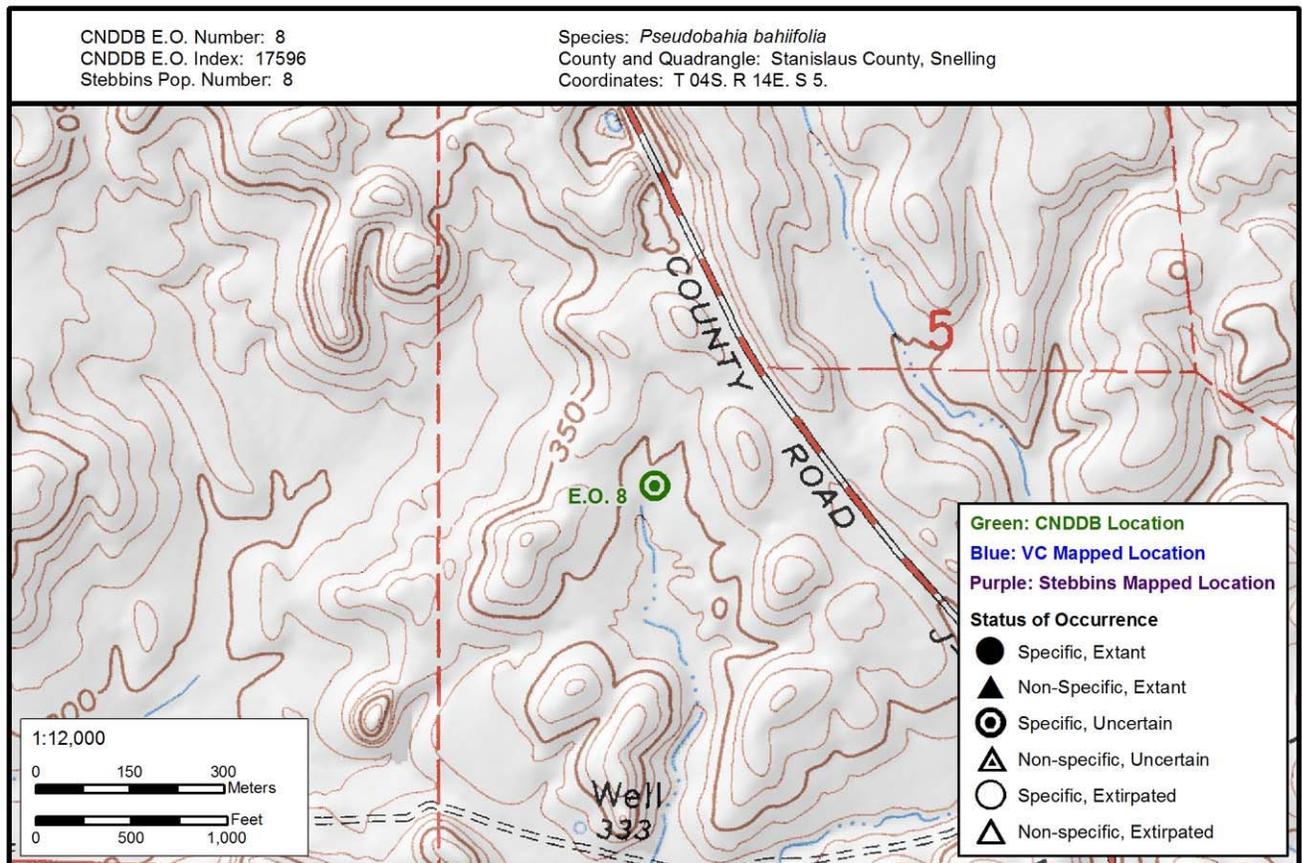
Past Status/Habitat Conditions: “One small population (60 individual plants) was observed. Approximately 50% of the plants were senescent on the survey date. The number of individuals is consistent with the 1986 observation... Non-native valley grassland dominated by *Bromus mollis*, *B. rubens*, *Erodium cicutarium*, and *Lepidium nitidum*. *P. bahiifolia* plants were growing on the north-facing knolls in rolling terrain. The soils at the site are classified as Pentz Loam (Arkley, 1964)” (Stebbins 1991). “50 plants in 1986, 60 in 1990. None found by B. Baldwin in 1997” (CNDDDB 2010).

Current Status/Habitat Conditions: Site is within small horse corral. Very marginal habitat at site, though suitable habitat occurs to the north (no plants observed in area).

Trend/Threats: Area is subject to expanding subdivisions and orchard conversion.

Land Ownership: Louise M. Rosasco, 30 Redcoasch Lane, Orinda, CA 94563

Land Use: Cattle ranching



Species: *Pseudobahia bahiifolia*
Status: Extirpated
Trend: Extirpated

CNDDDB E.O. Number: 10
Last Site Visit: Oct. 8, 1990
Plants Last Seen: 1848

Other Pop. Number: ST 10
By: John Stebbins
Mapping Precision: Specific

Past Documentation: "Yuba County, on pastures of the upper Sacramento Valley", T. Hartweg 208 1-12 April 1847 (photograph UC). Type locality. Hartweg collected 208 in 1847 in the vicinity of "Cordua's farm" at the junction of the Yuba and Feather River (Johnson 1978)" (Stebbins 1990).

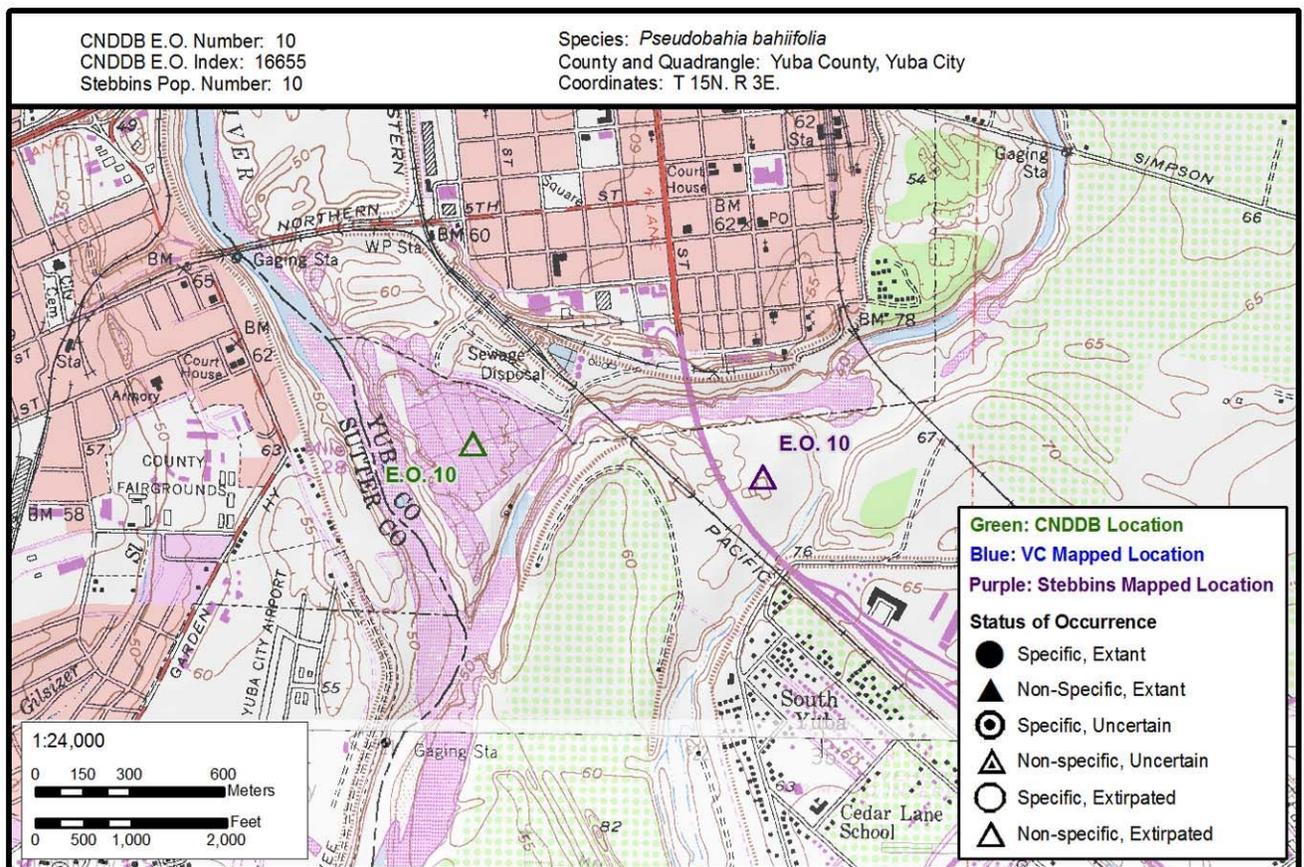
Past Status/Habitat Conditions: "Present day site of Marysville. Virtually the entire area near the junction of the two rivers has been converted to either residential, industrial, or agricultural uses. The five mile area bounded roughly by Highway 20 on the north, the county airport on the south, Highway 70 on the east, and the Feather River on the west was searched on 18 March, 1990 and again on 8 October, 1990 without locating any suitable habitat capable of supporting *P. bahiifolia*. The only significant stands of native vegetation remaining occur in the riparian habitat along both rivers" (Stebbins 1990).

Current Status/Habitat Conditions: Presumed extirpated. No suitable habitat.

Trend/Threat: Extirpated

Land Ownership: Unknown

Land Use: Residential, industrial and agricultural



Species: *Pseudobahia bahiifolia*
Status: Presumed Extirpated
Trend: Presumed Extirpated

CNDDDB E.O. Number: 11
Last Site Visit: Apr. 9, 2010
Plants Last Seen: 1939

Other Pop. Number: ST 11
By: Jake Schweitzer
Mapping Precision: Specific

Past Documentation: “Stanislaus County, 8 miles east of Oakdale, Haystack Hill’, Robert F. Hoover 753, 2 March 1936 (UC, JEPS); Robert F. Hoover 2038, 4 May, 1937 (RSA); Robert F. Hoover 3948 (CAS). The presumed location of the population is mapped along the alignment of Highways 108/120” (Stebbins 1991).

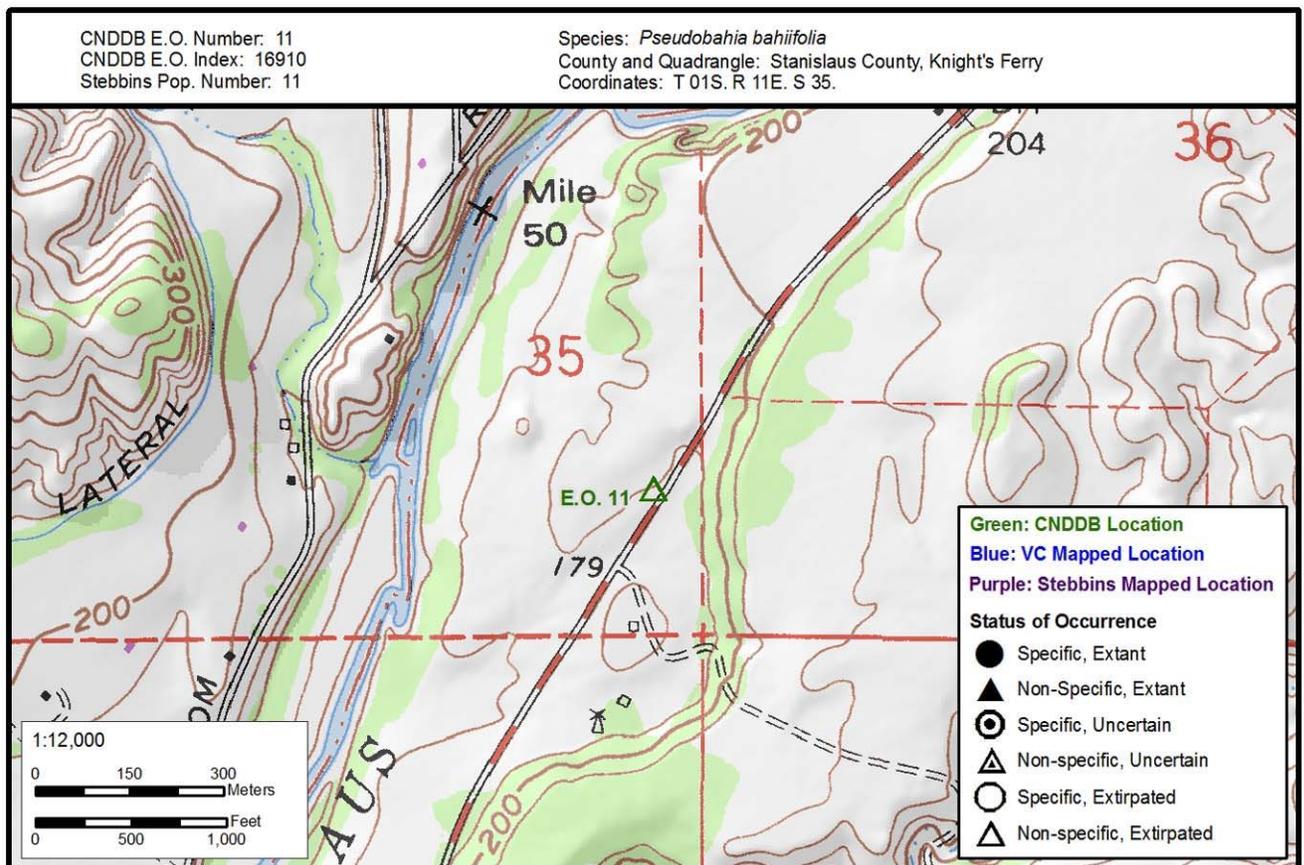
Past Status/Habitat Conditions: “The accessible lands on both sides of the Highway 4-12 miles east of Oakdale were extensively searched without success by John Stebbins on 10 April, 1990. The likely site for Hoover’s collections is now an old soil quarry site located on the south side of the road 7.6 miles east of Oakdale. The other lands in the vicinity are primarily agricultural (orchards), or small ranch type operations inhabited by mostly ruderal species associated with land cultivation and other soil disturbance practices. Some native grassland still exists to the southeast of Oakdale, but soil conditions did not appear favorable for *P. bahiifolia*” (Stebbins 1991).

Current Status/Habitat Conditions: Population is mapped “specific” along highway 108. Surrounding floodplain is unsuitable habitat, and adjacent hills are developed as orchard, quarry, and rangeland. Rangeland to south is suitable in some areas, but not mapped as Amador soils. No plants observed in the pasture.

Trend/Threat: Presumed extirpated

Land Ownership: Private

Land Use: Soil quarry, development, agriculture and ranching



Species: *Pseudobahia bahiifolia*
Status: Presumed Extant
Trend: Declining?

CNDDDB E.O. Number: (13)
Last Site Visit: Apr 9, 2010
Plants Last Seen: 1990

Other Pop. Number: ST 13
By: Jake Schweitzer
Mapping Precision: Specific

Past Documentation: “Stanislaus County, Barnett Ranch off Barnett Road; 0.9 miles south of Cooperstown Road, along bluff east of Dry creek’ CNDDDB report based upon observation by Perry Allen in 1977. No herbarium collection was made. The population was verified by John Stebbins on 13 April, 1990” (Stebbins 1991).

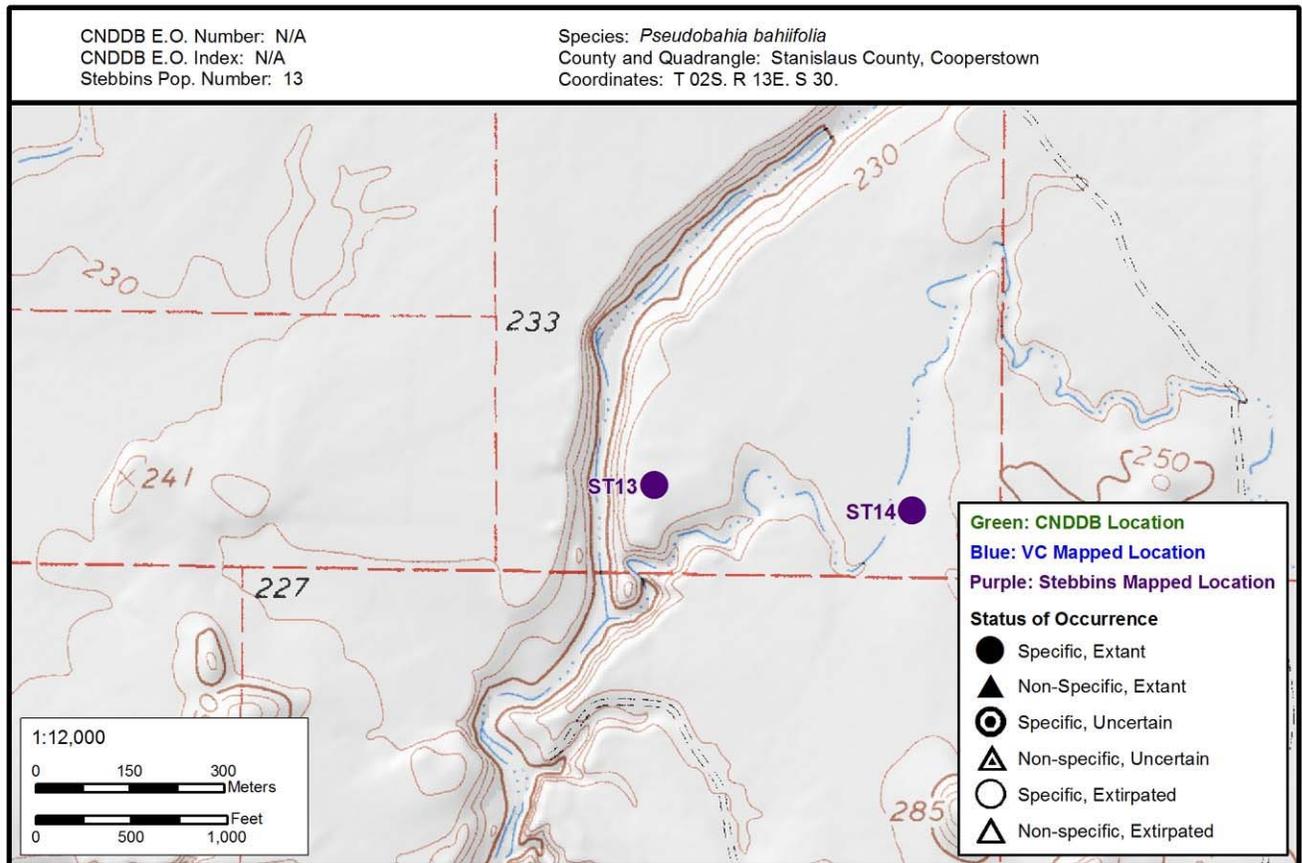
Past Status/Habitat Conditions: “Extant, small population (9 plants) observed on survey date... A very small population of extremely senescent plants was observed in non-native grassland located on a northwest facing bluff overlooking Dry Creek. Common associates included *Bromus rubens*, *Lasthenia fremontii*, *Clarkia purpurea*, *Lepidium nitidum*, and *Erodium cicutarium*. The soils are classified as acidic Amador loams. Numerous rock outcrops are present in the immediate vicinity. No collection was made due to the small size of the population. Note: *Clarkia rostrata*, a rare species was observed near the site” (Stebbins 1991). No plants observed in 2010, but habitat remains in excellent condition.

Current Status/Habitat Conditions: Presumed extant due to excellent habitat conditions in the area.

Trend/Threats: None apparent

Land Ownership: Robert Ichar, 2909 Parkview Drive, Modesto, CA 95355

Land Use: Cattle ranching



Species: *Pseudobahia bahiifolia*
Status: Presumed Extant
Trend: Presumed Stable

CNDDDB E.O. Number: (14)
Last Site Visit: Apr. 13, 1990
Plants Last Seen: Apr. 13, 1990

Other Pop. Number: ST 14
By: John Stebbins
Mapping Precision: Specific

Past Documentation: "Stanislaus County, Barnett Ranch off Barnett Road; 1.1 miles south of Cooperstown Road, 0.35 miles east of Dry Creek. CNDDDB report based upon observation by Perry Allen in 1977. No herbarium collection was made. The population was verified by John Stebbins on 13 April, 1990" (Stebbins 1991).

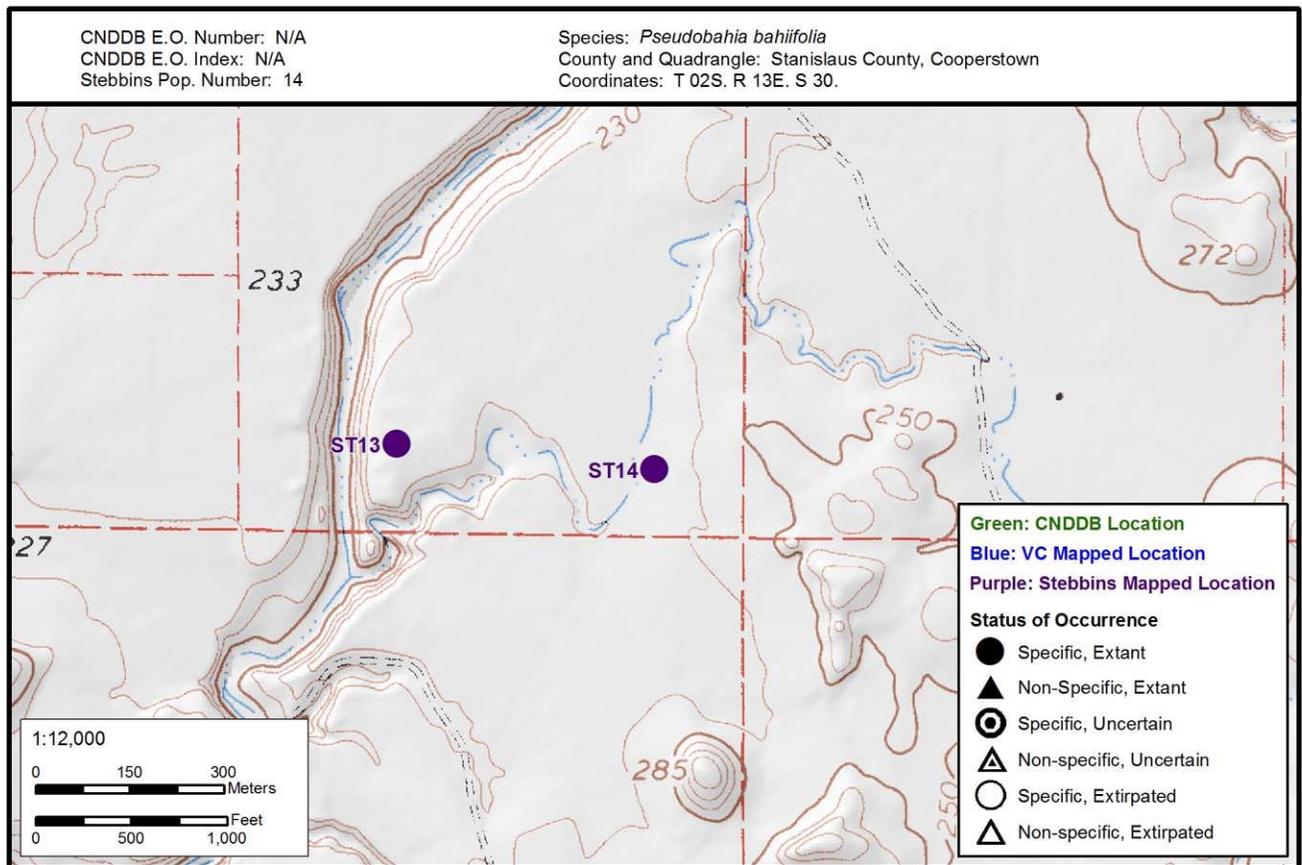
Past Status/Habitat Conditions: "Extant, small population (27 plants) observed on survey date... A small population of senescent plants was observed in non-native grassland located on a north-facing bluff east of Dry Creek. Common associates included *Bromus mollis*, *Lasthenia fremontii*, *Agoseris heterophylla*, *Lepidium nitidum*, and *Erodium cicutarium*. The soils are classified as acidic Amador loams (Arkley 1964). No collection was made due to the small size and advanced phenology of the population on the survey date" (Stebbins 1991). Not visited in 2010.

Current Status/Habitat Conditions: Presumed extant due to excellent habitat conditions in the area.

Trend/Threats: Grazing levels appear to be moderate. No immediate threats are evident.

Land Ownership: Robert Ichard, 2909 Parkview Drive, Modesto, CA 95355

Land Use: Cattle ranching



Species: *Pseudobahia bahiifolia*
Status: Extant
Trend: Stable

CNDDDB E.O. Number: 15
Last Site Visit: Apr. 9, 2010
Plants Last Seen: Apr. 9, 2010

Other Pop. Number: ST 15
By: Jake Schweitzer
Mapping Precision: Specific

Past Documentation: "Stanislaus County, Barnett Ranch off Barnett Road; 1.2 miles south of Cooperstown Road, 2.0 miles southeast of Warnerville", CNDDDB report based upon observation of a small population by Perry Allen in 1977. No herbarium collection was made. The site was surveyed by John Stebbins on April 13, 1990" (Stebbins 1991).

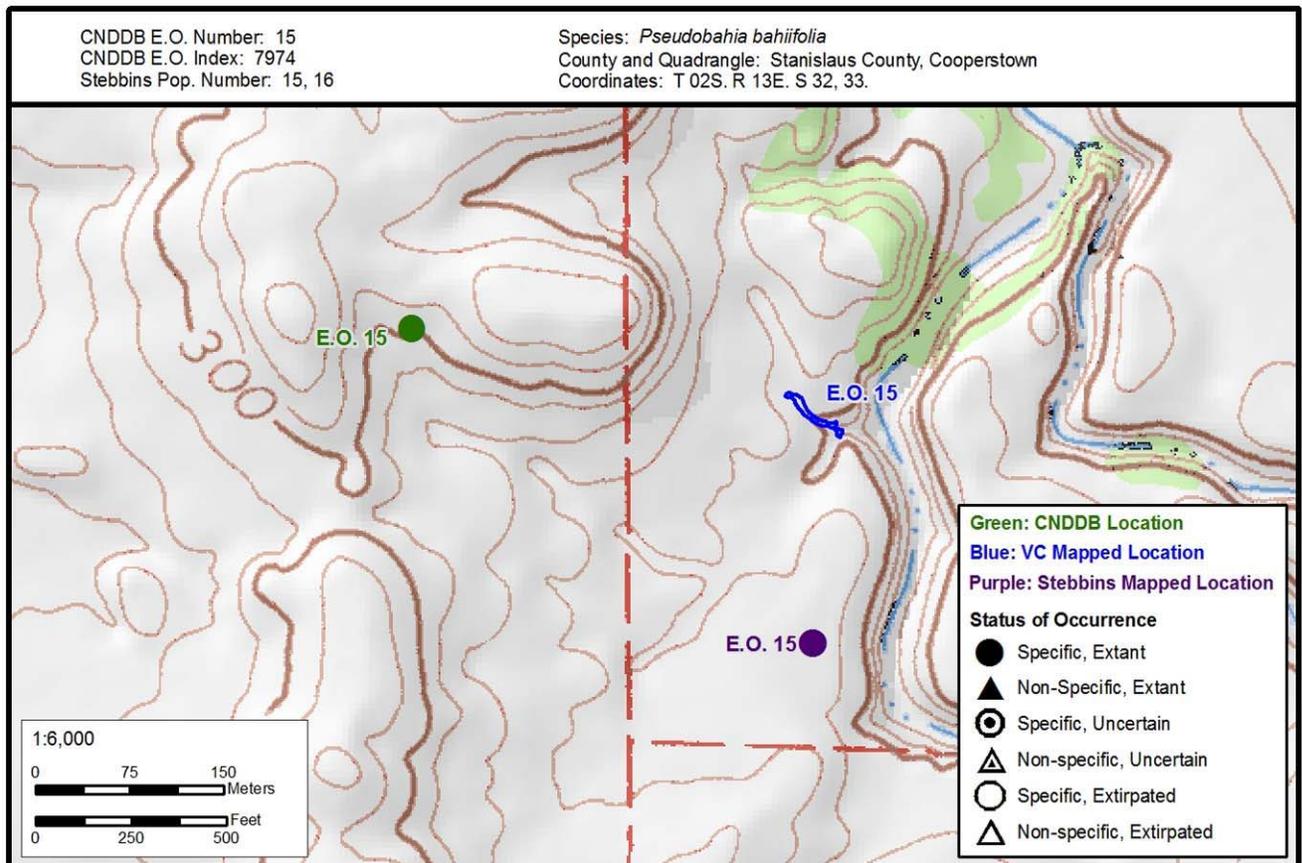
Past Status/Habitat Conditions: "Presumed extant, no plants were observed but habitat appeared suitable for the species. Based upon Allen's other identifications in the region it is reasonable to assume that the 1977 report was valid... Non-native grassland dominated by *Bromus rubens* and *Erodium botrys*. Amador loam acidic soils (Arkley 1964). Heavily grazed in the immediate vicinity of reported population. The species could occur in more favorable seasons at this site" (Stebbins 1991). "Associated with *Micropus californicus*, *Bromus mollis*... *Lubpinus bicolor*, *Plagiobothrys tenellus*, *Erodium cicutarium*... *Lasthenia fremontii* and *Triteleia* sp. Less than 100 plants seen in 1977, 280 plants seen in 1977, 280 plants seen in 1990. Group includes former occurrences 16, 19 and 20" (CNDDDB 2010).

Current Status/Habitat Conditions: Over a thousand individuals were found in wet seepy soils to dry open along the edge of a drainage. On northern 5-10% to vertical slopes of Amador loam soil types, the population was associated with *Bromus diandrus*, *Triphysaria eriantha* and *Trifolium willdenovii*.

Trend/Threats: Trend is stable. No threats observed in 2010.

Land Ownership: Bessie Rosasco, 124 N. Poplar Street, Sonora, CA 95370

Land Use: Cattle ranching



Species: *Pseudobahia bahiifolia*
Status: Presumed Extant
Trend: Declining?

CNDDDB E.O. Number: 17
Last Site Visit: Apr. 9, 2010
Plants Last Seen: Apr. 12, 1990

Other Pop. Number: ST 17
By: Jake Schweitzer
Mapping Precision: Specific

Past Documentation: “Stanislaus County, Barnett Ranch off Barnett Road; 0.7 miles south of Cooperstown Road, along bluff west of Dry creek’ CNDDDB report based upon observation of a one small population by Perry Allen in 1977. No herbarium collection was made. The population (along with three others) was verified by John Stebbins on 12 April, 1990. Documentation: John C. Stebbins 12 April, 1990 (FSC, UC)” (Stebbins 1991).

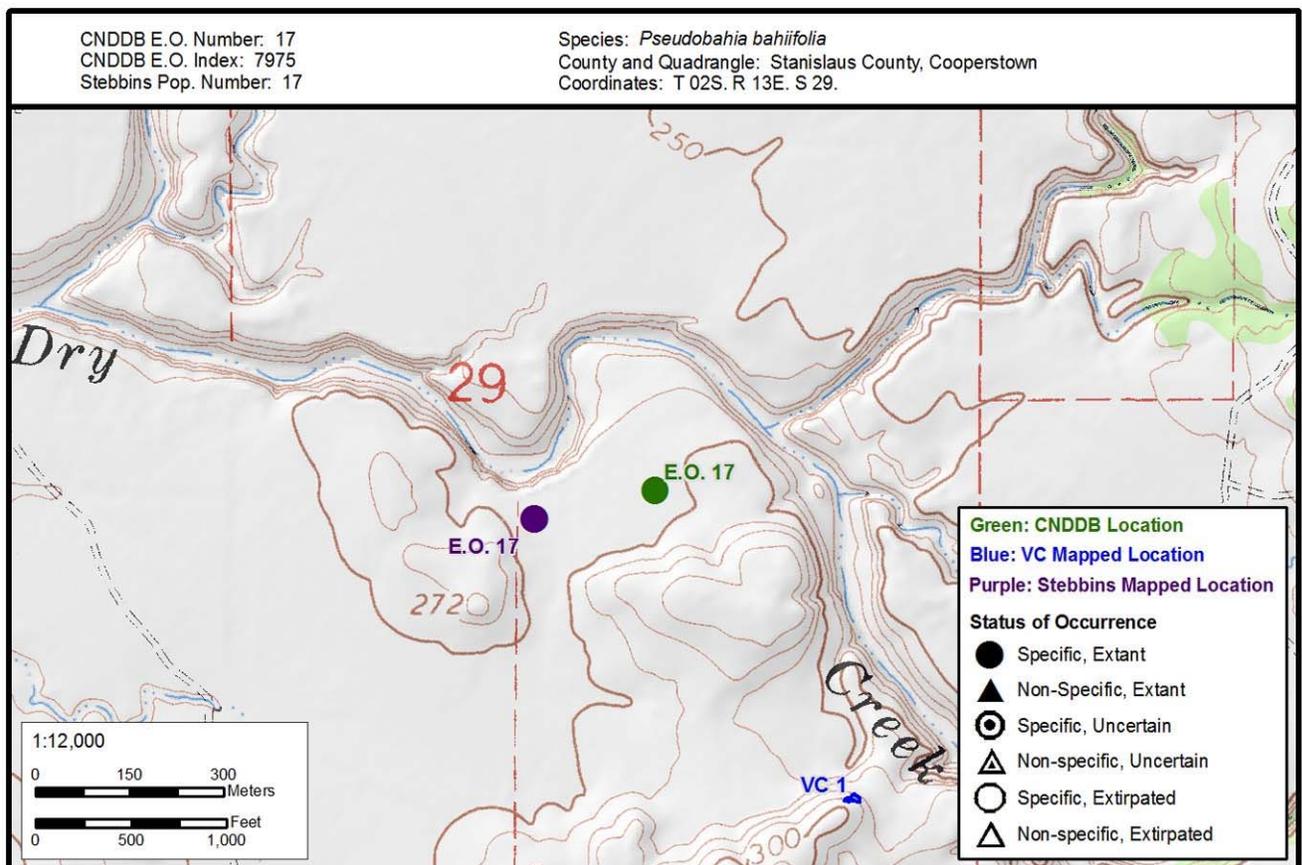
Past Status/Habitat Conditions: “Extant, small population (16 plants) observed on survey date... A small population of senescent plants was observed in non-native grassland located on a northeast facing bluff overlooking Dry Creek. Common associates included *Micropus californicus*, *Lasthenia fremontii*, *Calandrina ciliata*, *Lepidium nitidum* and *Erodium cicutarium*” (Stebbins 1991). “One plant observed in 1977, 16 in 1990 in south polygon. Northern polygon is a large population; over 15,000 plants seen within 5 acre site in 1990. Often occurs with *Lasthenia chrysostoma*; the two are difficult to separate. Includes former EO #18.” (CNDDDB 2010)

Current Status/Habitat Conditions: No plants observed in 2010, though excellent habitat is still present along the bluff. Note that CNDDDB point is mapped far from the suitable habitat.

Trend/Threats: Future expansion of nearby quarry

Land Ownership: Bessie Rosasco, 124 N. Poplar Street, Sonora, CA 95370

Land Use: Cattle ranching



Species: *Pseudobahia bahiifolia*
Status: Presumed Extant
Trend: Presumed Stable

CNDDDB E.O. Number: (18)
Last Site Visit: 2001
Plants Last Seen: April 12, 1990

Other Pop. Number: ST 18
By: John Vollmar
Mapping Precision: Specific

Past Documentation: “Stanislaus County, Barnett Ranch, east rim of chasm along tributary to Dry Creek, 0.5 miles southwest of Cooperstown Road, CNDDDB report by Perry Allen based upon observation made in 1977. No herbarium collection was made. Other Documentation: John C. Stebbins 90-069, 12 April, 1990 (FSC, UC).” (Stebbins 1991).

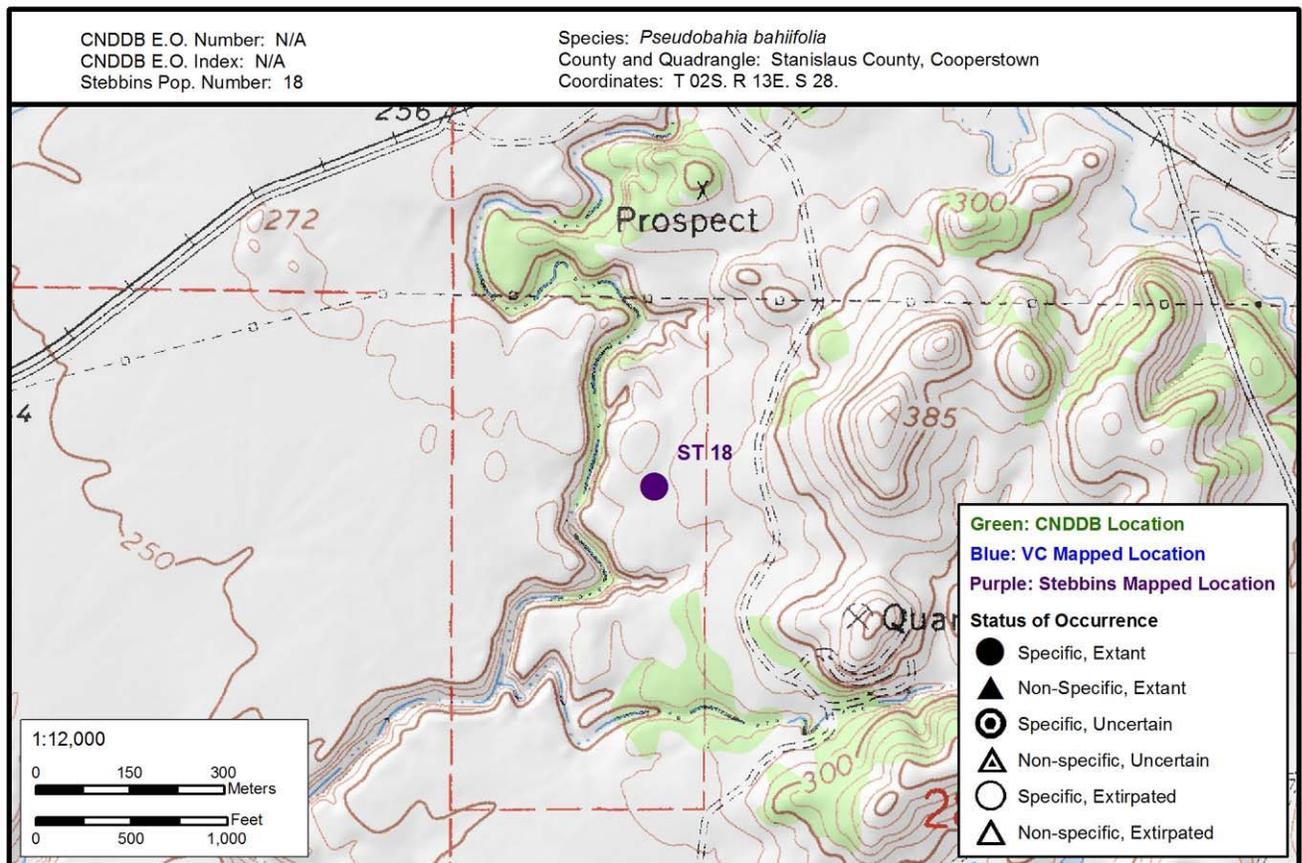
Past Status/Habitat Conditions: “Extant, extensive population observed on survey date...Extremely large population (15,000+ plants) spread over approximately five acres of undulating terrain of non-native grassland and lower blue oak woodland on acidic Amador soils. Most plants were present on north-facing slopes or in the shade associated with the trees lining the upper bank of the creek, common associates included *Micropus californicus*, *Lasthenia fremontii*, *Microsteris gracilis*, and *Erodium cicutarium*” (Stebbins 1991). “One plant observed in 1977, 16 in 1990 in south polygon. Northern polygon is a large population; over 15,000 plants seen within 5 acre site in 1990. Often occurs with *Lasthenia chrysostoma*; the two are difficult to separate” (CNDDDB 2010). John Vollmar visited the site in 2001 and found similar conditions to those described by Stebbins in 1990.

Current Status/Habitat Conditions: Unknown

Trend/Threats: Trend is presumed stable due to general habitat conditions. No threats are apparent.

Land Ownership: James Curtoni, P.O. Box 1214, Oakdale, CA 95361

Land Use:



Species: *Pseudobahia bahiifolia*
Status: Presumed Extant
Trend: Declining?

CNDDDB E.O. Number: (19)
Last Site Visit: Apr. 9, 2010
Plants Last Seen: Apr. 12, 1990

Other Pop. Number: ST 19
By: Steven Santos
Mapping Precision: Specific

Past Documentation: “Stanislaus County, Barnett Ranch off Barnett Road; 1.7 miles south of Cooperstown Road and 2.0 air miles south-southwest of Cooperstown’ along bluff west of Dry creek’ CNDDDB report based upon observation by Perry Allen in 1977. No herbarium collection was made. The populations were verified by John Stebbins on 12 April, 1990. Other Documentation: John C. Stebbins 90-070, (FSC, UC)” (Stebbins 1991).

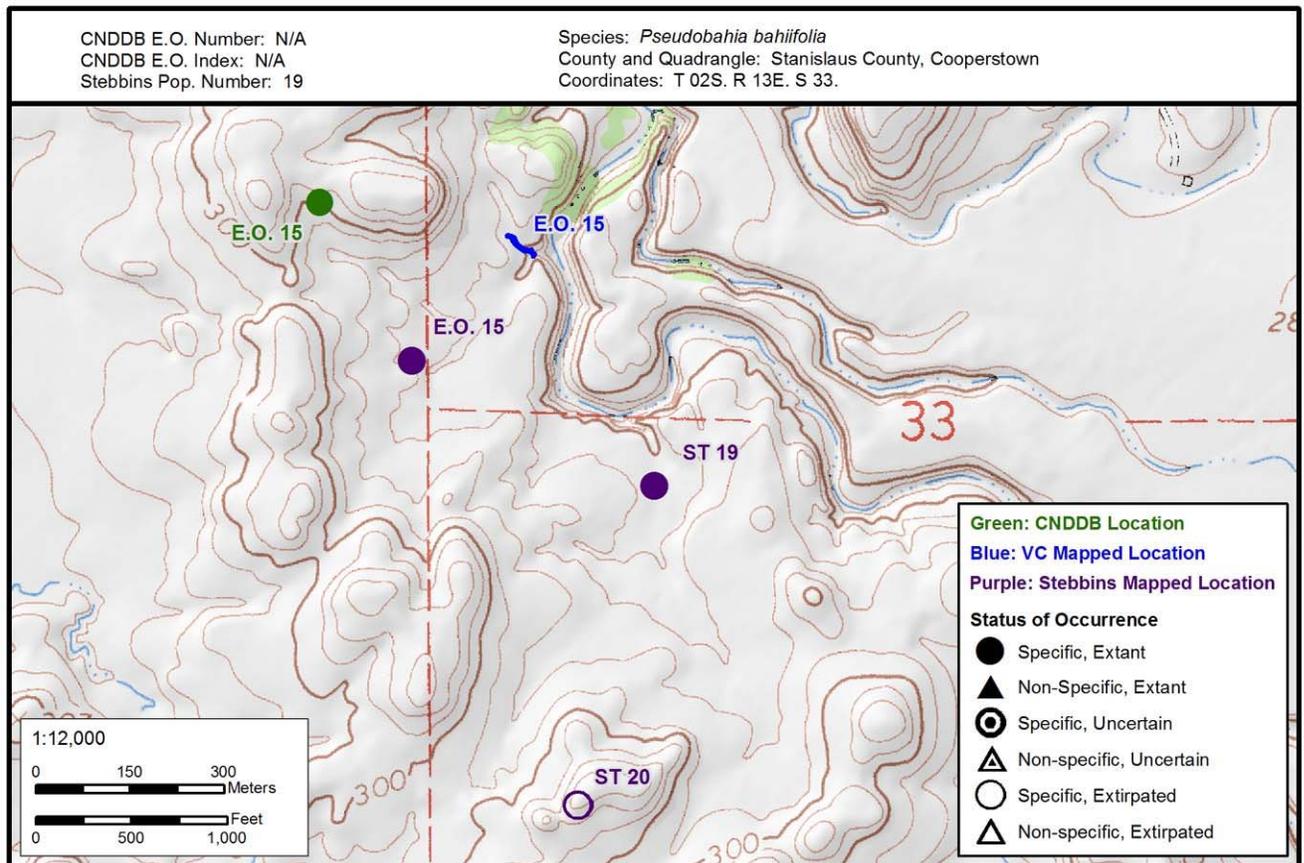
Past Status/Habitat Conditions: “Extant, 4 small isolated populations (80) plants) observed on survey date...The 4 small populations of plants were observed in non-native grassland located on a series of northeast facing bluffs overlooking upper Dry Creek. Common associates included *Micropus californicus*, *Bromus mollis*, *Lupinus bicolor*, *Plagiobothrys tenellus* and *Erodium cicutarium*. The soils are classified as acidic Amador loam (Arkley 1964). Numerous rock outcrops are present in the immediate vicinity. The low rolling hills (mima mounds) immediately west contained vernal pools with the rare taxon *Orthocarpus campestris* var. *succulentus*.” (Stebbins 1991). “Growing on acidic Amador loam soils in non-native grassland. Associated with... *B. rubens*... *E. botrys*, *Lasthenia fremontii* and *Triteleia* sp. Less than 100 plants seen in 1977, 280 plants seen in 1977, 280 plants seen in 1990. Includes former occurrences 16, 19 and 20” (CNDDDB 2010).

Current Status/Habitat Conditions: Thought not observed, presumed extant due to excellent habitat conditions.

Trend/Threats: Trend is possibly declining, since no plants were observed in 2010. No immediate threats are evident.

Land Ownership: Dennis Armstrong, 205 Laurel Street, Oakdale, CA 95361

Land Use: Cattle ranching



Species: *Pseudobahia bahiifolia*
Status: Extant
Trend: Stable

CNDDDB E.O. Number: 21
Last Site Visit: April 22, 2010
Plants Last Seen: April 22, 2010

Other Pop. Number: ST 21
By: Jake Schweitzer/John Stebbins
Mapping Precision: Specific

Past Documentation: “Fresno County, 0.2 miles east of Friant near Friant water tank, due west of Friant-Kern Canal and south of Millerton Road”, John C. Stebbins and James Holeman 84-021, 22 March, 1984 (FSC). Other Specimens: John C. Stebbins (with Jim Shevock) 85-017 (FSC), John C. Stebbins 90-015 (FSC).” (Stebbins 1990). Also visited by J. Stebbins in 1992 (2500 plants) and 1995 (1200 plants), and by J. Game in 2001 (unknown number) (CNDDDB 2010).

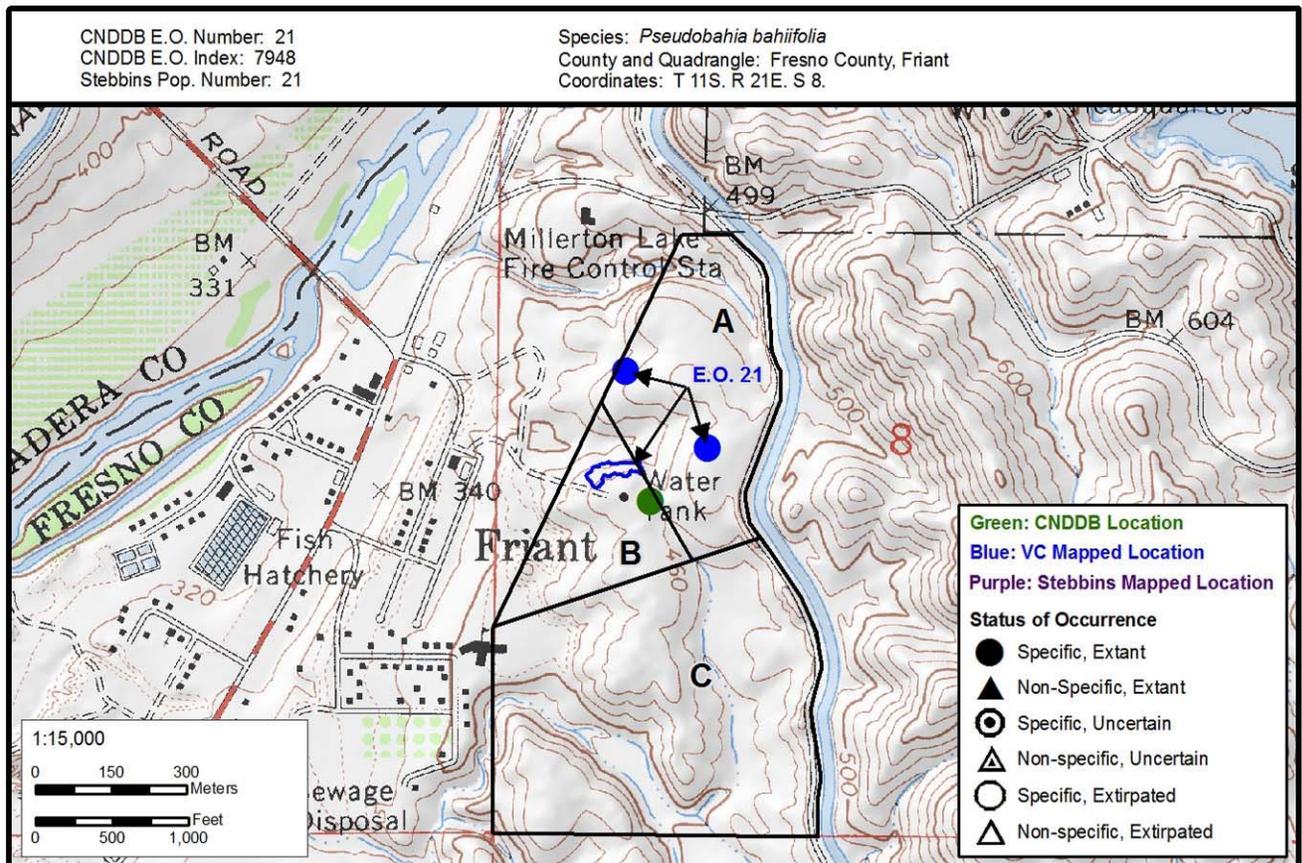
Past Status/Habitat Conditions: “Status extant, habitat present (partially protected)” (Stebbins 1990). “Habitat conditions include low rolling hills of non-native valley grassland. Mima mound topography with most plants on north-facing slopes. Soils are classified as Rocklin loam (pumice variant). Associated species include *Muilla maritima*, *Vulpia myuros*, *Bromus rubens*, *Erodium botrys*. Area A is 36 acres (300 plants) and is jointly managed by U.S. Bureau of Reclamation and the Nature Conservancy. Area B (200 plants) is subject to near finalization as a protected conservation easement of about 3.6 acres between the owner and TNC. Area C (300 plants) is subject to moderate to heavy levels of cattle grazing” (Stebbins 1990).

Current Status/Habitat Conditions: Population is currently extant and 1000’s of plants were observed in 2010. Plants were observed on northeast facing slopes ranging from 20-60% slopes. Associated species include *Erodium botrys*, *Hypochaeris glabra*, *Mimulus cardinalis*, *Bromus hordeaceus*, and *Castilleja attenuata*.

Trend/Threats: Trend is stable. Potential threats include proposed development in southern portion of site.

Land Ownership: Bureau of Reclamation

Land Use: Cattle ranching



Species: *Pseudobahia bahiifolia*
Status: Presumed Extant
Trend: Presumed Stable

CNDDDB E.O. Number: 23
Last Site Visit: 2009
Plants Last Seen: 2009

Other Pop. Number: ST 22
By: Live Oak Associates
Mapping Precision: Specific

Past Documentation: “Fresno County, three sub-population sites between 0.5 and 1.0 miles south of Friant and 0.5 miles west of the Friant-Kern Canal, low rolling hills in valley grassland with *Muilla maritime*”, John C. Stebbins 84027, 84029, 22 March, 1984 (FSC, UC) Other documentation, John C. Stebbins 90-016 (FSC, UC)” (Stebbins 1990). Botanists from Live Oak Associates conducted surveys and documented plants on the site from 2007-2009.

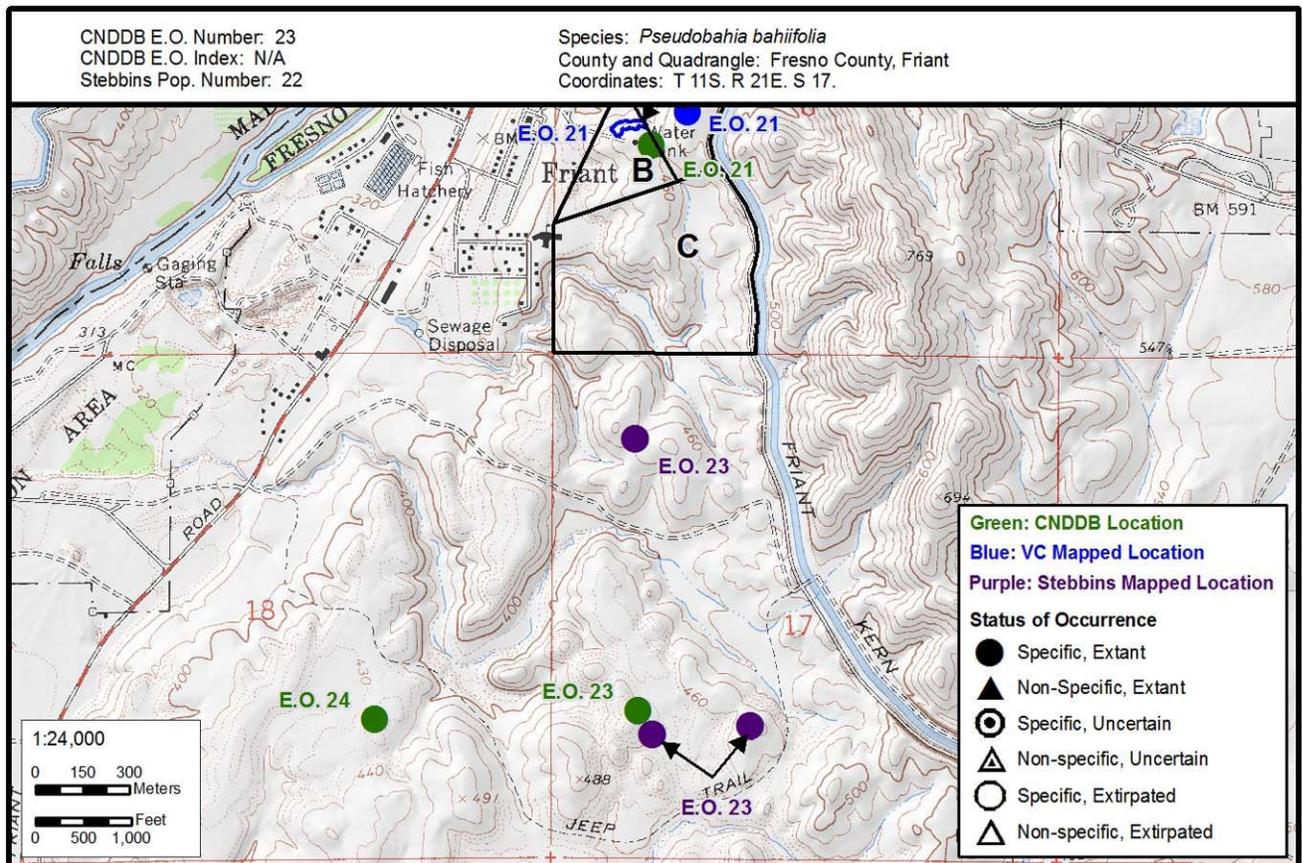
Past Status/Habitat Conditions: “Plant was extant, habitat and plant observed on survey data (1990). Habitat conditions, overall status is good, based upon comparison with previous site visits to the site in 1984 and 1987. Non-native grassland is dominated by *Bromus rubens*, *Muilla maritime*, *B. mollis*, and *Amsinckia intermedia*. Approximately 600 plants of *Pseudobahia bahiifolia* are evenly divided among the three sites (see map). Plants are mostly found on the north-facing slopes of the rolling hills of Rocklin sand loam pumice soil. Note: the associated vernal pools between the hills contain the endangered taxon, *Orthocarpus campestris* var. *succulentus*” (Stebbins 1990).

Current Status/Habitat Conditions: Current status is presumed extant due to presence of good habitat. Site was not visited in 2010 due to lack of access.

Trend/Threats: Trend is presumed stable due to presence of good habitat. Threats include proposed development in area.

Land Ownership: Private

Land Use: Cattle ranching



Species: *Pseudobahia bahiifolia*
Status: Presumed Extant
Trend: Presumed Stable

CNDDDB E.O. Number: 24
Last Site Visit: 2009
Plants Last Seen: 2009

Other Pop. Number: N/A
By: Live Oak Associates
Mapping Precision: Specific

Past Documentation: “Approximately 1.5 km (1 mile) south of Friant, 1 km (0.6 mile) east of gravel pit, documented by J. Stebbins, field survey form and map, STE92F0004 in 1992” (CNDDDB 2010). Botanists from Live Oak Associates conducted surveys and documented plants on the site from 2007-2009.

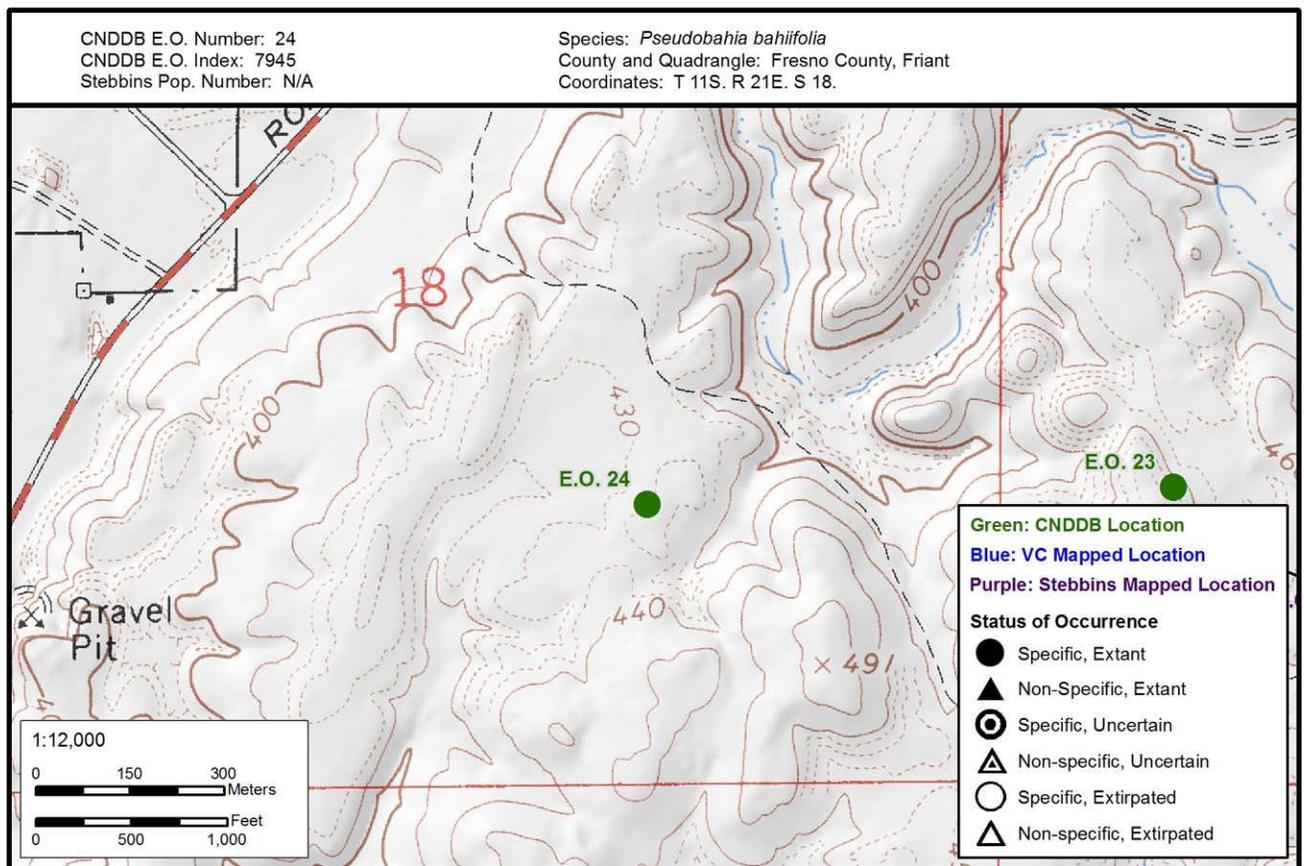
Past Status/Habitat Conditions: “Past status was extant. Growing on Rocklin volcanic soils within valley grassland with mima mound topography. Associated with *Bromus rubens*, *Muilla maritima*, and *Lupinus bicolor*.”

Current Status/Habitat Conditions: Site not visited in 2010 due to lack of access. Status is presumed extant, due to good quality habitat. Plants were observed recently (2009).

Trend/Threats: Trend is presumed stable due to recent observation (2009) and good quality habitat. Threats include proposed development.

Land Ownership: Private

Land Use: Cattle ranching



Species: *Pseudobahia bahiifolia*
Status: Uncertain
Trend: Declining

CNDDDB E.O. Number: 25
Last Site Visit: Apr 22, 2010
Plants Last Seen: April 1995

Other Pop. Number: ST 23
By: Jake Schweitzer/John Stebbins
Mapping Precision: Specific

Past Documentation: “Madera County, north of Friant and west of Millerton Reservoir; just north of Highway 145 on Friant-O’Neals Road, on grassy slope on east side of road”, Dale E. Johnson 29, 15 April 1973 (UC). Other specimens: Dale E. Johnson (with A.R. Smith) 55, 5 April 1974 (UC, RSA); John C. Stebbins 90-005, 24 March 1990 (FSC,UC)” (Stebbins 1990). Additional past documentation include R. Bacigalupi et al. on April 27, 1995. “80 plants in 1990, 80 in 1995. This is probably remnant of larger population (including occurrence 26) which has been fragmented due to operation of nearby pumicite quarry” (CNDDDB 2010).

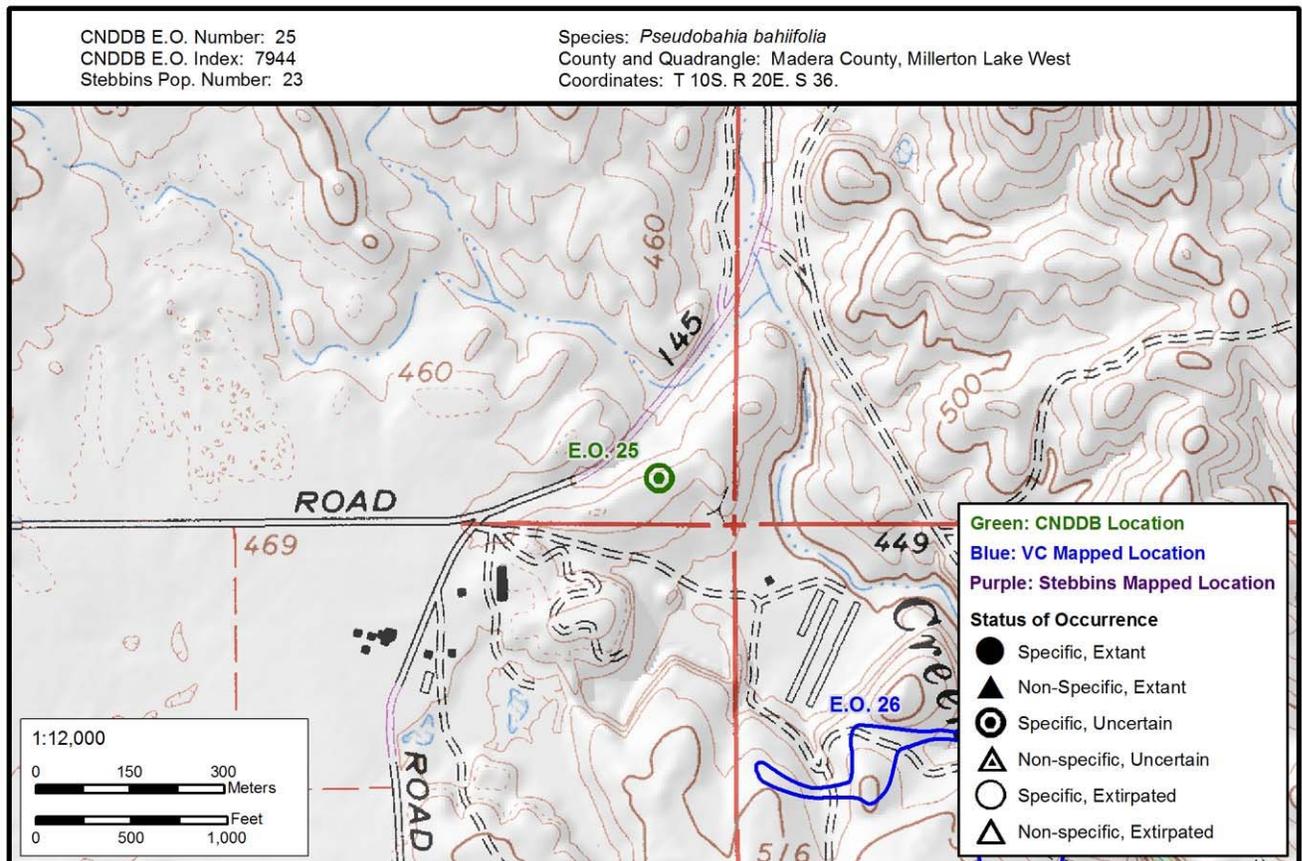
Past Status/Habitat Conditions: Past status was presumed extant. Past habitat conditions described as “Growing in non-native valley grassland on upper slope of road bank. Associates include *Bromus diandrus*, *Eschscholzia lobii*, *Amsinckia intermedia*, *Thysanocarpus curvipes*, and *Erodium botrys*. Site threatened by commercial development, quarry activities, road widening, and nearby store. Site was for sale in 1995” (CNDDDB 2010).

Current Status/Habitat Conditions: Species was not observed in 2010. Current status is uncertain. Site is undergrazed and supports dense, tall annual grasses. Habitat quality is poor. Site is likely fragmented

Trend/Threats: Undergrazing, road widening, quarry activities.

Land Ownership: Private

Land Use: Mining



Species: *Pseudobahia bahiifolia*
Status: Extant
Trend: Stable

CNDDDB E.O. Number: 26
Last Site Visit: Apr. 7, 2010
Plants Last Seen: Apr. 7, 2010

Other Pop. Number: ST 24
By: Jake Schweitzer/J. Stebbins
Mapping Precision: Specific

Past Documentation: “Madera County; 1.4 miles North of San Joaquin River at Friant Bridge, on property of California Industrial Minerals, near pumicite quarry. In valley grassland of low rolling hills dominated by *Bromus rubens*, *Lasthenia fremontii*, *Lupinus bicolor*, *Erodium botrys*, and *Plagiobothrys nothofulvus*. Rimo Bacigalupi and S. Carlquist 4014, 28 March, 1953 (CAS, UC, DAV, JEPS, UCSB); “edges of Friantite Quarry,” Lincoln Constance and J. Dawson 4865, 27 April, 1955 (CAS, JEPS); Other specimens: John Stebbins 90-004 (FSC, UC), 24 March 1990” (Stebbins 1991). Occurrence consists of several subpopulations. Larger colony has also been observed by B. Baldwin in 1997 and E. Cypher in 2004. (CNDDDB 2004).

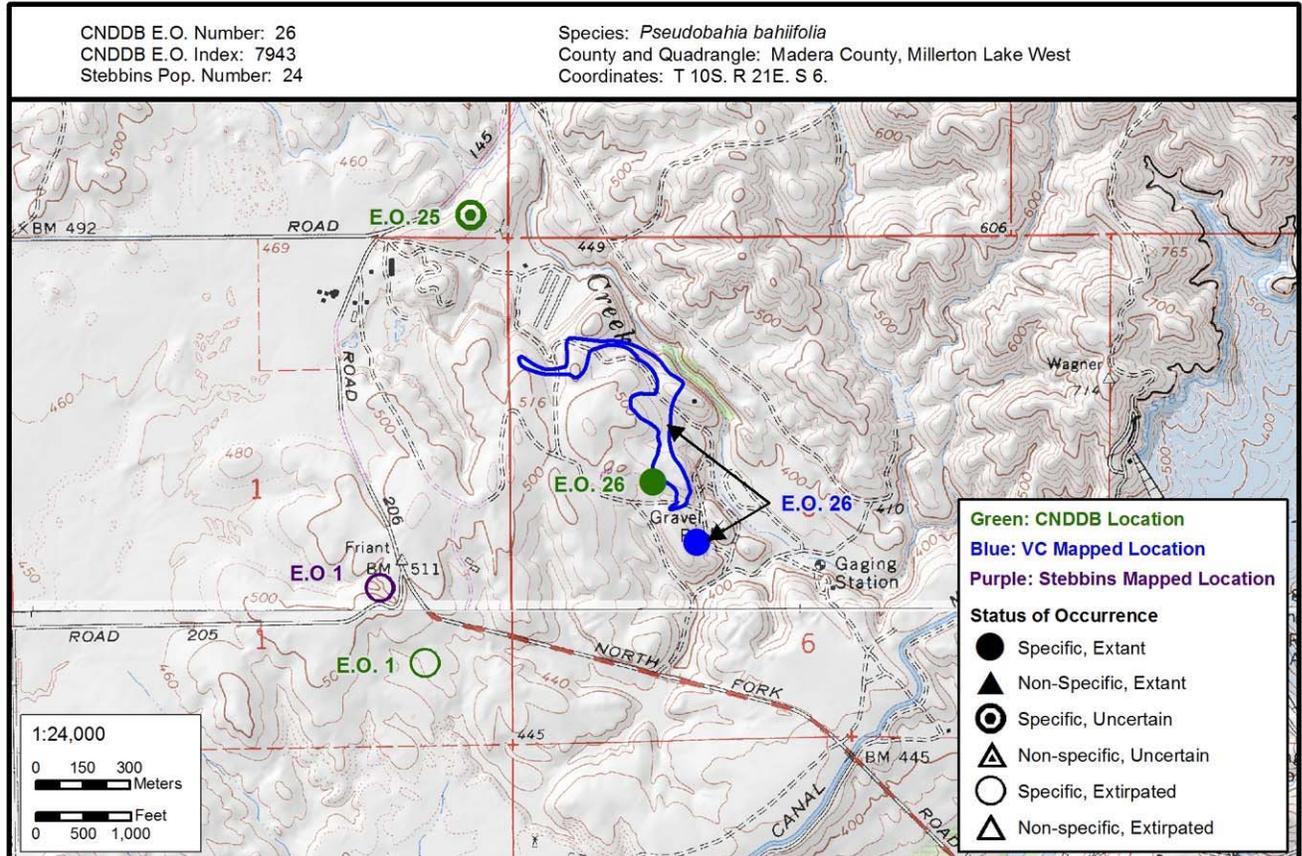
Past Status/Habitat Conditions: “Extant, excessive habitat remaining. A large colony of 7-sub populations was observed on the survey date. The numbers and habitat condition were similar to those observed in 1989. The natural grasslands remaining at the site are dominated by *Bromus rubens*, *Erodium botrys*, *Thysanocarpus curvipes* and *Lupinus bicolor*. The on-going quarry operations are now localized to the north of most of the remaining plants. The entire area is grazed by cattle and utilized for associated quarry and storage of equipment. Explosives are stored in an underground structure nearby. It is estimated that the species was likely much more widespread historically in the area, and the observed plants represent fragmented remainders of an extremely large contiguous population that occurred west of Cottonwood Creek and east of Highway 145” (Stebbins 1991). Approximately 18,000 Plants were seen 1989 and 1990, 16,000+ Seen in 1991, and less than 10,000 were seen in 2004 from the larger colony (CNDDDB 2004).

Current Status/Habitat Conditions: Tens of thousands of plants observed in 2010. Site is located on primarily north and eastern facing slope on Rocklin rocky sandy loam soils.

Trend/Threats: Possible threats are quarry operations, ORV use, grazing, and commercial development.

Land Ownership: Private

Land Use: Mining



Species: *Pseudobahia bahiifolia*
Status: Extant
Trend: Stable

CNDDDB E.O. Number: 27
Last Site Visit: Apr. 9,2010
Plants Last Seen: Apr. 9,2010

Other Pop. Number: N/A
By: Jake Schweitzer
Mapping Precision: Specific

Past Documentation: Observed by P. Allen in 1977 (CNDDDB 1977).

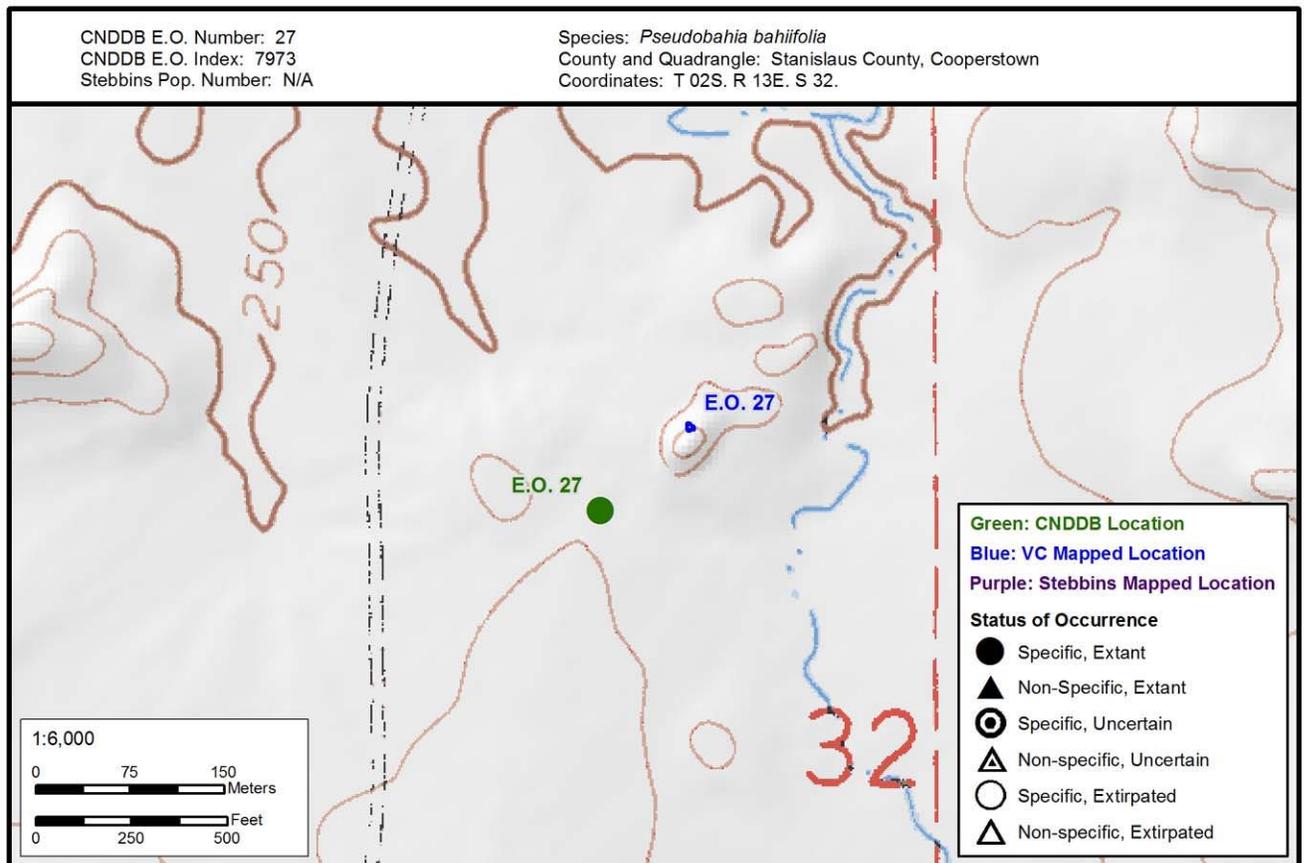
Past Status/Habitat Conditions: A small population was noted by Allen in 1977 during surveys for proposed nuclear power plant site (CNDDDB 1977). Not visited by Stebbins in 1990.

Current Status/Habitat Conditions: Approximately 200 plants were observed by J. Schweitzer (Vollmar Consulting) in 2010. Site is located on a north-facing slope on Amador loam soils. Some associated species are *Erodium botrys*, *Hypochaeris glabra*, and *Trifolium willdenovii*.

Trend/Threats: Population is stable. No threats are apparent.

Land Ownership: Unknown

Land Use: Cattle ranching



Species: *Pseudobahia bahiifolia*
Status: Presumed Extant
Trend: Declining?

CNDDDB E.O. Number: 28
Last Site Visit: Apr. 9, 2010
Plants Last Seen: Apr.13,1990

Other Pop. Number: ST 25
By: Jake Schweitzer/Steven Santos
Mapping Precision: Specific

Past Documentation: “Stanislaus County, 0.25 miles north of Cooperstown Road on bluffs immediately west of north fork Dry Creek.” The site was surveyed by John C. Stebbins on 13 April, 1990 (Stebbins, 1991). P. Allen surveyed the site in 1977 (CNDDDB 1990).

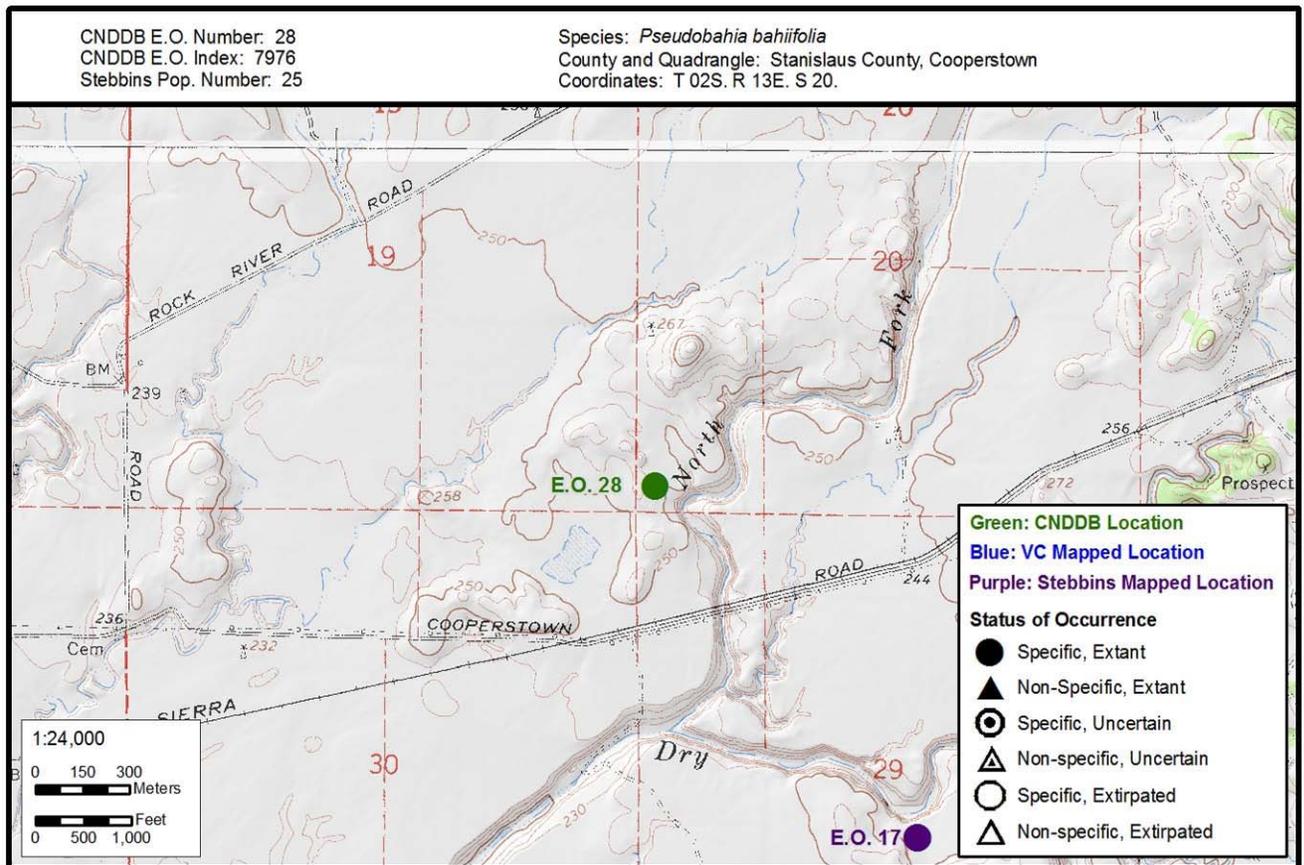
Past Status/Habitat Conditions: “Extant, 26 plants were observed on the 1990 survey date. No herbarium collection was made due to the small size of the population. The site is on a non-native grassland dominated by *Bromus rubens*, *Micropus californicus*, and *Erodium botrys*. Soils are Amador loam acidic (Arkley, 1964). Plants were growing on north-facing bluffs due west of the north fork of Dry Creek. Population probably is more extensive in favorable years at this site. About 60% of the plants were senescent on the survey date. Grazing levels were moderate on the survey date”. (Stebbins, 1991)

Current Status/Habitat Conditions: Not observed in 2010, though suitable habitat is present. Current status is possibly declining.

Trend/Threats: No observed threats in 2010.

Land Ownership: Private

Land Use: Cattle ranching



Species: *Pseudobahia bahiifolia*
Status: Extant
Trend: Stable

CNDDDB E.O. Number: 29
Last Site Visit: Apr. 7,2010
Plants Last Seen: Apr. 7,2010

Other Pop. Number: N/A
By: Jake Schweitzer
Mapping Precision: Specific

Past Documentation: Observed by J. Vollmar (Vollmar Consulting) and J. Kelsey in 2000, and by J. Dittes and J. Guardino (Vollmar Consulting) in 2001 (CNDDDB 2001).

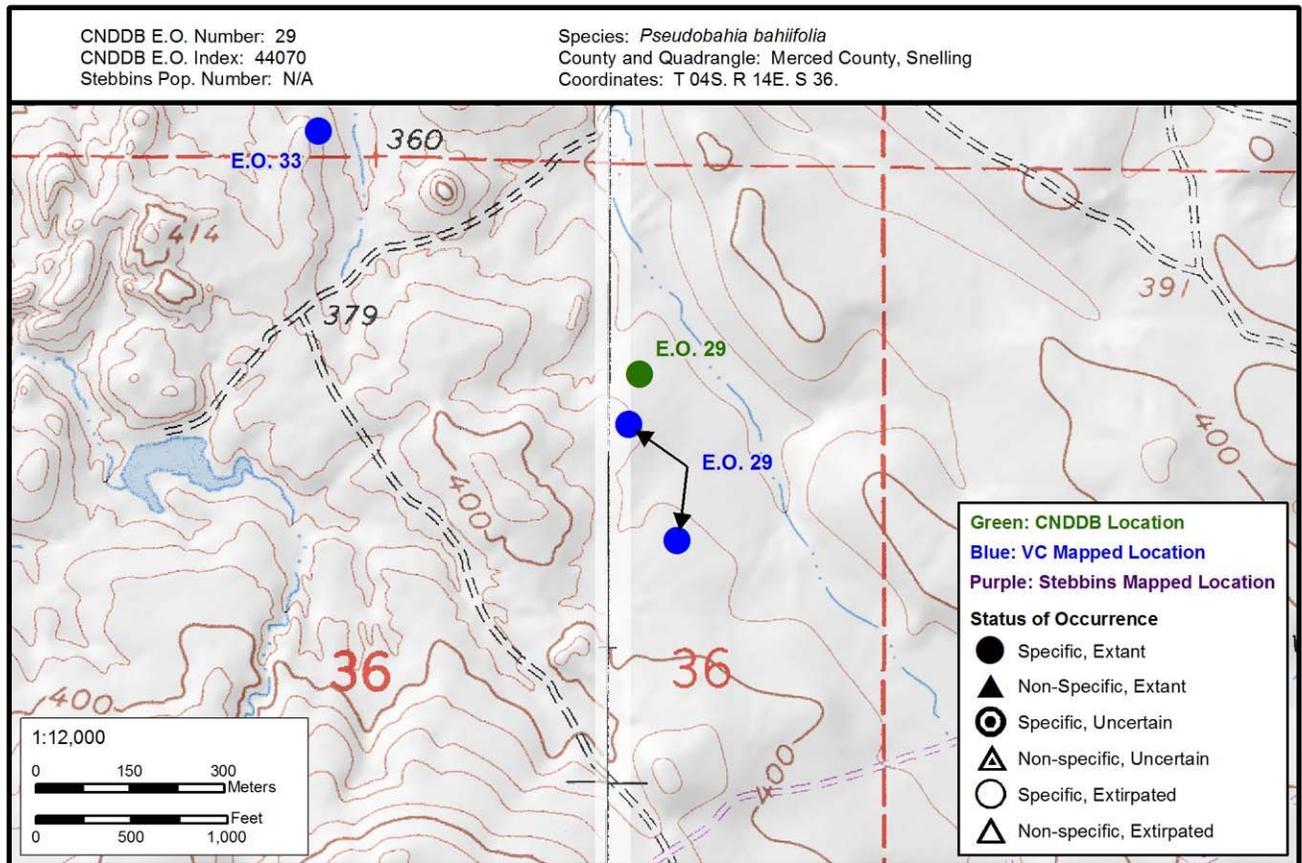
Past Status/Habitat Conditions: Approximately 65 plants were observed in 2 colonies in 2000. The land appears to be well managed. About 25 plants were observed in 2001. The site is dominated by annual grassland on NNE-facing slope (15-20%) of small, closely-spaced Mima mounds. Nearby, there are crops of sandstone & volcanic tuff. Soils are Amador/Hornitos series. Plants are found on upper portion of mounds (CNDDDB 2001).

Current Status/Habitat Conditions: Only four plants were observed in two colonies by J. Schweitzer (Vollmar Consulting) in 2010. Site is located on a north-facing slope on Hornitos fine sandy loam soils on a large Mima mound. Some associated species are *Triphysaria eriantha*, *Erodium botrys*, *Hypochaeris glabra*, *Navaarretia intertexta*, *Plantago erecta* and *Vulpia microstachys*.

Trend/Threats: Site is grazed but there are no apparent threats to plants (CNDDDB 2001). No threats observed in 2010.

Land Ownership: Private

Land Use: Cattle ranching



Species: *Pseudobahia bahiifolia*
Status: Extant
Trend: Stable

CNDDDB E.O. Number: 30
Last Site Visit: Apr. 7,2010
Plants Last Seen: Apr. 7,2010

Other Pop. Number: N/A
By: Jake Schweitzer/Steven Santos
Mapping Precision: Specific

Past Documentation: Observed by J. Dittes and J. Guardino (Vollmar Consulting) in 2002 (CNDDDB 2002).

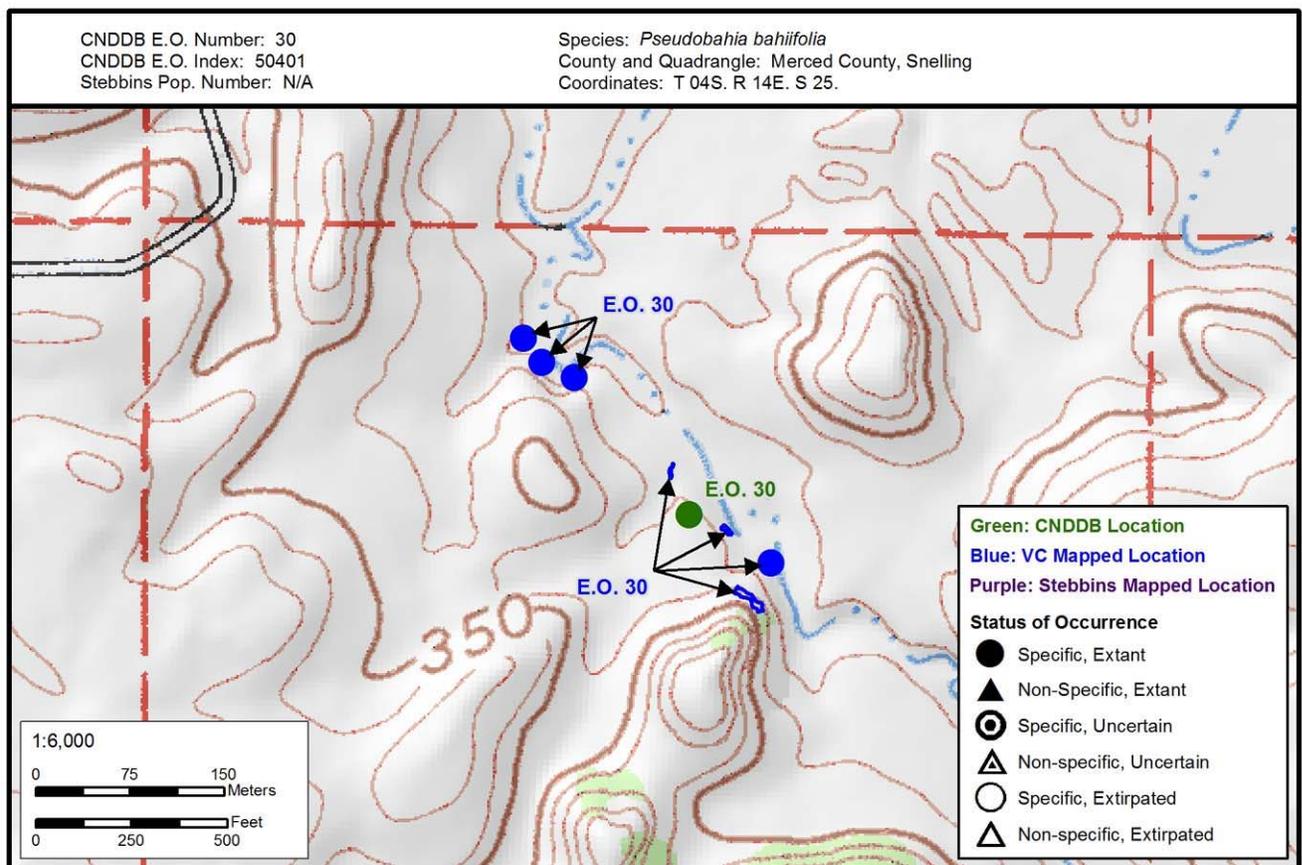
Past Status/Habitat Conditions: Unknown number of plants seen in 2001 and 2002. The site is on an annual grassland/Blue Oak woodland and grassland dominated by non-native annual grasses. There are plants growing on the north-facing slope and along the upper terrace of seasonal drainage. Plants occur on valley spring formation (CNDDDB 2002).

Current Status/Habitat Conditions: Approximately 700 plants were observed in 2010. Site is located primarily on north-facing slopes on Hornitos fine sandy loam and Sandstone rock land soils. Some associated species include *Erodium botrys*, *Anagallis arvensis*, *Micropus californicus*, *Avena barbata*, *Hypochaeris glabra*, *Galium murale*, and *Triphysaria eriantha*.

Trend/Threats: Some potential threats are soil erosion, overgrazing, and competition from non-native annuals (CNDDDB 2002). No significant threats observed in 2010.

Land Ownership: Private

Land Use: Cattle ranching



Species: *Pseudobahia bahiifolia*
Status: Presumed Extant
Trend: Declining?

CNDDDB E.O. Number: 31
Last Site Visit: Apr. 7,2010
Plants Last Seen: Apr.16,2001

Other Pop. Number: N/A
By: Jake Schweitzer
Mapping Precision: Specific

Past Documentation: Observed by J. Dittes and J. Guardino (Vollmar Consulting) in 2001 (CNDDDB 2010).

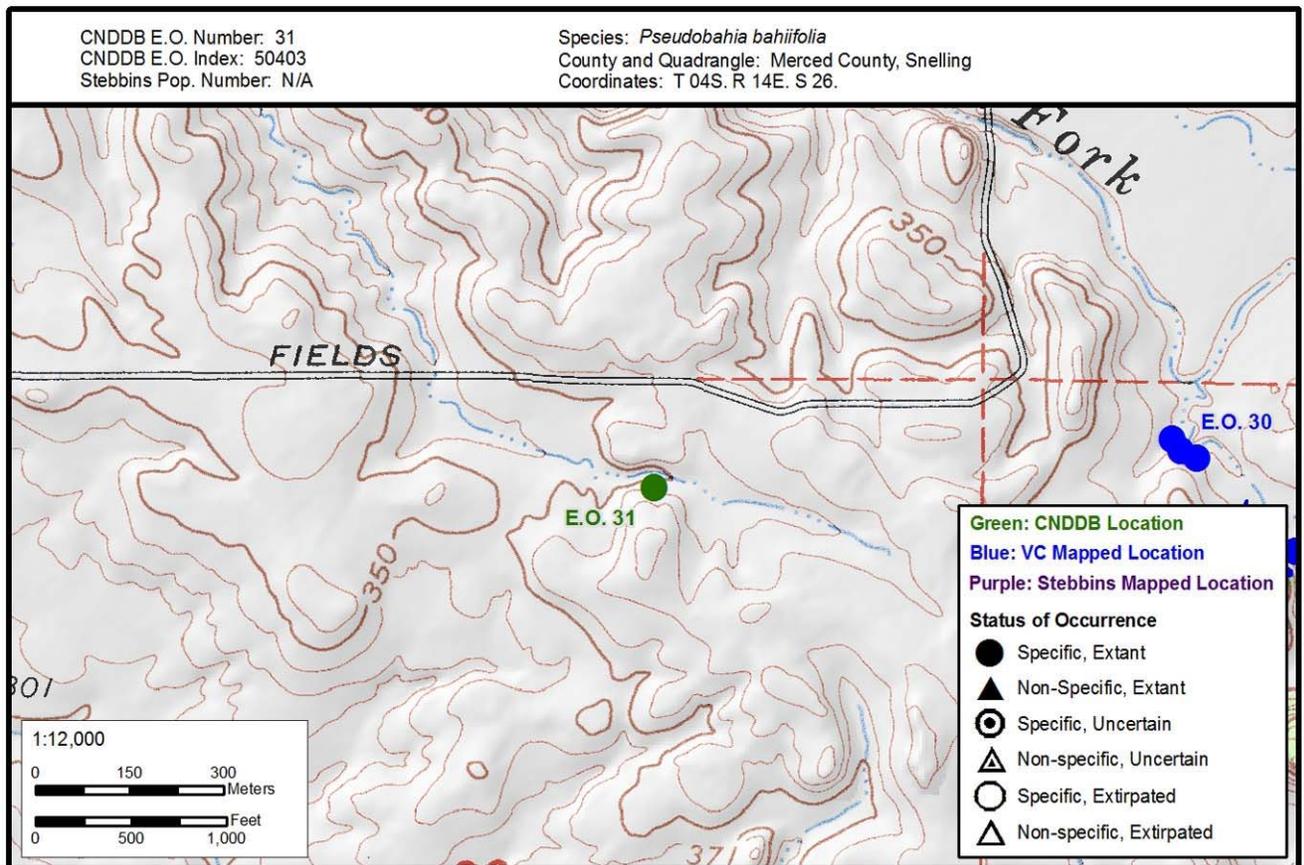
Past Status/Habitat Conditions: An unknown number of plants were seen in 2001. The site is on annual grassland on a rock outcrop south of a seasonal drainage, mid-slope. Soils are derived from Valley Springs formation, although geology is mapped as Ione on Marchland maps. Some associate plant species are *Bromus hordeacues*, *Erodium botrys*, *Hypochaeris glabra*, and *Triteleia hyacinthine* (CNDDDB 2010).

Current Status/Habitat Conditions: Occurrence was not found in 2010. Habitat is atypical of the species (very cobbly with atypical plant associates). Possibly mis-mapped.

Trend/Threats: Trend is possibly declining since plants have not been observed since 2001. No significant threats observed in 2010.

Land Ownership: Private

Land Use: Cattle ranching



Species: *Pseudobahia bahiifolia*
Status: Extant
Trend: Stable

CNDDDB E.O. Number: 32
Last Site Visit: Apr. 7,2010
Plants Last Seen: Apr. 7,2010

Other Pop. Number: N/A
By: Jake Schweitzer
Mapping Precision: Specific

Past Documentation: Observed by J. Dittes and J. Guardino (Vollmar Consulting) in 2001 (CNDDDB 2001).

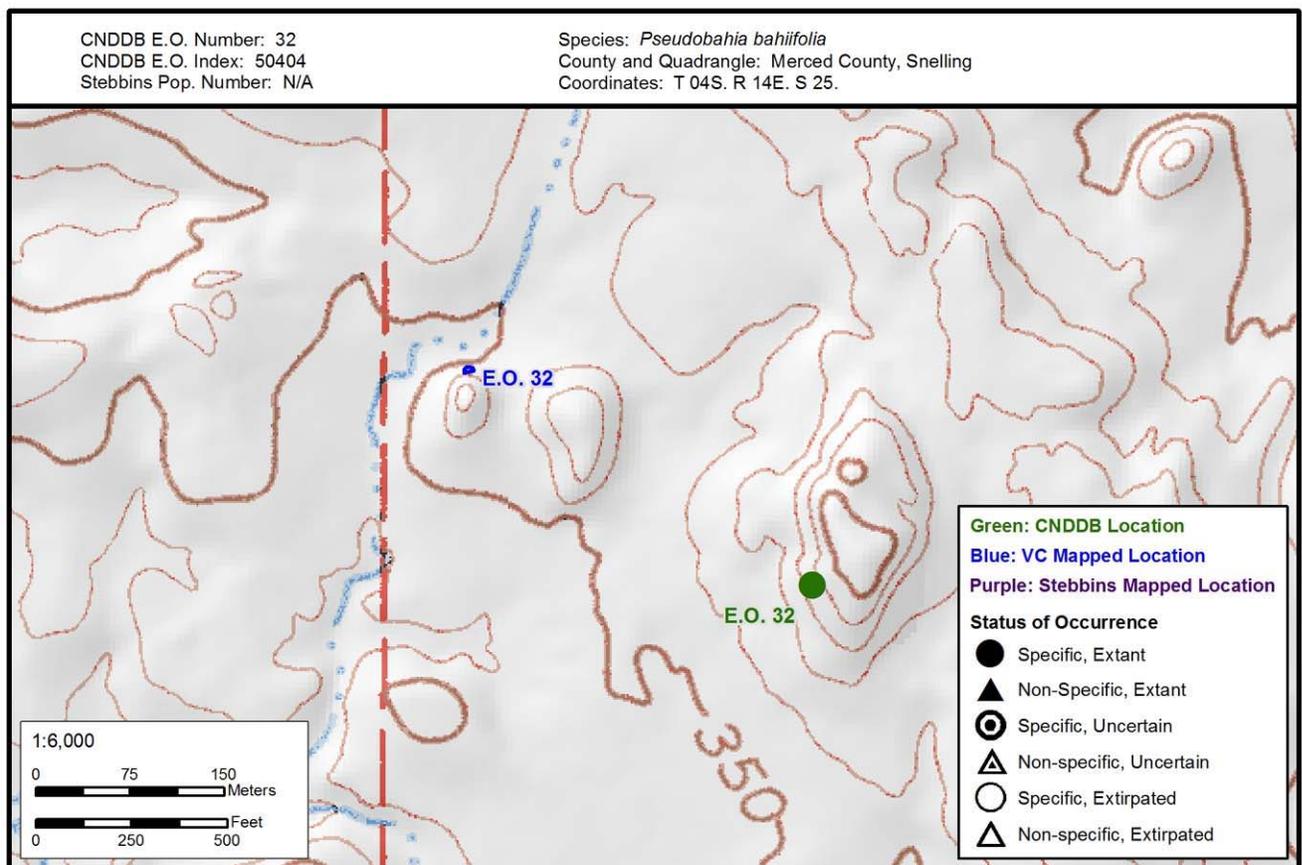
Past Status/Habitat Conditions: Less than 25 plants were seen in 2001. The site is dominated by annual grassland dominated by non-native annual grasses. Plants were growing on the upper third of slopes of north and west-facing aspects. Some associate plant species are: *Erodium botrys*, *Hypochaeris glabra*, and *Plantago erecta* (CNDDDB 2001).

Current Status/Habitat Conditions: Approximately 100 plants were observed by J. Schweitzer (Vollmar Consulting) in 2010. Site is located on a northwest-facing slope on Amador loam soils. Some associated species include *Bromus hordeaceus*, *Erodium botrys*, *Hypochaeris glabra*, *Plantago erecta*, *Holocarpha virgata*, *Micropus californicus*, and *dichelostemma capitatum ssp capitatum*. No plants found at exact point location (see map).

Trend/Threats: Trend is stable. No threats observed in 2010.

Land Ownership: Private

Land Use: Cattle ranching



Species: *Pseudobahia bahiifolia*
Status: Extant
Trend: Stable

CNDDDB E.O. Number: 33
Last Site Visit: Apr. 7,2010
Plants Last Seen: Apr. 7,2010

Other Pop. Number: N/A
By: Jake Schweitzer
Mapping Precision: Specific

Past Documentation: Observed by J. Dittes and J. Guardino (Vollmar Consulting) in 2001 (CNDDDB 2001).

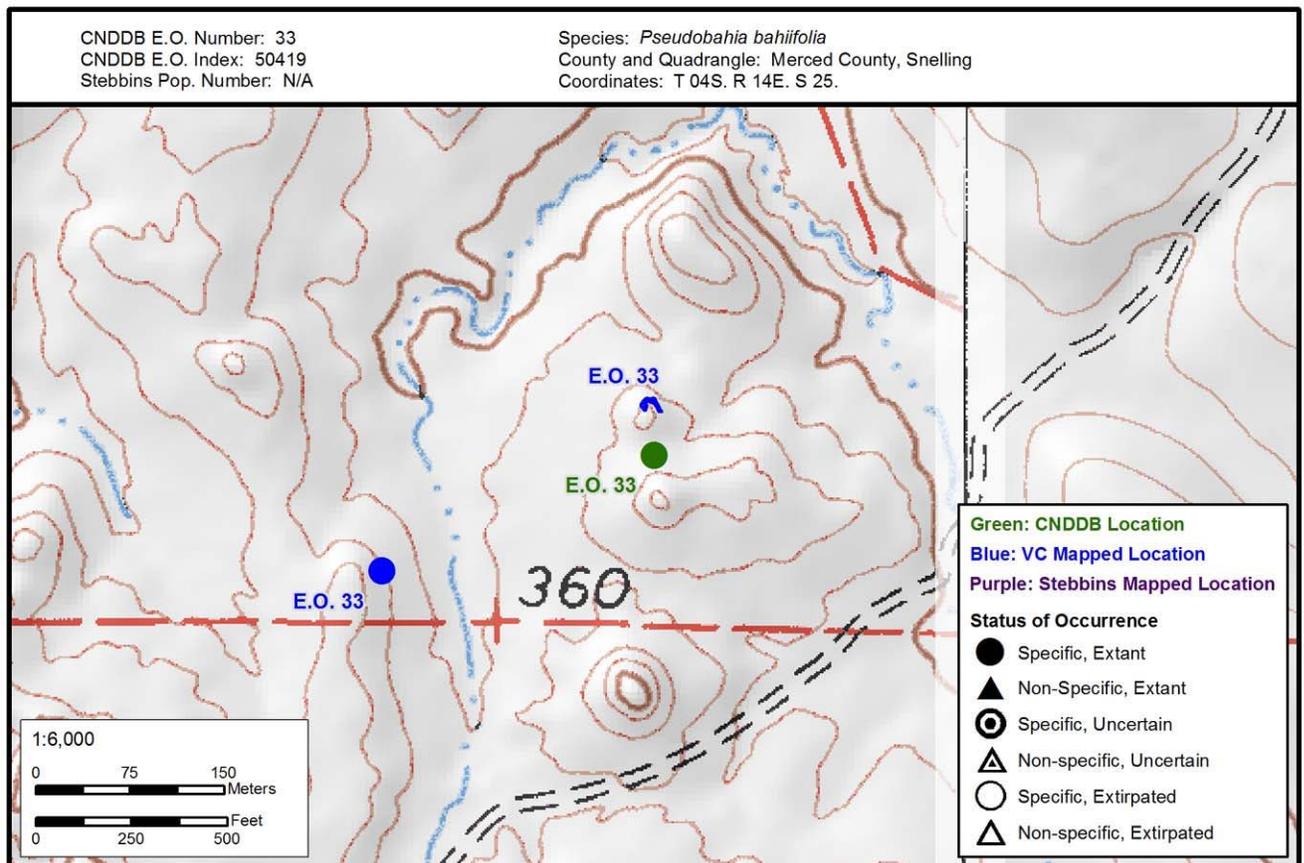
Past Status/Habitat Conditions: An unknown number of plants were seen in 2001. Plants occur on Valley Springs formation. Plants were growing on the upper third of slopes of north and west-facing aspects. Some associate plant species are: *Erodium botrys*, *Hypochaeris glabra*, and *Plantago erecta* (CNDDDB 2001).

Current Status/Habitat Conditions: Approximately 350 plants were observed by J. Schweitzer (Vollmar Consulting) in 2010. Site is located on a northwest-facing slope on Hornitos fine sandy loam soils. Some associated species include *Erodium botrys*, *Triphysaria eriantha*, *Vulpia microstachys*, *Hypochaeris glabra*, *Avena barbata*, *dichelostemma capitatum ssp capitatum*, and *Lomatium caruifolium*.

Trend/Threats: No significant threats observed in 2010.

Land Ownership: Private – Kelsey Ranch

Land Use: Cattle ranching



Species: *Pseudobahia bahiifolia*
Status: Uncertain
Trend: Unknown

CNDDDB E.O. Number: 34
Last Site Visit: Apr. 9, 2010
Plants Last Seen: Apr.1,1937

Other Pop. Number: N/A
By: Jake Schweitzer
Mapping Precision: Non-Specific

Past Documentation: Observed by C. Belshaw in 1937 (CNDDDB 1937).

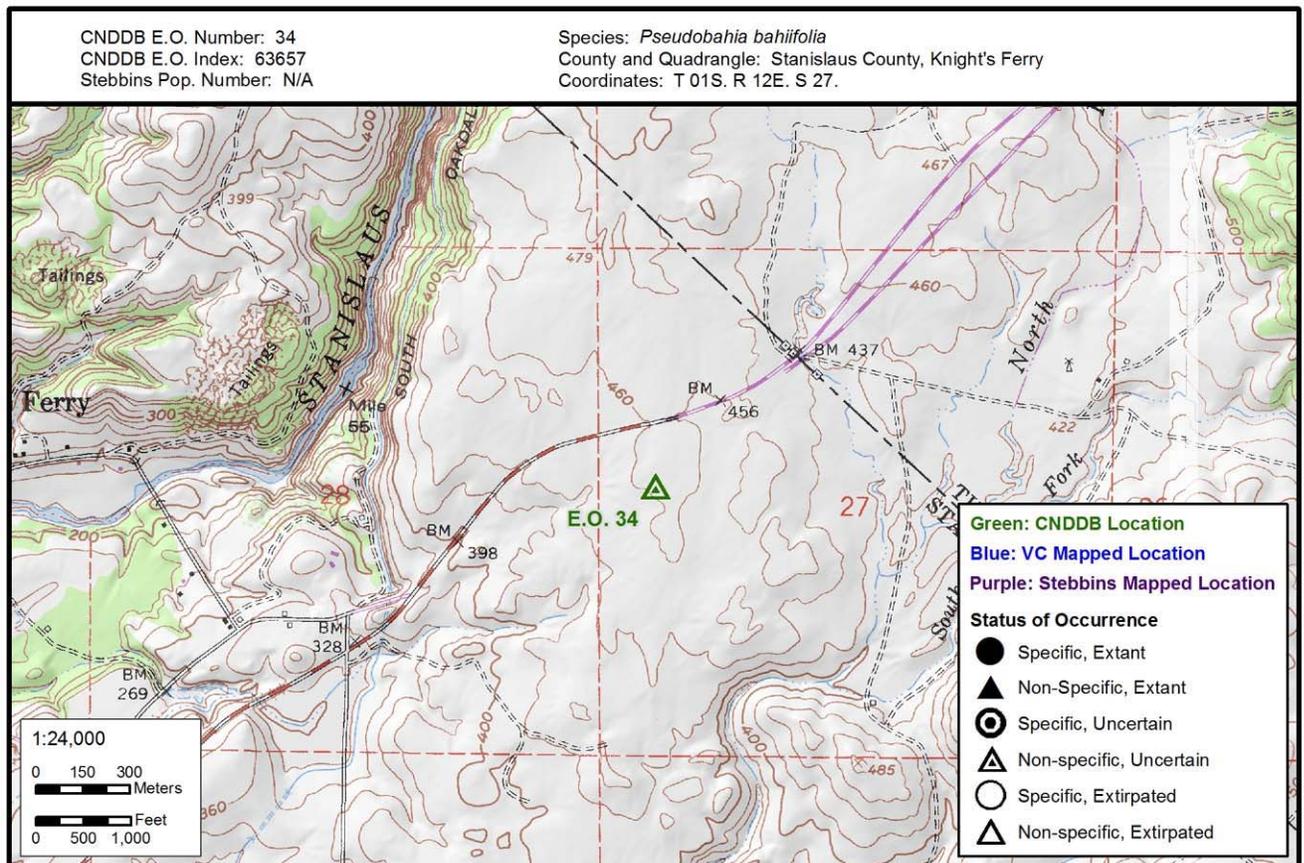
Past Status/Habitat Conditions: Plants were seen around margins of volcanic boulders (CNDDDB 1937).

Current Status/Habitat Conditions: Occurrence is presumably mis-mapped, as habitat conditions are not suitable for species. Substrate is dark volcanic material, not Amador loam. Suitable habitat occurs south of mapped location, across Wildcat Creek, but this area was not surveyed due to lack of access.

Trend/Threats: Trend is unknown, as point is non-specific and location is likely not near mapped point. No threats were observed.

Land Ownership: Private

Land Use: Cattle ranching



Species: *Pseudobahia bahiifolia*
Status: Extant
Trend: Stable

CNDDDB E.O. Number: N/A
Last Site Visit: Apr. 9,2010
Plants Last Seen: Apr. 9,2010

Other Pop. Number: VC 1
By: Jake Schweitzer
Mapping Precision: Specific

Past Documentation: N/A

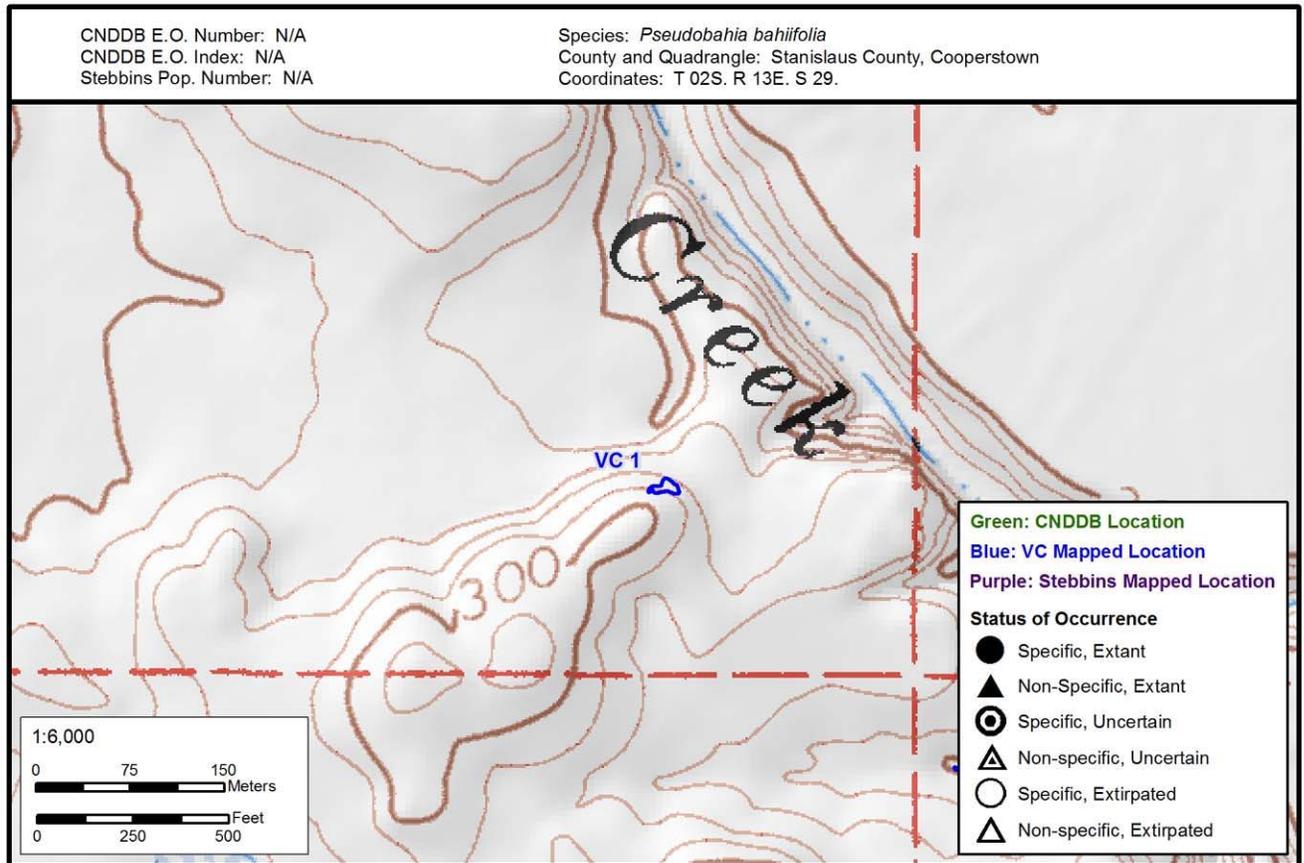
Past Status/Habitat Conditions: N/A

Current Status/Habitat Conditions: Thousands of plants were observed by J. Schweitzer (Vollmar Consulting) in 2010. Site is located on a north-facing slope near the top of a hill on Amador loam soils. Some associated species include *Avena barbata*, *Erodium botrys*, *Hypochaeris glabra*, *Triphsaria eriantha*, and *Bromus hordeaceus*.

Trend/Threats: No threats observed in 2010.

Land Ownership: Private

Land Use: Cattle ranching



Species: *Pseudobahia bahiifolia*
Status: Extant
Trend: Stable

CNDDDB E.O. Number: N/A
Last Site Visit: Apr. 9,2010
Plants Last Seen: Apr. 9,2010

Other Pop. Number: VC 2
By: Jake Schweitzer
Mapping Precision: Specific

Past Documentation: N/A

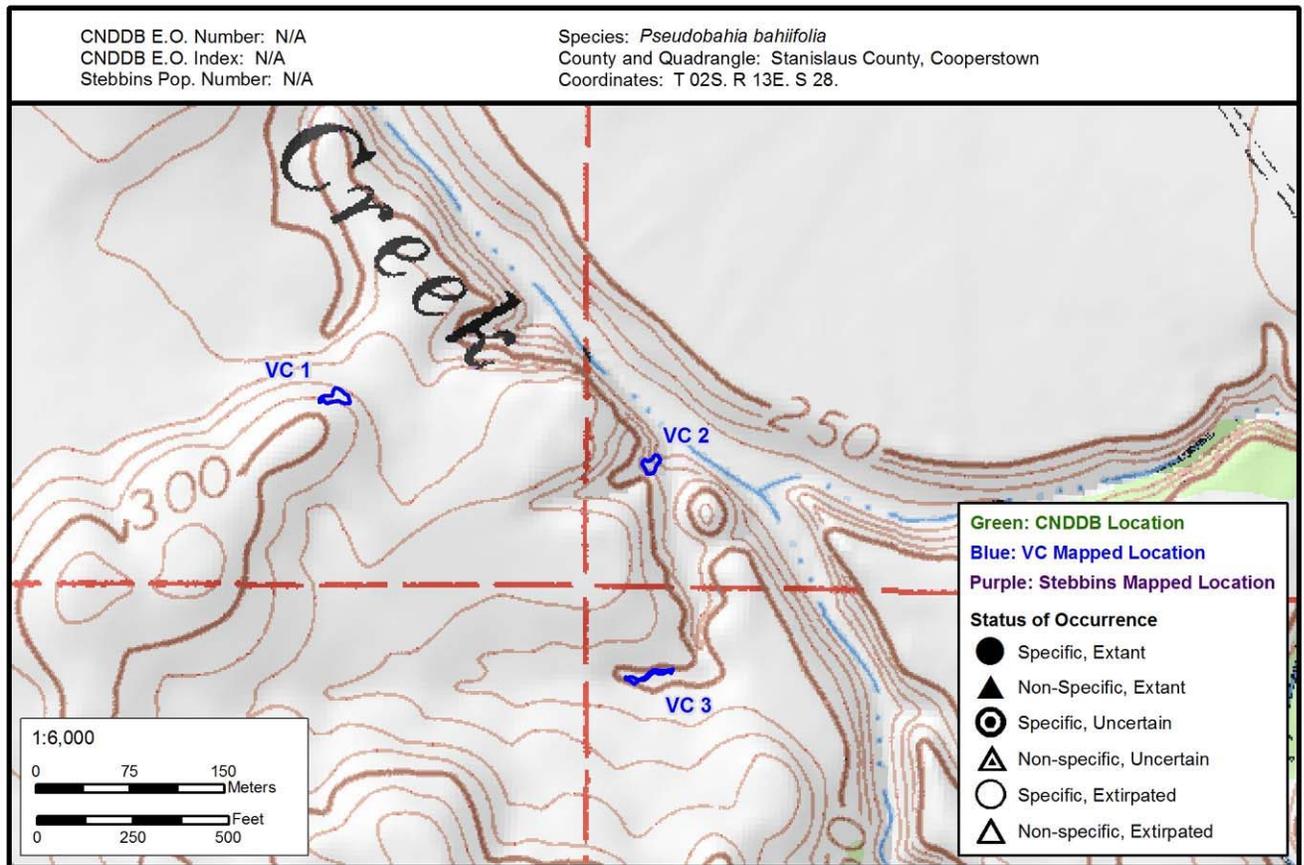
Past Status/Habitat Conditions: N/A

Current Status/Habitat Conditions: Approximately 600 plants were observed by J. Schweitzer (Vollmar Consulting) in 2010. Site is located on a north-facing slope on Amador loam soils. Some associated species include *Leymus triticoides*, *Bromus diandrus*, *Miconia calvescens*, and *Plagiobothrys tenellus*.

Trend/Threats: No threats observed in 2010.

Land Ownership: Private

Land Use: Cattle ranching



Species: *Pseudobahia bahiifolia*
Status: Extant
Trend: Stable

CNDDDB E.O. Number: N/A
Last Site Visit: Apr. 9,2010
Plants Last Seen: Apr. 9,2010

Other Pop. Number: VC 3
By: Steven Santos
Mapping Precision: Specific

Past Documentation: N/A

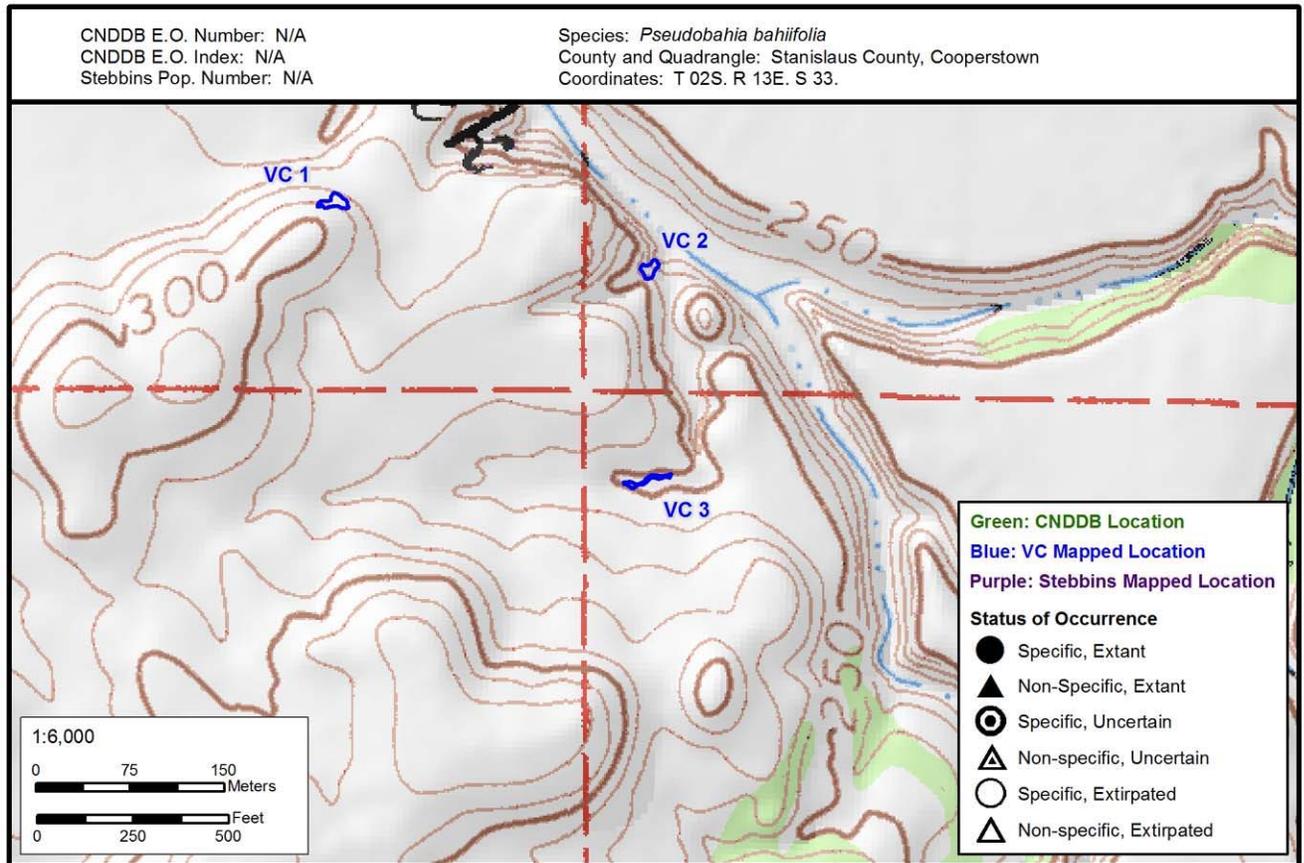
Past Status/Habitat Conditions: N/A

Current Status/Habitat Conditions: Thousands of plants were observed by S. Santos (Vollmar Consulting) in 2010. Site is located on a north-facing slope on Amador loam soils on a seasonal creek bank top. Population is interrupted by, but not co-occurring with *Lasthenia californica*. Some associated species include *Avena barbata*, *Erodium botrys*, *Hypochaeris glabra*, *Triphsaria eriantha*, and *Logfia californica*.

Trend/Threats: No threats observed in 2010.

Land Ownership: Private

Land Use: Cattle ranching



Species: *Pseudobahia bahiifolia*
Status: Extant
Trend: Stable

CNDDDB E.O. Number: N/A
Last Site Visit: Apr.8,2010
Plants Last Seen: Apr.8,2010

Other Pop. Number: VC 4
By: Jake Schweitzer
Mapping Precision: Specific

Past Documentation: N/A

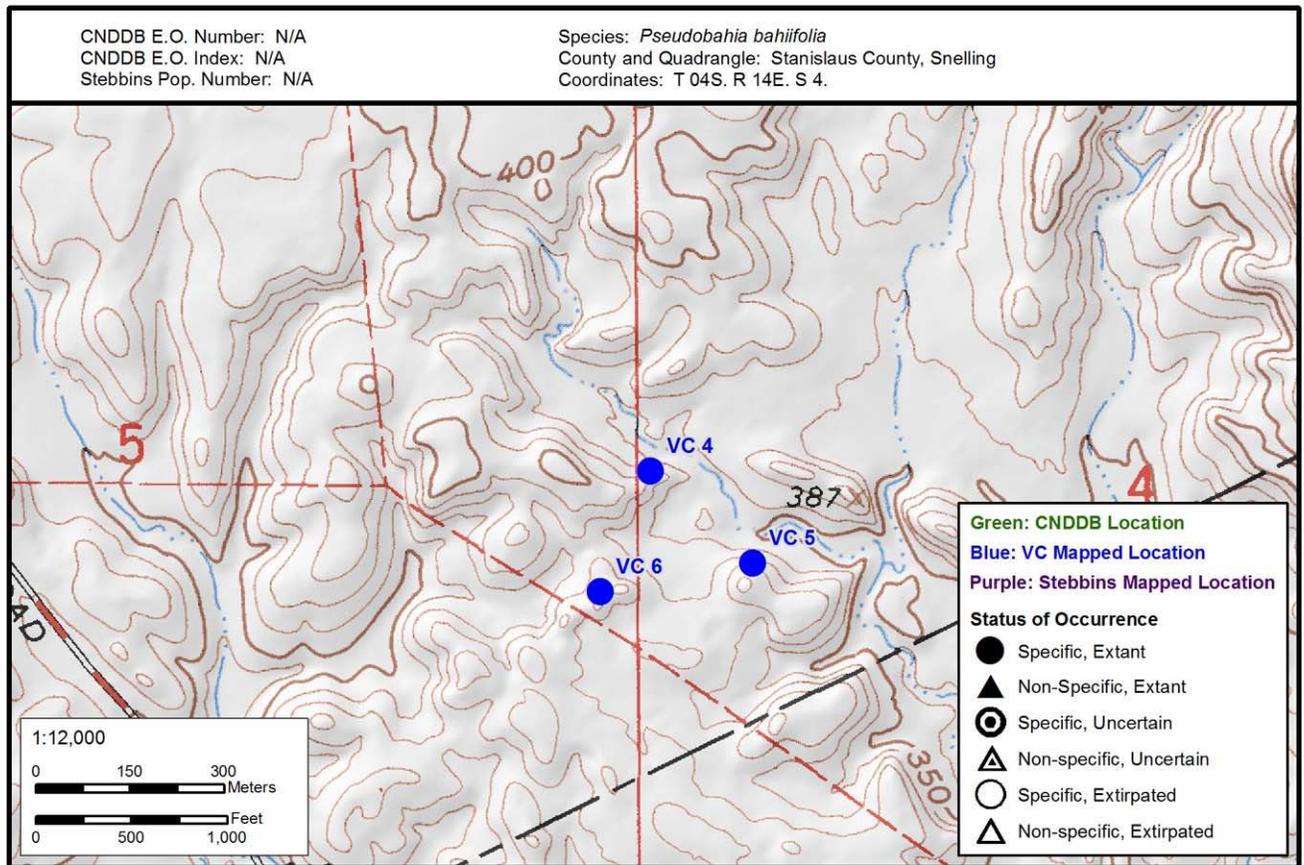
Past Status/Habitat Conditions: N/A

Current Status/Habitat Conditions: Approximately 100 plants were observed by J. Schweitzer (Vollmar Consulting) in 2010. Site is located on a north-facing slope on Hornitos gravelly fine sandy loam soils. Some associated species include *Aira caryophyllea*, *Bromus diandrus*, *Hypochaeris glabra*, and *Erodium botrys*.

Trend/Threats: No threats observed in 2010.

Land Ownership: Private

Land Use: Cattle ranching



Species: *Pseudobahia bahiifolia*
Status: Extant
Trend: Stable

CNDDDB E.O. Number: N/A
Last Site Visit: Apr.8,2010
Plants Last Seen: Apr.8,2010

Other Pop. Number: VC 5
By: Steven Santos
Mapping Precision: Specific

Past Documentation: N/A

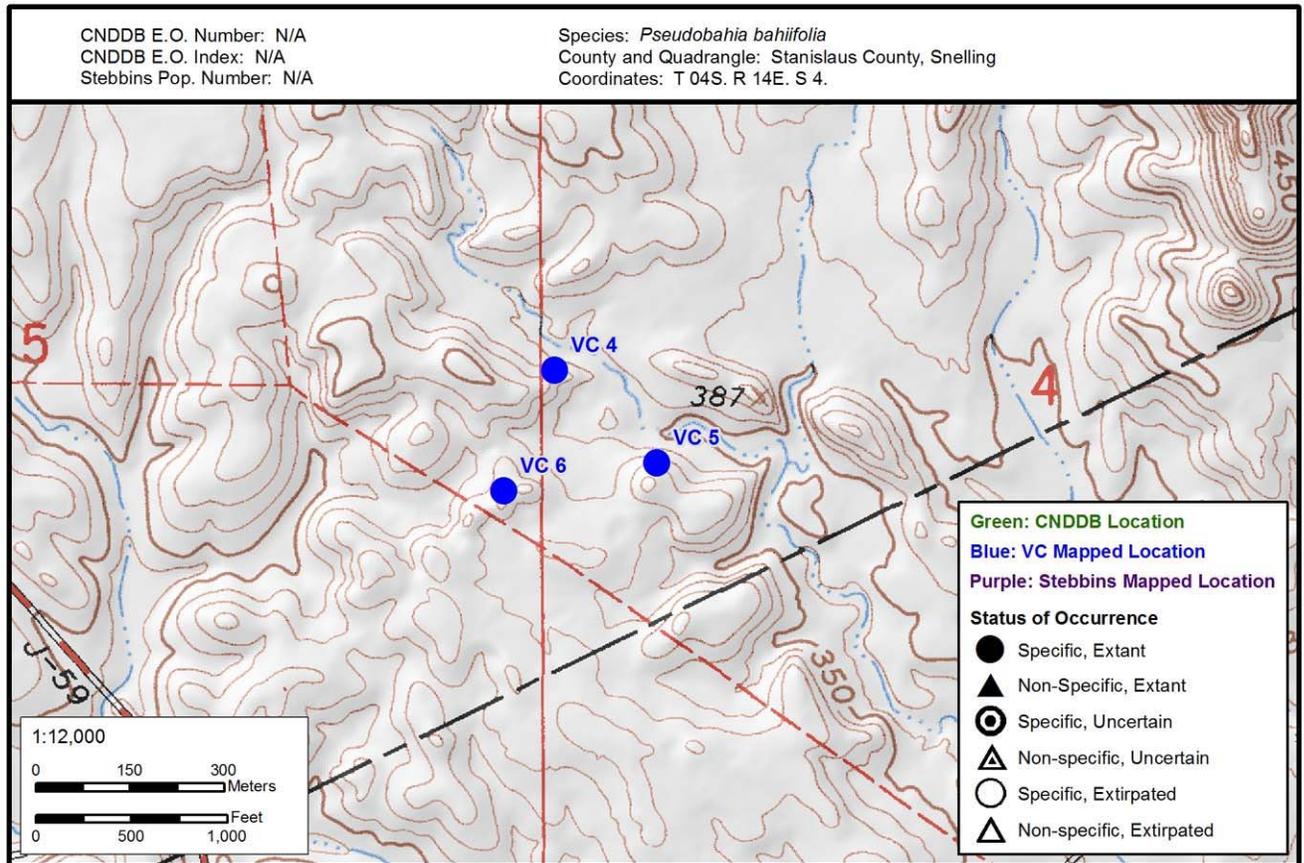
Past Status/Habitat Conditions: N/A

Current Status/Habitat Conditions: Approximately 80 plants were observed by S. Santos (Vollmar Consulting) in 2010. Site is located on a steep north-facing slope on Hornitos gravelly fine sandy loam soils. Some associated species include *Erodium botrys*, *Dichelostemma capitatum* ssp. *capitatum*, *Bromus diandrus*, *Vulpia microstachys*, *Briza minor*, and *Avena barbata*.

Trend/Threats: No threats observed in 2010.

Land Ownership: Private

Land Use: Cattle ranching



Species: *Pseudobahia bahiifolia*
Status: Extant
Trend: Stable

CNDDDB E.O. Number: N/A
Last Site Visit: Apr.8,2010
Plants Last Seen: Apr.8,2010

Other Pop. Number: VC 6
By: Jake Schweitzer/Steven Santos
Mapping Precision: Specific

Past Documentation: N/A

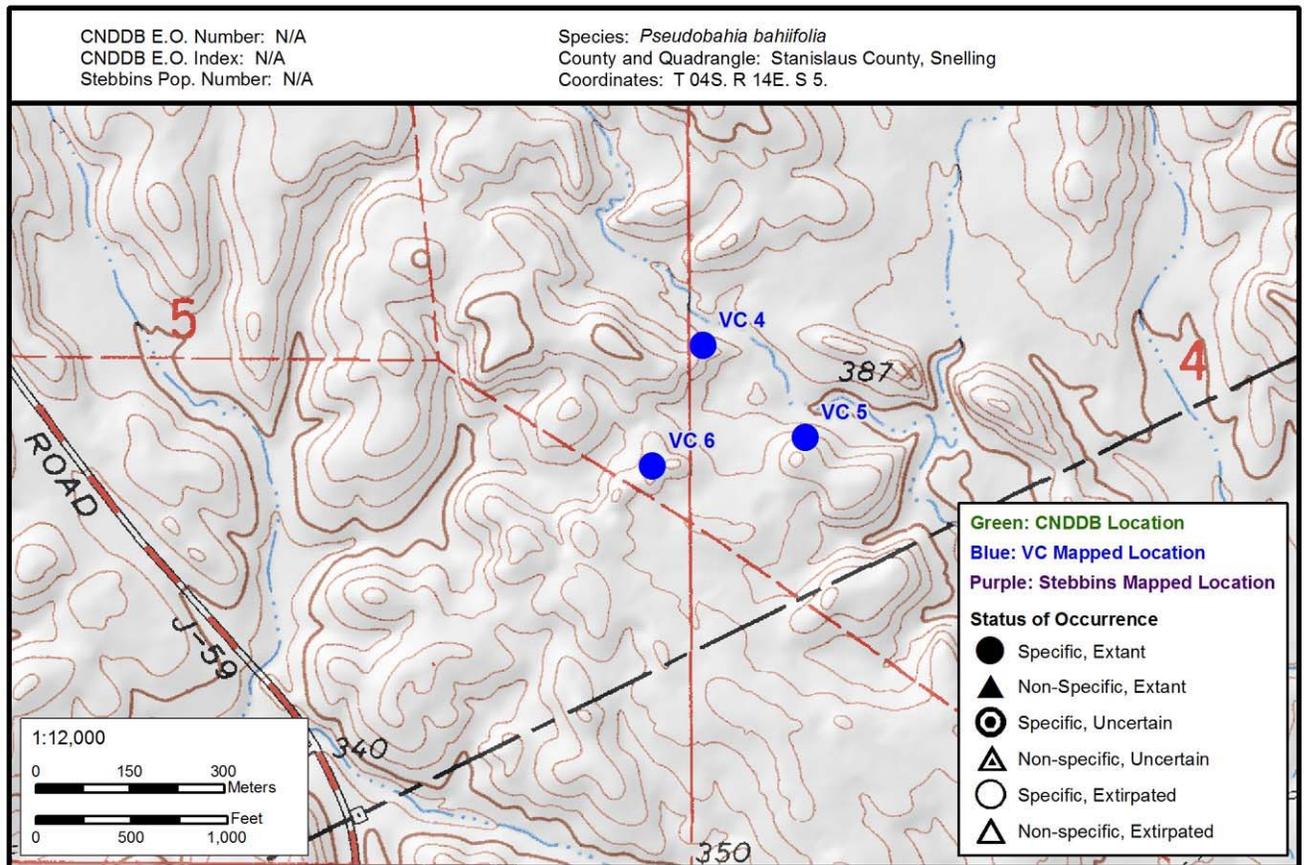
Past Status/Habitat Conditions: N/A

Current Status/Habitat Conditions: Approximately 50 plants were observed by J. Schweitzer and S. Santos (Vollmar Consulting) in 2010. Site is located on a north-facing cliff top on Hornitos gravelly fine sandy loam soils.

Trend/Threats: No threats observed in 2010.

Land Ownership: Private

Land Use: Cattle ranching



Species: *Pseudobahia bahiifolia*
Status: Extant
Trend: Stable

CNDDDB E.O. Number: N/A
Last Site Visit: Apr.8,2010
Plants Last Seen: Apr.8,2010

Other Pop. Number: VC 7
By: Jake Schweitzer
Mapping Precision: Specific

Past Documentation: N/A

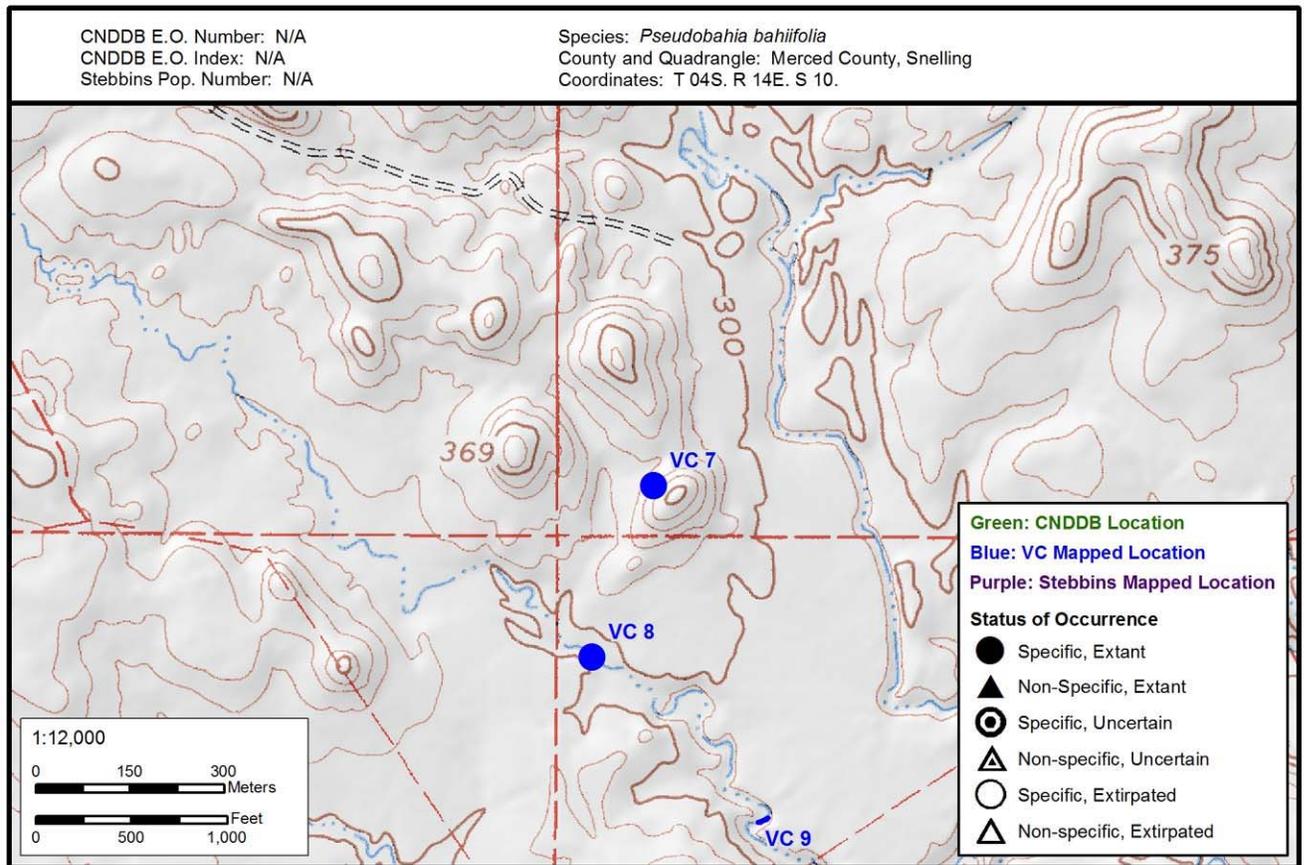
Past Status/Habitat Conditions: N/A

Current Status/Habitat Conditions: Approximately 75 plants were observed by J. Schweitzer (Vollmar Consulting) in 2010. Site is located on a north-facing cliff top on Redding gravelly loam soils. Some associated species include *Plantago erecta*, *Bromus madritensis*, *Erodium botrys*, and *Mimulus floribundus*.

Trend/Threats: No threats observed in 2010.

Land Ownership: Private

Land Use: Cattle ranching



Species: *Pseudobahia bahiifolia*
Status: Extant
Trend: Stable

CNDDDB E.O. Number: N/A
Last Site Visit: Apr.21,2010
Plants Last Seen: Apr.21,2010

Other Pop. Number: VC 8
By: John Vollmar
Mapping Precision: Specific

Past Documentation: N/A

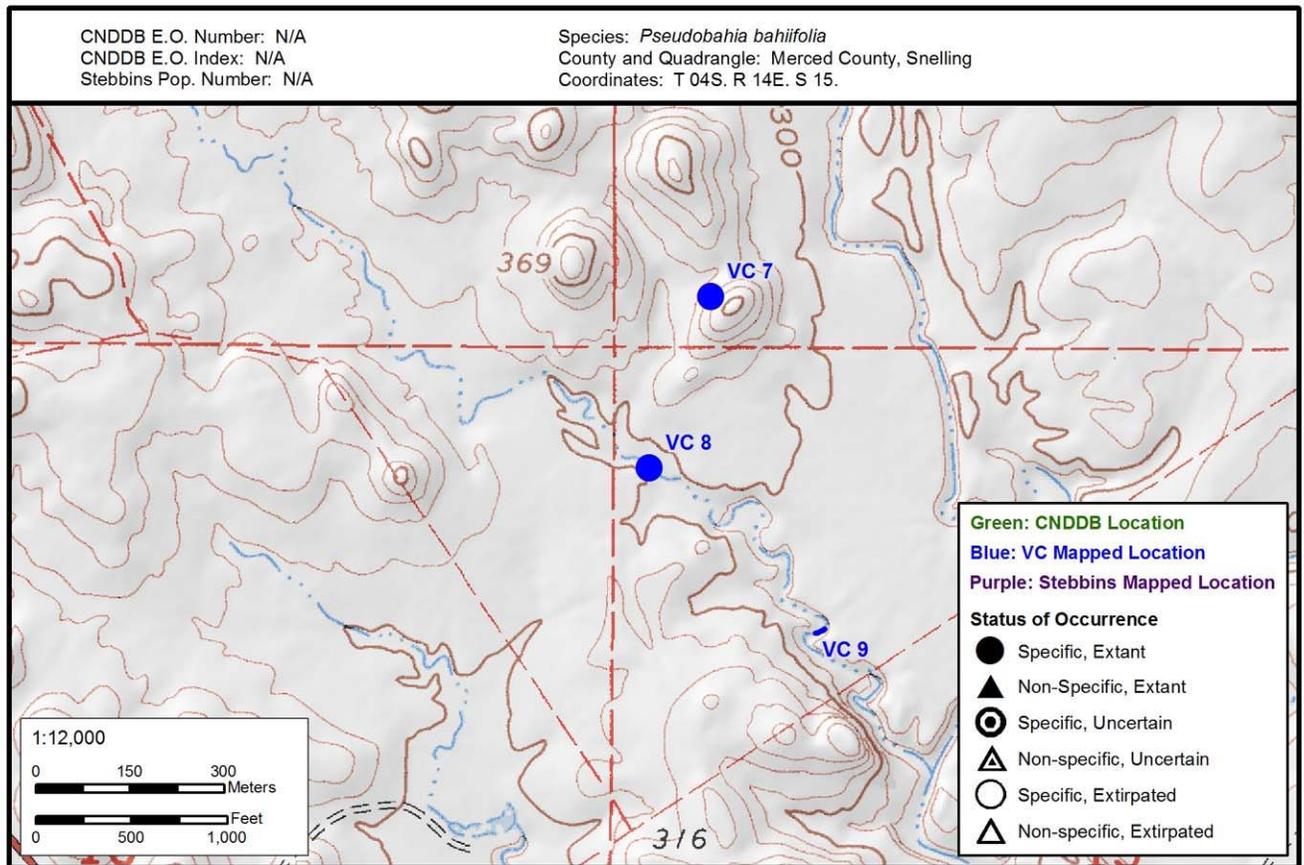
Past Status/Habitat Conditions: N/A

Current Status/Habitat Conditions: Approximately 30 plants were observed by J. Vollmar (Vollmar Consulting) in 2010. Site is located on a northeast-facing slope on Redding gravelly loam soils, along a small, ephemeral creek.

Trend/Threats: No threats observed in 2010.

Land Ownership: Private

Land Use:



Species: *Pseudobahia bahiifolia*
Status: Extant
Trend: Stable

CNDDDB E.O. Number: N/A
Last Site Visit: Apr.21,2010
Plants Last Seen: Apr.21,2010

Other Pop. Number: VC 9
By: John Vollmar
Mapping Precision: Specific

Past Documentation: N/A

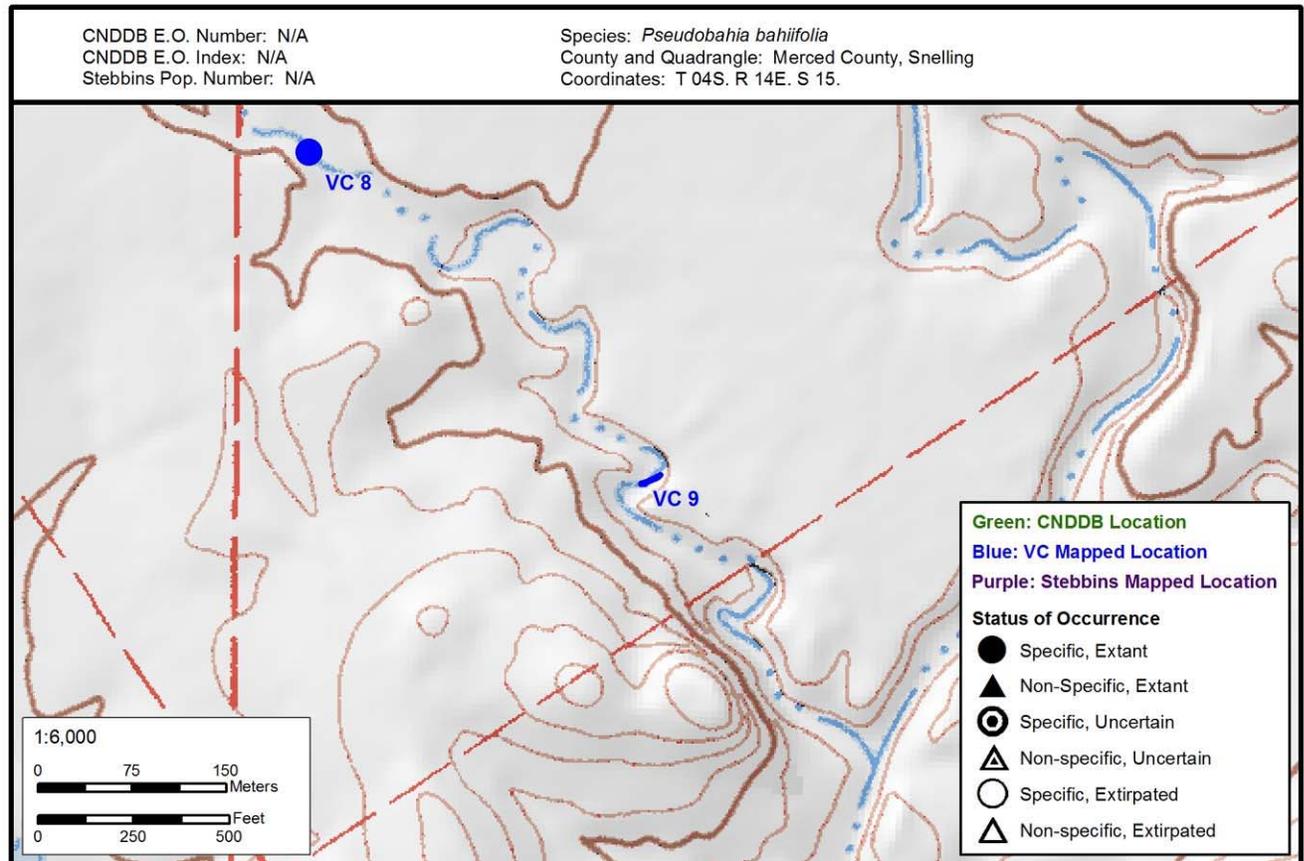
Past Status/Habitat Conditions: N/A

Current Status/Habitat Conditions: Approximately 200 plants were observed by J. Vollmar (Vollmar Consulting) in 2010. Site is located on a west-facing slope on Pentz loam soils along a seasonal creek.

Trend/Threats: No threats observed in 2010.

Land Ownership: Private

Land Use:



Species: *Pseudobahia bahiifolia*
Status: Extant
Trend: Stable

CNDDDB E.O. Number: N/A
Last Site Visit: Apr.21,2010
Plants Last Seen: Apr.21,2010

Other Pop. Number: VC 10
By: John Vollmar
Mapping Precision: Specific

Past Documentation: N/A

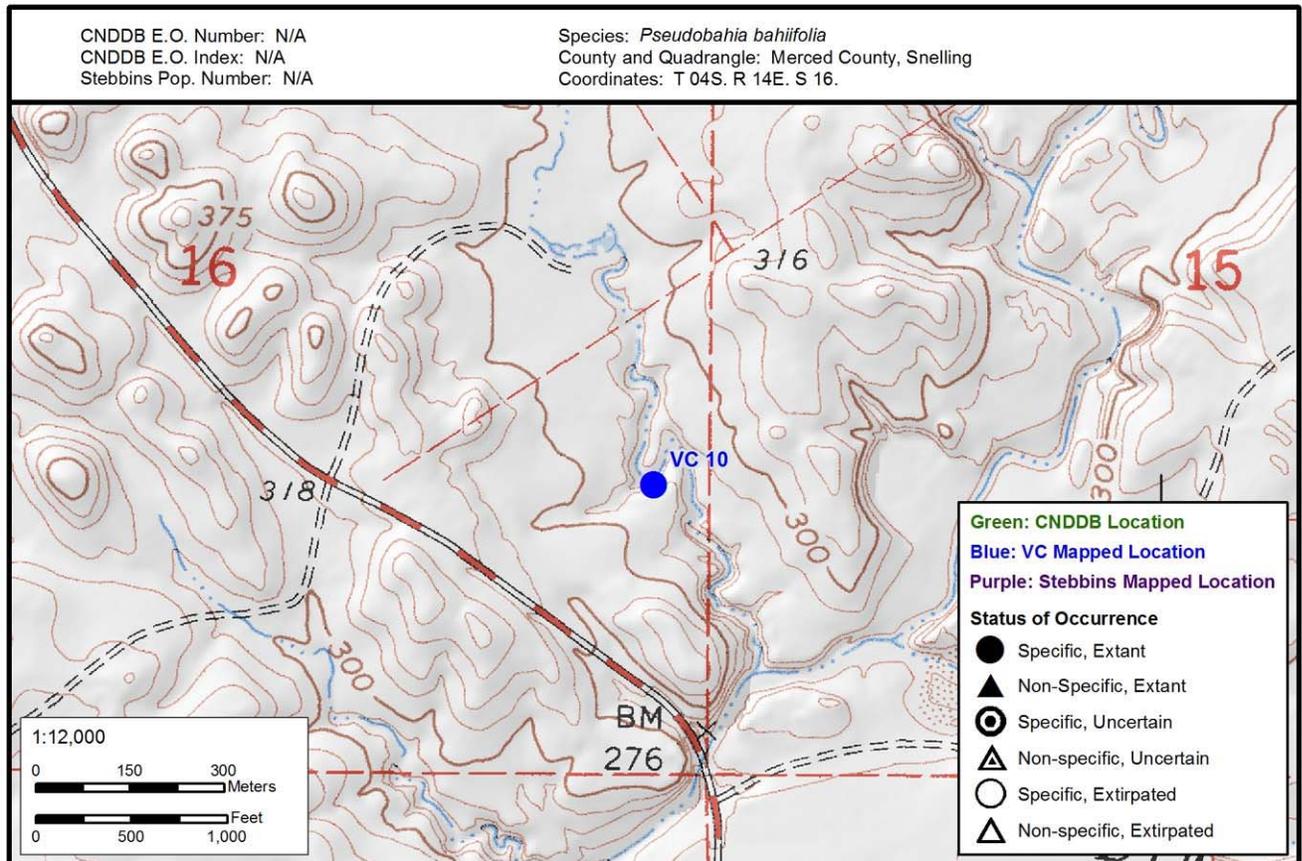
Past Status/Habitat Conditions: N/A

Current Status/Habitat Conditions: Approximately 30 plants were observed by J. Vollmar (Vollmar Consulting) in 2010. Site is located on a north-facing slope on Corning gravelly loam soils.

Trend/Threats: No threats observed in 2010.

Land Ownership: Private

Land Use:



Species: *Pseudobahia bahiifolia*
Status: Extant
Trend: Stable

CNDDDB E.O. Number: N/A
Last Site Visit: Apr.9,2010
Plants Last Seen: Apr.9,2010

Other Pop. Number: VC 11
By: John Vollmar
Mapping Precision: Specific

Past Documentation: N/A

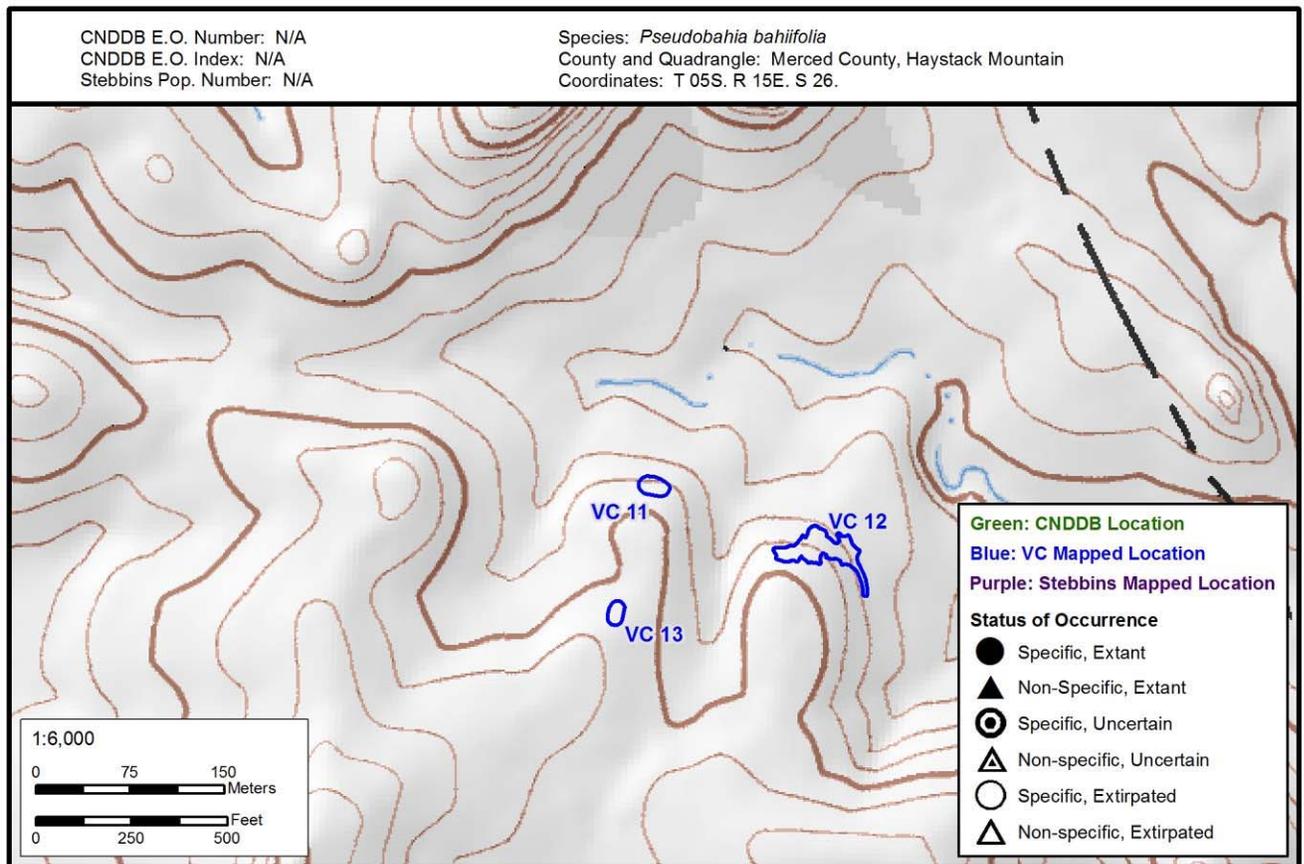
Past Status/Habitat Conditions: N/A

Current Status/Habitat Conditions: Approximately 100 plants were observed by J. Vollmar (Vollmar Consulting) in 2010. Site is located within large, well-developed mima mounds formed on a north-facing slope with Amador loam soils. Plants are generally restricted to upper north to northeast sides of the mounds. Some associated plants include *Erodium botrys* and *Hypochaeris glabra*.

Trend/Threats: No threats observed in 2010.

Land Ownership: Private

Land Use: Cattle ranching



Species: *Pseudobahia bahiifolia*
Status: Extant
Trend: Stable

CNDDDB E.O. Number: N/A
Last Site Visit: Apr.9,2010
Plants Last Seen: Apr.9,2010

Other Pop. Number: VC 12
By: John Vollmar
Mapping Precision: Specific

Past Documentation: N/A

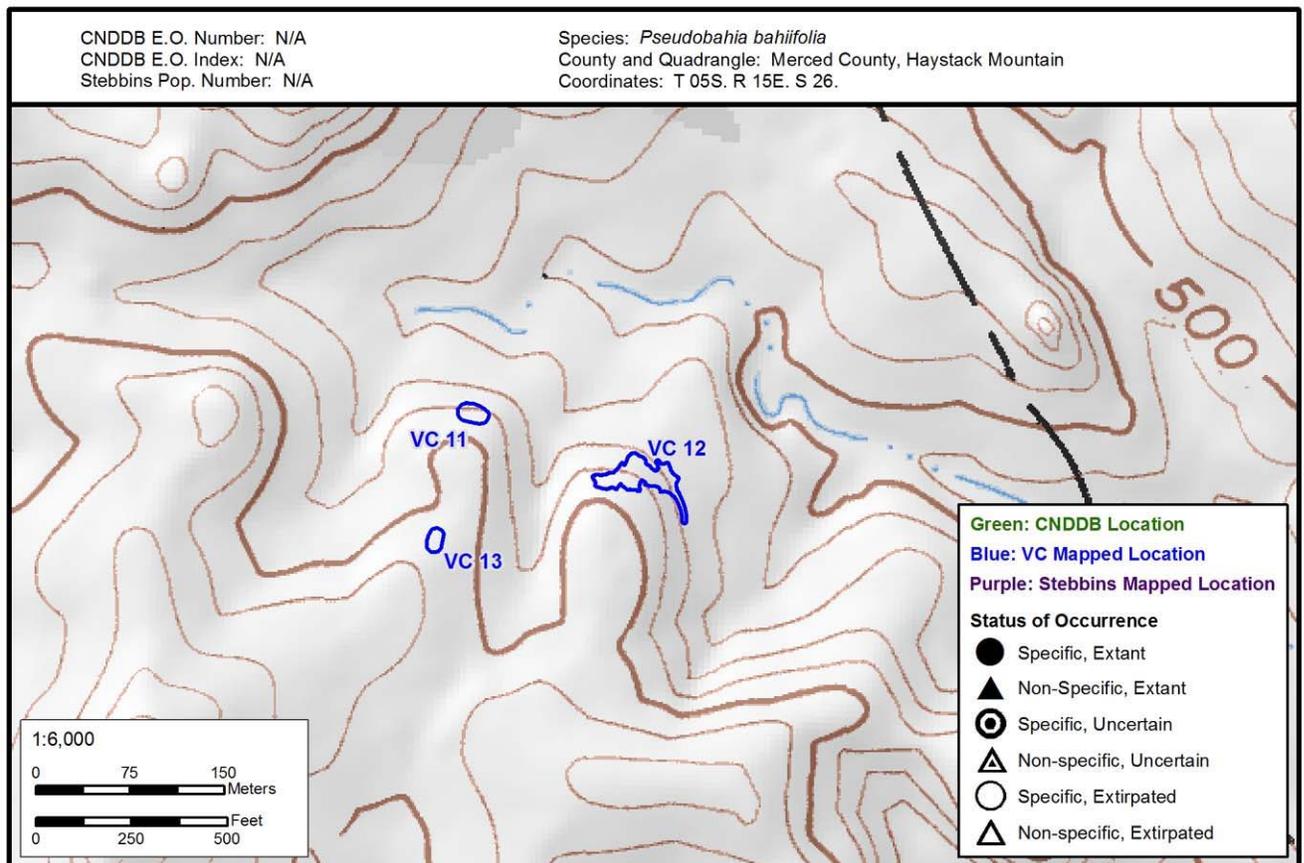
Past Status/Habitat Conditions: N/A

Current Status/Habitat Conditions: Approximately 95 plants were observed by J. Vollmar (Vollmar Consulting) in 2010. Site is located within large, well-developed mima mounds formed on a north-facing slope with Amador loam and Hornitos gravelly fine sandy loam soils. Plants are generally restricted to upper north to northeast sides of the mounds. Some associated plants include *Erodium botrys*, *Anagallis arvensis*, *Micropus californicus*, *Avena barbata*, *Hypochaeris glabra*, and *Galium murale*.

Trend/Threats: No threats observed in 2010.

Land Ownership: Private

Land Use: Cattle ranching



Species: *Pseudobahia bahiifolia*
Status: Extant
Trend: Stable

CNDDDB E.O. Number: N/A
Last Site Visit: Apr.9,2010
Plants Last Seen: Apr.9,2010

Other Pop. Number: VC 13
By: John Vollmar
Mapping Precision: Specific

Past Documentation: N/A

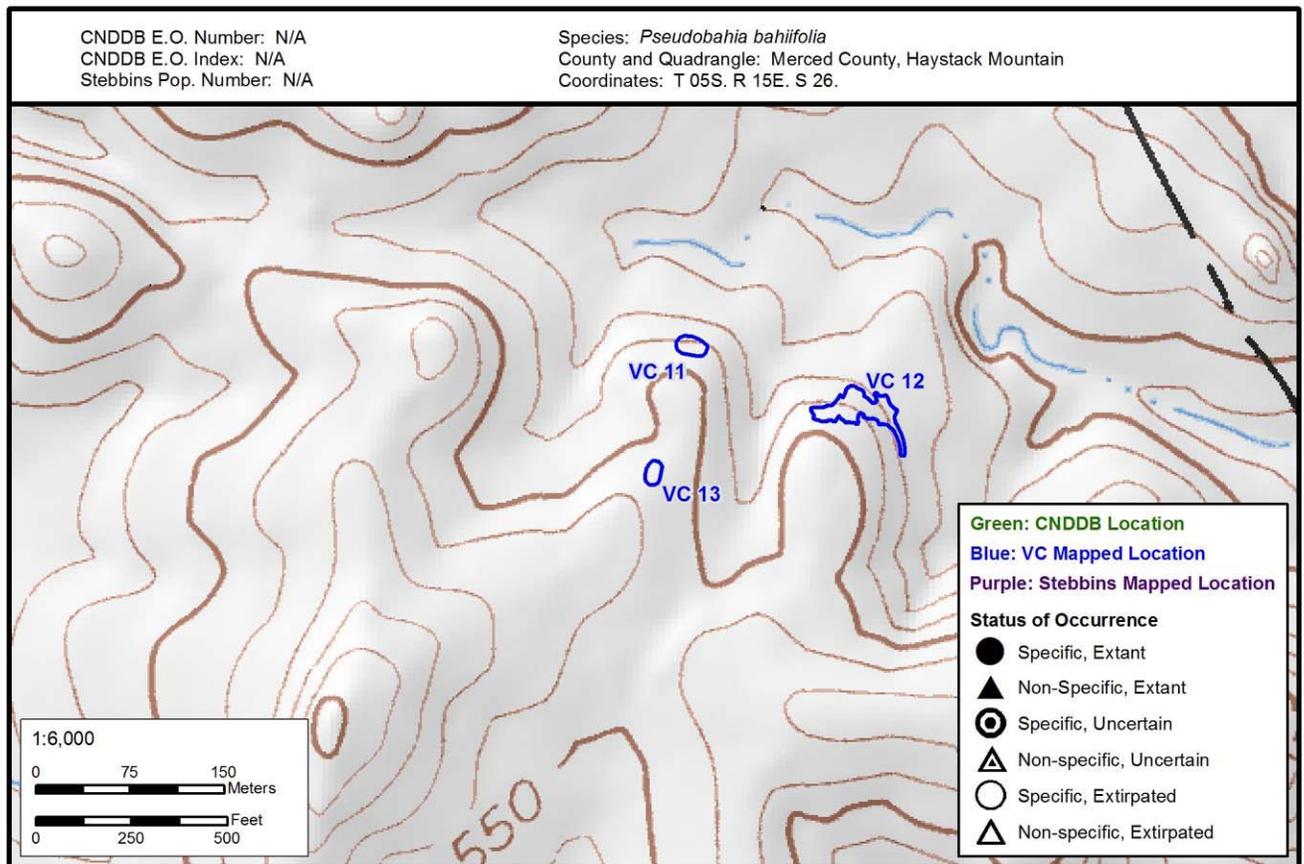
Past Status/Habitat Conditions: N/A

Current Status/Habitat Conditions: Approximately 280 plants were observed by J. Vollmar (Vollmar Consulting) in 2010. Site is located within large, well-developed mima mounds formed on a north-facing slope with Amador loam soils. Plants are generally restricted to upper north to northeast sides of the mounds. Some associated plants include *Erodium botrys* and *Hypochaeris glabra*.

Trend/Threats: No threats observed in 2010.

Land Ownership: Private

Land Use: Cattle ranching



Species: *Pseudobahia bahiifolia*
Status: Extant
Trend: Stable

CNDDDB E.O. Number: N/A
Last Site Visit: Apr. 7, 2010
Plants Last Seen: Apr. 7, 2010

Other Pop. Number: VC 14
By: John Vollmar
Mapping Precision: Specific

Past Documentation: N/A

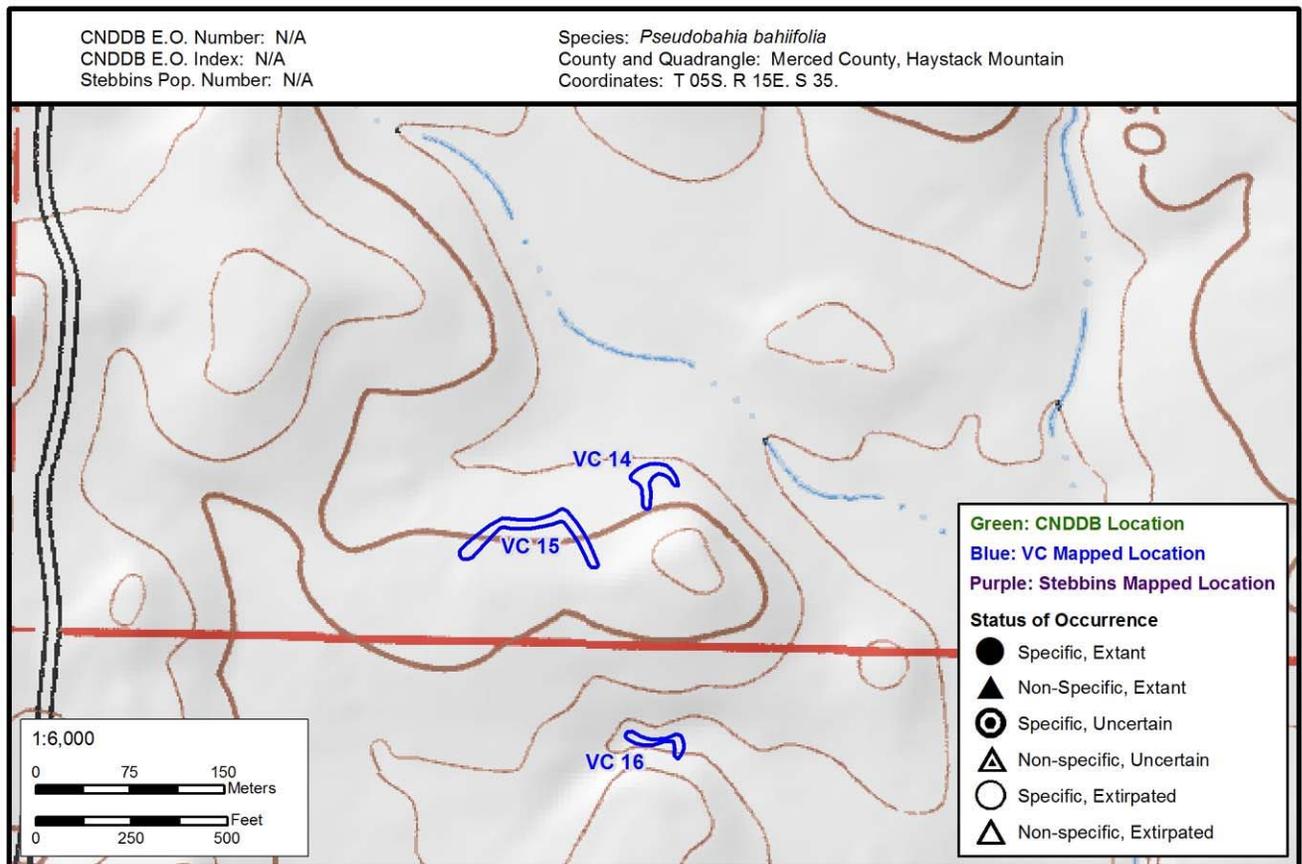
Past Status/Habitat Conditions: N/A

Current Status/Habitat Conditions: Approximately 270 plants were observed by J. Vollmar (Vollmar Consulting) in 2010. Site is located on a north-facing slope on Amador loam soils in an open grassland with large mima mounds. Plants are generally restricted to upper north to northeast sides of the mounds. Some associated plants include *Erodium botrys* and *Hypochaeris glabra*.

Trend/Threats: No threats observed in 2010.

Land Ownership: Private

Land Use: Cattle ranching



Species: *Pseudobahia bahiifolia*
Status: Extant
Trend: Stable

CNDDDB E.O. Number: N/A
Last Site Visit: Apr. 7,2010
Plants Last Seen: Apr. 7,2010

Other Pop. Number: VC 15
By: John Vollmar
Mapping Precision: Specific

Past Documentation: N/A

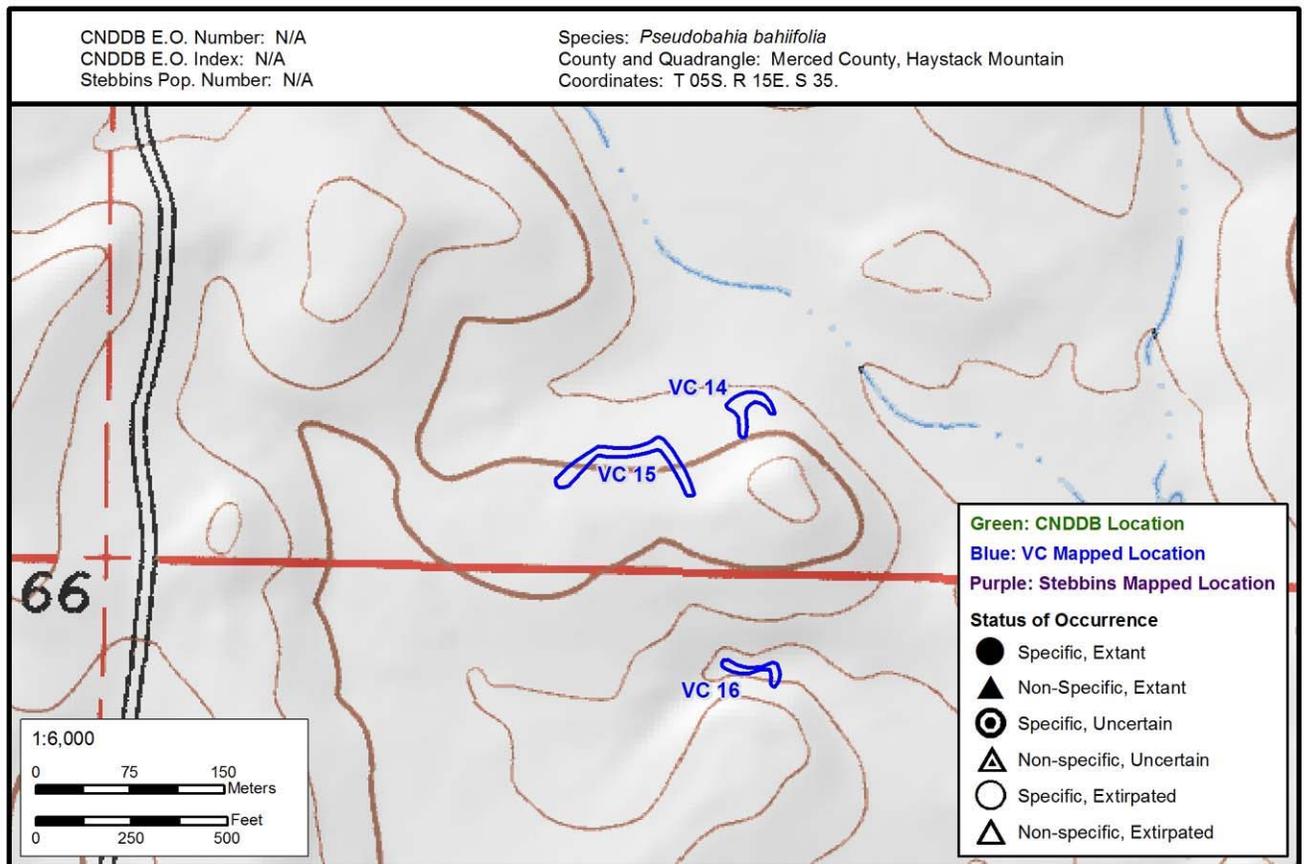
Past Status/Habitat Conditions: N/A

Current Status/Habitat Conditions: Approximately 400 plants were observed by J. Vollmar (Vollmar Consulting) in 2010. Site is located on a north-facing slope on Amador loam soils in an open grassland with large mima mounds. Plants are generally restricted to upper north to northeast sides of the mounds. Some associated plants include *Erodium botrys* and *Hypochaeris glabra*.

Trend/Threats: No threats observed in 2010.

Land Ownership: Private

Land Use: Cattle ranching



Species: *Pseudobahia bahiifolia*
Status: Extant
Trend: Stable

CNDDDB E.O. Number: N/A
Last Site Visit: Apr. 7, 2010
Plants Last Seen: Apr. 7, 2010

Other Pop. Number: VC 16
By: John Vollmar
Mapping Precision: Specific

Past Documentation: N/A

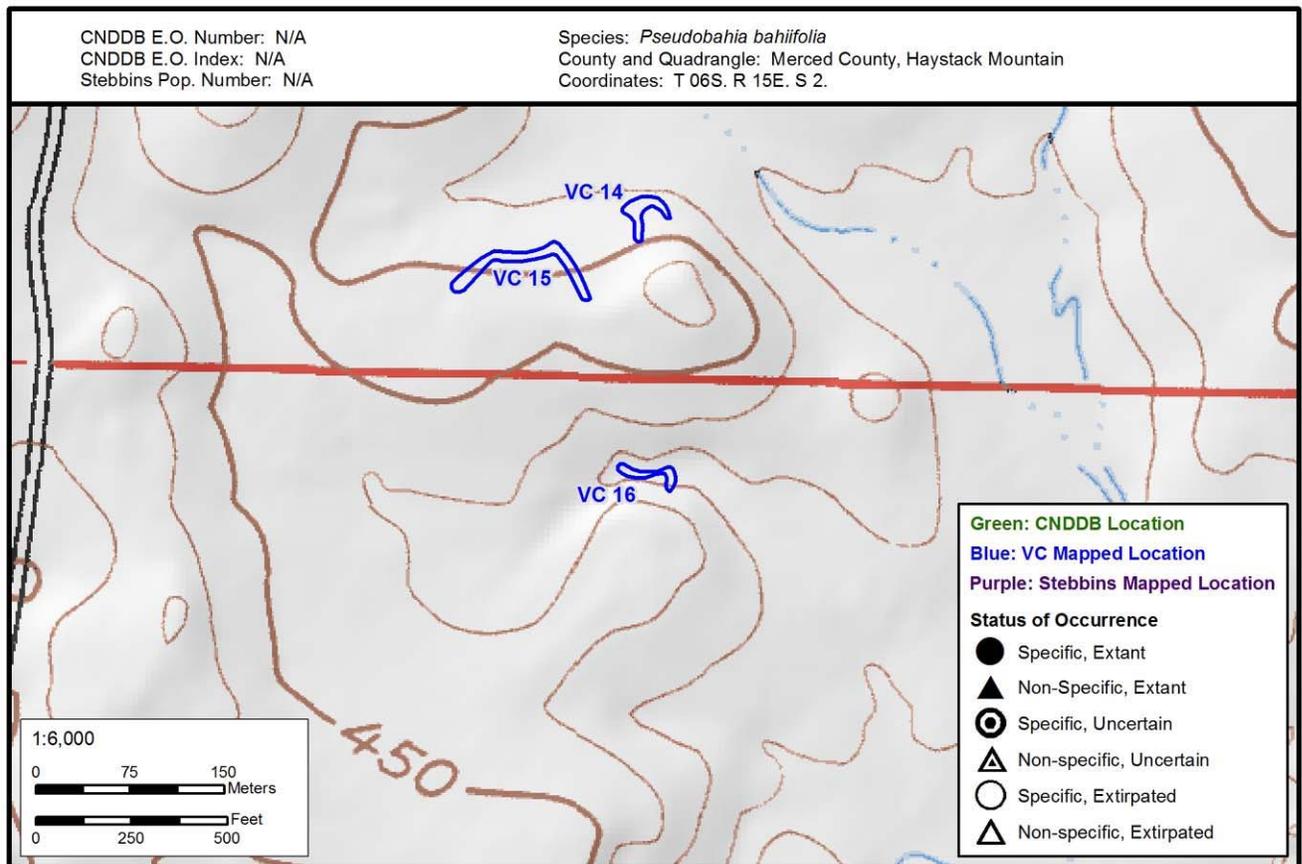
Past Status/Habitat Conditions: N/A

Current Status/Habitat Conditions: Approximately 2580 plants were observed by J. Vollmar (Vollmar Consulting) in 2010. Plants are generally restricted to upper north to northeast sides of the mounds. Site is located on a north-facing slope on Amador loam soils in an open grassland with large mima mounds. Some associated plants include *Erodium botrys* and *Hypochaeris glabra*.

Trend/Threats: No threats observed in 2010.

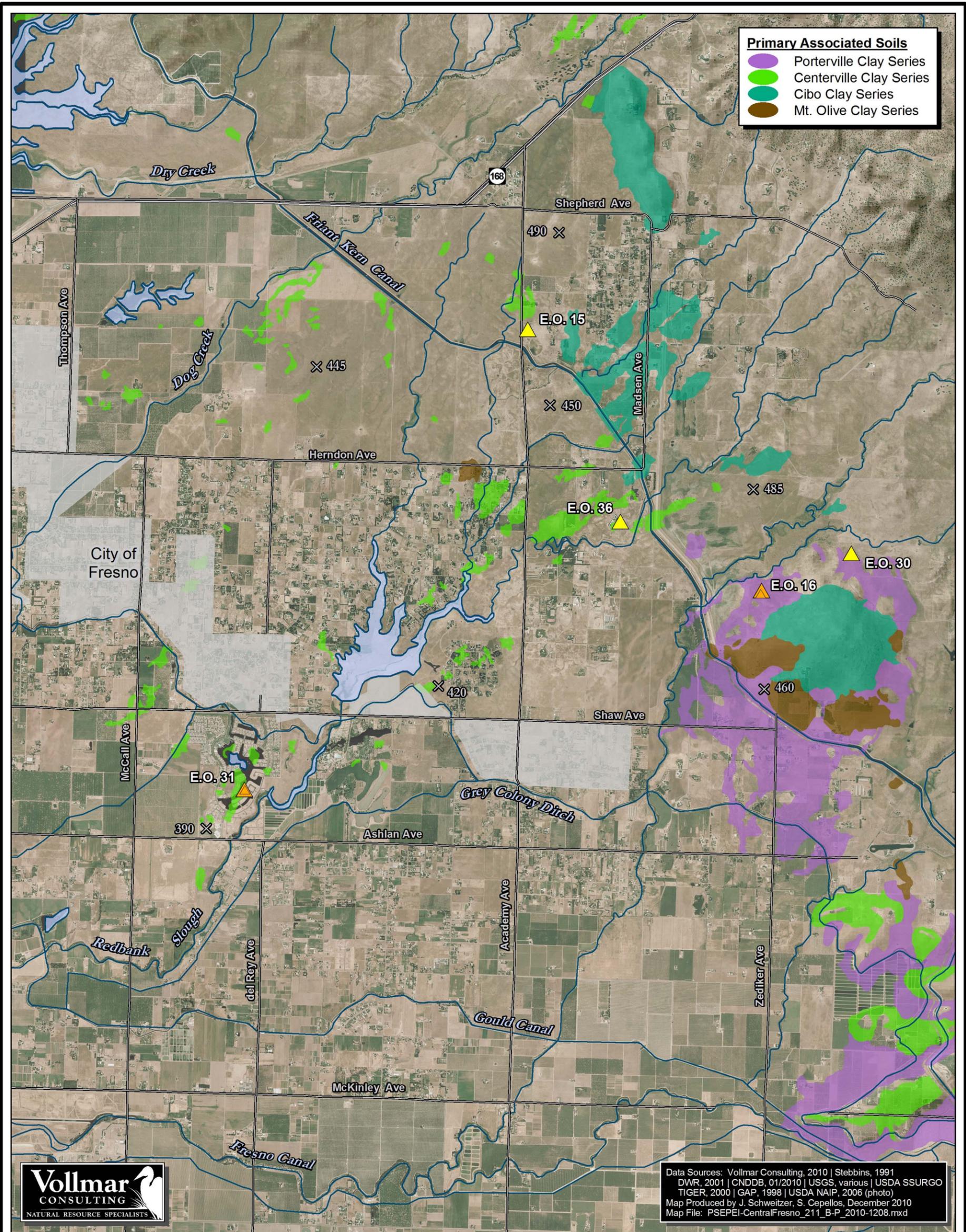
Land Ownership: Private

Land Use: Cattle ranching



APPENDIX C

INTERMEDIATE-SCALE MAPS OF *PSEUDOBALIA PEIRSONII* OCCURRENCE CLUSTERS



Data Sources: Vollmar Consulting, 2010 | Stebbins, 1991
 DWR, 2001 | CNDDDB, 01/2010 | USGS, various | USDA SSURGO
 TIGER, 2000 | GAP, 1998 | USDA NAIP, 2006 (photo)
 Map Produced by J. Schweitzer, S. Cepellos, December 2010
 Map File: PSEPEI-CentralFresno_211_B-P_2010-1208.mxd

Legend

Status of *Pseudobahia peirsonii*, 2010*

- ▲ New Occurrence Identified During 2010 Surveys
- ▲ Confirmed Extant
- ▲ Presumed Extant
- ▲ Status Uncertain
- ▲ Presumed or Confirmed Extirpated

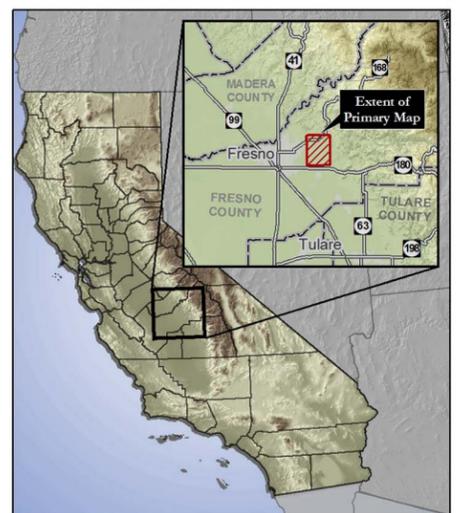
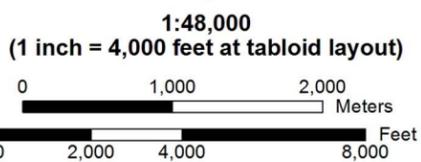
Reference Features

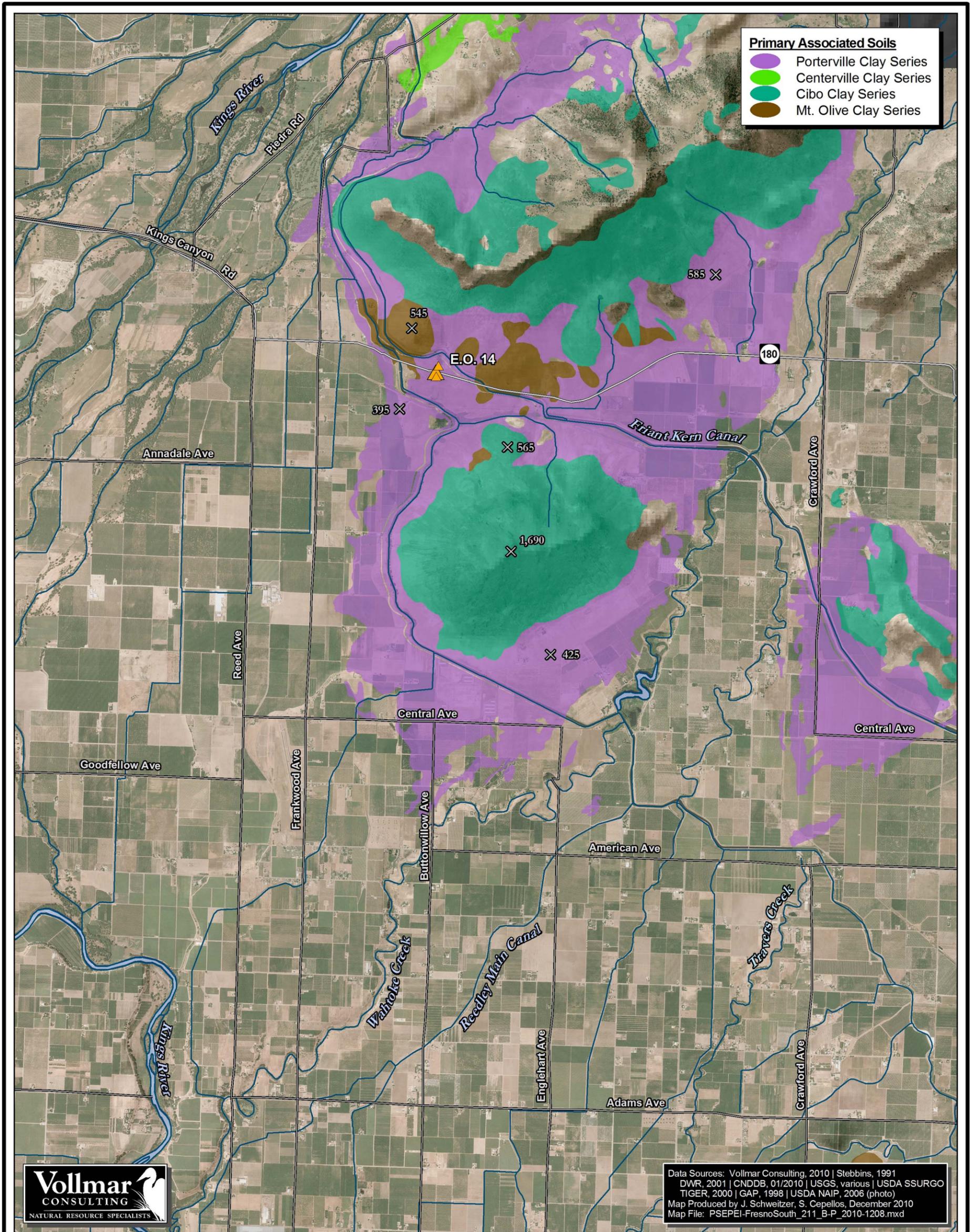
- ⊗ Elevation Marker (feet)
- County Boundary
- Water Body
- River or Creek
- Major Road

* Larger symbols represent 2010 CNDDDB location.
 "E.O." = CNDDDB ID, "ST" = Stebbins ID (no CNDDDB ID)

APPENDIX C-1
Central Fresno County
Occurrences of *Pseudobahia peirsonii*

San Joaquin Valley, California





Legend

Status of *Pseudobahia peirsonii*, 2010*

- ▲ New Occurrence Identified During 2010 Surveys
- ▲ Confirmed Extant
- ▲ Presumed Extant
- ▲ Status Uncertain
- △ Presumed or Confirmed Extirpated

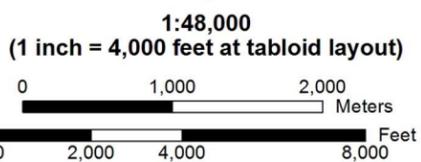
Reference Features

- ⊗ Elevation Marker (feet)
- County Boundary
- Water Body
- River or Creek
- Major Road

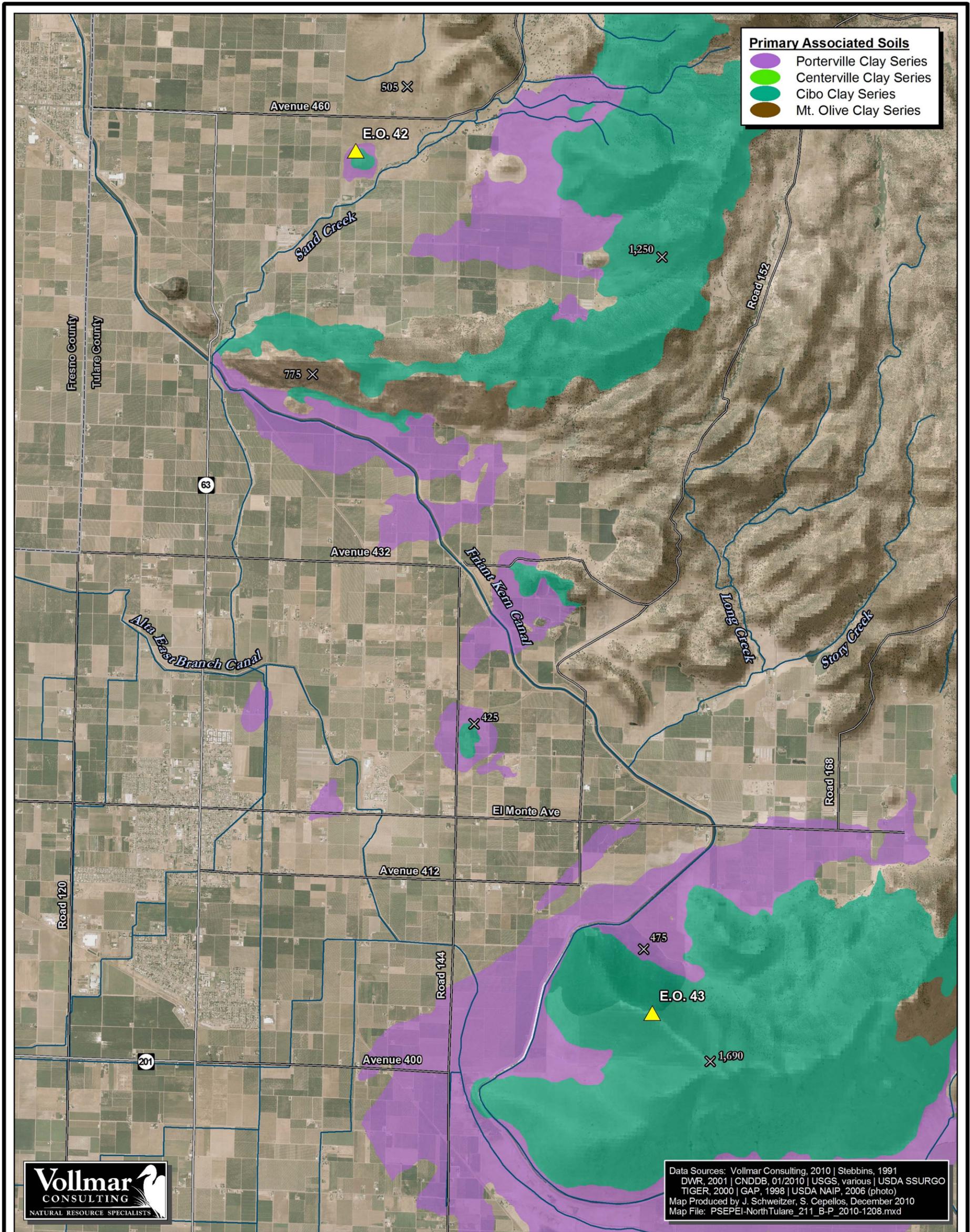
* Larger symbols represent 2010 CNDDDB location.
 "E.O." = CNDDDB ID, "ST" = Stebbins ID (no CNDDDB ID)

APPENDIX C-2
Southern Central Fresno County
Occurrences of *Pseudobahia peirsonii*

San Joaquin Valley, California



Data Sources: Vollmar Consulting, 2010 | Stebbins, 1991
 DWR, 2001 | CNDDDB, 01/2010 | USGS, various | USDA SSURGO
 TIGER, 2000 | GAP, 1998 | USDA NAIP, 2006 (photo)
 Map Produced by J. Schweitzer, S. Cepellos, December 2010
 Map File: PSEPEI-FresnoSouth_211_B-P_2010-1208.mxd



Data Sources: Vollmar Consulting, 2010 | Stebbins, 1991
 DWR, 2001 | CNDDDB, 01/2010 | USGS, various | USDA SSURGO
 TIGER, 2000 | GAP, 1998 | USDA NAIP, 2006 (photo)
 Map Produced by J. Schweitzer, S. Cepellos, December 2010
 Map File: PSEPEI-NorthTulare_211_B-P_2010-1208.mxd

Legend

Status of *Pseudobahia peirsonii*, 2010*

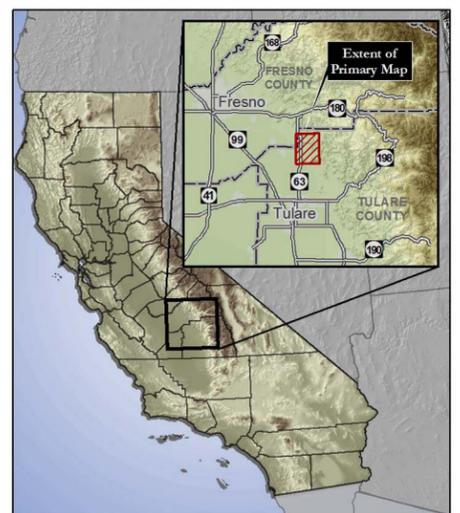
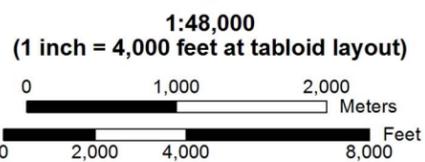
- ▲ New Occurrence Identified During 2010 Surveys
- ▲ Confirmed Extant
- ▲ Presumed Extant
- ▲ Status Uncertain
- △ Presumed or Confirmed Extirpated

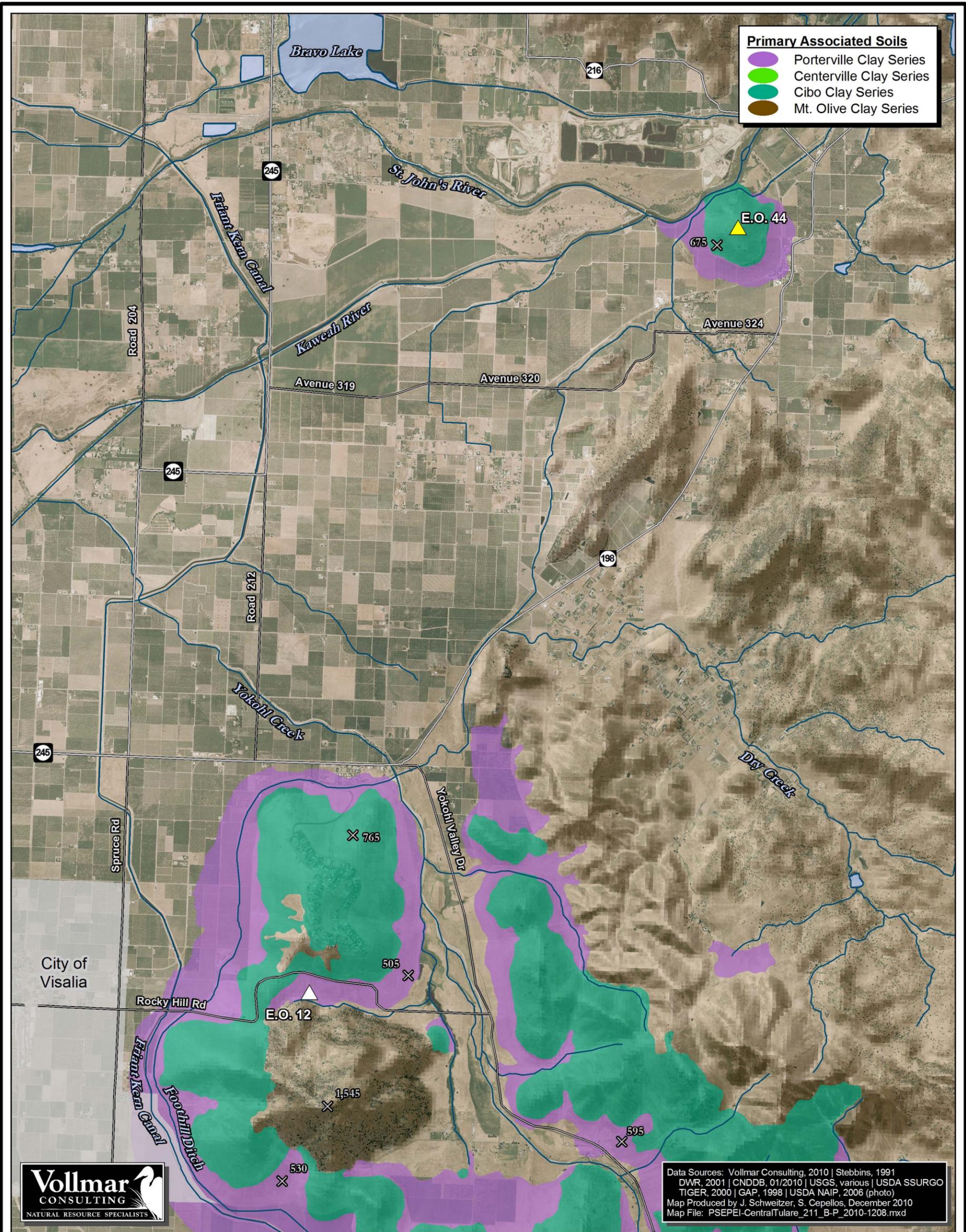
Reference Features

- ⊗ Elevation Marker (feet)
- County Boundary
- Water Body
- River or Creek
- Major Road

* Larger symbols represent 2010 CNDDDB location.
 "E.O." = CNDDDB ID, "ST" = Stebbins ID (no CNDDDB ID)

APPENDIX C-3
Northern Tulare County
Occurrences of *Pseudobahia peirsonii*
San Joaquin Valley, California





Primary Associated Soils

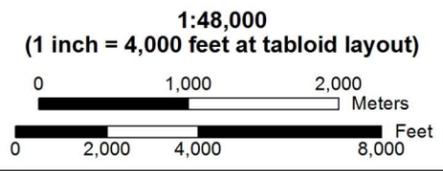
- Porterville Clay Series
- Centerville Clay Series
- Cibo Clay Series
- Mt. Olive Clay Series

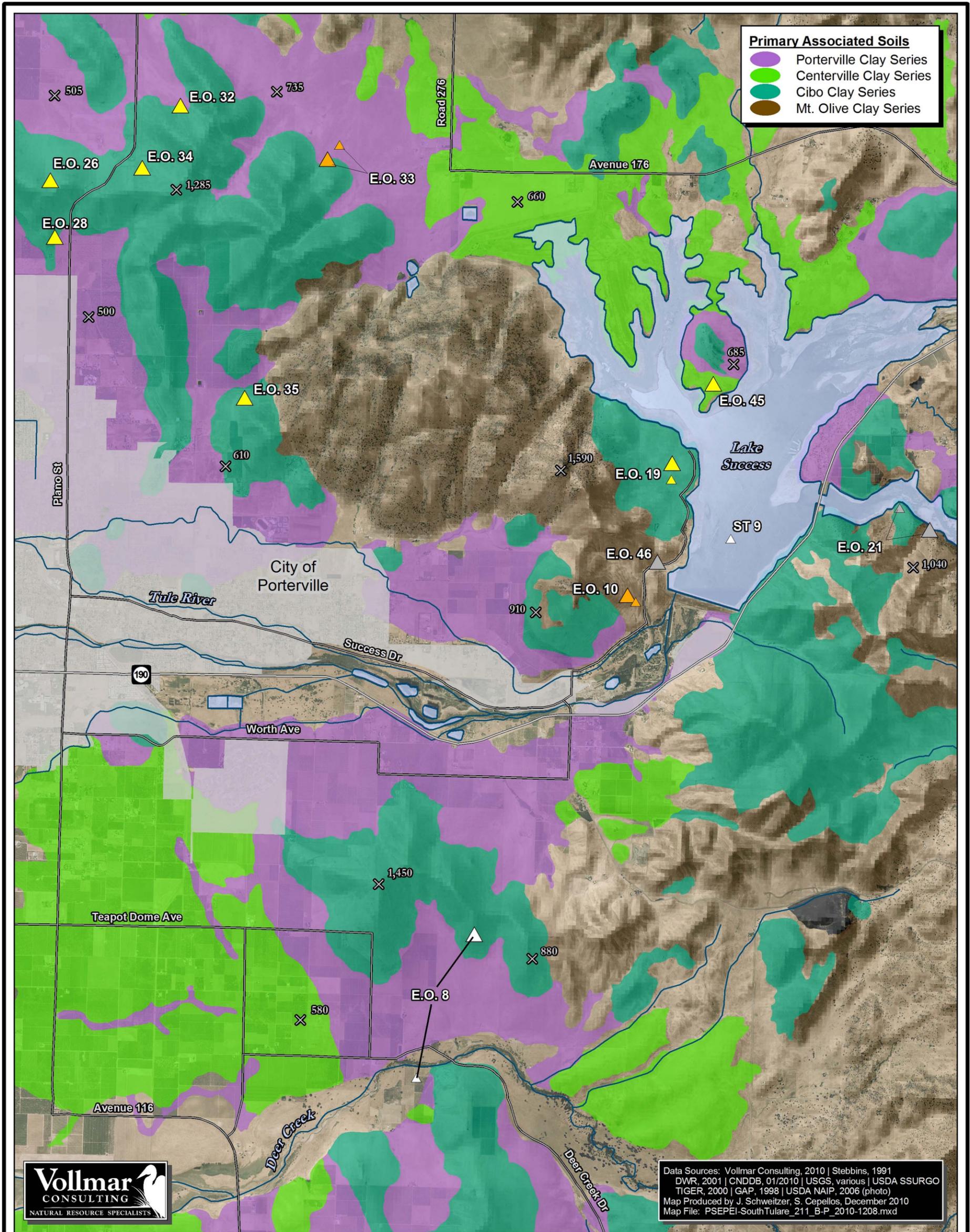


Data Sources: Vollmar Consulting, 2010 | Stebbins, 1991
 DWR, 2001 | CNDDDB, 01/2010 | USGS, various | USDA SSURGO
 TIGER, 2000 | GAP, 1998 | USDA NAIP, 2006 (photo)
 Map Produced by J. Schweitzer, S. Cepellos, December 2010
 Map File: PSEPEI-CentralTulare_211_B-P_2010-1208.mxd

- Legend**
- Status of *Pseudobahia peirsonii*, 2010***
- ▲ New Occurrence Identified During 2010 Surveys
 - ▲ Confirmed Extant
 - ▲ Presumed Extant
 - ▲ Status Uncertain
 - ▲ Presumed or Confirmed Extirpated
- Reference Features**
- ✕ Elevation Marker (feet)
 - County Boundary
 - Water Body
 - River or Creek
 - Major Road
- * Larger symbols represent 2010 CNDDDB location.
 * "E.O." = CNDDDB ID, "ST" = Stebbins ID (no CNDDDB ID)

APPENDIX C-4
Central Tulare County
Occurrences of *Pseudobahia peirsonii*
 San Joaquin Valley, California





Legend

Status of *Pseudobahia peirsonii*, 2010*

- ▲ New Occurrence Identified During 2010 Surveys
- ▲ Confirmed Extant
- ▲ Presumed Extant
- ▲ Status Uncertain
- △ Presumed or Confirmed Extirpated

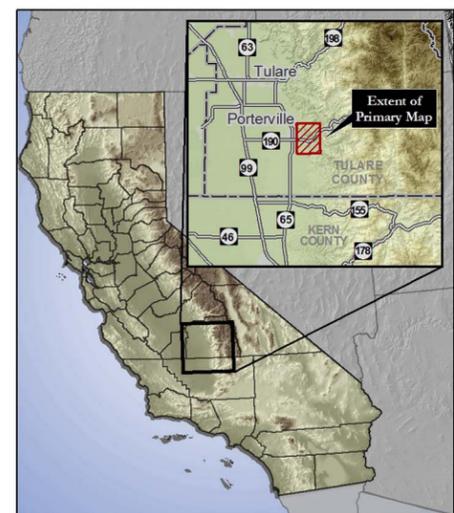
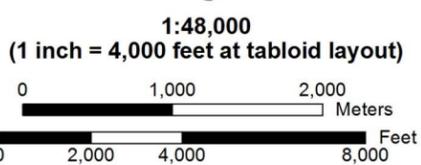
Reference Features

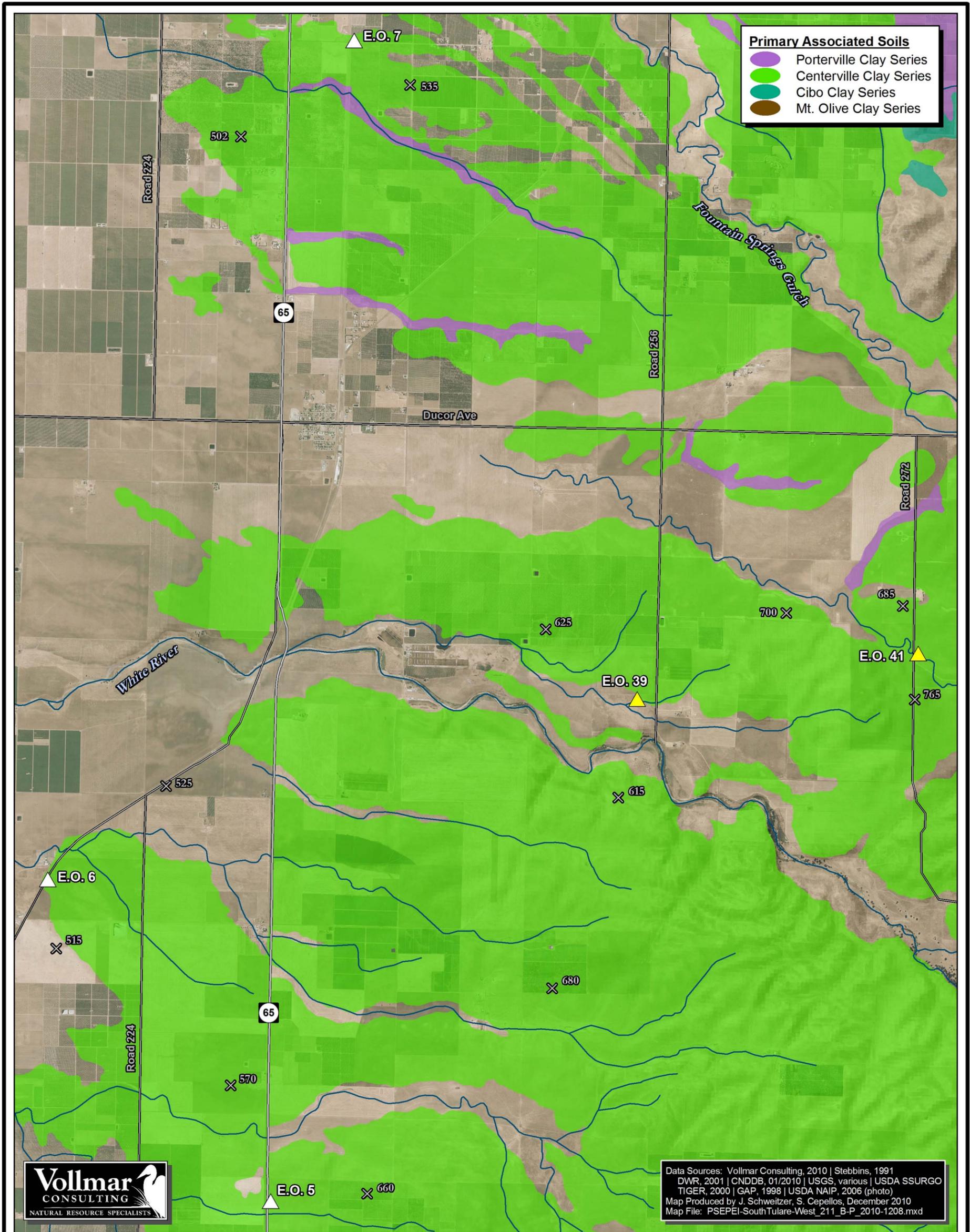
- ⊗ Elevation Marker (feet)
- County Boundary
- Water Body
- River or Creek
- Major Road

* Larger symbols represent 2010 CNDDDB location.
 "E.O." = CNDDDB ID, "ST" = Stebbins ID (no CNDDDB ID)

APPENDIX C-5
Southern Central Tulare County
Occurrences of *Pseudobahia peirsonii*

San Joaquin Valley, California





Primary Associated Soils

- Porterville Clay Series
- Centerville Clay Series
- Cibo Clay Series
- Mt. Olive Clay Series



Data Sources: Vollmar Consulting, 2010 | Stebbins, 1991
 DWR, 2001 | CNDDDB, 01/2010 | USGS, various | USDA SSURGO
 TIGER, 2000 | GAP, 1998 | USDA NAIP, 2006 (photo)
 Map Produced by J. Schweitzer, S. Cepellos, December 2010
 Map File: PSEPEI-SouthTulare-West_211_B-P_2010-1208.mxd

Legend

Status of *Pseudobahia peirsonii*, 2010*

- ▲ New Occurrence Identified During 2010 Surveys
- ▲ Confirmed Extant
- ▲ Presumed Extant
- ▲ Status Uncertain
- ▲ Presumed or Confirmed Extirpated

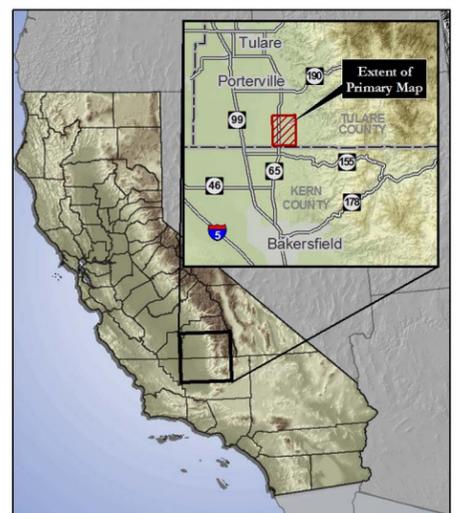
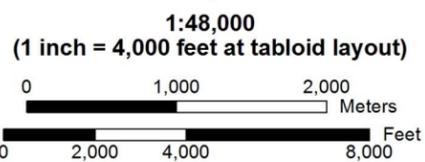
Reference Features

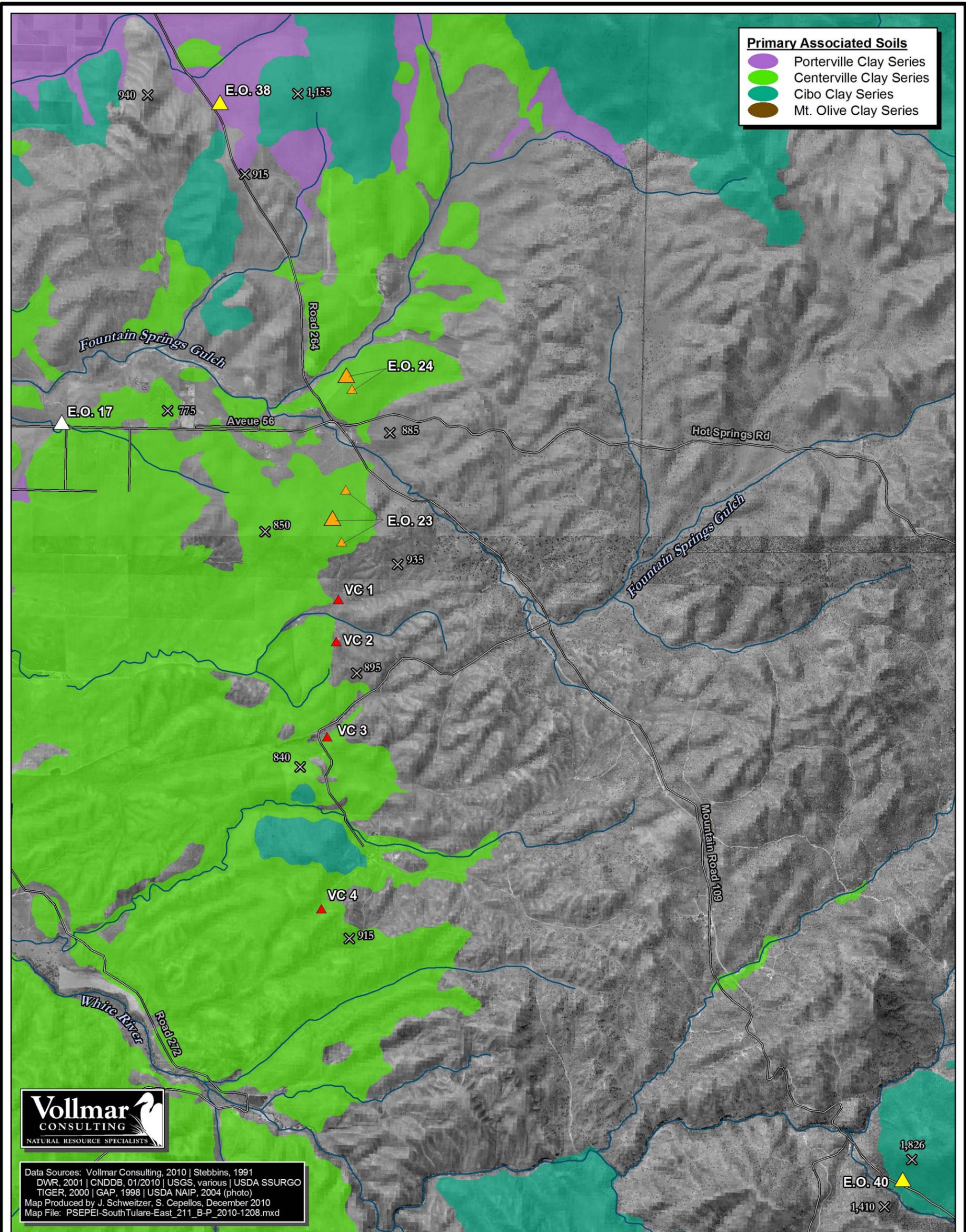
- ✕ Elevation Marker (feet)
- County Boundary
- Water Body
- River or Creek
- Major Road

* Larger symbols represent 2010 CNDDDB location.
 "E.O." = CNDDDB ID, "ST" = Stebbins ID (no CNDDDB ID)

APPENDIX C-6
Southwestern Tulare County
Occurrences of *Pseudobahia peirsonii*

San Joaquin Valley, California





Primary Associated Soils

- Porterville Clay Series
- Centerville Clay Series
- Cibo Clay Series
- Mt. Olive Clay Series



Data Sources: Vollmar Consulting, 2010 | Stebbins, 1991
 DWR, 2001 | CNDDDB, 01/2010 | USGS, various | USDA SSURGO
 TIGER, 2000 | GAP, 1998 | USDA NAIP, 2004 (photo)
 Map Produced by J. Schweitzer, S. Cepellos, December 2010
 Map File: PSEPEI-SouthTulare-East_211_B-P_2010-1208.mxd

APPENDIX C-7

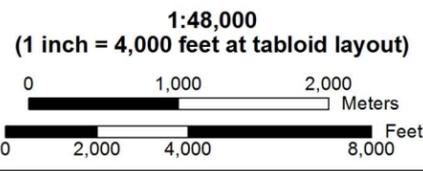
Central Southern Tulare County Occurrences of *Pseudobahia peirsonii*

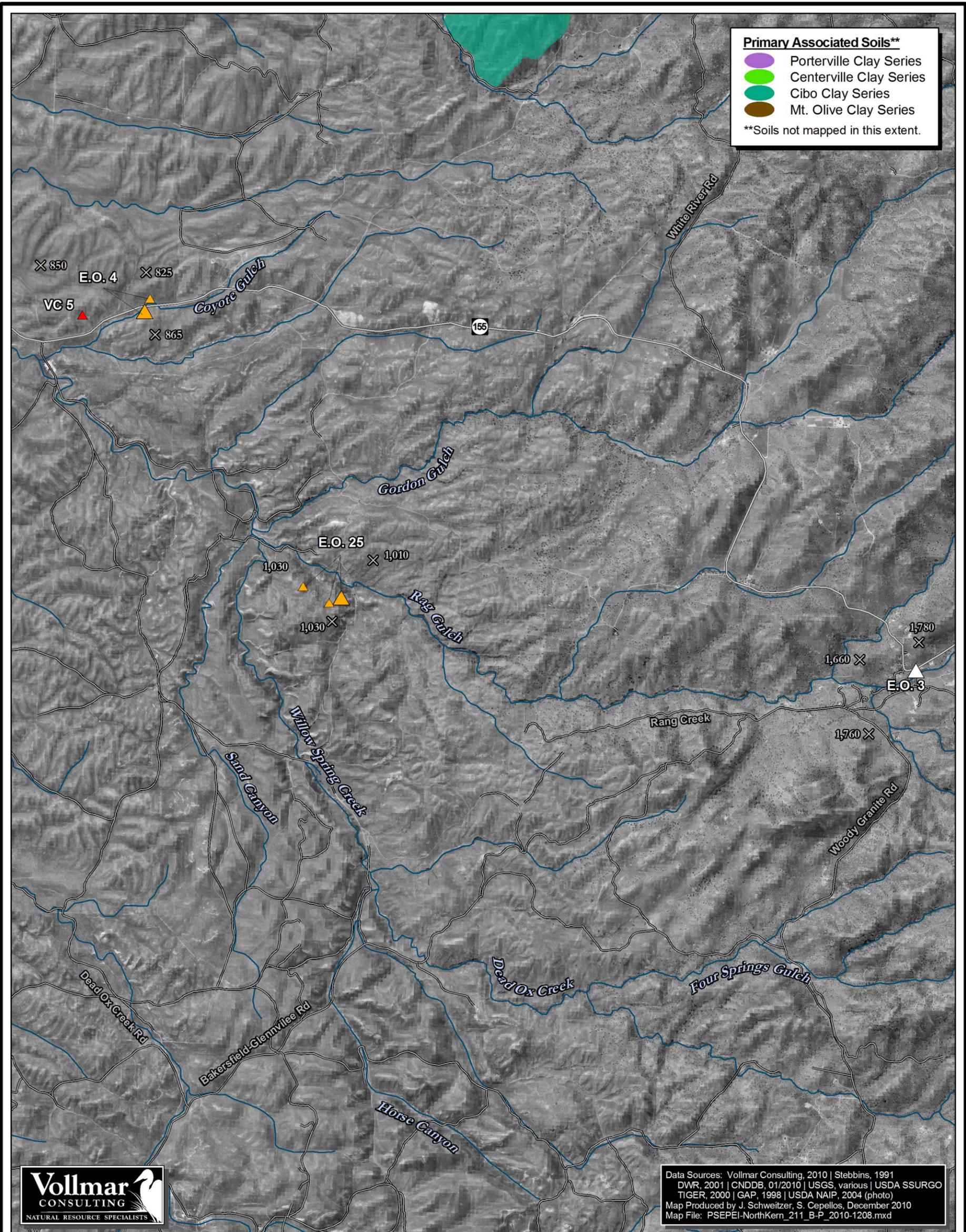
San Joaquin Valley, California

- Legend**
- Status of *Pseudobahia peirsonii*, 2010***
- ▲ New Occurrence Identified During 2010 Surveys
 - ▲ Confirmed Extant
 - ▲ Presumed Extant
 - ▲ Status Uncertain
 - ▲ Presumed or Confirmed Extirpated

- Reference Features**
- X Elevation Marker (feet)
 - County Boundary
 - Water Body
 - River or Creek
 - Major Road

* Larger symbols represent 2010 CNDDDB location.
 "E.O." = CNDDDB ID, "ST" = Stebbins ID (no CNDDDB ID)





Primary Associated Soils**

- Porterville Clay Series
- Centerville Clay Series
- Cibo Clay Series
- Mt. Olive Clay Series

**Soils not mapped in this extent.



Data Sources: Vollmar Consulting, 2010 | Stebbins, 1991
 DWR, 2001 | CNDDDB, 01/2010 | USGS, various | USDA SSURGO
 TIGER, 2000 | GAP, 1998 | USDA NAIP, 2004 (photo)
 Map Produced by J. Schweitzer, S. Cepellos, December 2010
 Map File: PSEPEI-NorthKern_211_B-P_2010-1208.mxd

Legend

Status of *Pseudobahia peirsonii*, 2010*

- ▲ New Occurrence Identified During 2010 Surveys
- ▲ Confirmed Extant
- ▲ Presumed Extant
- ▲ Status Uncertain
- ▲ Presumed or Confirmed Extirpated

Reference Features

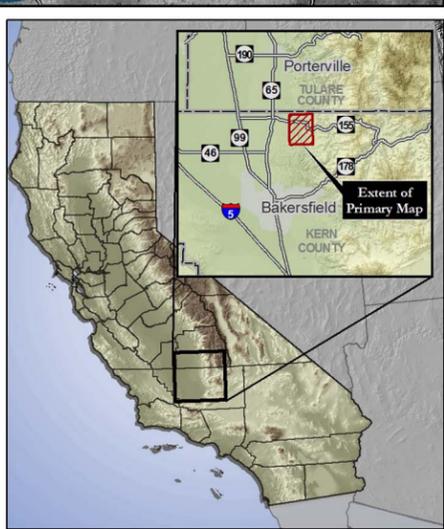
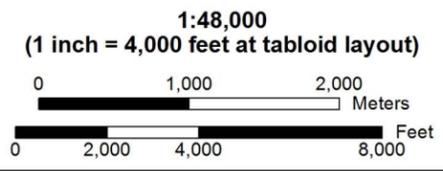
- × Elevation Marker (feet)
- County Boundary
- Water Body
- River or Creek
- Major Road

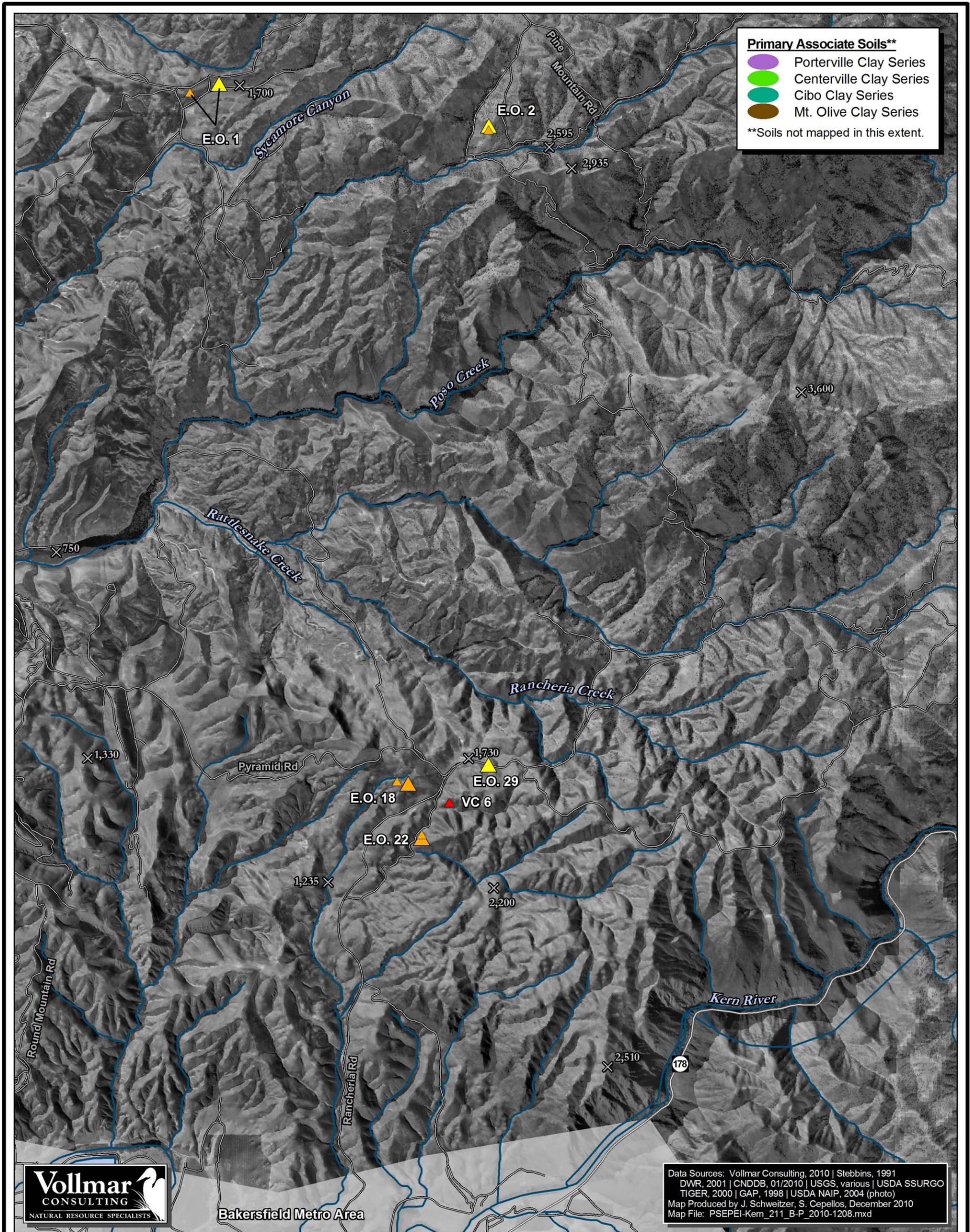
* Larger symbols represent 2010 CNDDDB location.
 "E.O." = CNDDDB ID, "ST" = Stebbins ID (no CNDDDB ID)

APPENDIX C-8

Northern Central Kern County Occurrences of *Pseudobahia peirsonii*

San Joaquin Valley, California





Primary Associate Soils**

- Porterville Clay Series
- Centerville Clay Series
- Cibo Clay Series
- Mt. Olive Clay Series

**Soils not mapped in this extent.

Data Sources: Vollmar Consulting, 2010 | Stebbins, 1991
 DWR, 2001 | CNDDDB, 01/2010 | USGS, various | USDA SSURGO
 TIGER, 2000 | GAP, 1998 | USDA NAIP, 2004 (photo)
 Map Produced by J. Schweitzer, S. Cepellos, December 2010
 Map File: PSEPEI-Kern_211_B-P_2010-1208.mxd



Bakersfield Metro Area

APPENDIX C-9 Central Kern County Occurrences of *Pseudobahia peirsonii* San Joaquin Valley, California

- Legend**
- Status of *Pseudobahia peirsonii*, 2010***
- ▲ New Occurrence Identified During 2010 Surveys
 - ▲ Confirmed Extant
 - ▲ Presumed Extant
 - ▲ Status Uncertain
 - ▲ Presumed or Confirmed Extirpated

- Reference Features**
- X Elevation Marker (feet)
 - County Boundary
 - Water Body
 - River or Creek
 - Major Road

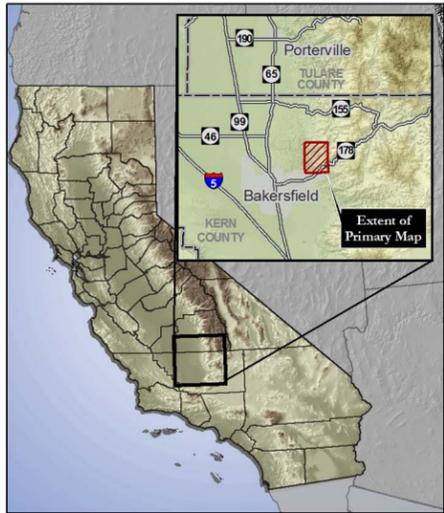
* Larger symbols represent 2010 CNDDDB location.
 "E.O." = CNDDDB ID, "ST" = Stebbins ID (no CNDDDB ID)



1:48,000
 (1 inch = 4,000 feet at tabloid layout)

0 1,000 2,000
 Meters

0 2,000 4,000 8,000
 Feet



APPENDIX D

**ACCOUNTS AND SITE MAPS OF INDIVIDUAL
PSEUDOBALIA PEIRSONII
OCCURRENCES**

Species: *Pseudobahia peirsonii*
Status: Presumed Extant
Trend: Declining

CNDDDB E.O. Number: 1
Last Site Visit: Apr. 13, 2010
Plants Last Seen: 1990

Other Pop. Number: ST 1
By: John Stebbins
Mapping Precision: Specific

Past Documentation: “Kern County on hill referred to as dry bog knoll at head of Adobe Canyon near road to old Granite Schoolhouse, 1650 feet. C.N. Smith 1080, 28 April, 1962 (JEPS); Adobe knoll at head of Adobe Canyon, grassland at 1650 feet, heavy clay, full sun Ernest Twisselman 10606, 26 April, 1990 (CAS, JEPS); Dry bog knoll, 2.5 miles west of Granite School, Dale E. Johnson 40, 3 April 1975 (UC). Other documentation: CNDDDB records report an observation of 50 plants by C. Chamberlain in 1981; Karen Kirkpatrick 90-04, 25 March, 1990 (FSC, CAS, UC); Stebbins 1991 reports an observation of approximately 1000 plants by Karen Kirkpatrick on 25 March, 1990” (Stebbins 1991).

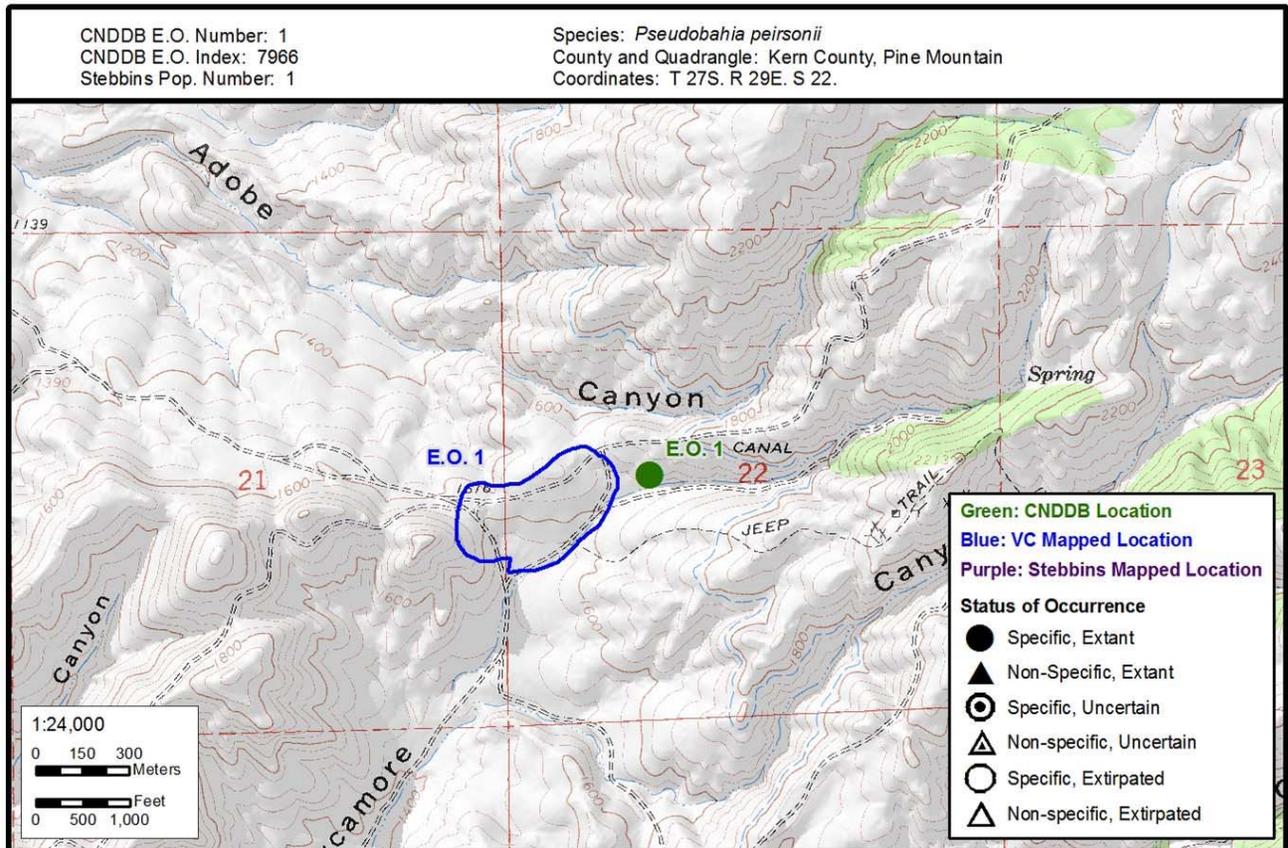
Past Status/Habitat Conditions: “Approximately 1000 plants were observed by Karen Kirkpatrick on 25 March, 1990. Population is situated on a south-facing “knoll” north of a dry creek bed between two unimproved dirt ranch roads. The soil is heavy cracked “abobe” clay. Some grazing and trampling impacts by cattle were evident but not excessive. The non-native grassland at the site was dominated by *Gilia tricolor*, *Dichelostemma pulchellum*, *Bromus rubens*, *Erodium cicutarium*, and *Lepidium nitidum*” (Stebbins 1991). “Less than 50 plants were seen in 1981, about 1000 plants seen in 1990” (CNDDDB 2010).

Current Status/Habitat Conditions: No plants observed during 2010 site visit, site was used in 2010 as cattle corral, heavily disturbed and dominated by almost 100% cover *Malva parviflora*. Soils intact and surrounding areas less disturbed with suitable habitat but species not observed. Continuing presence is assumed based on suitable surrounding habitat and no radical land use changes.

Trend/Threats: Population appears to be declining due to use of site as a livestock corral and excessive trampling by cattle.

Land Ownership: John Wofford, Star Route 1, Box 18, Kernville, CA 93238

Land Use: Cattle grazing, corralling, ranching



Species: *Pseudobahia peirsonii*
Status: Presumed Extant
Trend: Presumed Stable

CNDDDB E.O. Number: 2
Last Site Visit: 1991
Plants Last Seen: 1963

Other Pop. Number: ST 2
By: John Stebbins
Mapping Precision: Non-Specific

Past Documentation: “Kern County Hugh Smiths field, northerly from Long Tom Gulch, foothills of Greenhorn Range, Charlotte Smith 303, 15 April, 1941 (JEPS); Kern County, Hugh Smiths Smith Ranch near head of Pine Mtn. Creek, Douglas Oak Woodland, Ernest Twisselmann 8106, 26 April 1963 (DS), Karen and Greg Kirkpatrick 1990; Stebbins 1991” (Stebbins 1991)

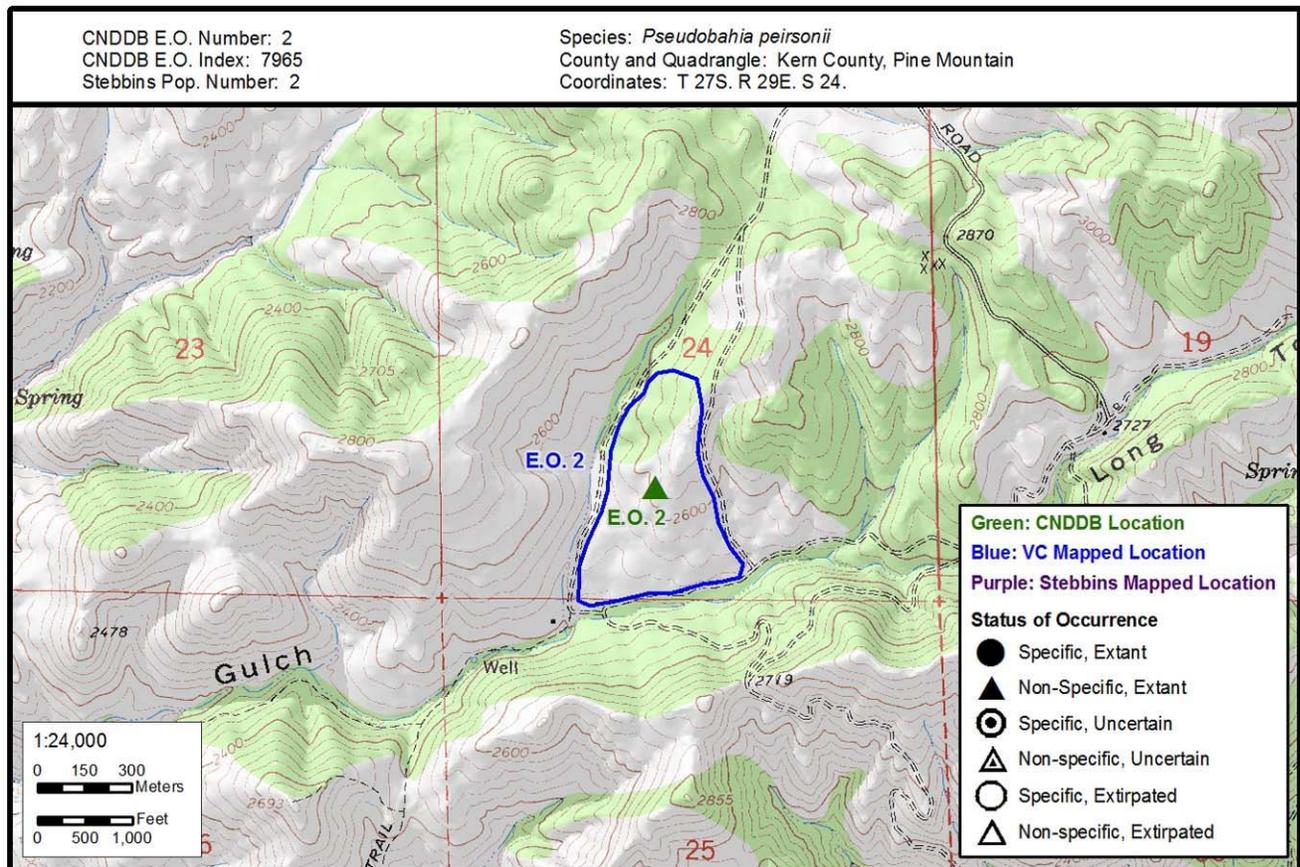
Past Status/Habitat Conditions: “Presumed extant but could not locate or confirm population site. Suitable habitat is present in the area of most likely occurrence (see map). The site was surveyed by Karen and Greg Kirkpatrick on 25 March, 1990 but they were denied entry access when they attempted to revisit the site two weeks later. Gentle slope of non-native grassland in opening of blue oak woodland. Soils appeared claylike but no *P. peirsonii* plants were observed. The survey date was perhaps too early for this elevation (2600 ft.), especially considering the collection dates recorded. Most of the annual flora was comparatively depauperate due to the extremely dry conditions” (Stebbins 1991). “One colony seen in 1963” (CNDDDB 2010)

Current Status/Habitat Conditions: No plants observed during 2010 field visit, as there was no site access at the time. However, presence is assumed due to the good overall habitat present in the form of annual grass rangelands in the area and no major land use changes.

Trend/Threats: Population is likely stable due to overall habitat conditions. In 1991, grazing levels were reported to be heavy but 2010 levels were moderate to light.

Land Ownership: Glenn Record, Inc. Box 37, Granite Station Bakersfield, CA 93301.

Land Use: Cattle grazing



Species: *Pseudobahia peirsonii*
Status: Presumed Extirpated
Trend: Presumed Extirpated

CNDDDB E.O. Number: 3
Last Site Visit: 1990
Plants Last Seen: 1974

Other Pop. Number: ST 3
By: John Stebbins
Mapping Precision: Non-Specific

Past Documentation: “Kern County, near Woody, CNDDDB record based upon a reported 1974 observation by B. R. Van Kirk; no herbarium collection was made” (Stebbins 1991).

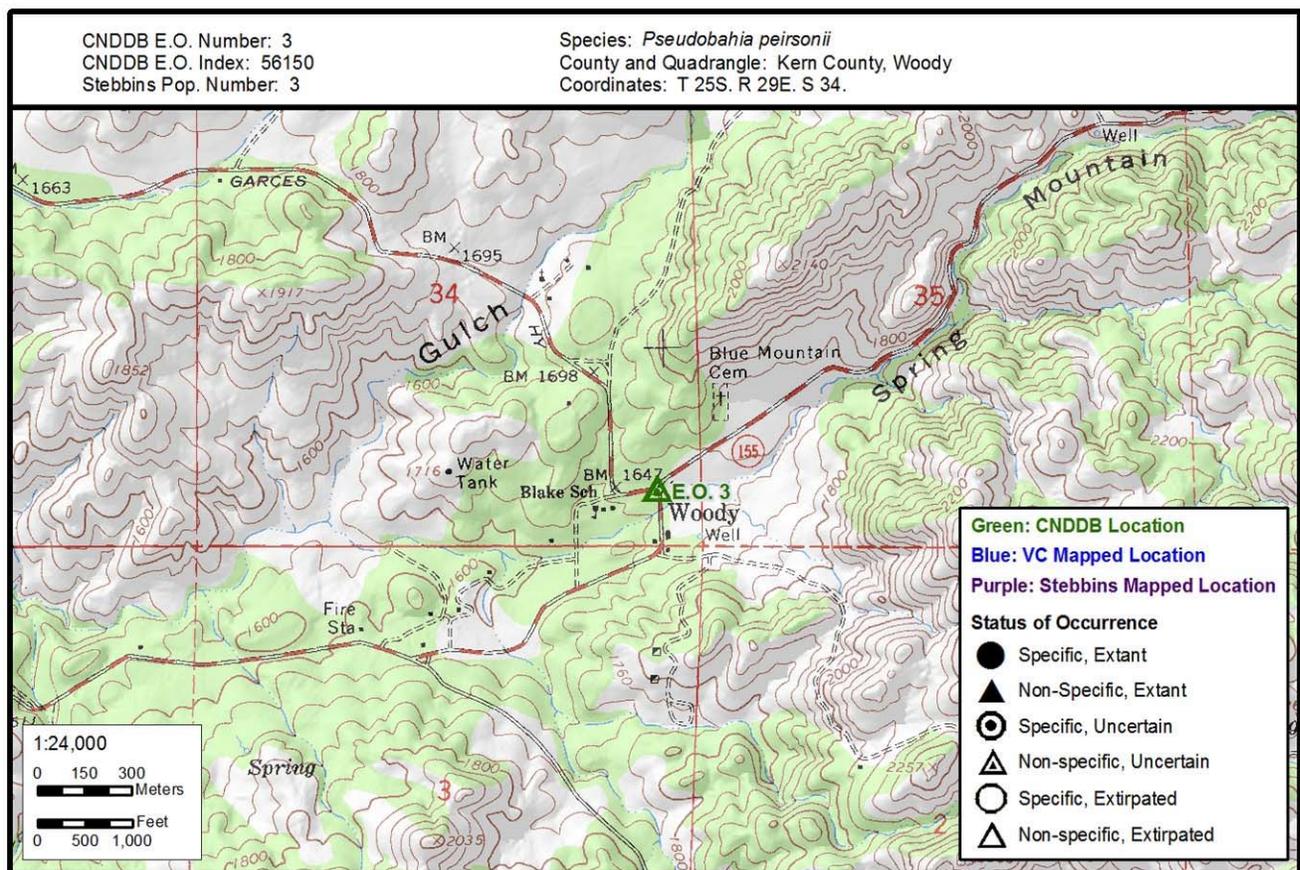
Past Status/Habitat Conditions: “Presumed extinct or erroneous. The readily accessible area around Woody was surveyed by John Stebbins and Karen Kirkpatrick on 7 April, 1990 without success. The area ‘near Woody’ consists of numerous small ranches and rural dilapidated dwellings. The heavily grazed blue oak woodland has understory dominated by aggressive ruderal species. The soils did not appear suitable for *P. peirsonii*. The record from this general location most likely applied to the area located along the road (Highway 155) to Woody six to nine miles to the west where numerous historic records were documented and the adobe clay soils are widespread” (Stebbins 1991). The species was again confirmed in these “other areas” in 2010.

Current Status/Habitat Conditions: Soils are not suitable; plants have not been observed since 1974.

Trend/Threats: Population is presumed extirpated.

Land Ownership: Private

Land Use: Grazing, domestic animals and dwellings



Species: *Pseudobahia peirsonii*
Status: Extant
Trend: Stable

CNDDDB E.O. Number: 4
Last Site Visit: 2010
Plants Last Seen: 2010

Other Pop. Number: ST 4
By: John Stebbins
Mapping Precision: Specific

Past Documentation: “Kern County, 9.5 miles west of Woody on Delano Road. Rolling hills of black adobe, Annual 1 to 2 ft., common in lower sonoran Carl B. Wolf 405, 16 April, 1935 (CAS, RSA, UC, UCLA); Other Documentation: Ernest Twisselmann 4244, 12 April, 1958 (CAS, JEPS); Kern County, 8.7 miles west of west of Woody on Highway 155; 300 plants on loose soil Dale Johnson 40(UC); John C. Stebbins and Karen Kirkpatrick 90-06, 7 April 1990 (FSC, UC)” (Stebbins 1991).

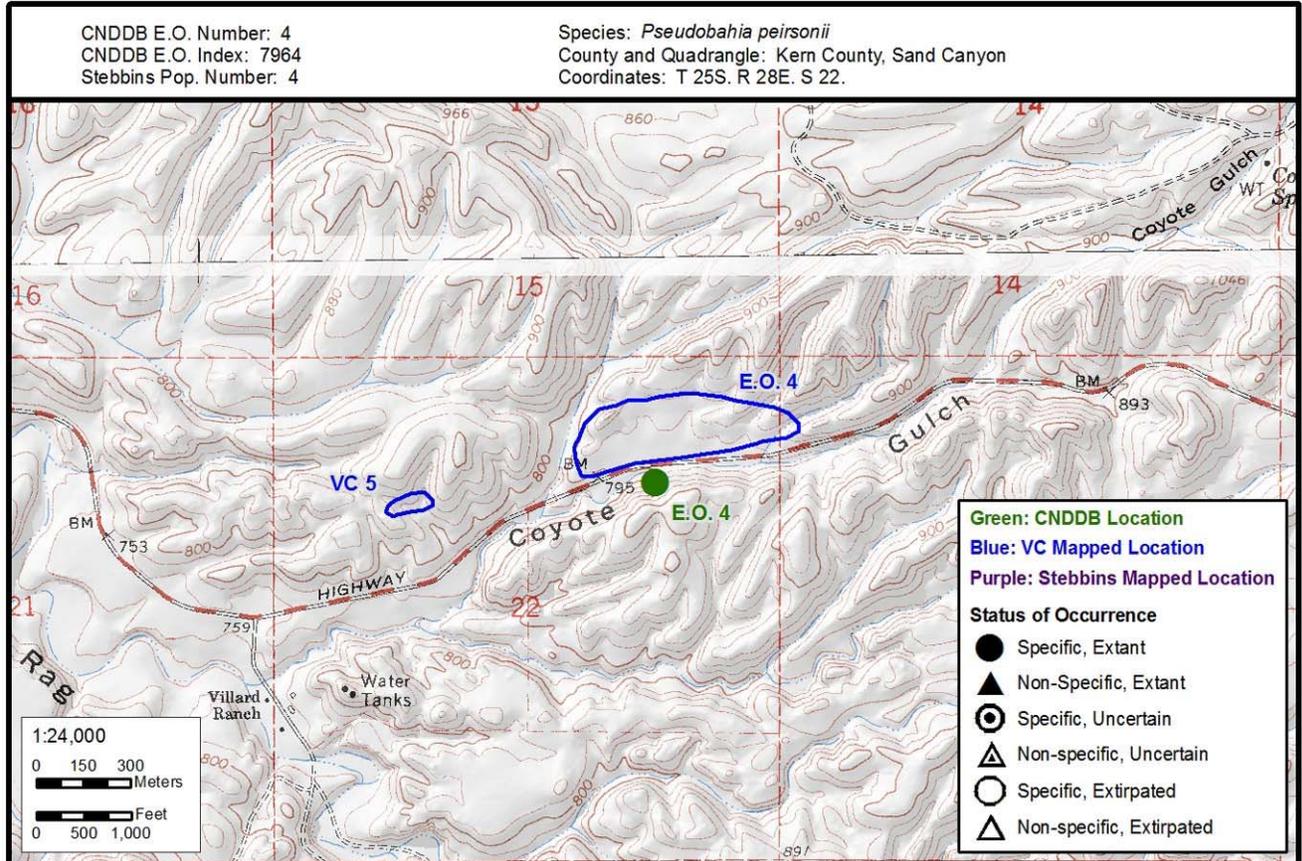
Past Status/Habitat Conditions: “Extant, 250 plants observed on survey date. Habitat is precarious due to slope subsidence and close proximity to maintained State Highway 155. It is located 8.7 miles west of Woody. Most plants were growing on top of an embankment between the road bed and the fence line. A few were established on the lower slopes of the embankment near the road on the looser soil. No plants were observed anywhere in the vicinity inside the very heavily grazed rangeland, although the adobe clay soils are very common throughout the immediate area. The common associates in the non-native grassland included *Phacelia cilata*, *Avena fatua*, *Dichelostemma pulchellum* and *Erodium cicutarium*” (Stebbins 1991). “Approximately 300 plants were seen in 1974, 250 in 1990, at least 30 in 1996” (CNDDDB 2010).

Current Status/Habitat Conditions: Although the site is dominated by roadside weeds and has been sprayed by CalTrans, the roadcut appears to have subsided. Population of 350 plants observed just north of original CNDDDB occurrence (mapped below).

Trend/Threats: Population is stable. Continued slope subsidence aggravated by cattle trampling. Roadway maintenance activities or road widening would affect or eliminate the population (CNDDDB 2010). Herbicide spraying will be restricted by CalTrans and consideration will be given to fencing the population to minimize cattle impacts.

Land Ownership: Jules Villard Estate, 1805 Val Verde, Delano, CA 93215

Land Use: Road easement and cattle grazing



Species: *Pseudobahia peirsonii*
Status: Extirpated
Trend: Extirpated

CNDDDB E.O. Number: 5
Last Site Visit: 2010
Plants Last Seen: 1952

Other Pop. Number: ST 5
By: J. Stebbins and K. Kirkpatrick
Mapping Precision: Specific

Past Documentation: "Tulare County, 0.8 miles north of Kern County line on east side of Highway 65, associated with *Brodiaea*, *Amsinkia*, and *Phacelia ciliate*. Sherwin Carlquist 287, 28 Marc, 1952 (CAS, UC)" (Stebbins 1991).

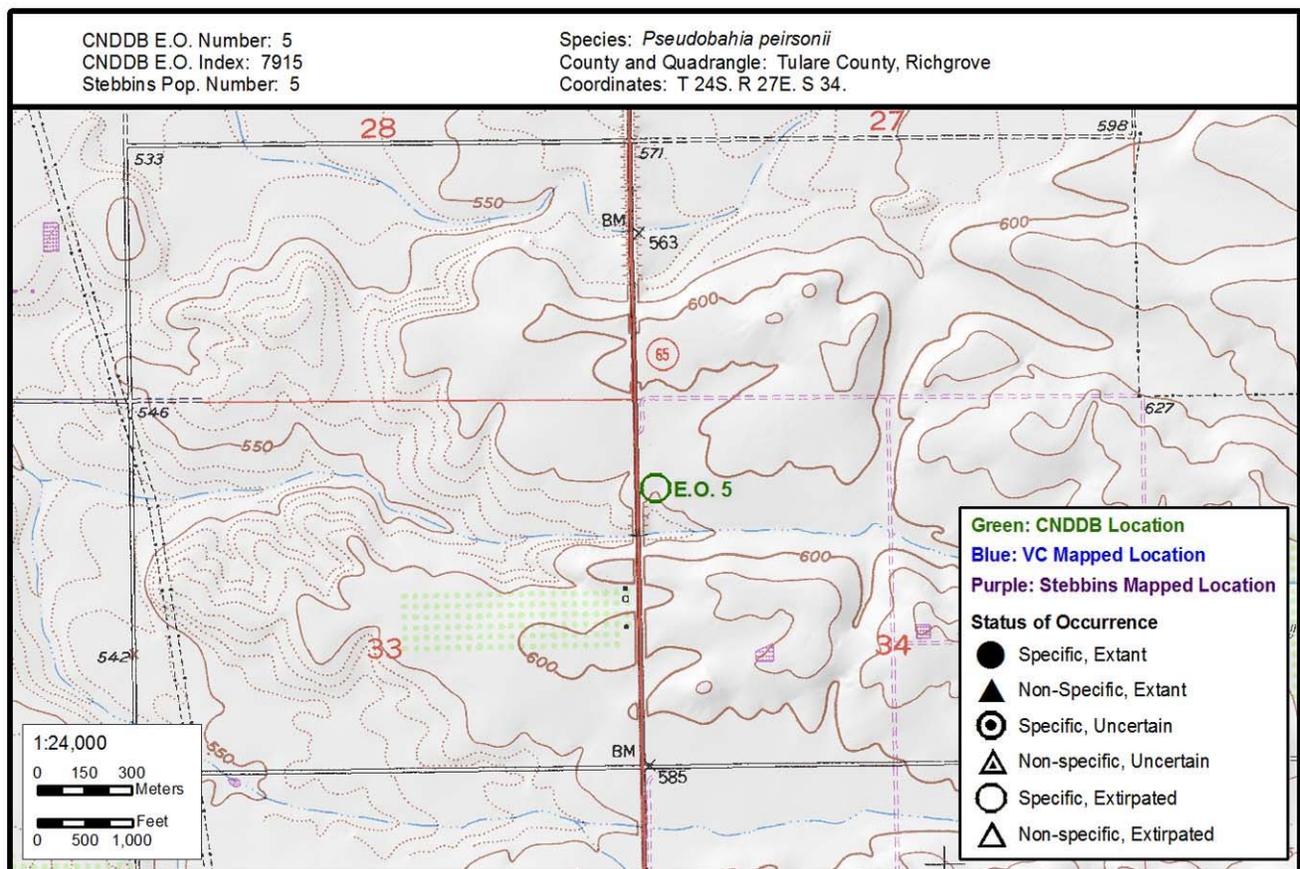
Past Status/Habitat Conditions: "Extirpated, all lands in the vicinity are converted to intensive agriculture (wheat, oats, citrus). The location was visited by John C. Stebbins and Karen Kirkpatrick on 7 April, 1990. Virtually no viable habitat remains in the vicinity" (Stebbins 1991). "Location is now an orange grove" (CNDDDB 2010). Site was again visited in 2010.

Current Status/Habitat Conditions: Extirpated

Trend/Threats: Extirpated

Land Ownership: Private

Land Use: Agriculture



Species: *Pseudobahia peirsonii*
Status: Extirpated
Trend: Extirpated

CNDDDB E.O. Number: 6
Last Site Visit: 2010
Plants Last Seen: 1965

Other Pop. Number: ST 6
By: John Stebbins
Mapping Precision: Non-specific

Past Documentation: "Tulare County, Vestal Substation by railroad tracks, Ernest C. Twisselmann 76-68, 7 March, 1965 (CAS); Tulare County, between Richgrove and Ducor, Robert F. Hoover 455, 20 March, 1935 (UC). Note: CNDDDB records state that Jack Zaninovich reported the population as extirpated in 1974" (Stebbins 1991).

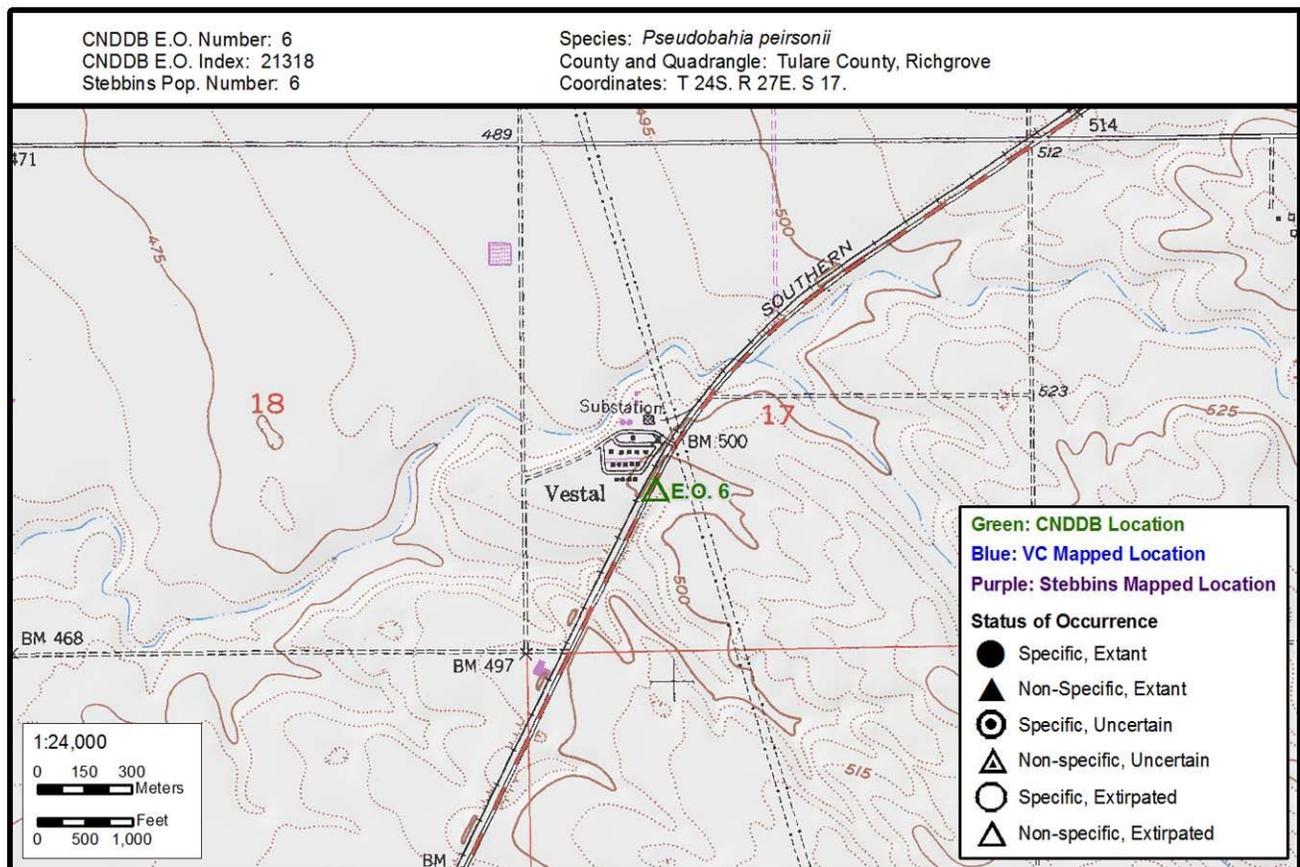
Past Status/Habitat Conditions: "Extirpated, all lands in the vicinity have been converted to intensive agriculture. The entire site and surrounding lands were surveyed on 7 April, 1990 by John C. Stebbins and Karen Kirkpatrick. The lands immediately north and south of the Southern California Edison Vestal Substation have all been recently plowed to ready for new plantings. The lands to the west were planted to grapes. The lands east of the substation (and east of the railroad) were planted to wheat on the survey date" (Stebbins 1991). "Site is now an orange grove. In 1990, land to north and south of site had been plowed to ready for new plantings. Lands to the west have been planted to grapes, while lands to the east were planted to wheat" (CNDDDB 2010).

Current Status/Habitat Conditions: Although no populations were observed in the most recent site visit in 2010, fair to moderate habitat was observed on lands owned by SCE directly South of Vestal substation.

Trend/Threats: Extirpated

Land Ownership: Private

Land Use: Agriculture, utilities, railroad



Species: *Pseudobahia peirsonii*
Status: Extirpated
Trend: Extirpated

CNDDDB E.O. Number: 7
Last Site Visit: Sep. 2, 1992
Plants Last Seen: 1974

Other Pop. Number: ST 7
By: Woodward-Clyde Consultants
Mapping Precision: Non-Specific

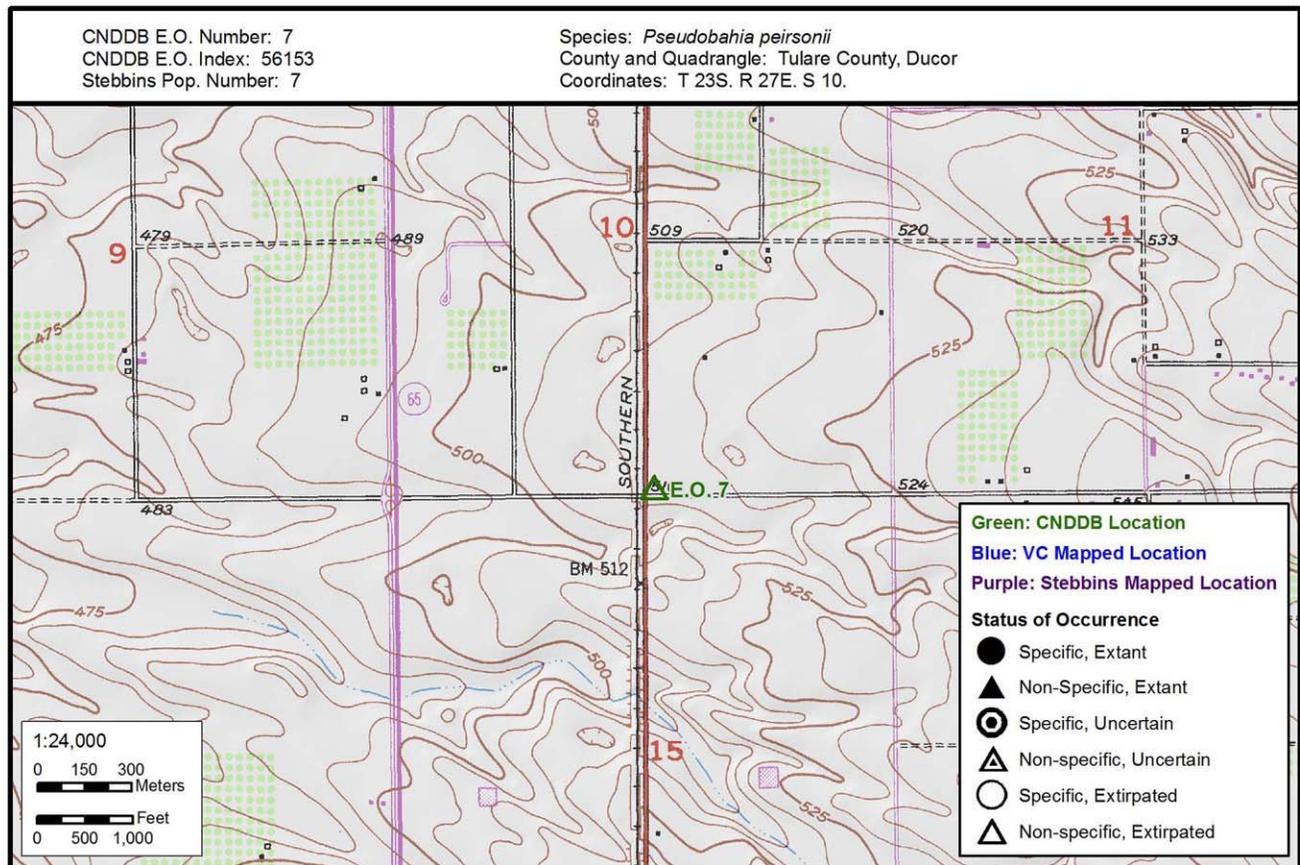
Past Documentation: "Tulare County, grassy flat, Ducor, P.A. Munz 9038, 20 March, 1925 (POM, UC), Type Speciment; Other Documentation: Ducor to Terra Bella, Tulare County, F.W. Peirson 5550, 20 March 1920 (CAS), Holotype; Tulare County, near Terra Bella, L.R. Abrams 10848, 28 March, 192 (CAS). Focused Biological Surveys for 8 Target Species in Tulare County, Woodward-Clyde Consultants 1992-09-02" (Stebbins 1991).
Past Status/Habitat Conditions: "Extirpated virtually all of the lands in the vicinity of Ducor north to Terra Bella have been converted to intensive agriculture. The area was surveyed by John Stebbins and Karen Kirkpatrick on 7 April, 1990. The immediate Ducor area is heavily agricultural except for the vacant ruderal lands within or near to the town. The most likely site for the collections, based upon the described soils is intensively farmed (USDA 1981). Virtually no habitat exists along Road 236 between Ducor and Terra Bella. The Terra Bella area contains no suitable habitat either, as all lands are agricultural. Virtually all of the lands in the vicinity of Ducor north to Terra Bella have been converted to intensive agriculture" (Stebbins 1991). "Site is extirpated" (CNDDDB 2010).

Current Status/Habitat Conditions: Extirpated, conditions unsuitable

Trend/Threats: Extirpated

Land Ownership: Private

Land Use: Agriculture (grains, row crops, citrus)



Species: *Pseudobahia peirsonii*
Status: Extirpated
Trend: Extirpated

CNDDDB E.O. Number: 8
Last Site Visit: 1992
Plants Last Seen: 1974

Other Pop. Number: ST 8
By: Woodward-Clyde Consultants
Mapping Precision: Non-specific

Past Documentation: "Tulare County, 4 miles southeast of Porterville", W.B. Richardson 84, 28 March, 1935 (UC)" (Stebbins 1991). "Focused Biological Surveys for 8 Target Species in Tulare County, Woodward-Clyde Consultants 1992-09-02" (CNDDDB 2010).

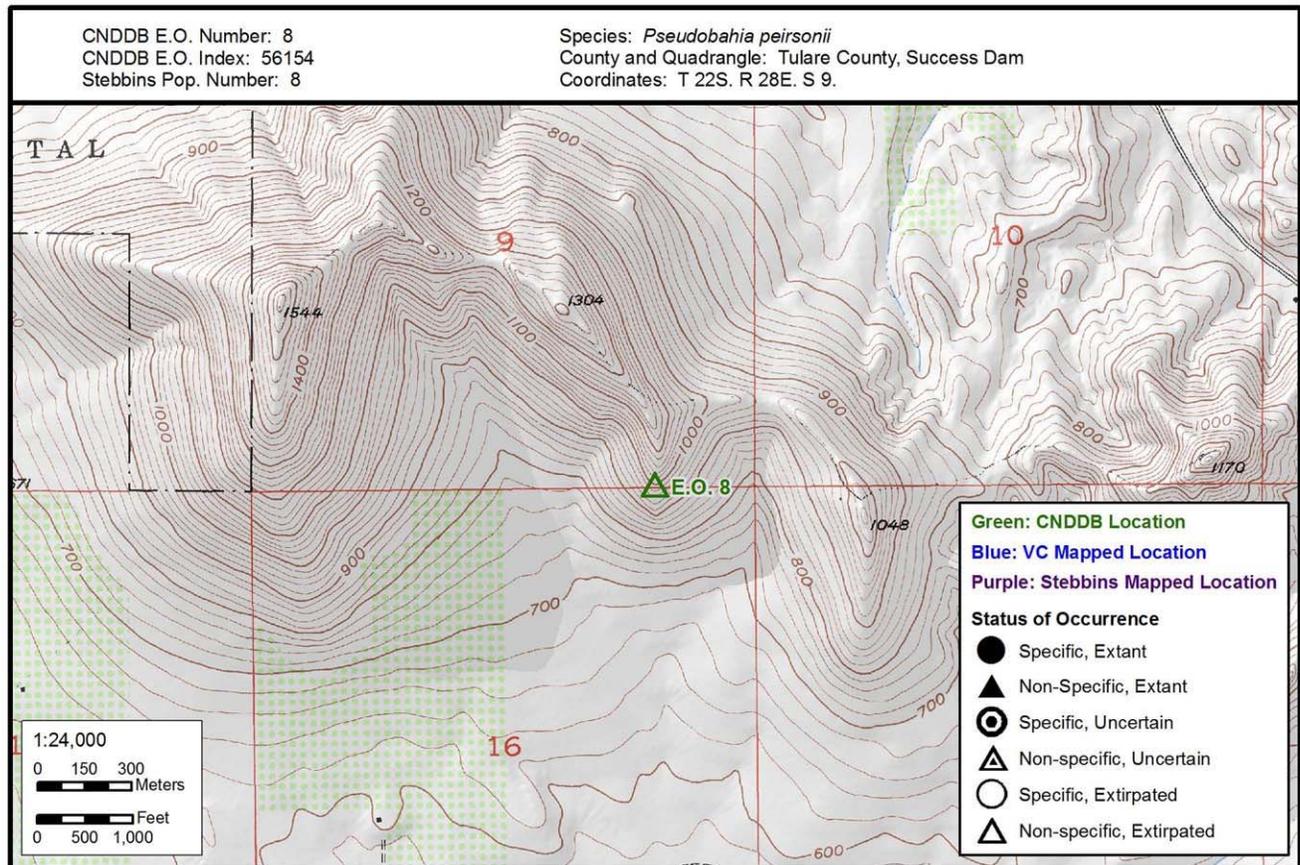
Past Status/Habitat Conditions: "Extirpated, most lands in the vicinity have been converted to irrigated agriculture (citrus, olives). The lands where the collection most likely was made (Deer Creek Valley) are currently being intensively farmed. John Stebbins and Karen Kirkpatrick surveyed the general area on 8 April, 1990 and were unable to find any *P. peirsonii* plants. Based upon the available published soil maps, the west slope of Tennessee Knob was also surveyed without success, although access was denied on some of the lands. Some suitable habitat exists also on the southeast slope, but access was denied on the survey date" (Stebbins 1991). "Most lands in this vicinity have been converted to intensive agriculture. Site is extirpated" (CNDDDB 2010).

Current Status/Habitat Conditions: Extirpated

Trend/Threats: Extirpated

Land Ownership: Private

Land Use: Agriculture (orchards)



Species: *Pseudobahia peirsonii*
Status: Extirpated
Trend: Extirpated

CNDDDB E.O. Number: (9)
Last Site Visit: Apr. 2010
Plants Last Seen: 1952

Other Pop. Number: ST 9
By: John Stebbins
Mapping Precision: Non-specific

Past Documentation: "Tulare County, 9 miles east of Porterville on road to Springville, Rimo Bacigalupi and J. MacBride 3559, 28 March, 1952 (FSC, JEPS, UC)" (Stebbins 1991).

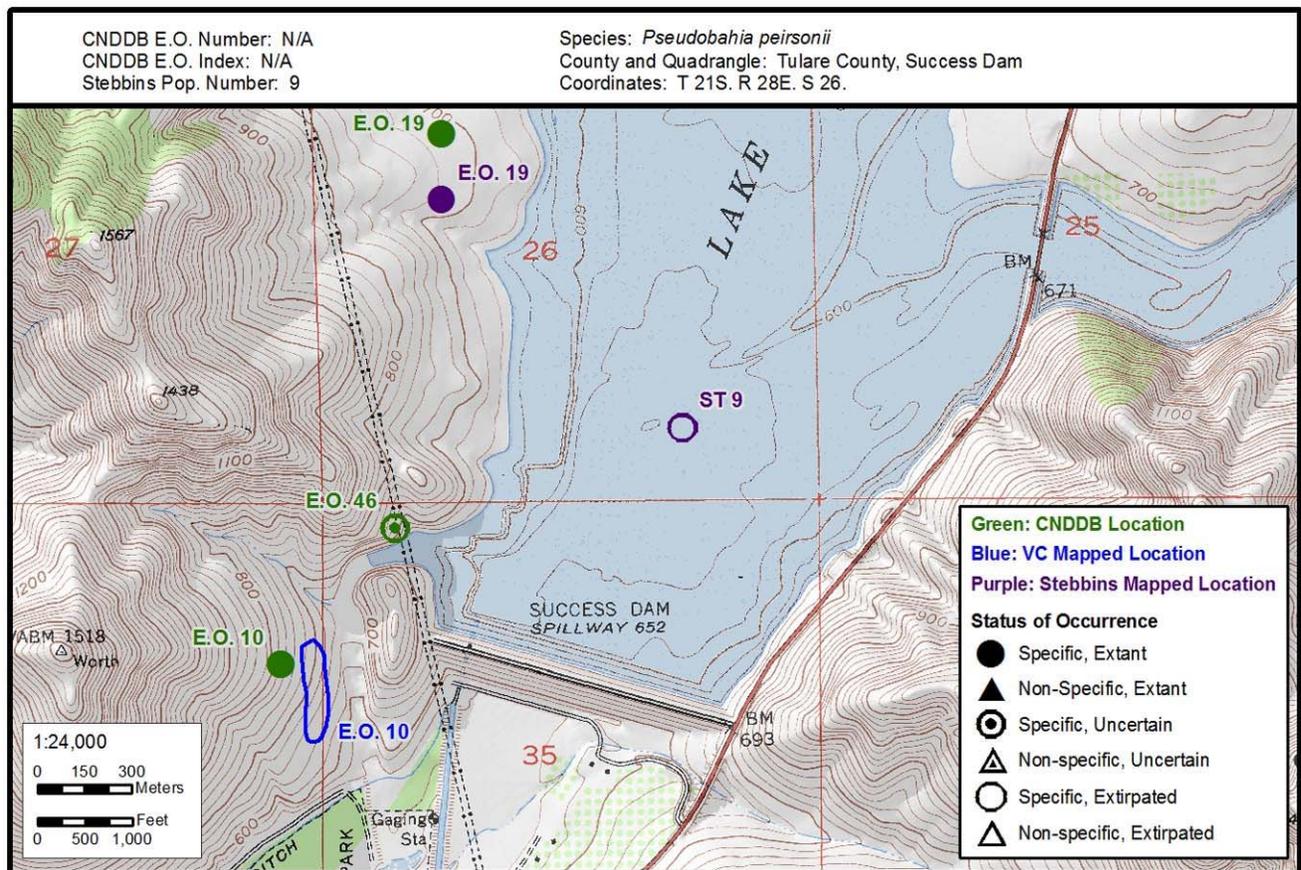
Past Status/Habitat Conditions: Extirpated, this site is now covered by Lake Success which was built in 1962. The collection was probably made along the road to Springville, which went through the large valley flooded by the reservoir. Reservoir, the area was extensively surveyed on 22 March, 1990 by John Stebbins. Undoubtedly, the collection was made from the heavy Porterville clay soils that are widespread in the valley. This general surrounding area has also been surveyed several times within the past six years to document any nearby populations that still exist in the vicinity" (Stebbins 1991).

Current Status/Habitat Conditions: Extirpated

Trend/Threats: Extirpated

Land Ownership: US Army Corps of Engineers P.O. Box 1072, Porterville, CA

Land Use: Reservoir, recreation



Species: *Pseudobahia peirsonii*
Status: Extant
Trend: Stable

CNDDDB E.O. Number: 10
Last Site Visit: 2010
Plants Last Seen: 2010

Other Pop. Number: ST 10
By: J. Stebbins and C. Kronberg
Mapping Precision: Specific

Past Documentation: "Tulare County, along road to Success Dam, 0.15 miles north of Bartlett Park and 0.35 miles below the spillway, CNDDDB Report by Jim Shevock based upon an observation made on 23 March, 1985. No herbarium collection was made. The site was later surveyed and approximately 100 plants were verified, John C. Stebbins and Charles Kronberg 85030, 6 April, 1985 (FSC); Other Documentation: John C. Stebbins 90-020, 22 March, 1990, (FSC)" (Stebbins 1991).

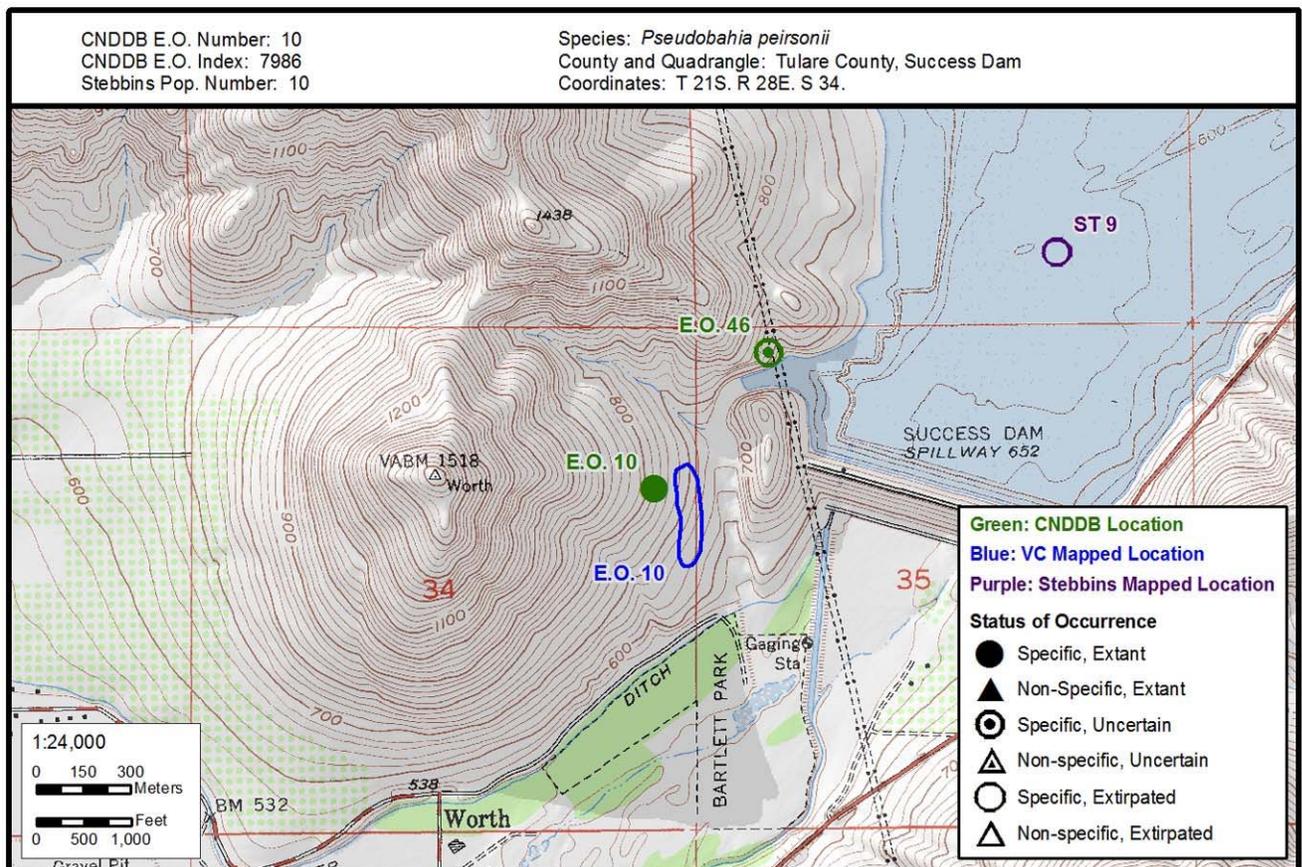
Past Status/Habitat Conditions: "Extant, a small population of 45 plants was observed on the survey date. The population is located in a very narrow strip on the north side of the road between the upper roadside "spray zone" and the fenceline. The individual plants were very depauperate and each had only one or two small flowers. The dry season and aggressive competition from the numerous ungrazed "weedy" associates was obviously a factor contributing to the poor overall condition of the population. No plants were observed on the inside of the fenceline in the extremely overgrazed grassland. The common associates in the ruderal non-native grassland included *Amsinckia intermedia*, *Avena barbata*, *Bromus diandrus*, and *B. rubens*. The grassland included *Amsinckia intermedia*, *Avena barbata*, *Bromus diandrus* and *B. rubens*. The soil is classified as Porterville clay (USDA, 1981)" (Stebbins 1991).

Current Status/Habitat Conditions: Population of 40 plants identified immediately west of CNDDDB occurrence. Population is within ¼ mile of previous population, but is not connected to original population. Original population was not observed. Area heavily modified.

Trend/Threats: Population is stable. Roadside maintenance, including spraying, slope stabilization and scraping

Land Ownership: Donald Callison, 354 W. Morton, Porterville, CA 93257

Land Use: Roadside right of way



Species: *Pseudobahia peirsonii*
Status: Extirpated
Trend: Extirpated

CNDDDB E.O. Number: 11
Last Site Visit: 1990
Plants Last Seen: 1897

Other Pop. Number: ST 11
By: John Stebbins
Mapping Precision: Non-specific

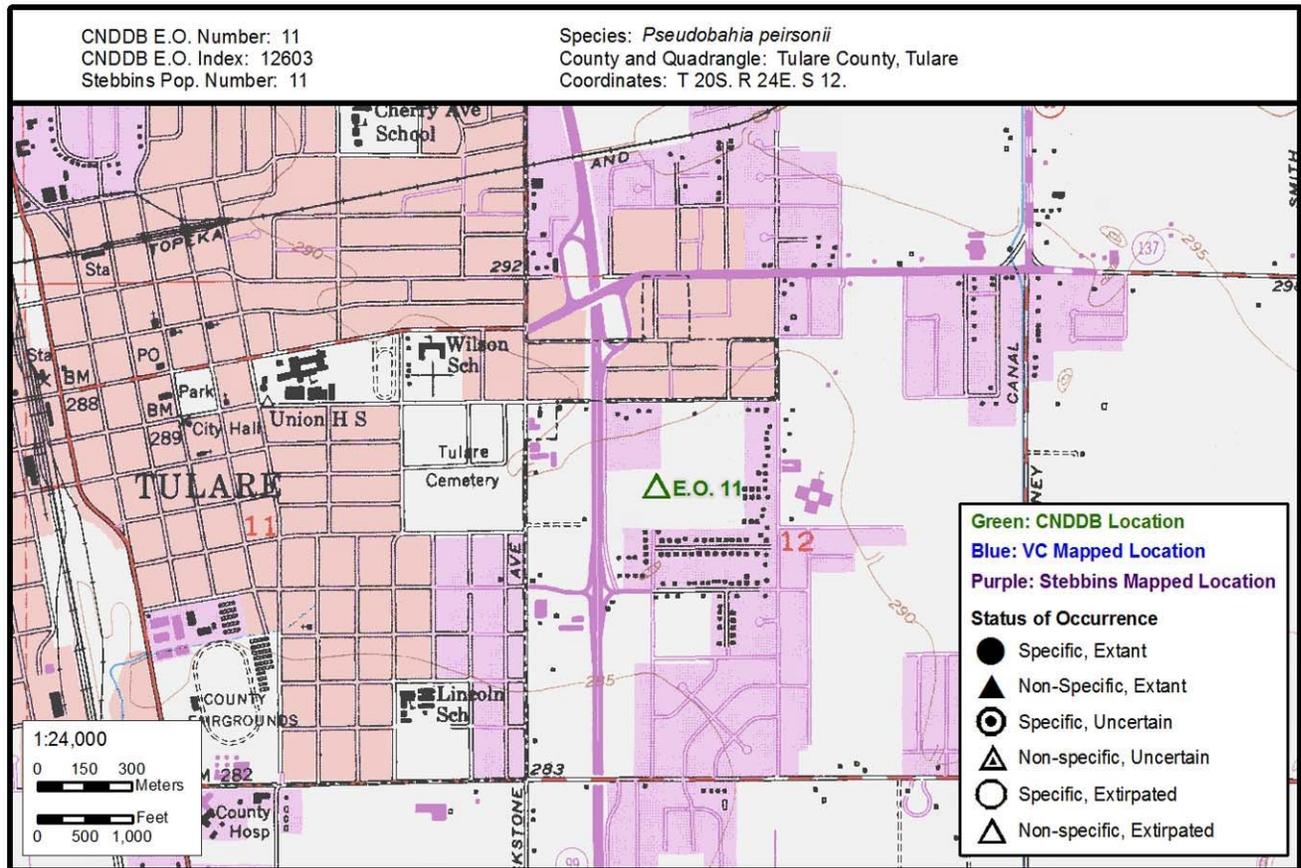
Past Documentation: "Tulare County, Tulare, J. Burt Davy s.n., pril, 1897 (UC), paratype" (Stebbins 1991).
Past Status/Habitat Conditions: "Extirpated, no habitat remains in the vicinity of Tulare, all lands have been converted over to intensive agriculture. Ruderal and agricultural lands dominate the landscape in the vicinity of Tulare. Based upon the soil conditions and the historic date of the collection it seems likely that the actual location was probably further east in the vicinity of Porterville or southeast near Ducor-Terra Bella." (Stebbins 1991).

Current Status/Habitat Conditions: Extirpated

Trend/Threats: Extirpated

Land Ownership: Private

Land Use: Agriculture, housing



Species: *Pseudobahia peirsonii*
Status: Presumed Extirpated
Trend: Presumed Extirpated

CNDDDB E.O. Number: 12
Last Site Visit: 2010
Plants Last Seen: 1953

Other Pop. Number: ST 12
By: John Stebbins
Mapping Precision: Non-specific

Past Documentation: "Tulare County, Exeter on Rocky Hill", H.E. and S.T. Parks 0435, 12 April, 1930 (DS)" (Stebbins 1991).

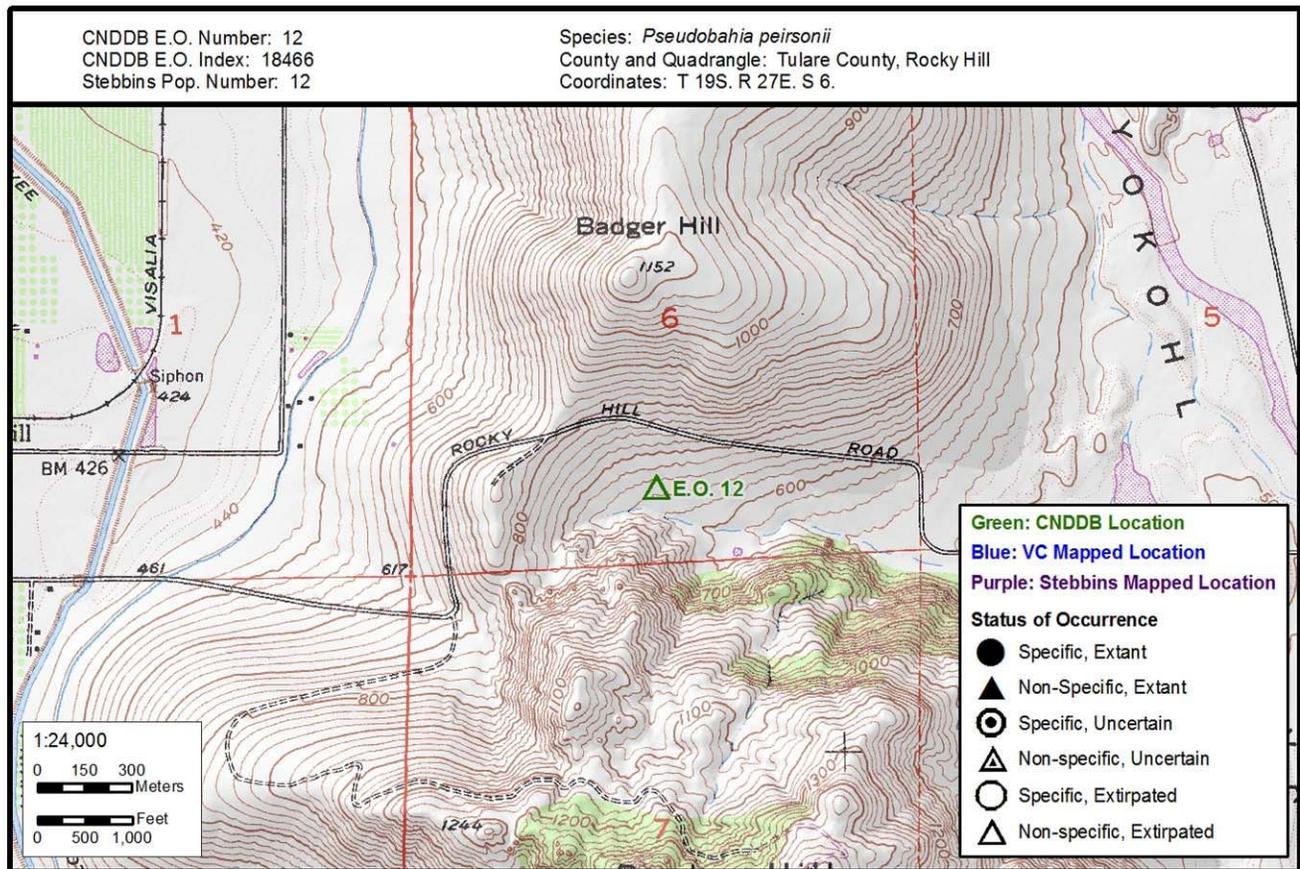
Past Status/Habitat Conditions: "Presumed extirpated, all of the area in the immediate vicinity of Exeter has been converted to agriculture, primarily citrus and Olives. The reference to Rocky Hill indicates that the collection perhaps was made in the Yokohl Valley area. Suitable heavy clay soils are widespread in that valley. Extensive surveys made in April 1990 by Karen and Greg Kirkpatrick in Sections 1, 12, 5, 6, and 7 failed to locate the species. Significant expanses of non-native grassland habitat are still present in the valley but it is rapidly being converted to smaller acreage "ranch type" uses. No other collections or observations since the 1930 record are available." (Stebbins 1991). Site was visited in 2010, no plants observed.

Current Status/Habitat Conditions: No suitable habitat on site. Suitable habitat still exists nearby but no access permitted.

Trend/Threats: Population is presumed extirpated because there is no suitable habitat on site.

Land Ownership: Private

Land Use: Agriculture



Species: *Pseudobahia peirsonii*
Status: Extirpated
Trend: Extirpated

CNDDDB E.O. Number: 13
Last Site Visit: Apr 8, 1990
Plants Last Seen: 1927

Other Pop. Number: ST 13
By: John Stebbins
Mapping Precision: Non-specific

Past Documentation: "Tulare County, Dinuba, A.B. Bevans s.n., 11 April, 1927 (CAS)" (Stebbins 1991).

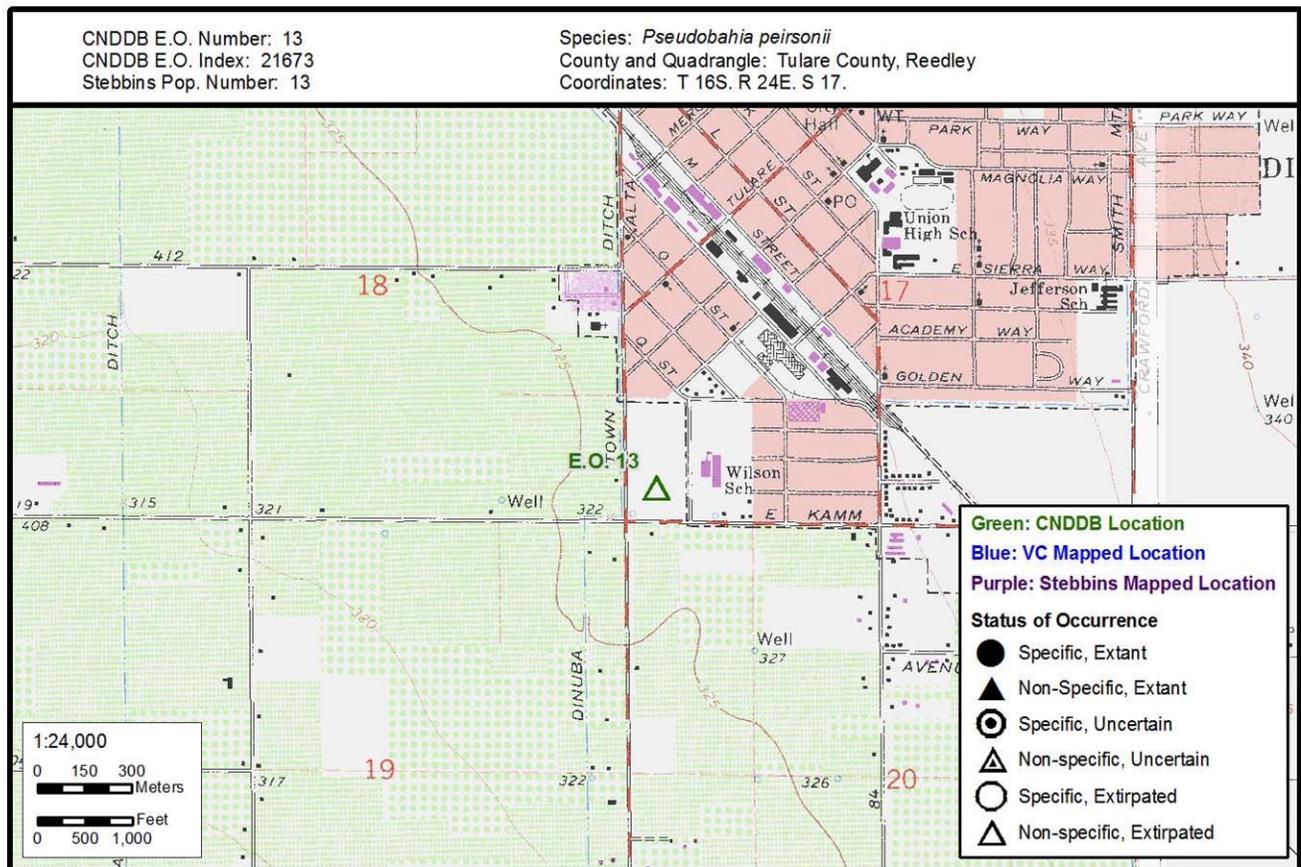
Past Status/Habitat Conditions: "Extirpated, all lands in the vicinity of Dinuba have been converted to intensive agriculture. Reconnaissance level surveys were performed in the area by John Stebbins on 8 April, 1990. Irrigated agricultural lands completely dominate the region. Virtually no natural habitat remains in the area. The most likely site of the collection, about 0.5 miles southeast of Dinuba, is given over to vineyards and citrus orchards" (Stebbins 1991).

Current Status/Habitat Conditions: Extirpated; area is intensive agriculture and housing.

Trend/Threats: Extirpated

Land Ownership: Private

Land Use: Agriculture



Species: *Pseudobahia peirsonii*
Status: Extant
Trend: Declining?

CNDDDB E.O. Number: 14
Last Site Visit: Mar 18, 2010
Plants Last Seen: Mar 18, 2010

Other Pop. Number: ST 14
By: John Stebbins
Mapping Precision: Specific

Past Documentation: "Fresno County, Charles Quibell 4158, 28 March, 1932 (FSC); Other Documentation: Elroy Robinson s.n., 21 April, 1935 (FSC); Saddle between Campbell and Jesse Morrow Mountains, John Weiler, 6 April, 1978; Dean Taylor, Dan Pearson, and John C. Stebbins, 8 April, 1986 (UC)" (Stebbins 1991).

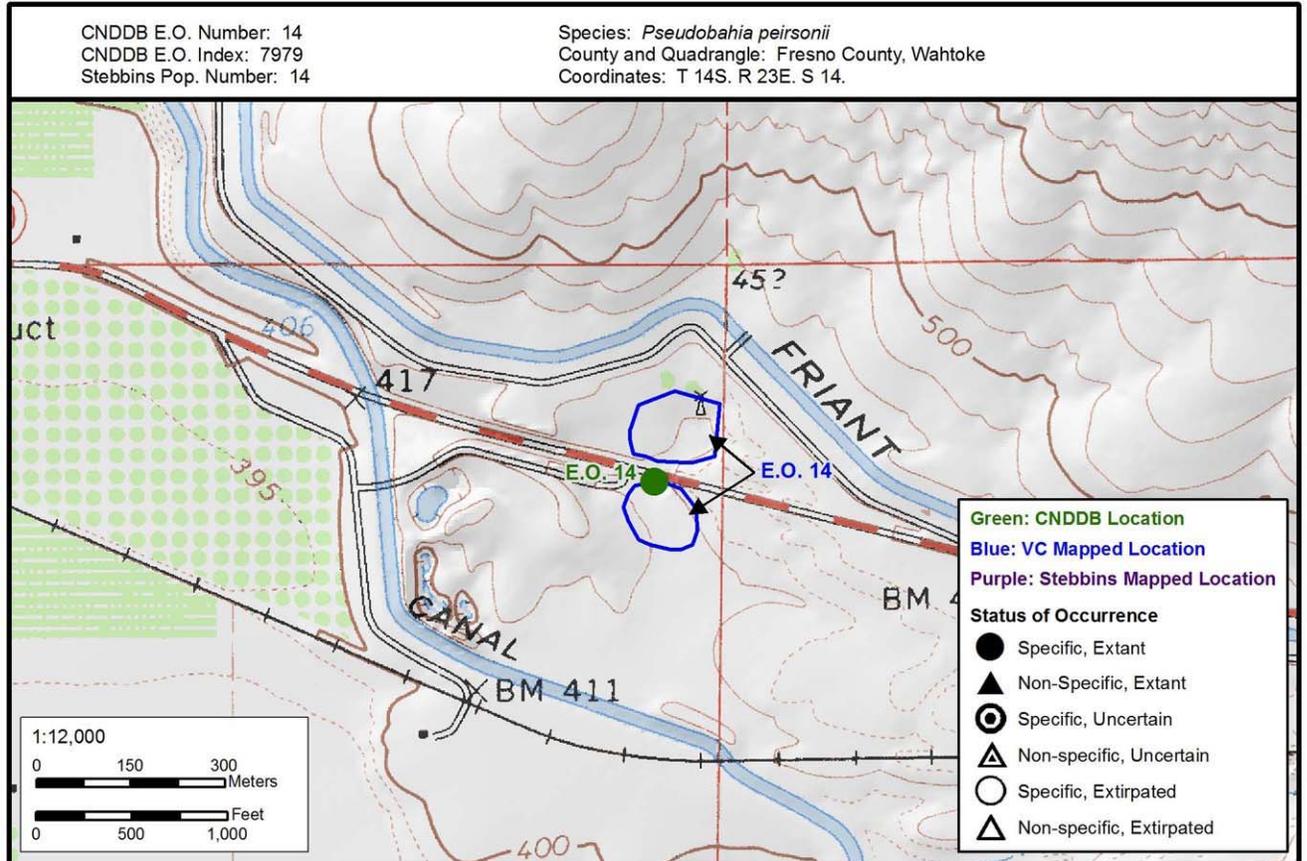
Past Status/Habitat Conditions: "Extant, plants present on north and south side of Highway 180. The entire site and surrounding areas were surveyed on 27 March, 1990 by John Stebbins and Brad Valentine (CalTrans biologist). Population A contains approximately 350 plants growing mostly on the flat above the embankment. The habitat is a heavily disturbed, non-native grassland dominated by *Avena fatua*, *Brassica kabera*, *Silybum marianum* and *Matricaria matricarioides*. Some plants are located on the Highway 180 easement. Population B contains approximately 300 plants growing on a gentle slope dominated by *B. kabera*, *Amsinckia intermedia*, *Avena fatua* and *Erodium cicutarium*. Both populations have been impacted by very heavy grazing, soil disturbance related to road stabilization work and cattle pasturing. The soil at the site is Porterville clay" (Huntington 1971). "Runoff from Highway 180 is flowing downslope into population B" (Stebbins 1991).

Current Status/Habitat Conditions: Confirmed population estimate of approximately 400 plants in the northern region and 200 plants in the southern. Associated species include many non-natives, including *Silybum*, *Hirschfeldia* and *Avena*. Populations were observed interspersed with many nonnative species on the northern and southern sides of Highway 180. However, the northern side may potentially be impacted by proposed RMC gravel project.

Trend/Threats: Population is possibly declining. Major threats include RMC cement and gravel project on Jesse Morrow Mountain. Another possible threat is road improvements and/or widening of Highway 180.

Land Ownership: RMC Pacific Materials, Inc., 5180 Golden Foothill Parkway 200, Eldorado Hills, CA 95762

Land Use: Cattle grazing, highway right of way



Species: *Pseudobahia peirsonii*
Status: Presumed Extant
Trend: Presumed Declining

CNDDDB E.O. Number: 15
Last Site Visit: Mar 24, 2010
Plants Last Seen: 1994

Other Pop. Number: ST 15
By: John Stebbins
Mapping Precision: Specific

Past Documentation: “R. Bansberg 1085, 2 May 1929 (FSC); Fresno County, John Weiler 65018, 6 April, 1965 (UC); Other Documentation: East side of Academy Avenue, 0.8 miles south of Shepherd Avenue and 0.013 miles north of the Friant Kern Canal in pasture between a house and the road, John C. Stebbins and Barbara M. Leitner 90-011, 30 March, 1990 (FSC, UC)” (Stebbins 1991).

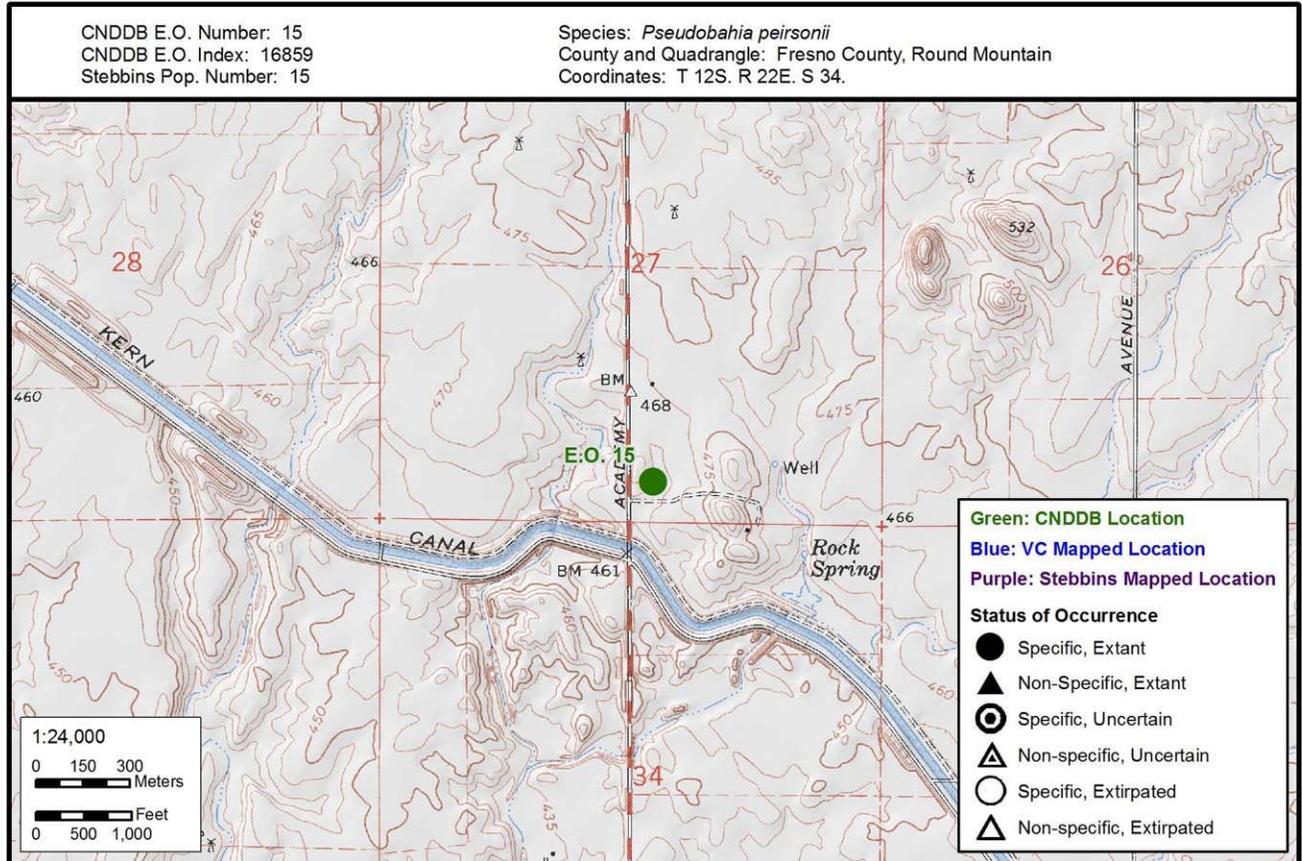
Past Status/Habitat Conditions: “Non-native grassland that is being used as a cattle pasture. Only a few calves were present on the survey date. The soil at the site is classified as Centerville Clay (Huntington, 1971). The most common associated species were *Avena fatua*, *Brassica kaber*, *Lupinus bicolor*, *Achyrachaena mollis*, *Amsinkia intermedia* and *Erodium cicutarium*. This population likely represents a relictual remnant of what historically was a large population on the heavy clay soils extending over a mile north to near Highway 168. Most of the habitat on the east side of Academy Avenue has been farmed (oats and barley), and more recently subdivided into several small ranch type homes” (Stebbins 1991). “Largest population seen in 1974. Population not relocated in 1985 survey. Approximately 350 plants seen in 1990, 100 in 1994” (CNDDDB 2010).

Current Status/Habitat Conditions: No plants were observed in the area east of Academy near FK Canal, likely due to previous disking of the landscape and a high presence of non-native species. Presence of the species is assumed present but most likely declining because the habitat is present but appeared to have been disked a few years ago.

Trend/Threats: The population is presumed declining and is threatened by agricultural and residential development and road widening. Incremental degradation due to competition from aggressive ruderal species is a potential problem.

Land Ownership: Johntz Enterprises LLC, 2116 Arlington Ave. #302, Los Angeles, CA

Land Use: Cattle pasture, well site



Species: *Pseudobahia peirsonii*
Status: Extant
Trend: Stable

CNDDDB E.O. Number: 16
Last Site Visit: Apr. 4, 2010
Plants Last Seen: Apr 4, 2010

Other Pop. Number: ST 16
By: John Stebbins
Mapping Precision: Specific

Past Documentation: “Fresno County, about 1.0 miles west of Round Mountain and 0.5 miles east of Friant-Kern Canal, observation by John Weiler in 1974 according to CNDDDB records; L. Honeysett s.n., 17 March, 1977 (UC); Fresno County, 0.5 miles northwest of Round Mountain, south of Hog Creek. On dark heavy clay soil at 475 feet, John C. Stebbins, Dean W. Taylor and Dan Pearson 8770, 8 April, 1986 (UC). The site was surveyed on 4 April, 1990 by John Stebbins and Rosalie Faubion (Biologist for BOR)” (Stebbins 1991).

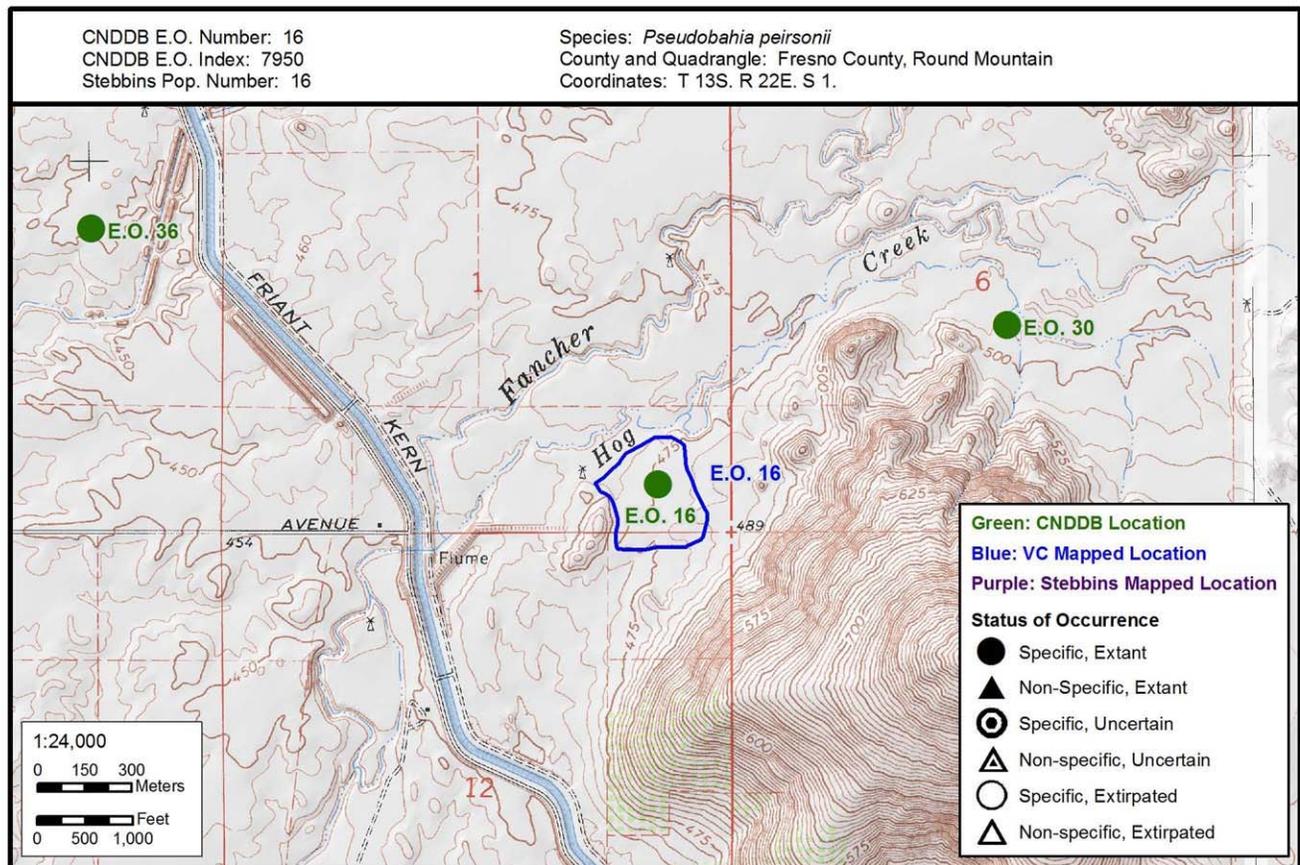
Past Status/Habitat Conditions: “Extant, about 4,500 plants over 42 acres were observed on the survey date. Non-native valley grassland dominated by *Achyrachaena mollis*, *Brassica kaber*, *Hordeum geniculatum*, *Lepidium nitidum*, *Bromus rubens*, and *Amsinckia intermedia*. The area has been routinely grazed at relatively moderate levels during the past five years (pers. obs. by John Stebbins). The entire population is located on very heavy Porterville clay soils (Huntington, 1971).” (Stebbins 1991). “1200 plants seen in 1986, 1000 in 1987, 3000 in 1989, 4500 in 1990, approximately 300 in 2008. 40% of this 42 acre population would be impacted by proposed Fancher Creek Reservoir Project” (CNDDDB 2010). Reservoir is now in place but has never been filled to impact population.

Current Status/Habitat Conditions: Approximately 5,000 individuals are scattered over about 40 acres on grazed and ungrazed parcels. The population appears to be stable and protected except for the possibility of an unusual flood event that could cover portions of the present population.

Trend/Threats: Population is stable. Threats include possible flood events.

Land Ownership: Fresno Flood Control in cooperation with CDFG

Land Use: Cattle grazing



Species: *Pseudobahia peirsonii*
Status: Extirpated
Trend: Extirpated

CNDDDB E.O. Number: 17
Last Site Visit: 2010
Plants Last Seen: 1986

Other Pop. Number: ST 17
By: John Stebbins
Mapping Precision: Non-specific

Past Documentation: "Tulare County, five miles east of Ducor, Note: This location is based upon a CNDDDB record of an observation at the site, however, no specifics about the reference are available. No herbaria records canvassed during this study cited the location. The general area is fairly close to the type locality, and the heavy clay soils required by the species are present. It is reasonable to assume that the observation was valid. The entire area was surveyed by John Stebbins and Karen Kirkpatrick on 7 April, 1990" (Stebbins 1991).

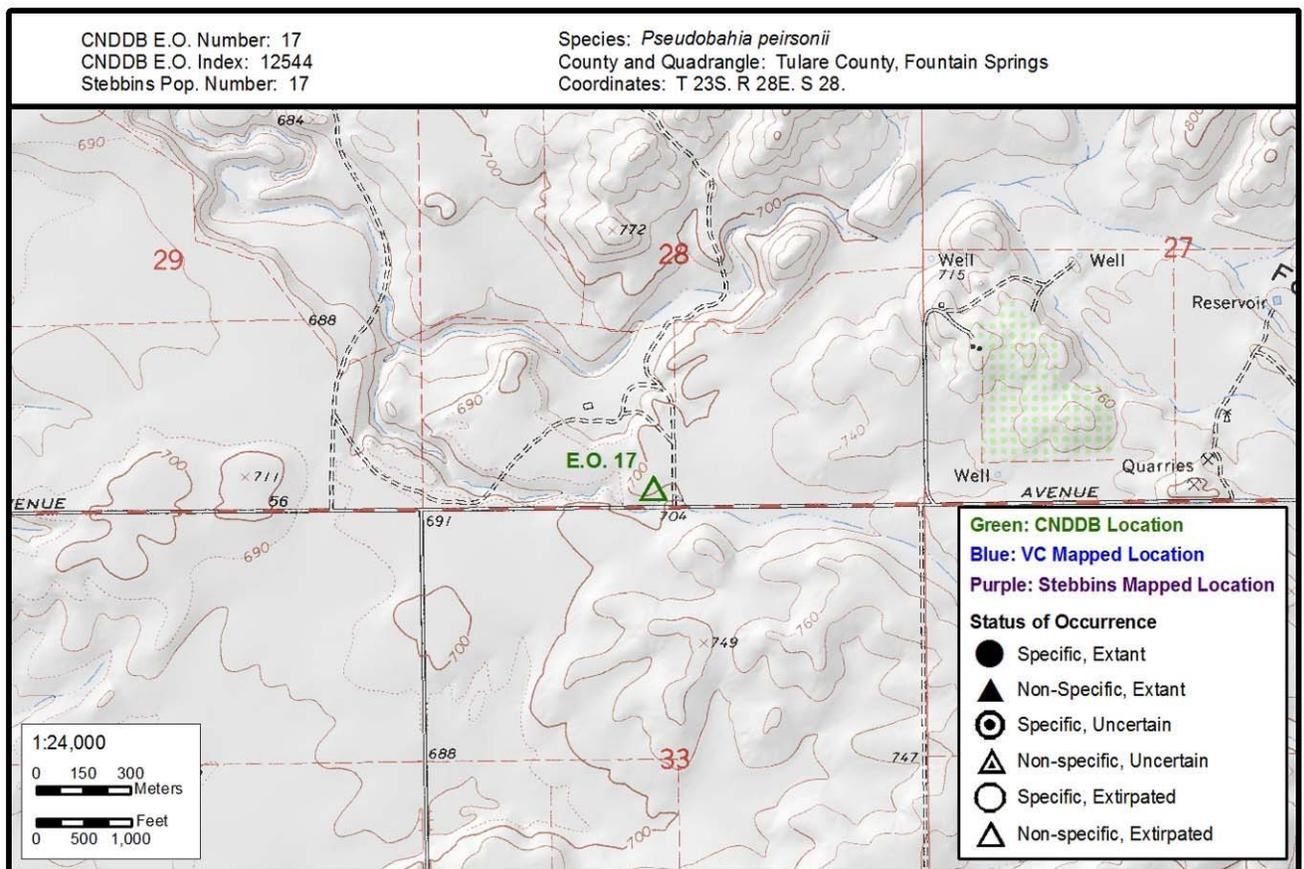
Past Status/Habitat Conditions: "Extirpated, most lands in the vicinity have been converted to intensive agriculture (oats, barley, wheat). Almost all lands in the general area are currently under agriculture. Approximately ten acres in Section 28 are uncultivated but the species was not observed on the survey date. The general area was also searched at a reconnaissance level in 1986 without success" (Stebbins 1991).

Current Status/Habitat Conditions: Surveyed in 2010; no habitat.

Land Use: Intensive agriculture (wheat)

Trend/Threats: Extirpated

Land Ownership: Private



Species: *Pseudobahia peirsonii*
Status: Extant
Trend: Stable

CNDDDB E.O. Number: 18
Last Site Visit: Mar. 30, 2010
Plants Last Seen: Mar. 30, 2010

Other Pop. Number: ST18
By: John Stebbins
Mapping Precision: Specific

Past Documentation: “Kern County, south-facing lower slope of Pyramid Hill due north of Rancheria Road, James R. Shevock (with Jack Zaninovich) 10149, 25 February, 1983 (CAS). Other documentation: Karen Kirkpatrick 90-01, 18 March, 1990 (FSC, UC). The site was visited again on 7 April, 1990 by Karen Kirkpatrick and John Stebbins” (Stebbins 1991).

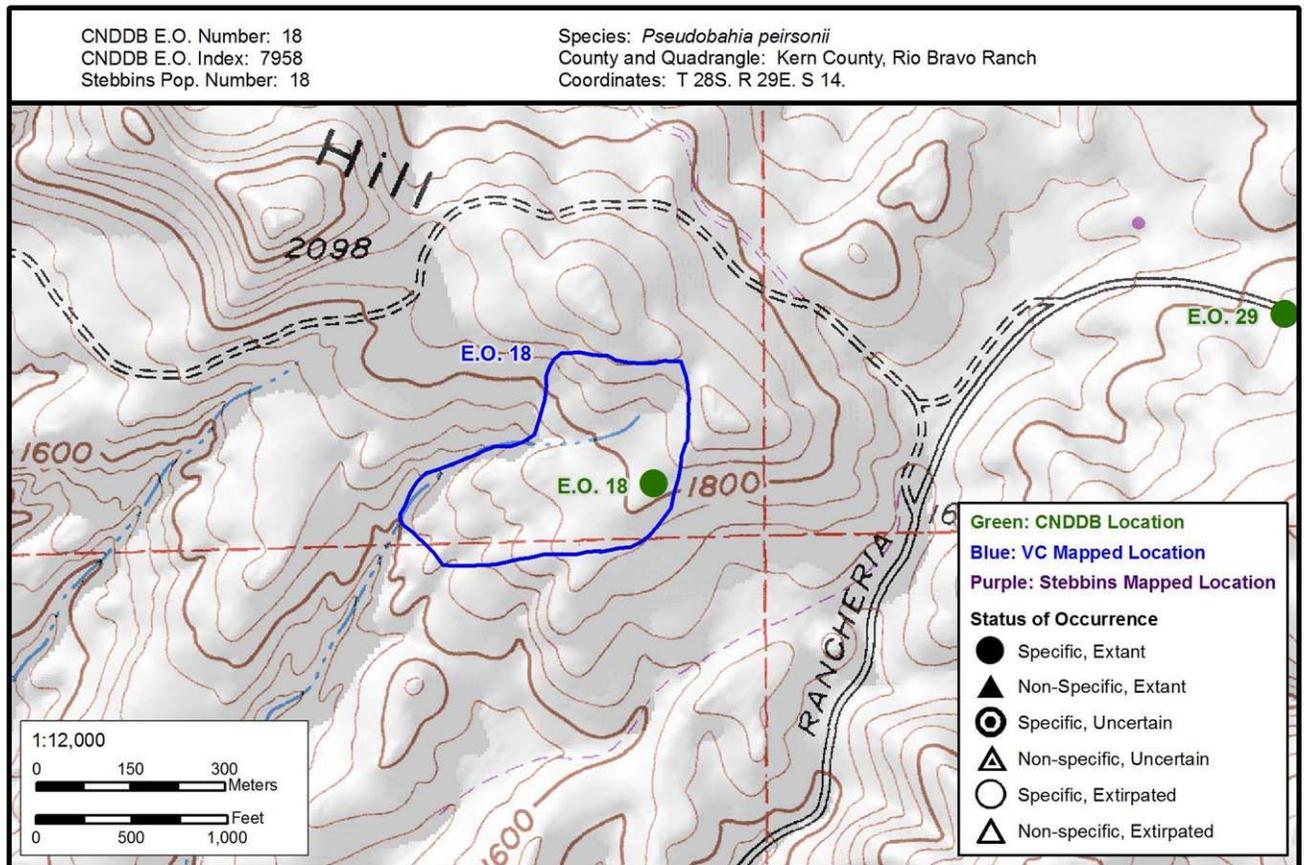
Past Status/Habitat Conditions: “Approximately 3,500 plants spread over 35 acres were observed on March 18, 1990. The site is a non-native grassland dominated by *Dichelostemma pulchella*, *Lepidium nitidum*, *Erodium cicutarium*, *Amsinckia intermedia*, and *Bromus rubens*. All of the plants were observed on south-facing gentle slopes in an area of heavy, cracked, clay soils. The rare species, *Fritillaria striata*, was also observed at the site growing on the same soils, but generally on the lowest portions of the slopes. The area has been routinely grazed and some trampling damage from cattle was noted. The overall site quality was rated as good” (Stebbins 1991).

Current Status/Habitat Conditions: Approximately 10,000 plants were observed during 2010 site visit. The rare plants *Fritillaria striata* and *Erodium macrophyllum* were also observed in 2010. Pyramid Hill site is the “best population” in terms of size, habitat quality, and defensibility.

Trend/Threats: Population is stable. Major threats include any potential changes in current grazing regime and incidental impacts from a new road alignment project downslope from the population (see map).

Land Ownership: Kenneth Mebane Ranches, PO Box 80055, Bakersfield, CA 93380

Land Use: Cattle grazing



Species: *Pseudobahia peirsonii*
Status: Presumed Extant
Trend: Presumed Declining

CNDDDB E.O. Number: 19
Last Site Visit: 2010
Plants Last Seen: Apr. 17, 2006

Other Pop. Number: ST19
By: John Stebbins
Mapping Precision: Specific

Past Documentation: "Tulare County, Mr. and Mrs. Henry Ramsey, 14 April, 1938 (RSA); Tulare County, near overflow camping area for north shore of Lake Success. Growing on dark clay soil in heavily grazed grassland at 750 feet, John C. Stebbins, 6 April, 1985 (FSC); Dean Taylor, John Stebbins, and Dan Pearson, 8 April, 1986 (JEPS, UC); Two reports of species at this location by Jim Shevock to the CNDDDB in 1983 and 1985 were mapped separately and are combined in this report. A field survey of this location was made on 22 March, 1990 by John Stebbins and Ann Howald of the CDFG. Other Documentation: John C. Stebbins, 22 March, 1990 (FSC, UC). Likely a small relictual remnant of the large historical concentrations of *P. peirsonii* that existed on the heavy clay soils in Success Valley before the ... reservoir" (Stebbins 1991). "150 plants were observed by Cypher in 2002. 30 plants were observed by Beyerl in 2006" (CNDDDB 2010).

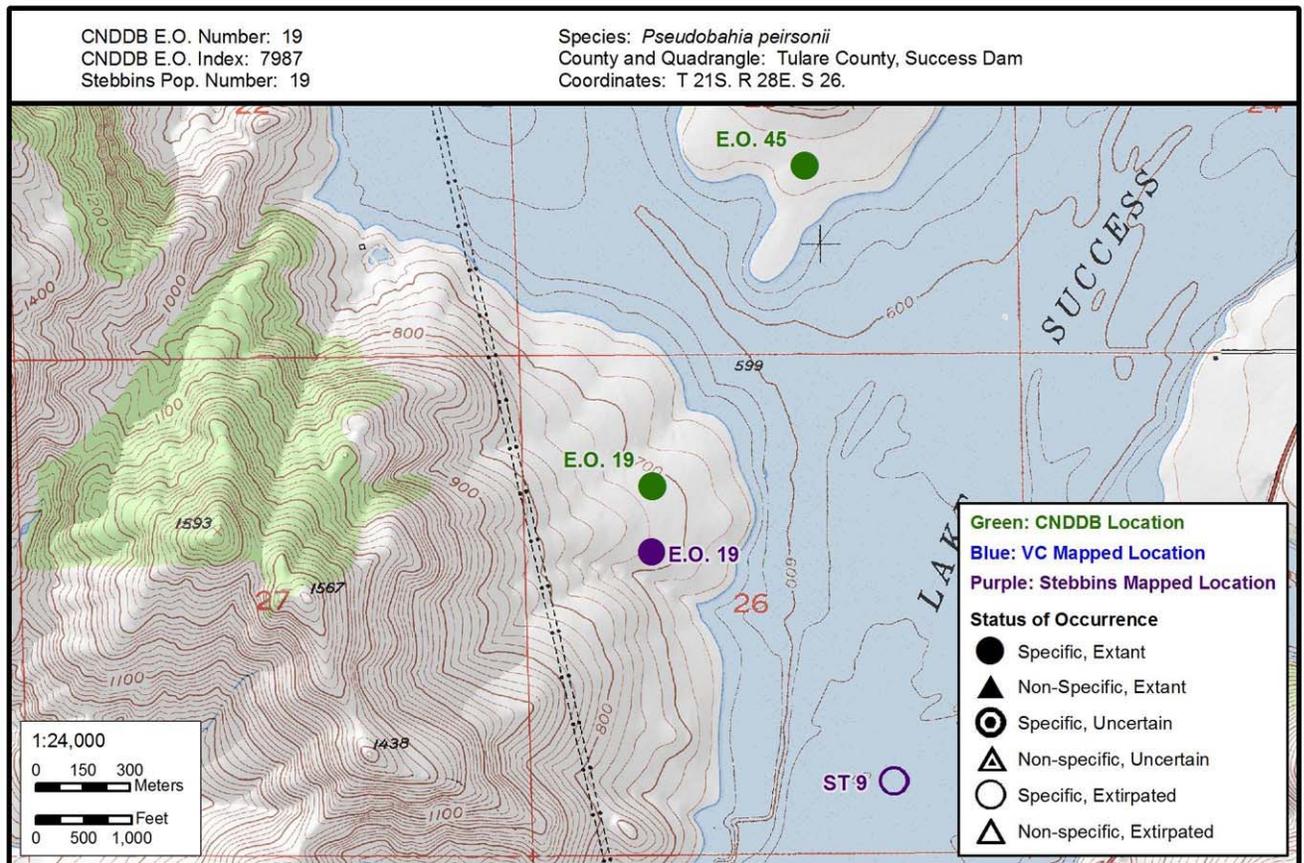
Past Status/Habitat Conditions: "Approximately 200 plants spread over three acres were observed on March 22, 1990. The site is a non-native grassland dominated by *Brassica nigra*, *Avena fatua*, *Capsella bursa-pastoris*, *Amsinckia intermedia*, and *Silybum marianum*. The soils are classified as Porterville clay (USDA, 1981). The site has been heavily impacted by excessive cattle grazing, vehicular traffic, and erosion trenches dug into the slope. Incidental impacts...associated with the occupants of the nearby overflow campground were observed during earlier surveys, but this facility was closed in 1990" (Stebbins 1991).

Current Status/Habitat Conditions: No plants were observed in 2010. Site has been heavily modified.

Trend/Threats: Population is declining (or extirpated). Major threats include overgrazing, competition from ruderal species, land leveling, and recreational impacts. Another major threat includes the possibility that the level of Lake Success could be raised for increased water storage. In that event, the population could be inundated or the recreational impacts would be expected to be intensified.

Land Ownership: US Army Corps of Engineers, PO BOX 1072, Porterville, CA 93258

Land Use: Cattle grazing, recreation



Species: *Pseudobahia peirsonii*
Status: Uncertain
Trend: Presumed Declining

CNDDDB E.O. Number: 21
Last Site Visit: 1990
Plants Last Seen: 1985

Other Pop. Number: ST 20
By: John Stebbins
Mapping Precision: Specific

Past Documentation: "Tulare County, Lake Success south fork Tule River arm, one mile northeast of Mine Hill summit", Note: This record is based upon an observation of 31 depauperate plants made in 1985 by John Stebbins. No specimens were taken at the time due to the small size and poor status of the population. A follow-up survey made in 1986 failed to locate any plants at the site, another field survey was performed on 22 March, 1990 by John Stebbins and no plants were observed. The small observed population was likely a fragmented remnant of the once extensive populations of *P. peirsonii* that historically existed in Success Valley (see populations 9, 10 and 19)" (Stebbins 1990).

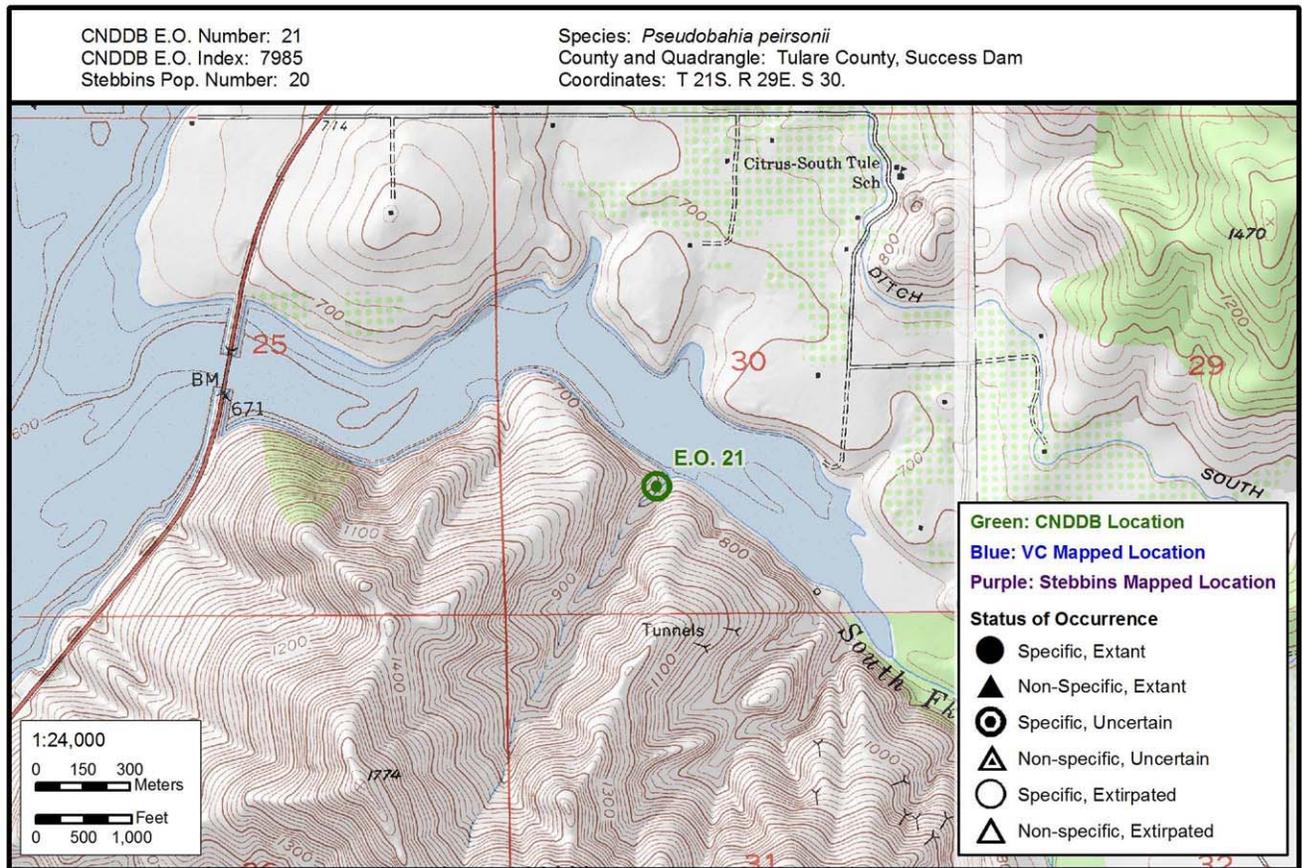
Past Status/Habitat Conditions: "Presumed extirpated, the site has become very degraded compared to earlier observations" (Stebbins 1990).

Current Status/Habitat Conditions: Site was not accessible in 2010. However, general conditions in site vicinity appear to be consistent with previous surveys.

Trend/Threats: Population is presumed declining. Potential threats include increasing water levels from Lake Success, erosion and recreational activities.

Land Ownership: Department of Defense and Army Corps of Engineers

Land Use: Grazing and recreation



Species: *Pseudobahia peirsonii*
Status: Extant
Trend: Stable

CNDDDB E.O. Number: 22
Last Site Visit: Mar. 29, 2010
Plants Last Seen: Mar. 29, 2010

Other Pop. Number: ST 21
By: John Stebbins
Mapping Precision: Specific

Past Documentation: “Kern County, along east side of Rancheria Road, 6.2 miles north of Junction with Highway 178, forty plants on black clay soil, Debbie Martin s.n. 4 April, 1986 (FSC). The site was surveyed on 17 March, 1990 by Karen Kirkpatrick and again on 4 April, 1990 by Karen Kirkpatrick and John Stebbins.” (Stebbins 1991).

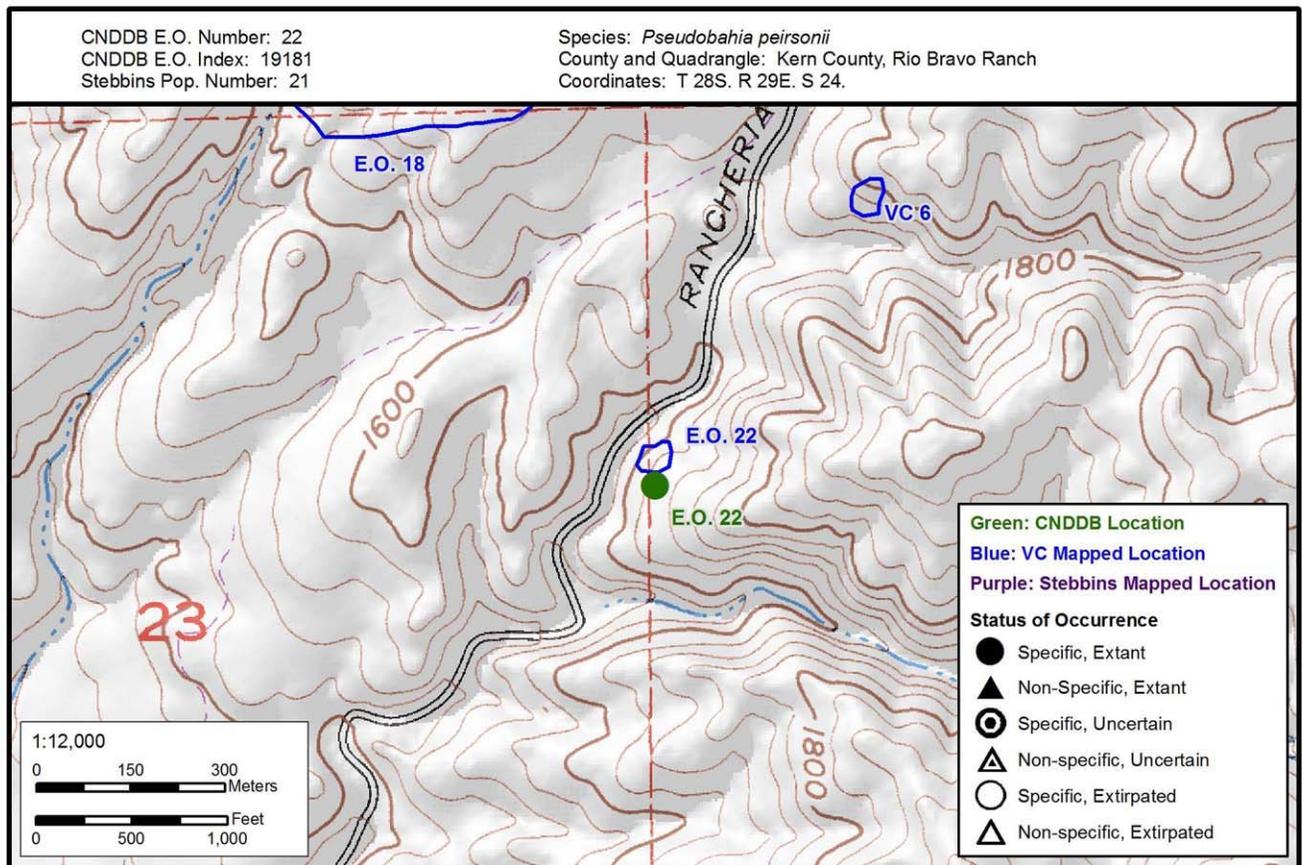
Past Status/Habitat Conditions: “Plant was presumed extirpated, but inconclusive in 1990. The area has been scraped, probably for fire control related to the road. Many “weedy” species dominated by *Grindelia camporum*, *Lactuca serriola*, and *Centaurea melitensis* were established at the disturbed site. The surrounding non-native grassland has also been excessively grazed and trampled by cattle. Extensive field work performed on both survey dates this season failed to locate the species, although the soils are suitable. Extremely dry conditions in 1990 may have contributed to the absence of the species in some of the smallest populations in the southern part of its range. This population may be present in a future more favorable growing season” (Stebbins 1991).

Current Status/Habitat Conditions: About 300 plants were observed in 2010. Habitat improved from earlier. Area is no longer threatened by potential roadway construction. Associated species include *Vulpia myuros*, *Bromus rubens*, *Avena* and *Bromus hordeaceus*. New population of approximately 200 plants discovered just north (see map below).

Trend/Threats: Population is stable. Potential threats are grazing and trampling.

Land Ownership: Kenneth Mebane Ranches, PO Box 80055, Bakersfield, CA 93380

Land Use: Cattle ranching



Species: *Pseudobahia peirsonii*
Status: Extant
Trend: Stable

CNDDDB E.O. Number: 23
Last Site Visit: Mar. 31, 2010
Plants Last Seen: Mar. 31, 2010

Other Pop. Number: ST 22
By: John Stebbins
Mapping Precision: Specific

Past Documentation: “Tulare County, 0.7 miles south of Fountain Springs along Southern California Edison Transmission Line, 800 feet, Dean Taylor 8778, 9 April, 1986 (JEPS, UC); Other Documentation: Karen Kirkpatrick 90-05, 29 March, 1990 (FSC, UC)” (Stebbins 1991). “Approximately 3,000 plants were seen by Taylor in 1986” (CNDDDB 2010).

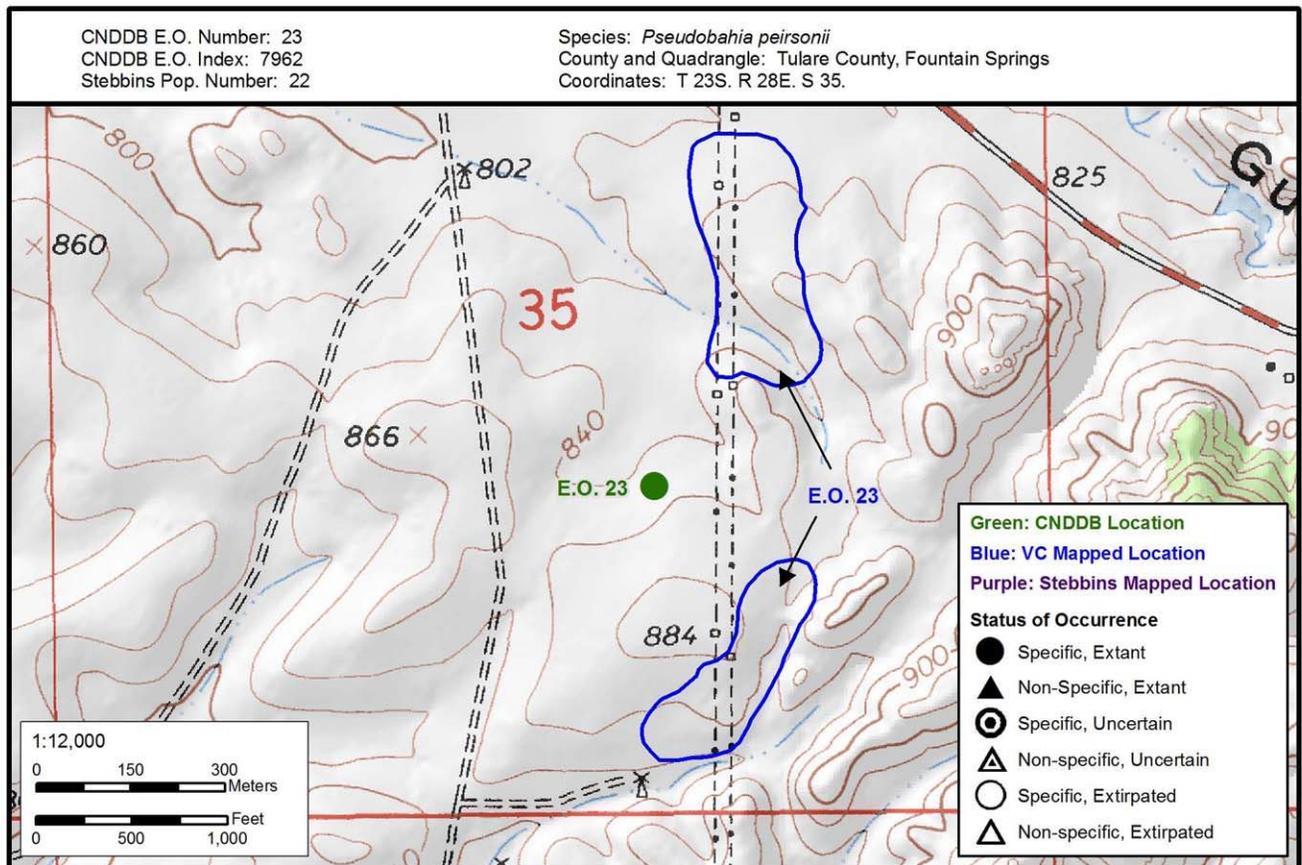
Past Status/Habitat Conditions: “Extant, approximately 1,000 plants were observed on the survey date (29 March, 1990). This was significantly less than the 3,000 plants reported by Taylor during his 1986 SCE transmission line survey. Non-native grassland dominated by *Avena barbata*, *Achyrachaena mollis*, *Amsinckia intermedia*, *Bromus mollis*, and *Lepidum nitidum*. Most plants are concentrated on the gentle (10%) northeast-facing slopes. The dark heavy soils are classified as Cibo clay (USDA, 1981). Most of the plants are located east of tower number 96. The entire area was being grazed but the levels appeared moderate, and it probably serves to limit competition with the annual grasses. The overall habitat quality was rated as good” (Stebbins 1991).

Current Status/Habitat Conditions: About 400 plants were observed in 2010 on clay soils two meters east of SCE transmission lines. The associated species are similar to 1990, but also *Lupinus bicolor* and *Vulpia* sp. The area has been moderately grazed and is good quality habitat.

Trend/Threats: Population is stable. Potential changes in grazing regime could lead to excessive damage from trampling and slope erosion. Maintenance and/or repair of SCE transmission lines or towers could impact the populations.

Land Ownership: Fountain Springs Acres, 23760 Avenue 224, Lindsay, CA 93247

Land Use: Cattle ranching, Powerline right of way (SCE easements)



Species: *Pseudobahia peirsonii*
Status: Extant
Trend: Stable

CNDDDB E.O. Number: 24
Last Site Visit: Mar. 31, 2010
Plants Last Seen: Mar. 31, 2010

Other Pop. Number: ST 23
By: John Stebbins
Mapping Precision: Specific

Past Documentation: "Tulare County, 0.4 miles north of Fountain Springs along Southern California Edison Transmission Line, 860 feet, Dean Taylor 8780, 9 April, 1986 (JEPS, UC). The population site was visited on 29 March, 1990 by Karen and Greg Kirkpatrick. No herbaria specimens were collected" (Stebbins 1991).

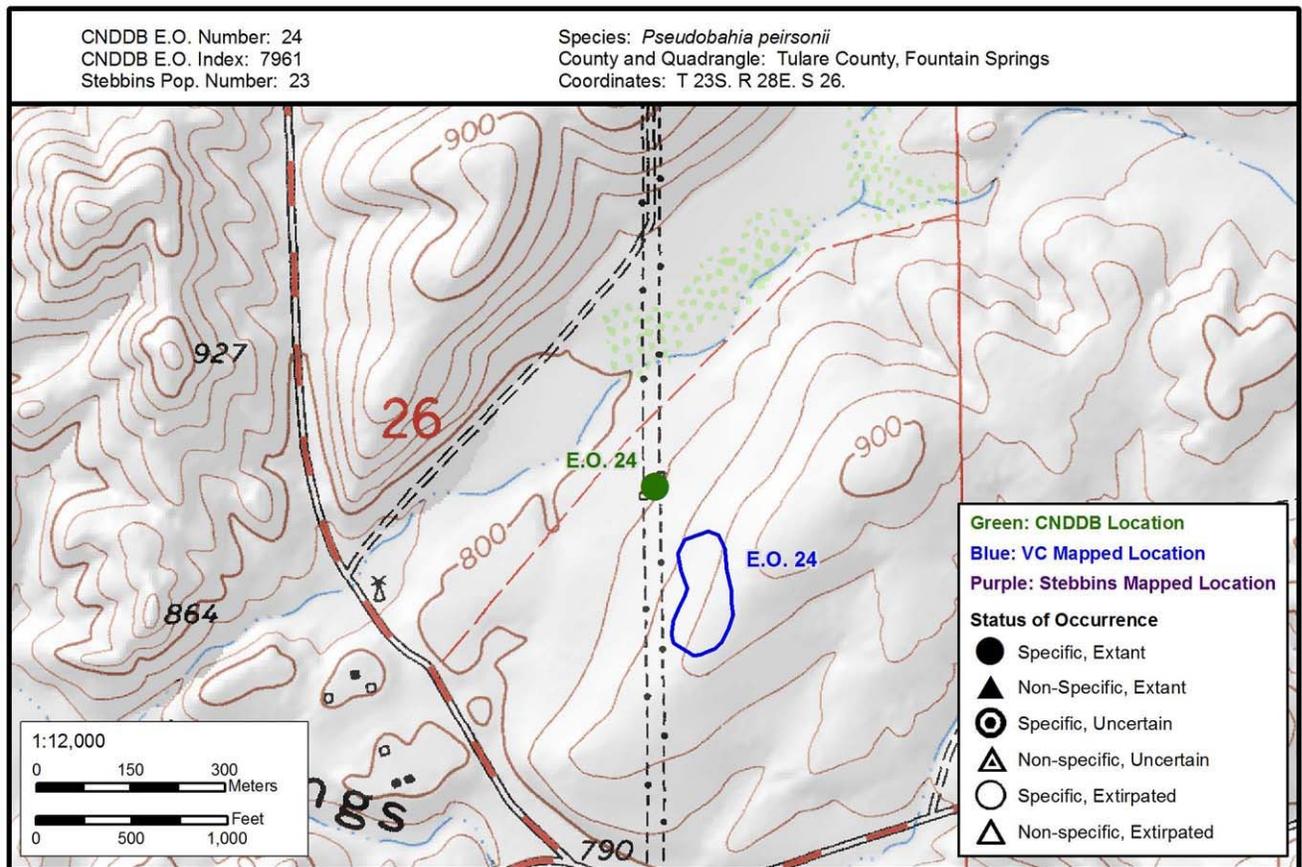
Past Status/Habitat Conditions: "Extant, but only 15 plants were observed on the survey date. This represents a significant decline from the 500 plants observed by Taylor in 1986. Non-native grassland dominated by *Hordeum leporinum*, *Sysymbrium altissimum*, *Amsinckia intermedia*, *Achyrrachaena mollis*, and *Erodium cicutarium*. The few plants were located directly under the SCE transmission lines on a gentle north-facing slope. The extremely dry conditions and aggressive competition from "weedy" taxa (primarily *Sysymbrium*) have overgrown and impacted this population. Very little exposed soil was evident. Cattle were present, but very little grazing had occurred in the vicinity of the observed plants. The soil is classified as Cibo clay, and it is much more widespread than the actual observed population. Overall habitat conditions were rated as poor" (Stebbins 1991).

Current Status/Habitat Conditions: "About 150 plants were observed in 2010 on clay soils 15 meters east of SCE transmission lines. They were almost obscured by dense tall mustard (*Hirschfeldia*). The associated species are *Achyrrachaena*, *Vulpia*, *Lepidium*, and *Avena*. The area has been periodically disked" (Stebbins 1991).

Trend/Threats: Population is stable. Potential threats are competition from ruderal woody species, disking, and potential transmission line maintenance or repair.

Land Ownership: Darrell Boland, 32286 Rd. 138, Visalia, CA, 93291

Land Use: Cattle ranching, Powerline right of way.



Species: *Pseudobahia peirsonii*
Status: Extant
Trend: Stable

CNDDDB E.O. Number: 25
Last Site Visit: March, 2010
Plants Last Seen: March, 2010

Other Pop. Number: ST 24
By: John Stebbins
Mapping Precision: Specific

Past Documentation: “Kern County, Rag Gulch 3 air miles southeast of Villard Ranch. About 200 plants at base of north-facing slope, east of Southern California Edison Transmission Line, 900 feet, Dean Taylor 8775, 9 April, 1986 (JEPS, UC). A field survey was attempted on 7 April 1990 by John Stebbins and Karen Kirkpatrick but permission to access the land was denied by a ranch manager” (Stebbins 1991).

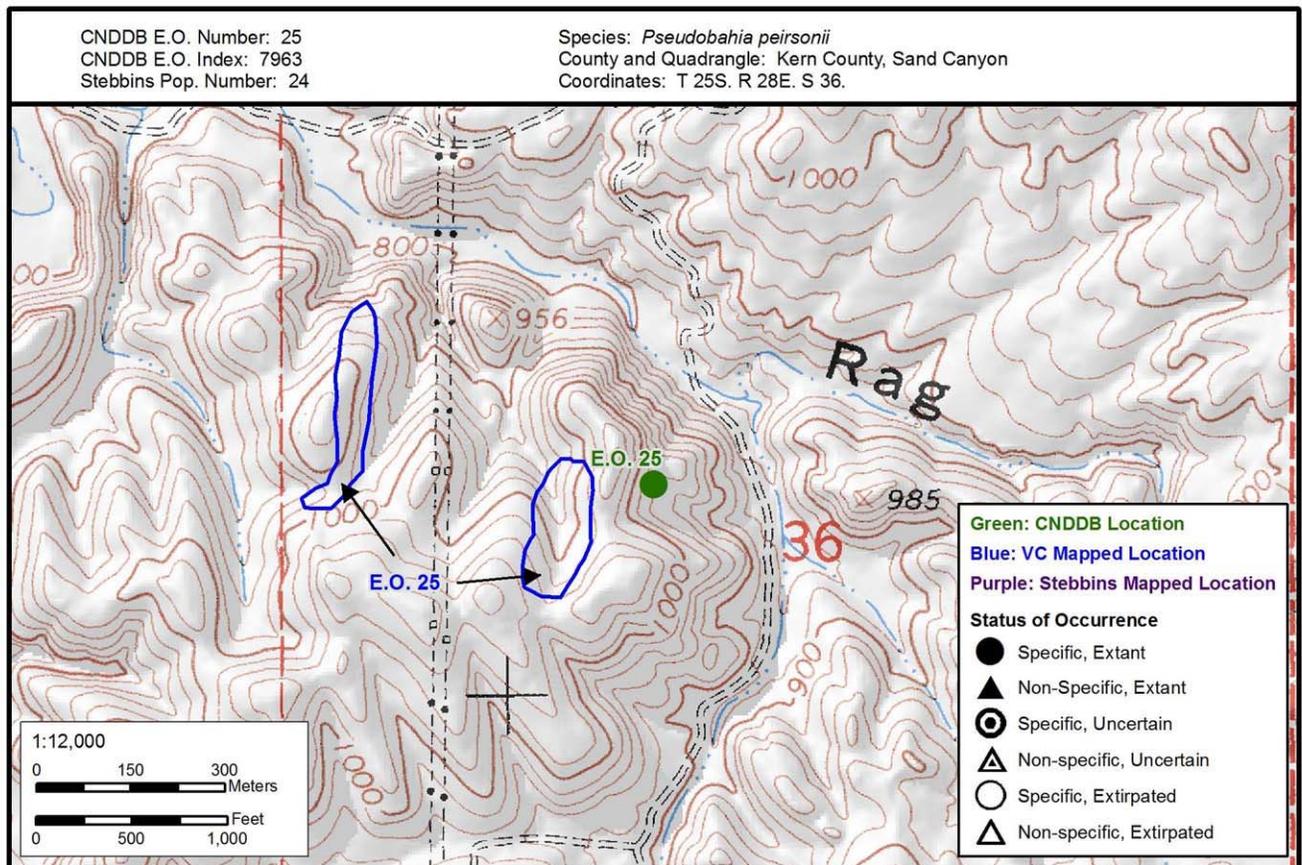
Past Status/Habitat Conditions: “Extant, no land use changes have occurred in the area (according to Villard ranch manager). It is assumed that the population still exists at the recorded site. It is reasonable to assume that the number of plants was down this season from the 500 plants reported in 1986. All of the lands on the Villard Ranch south of Highway 155 were observed to be heavily grazed non-native grassland on the survey date. Obviously the condition was aggravated by the dry season. The site where the plants were observed was also colonized by *Tritelia laxa* (D. Taylor, pers. comm. 1990). During the 1986 survey he performed for SCE he noted that the grazing levels were very heavy. He also stated that the plants were growing on dark heavy clay soil allied to the Porterville series” (Stebbins 1991).

Current Status/Habitat Conditions: About 600 plants plus 300 new plants were observed in 2010. The new population is 30 feet northwest of Tower 107/3. Both sites are dominated by *Vulpia myuros*, *Bromus rubens*, *Avena*, *Bromus hordeaceus*. Both sites are good quality habitat.

Trend/Threats: Population is improving. Potential threats are excessive grazing, trampling, erosion, and impacts from nearby ranch road.

Land Ownership: Jule Villard Estate, 1805 Val Verde, Delano, CA 93215

Land Use: Cattle ranching



Species: *Pseudobahia peirsonii*
Status: Presumed Extant
Trend: Declining?

CNDDDB E.O. Number: 26
Last Site Visit: May 8, 2001
Plants Last Seen: May 8, 2001

Other Pop. Number: N/A
By: J. Stewart
Mapping Precision: Specific

Past Documentation: Observed by R. Hansen in 1988 and J. Stewart in 2001. Surveyed by J. Stebbins in 1989 (CNDDDB 2010).

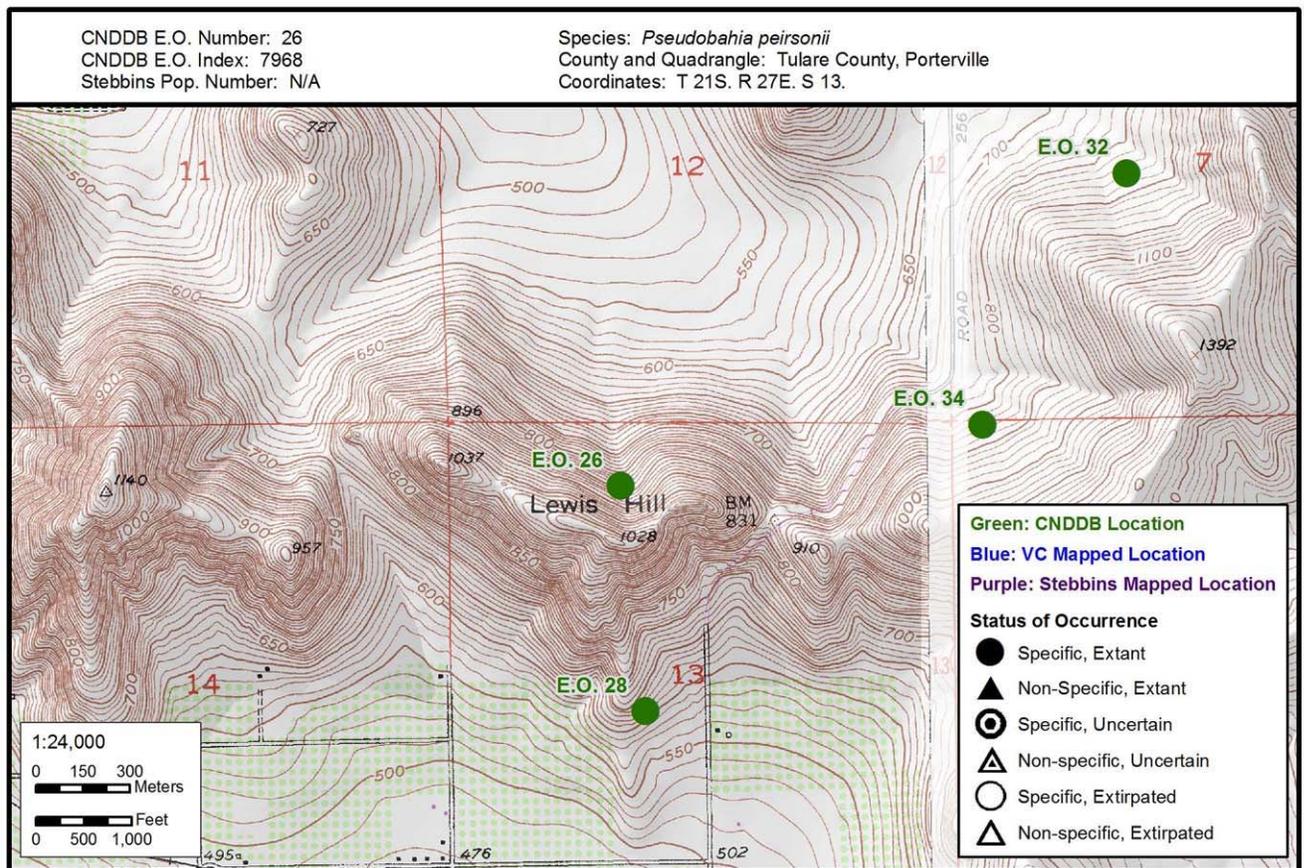
Past Status/Habitat Conditions: Approximately 70 plants were seen in 1988 and less than 100 seen in 2001. Plants were growing on Cibo clay and Cibo rock outcrop complex soils in an abandoned wheat field. Associated species include *Hordeum leporinum*, *Amsinckia intermedia*, *Achyrachaena mollis*, *Avena barbata*, *Senecio*, *Bromus mollis*, *Medicago*, *Stellaria* and *Erodium cicutarium* (CNDDDB 2010).

Current Status/Habitat Conditions: Presumed extant, habitat conditions are presumed to be poor.

Trend/Threats: Population is possibly declining. Potential threats are excessive grazing, disking, and tilling.

Land Ownership: Private

Land Use: Cattle ranching



Species: *Pseudobahia peirsonii*
Status: Presumed Extant
Trend: Declining?

CNDDDB E.O. Number: 28
Last Site Visit: Apr. 12, 1990
Plants Last Seen: Mar. 27, 1988

Other Pop. Number: ST 28
By: John Stebbins
Mapping Precision: Specific

Past Documentation: "Tulare County, south side of Lewis Hill, west of Piano Rd., 0.5 miles north of Reid Road, north of Porterville, Robert Hansen s.n, 19 March, 1988 (FSC). The site was surveyed by Karen Kirkpatrick on 12 April, 1990" (Stebbins, 1991).

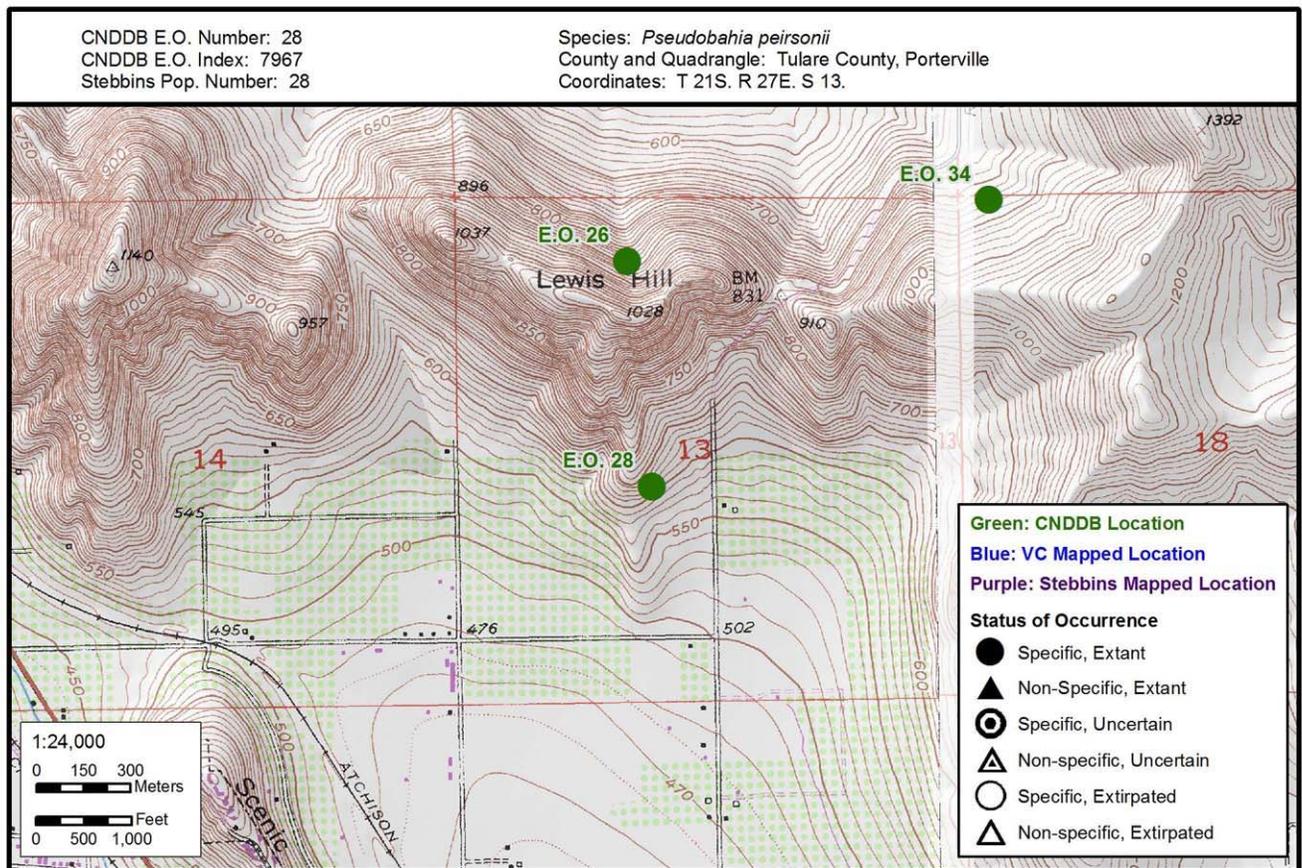
Past Status/Habitat Conditions: Presumed extant, no plants were observed on the rather late survey date, but no change in habitat conditions have occurred since the 1998 observations. The species may not have been present due to the extremely dry season and heavy grazing. About 300 plants were observed two years ago at the site (Hansen 1988). The collected specimens were verified by John Stebbins in 1988 (Stebbins 1991). Very dry, heavily grazed non-native grassland dominated by *Avena barbata*, *Dichelostemma pulchellum*, *Lactuca serriola*, *Erodium cicutarium*, and *Chlorogalum pomeridianum*. The south-facing slope ws about a 45% gradient, and has been used as a horse and mule "pasture." The soils are classified as Cibo clay (USDA, 1981).

Current Status/Habitat Conditions: Site not accessible in 2010. Habitat is poor because area has been subjected to heavy grazing, but presence is assumed.

Trend/Threats: Population is possibly declining. Potential threats are excessive grazing, trampling, and competition from aggressive non-native annuals.

Land Ownership: Robert Gauger, 1910 N. Piano Ave., Porterville, CA 93257

Land Use: Horse and mule pasture



Species: *Pseudobahia peirsonii*
Status: Presumed Extant
Trend: Presumed Stable

CNDDDB E.O. Number: 29
Last Site Visit: Apr. 23, 1992
Plants Last Seen: Apr. 23, 1992

Other Pop. Number: N/A
By: R. Lewis
Mapping Precision: Specific

Past Documentation: Observed by R. Lewis in 1992 (CNDDDB 2010).

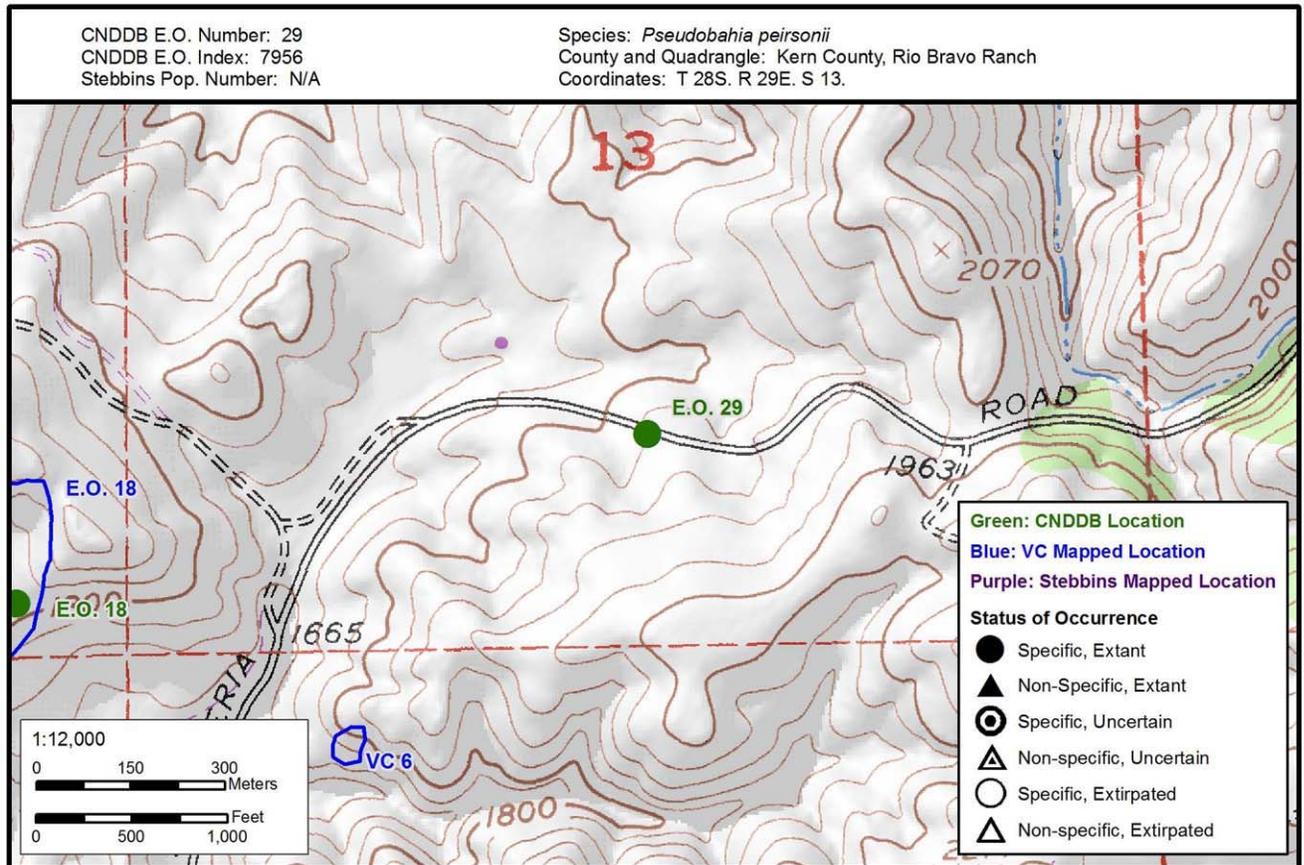
Past Status/Habitat Conditions: "Twenty-nine plants were observed in 1992 on deep heavy dark brown clay in non-native grassland. Associate species include *Bromus rubens*, *Bromus diandrus*, *Amsinckia* sp. and *Clarkia* sp" (CNDDDB 2010).

Current Status/Habitat Conditions: Site not visited in 2010. Presence presumed; habitat is good as no land use changes have occurred in vicinity (Stebbins 2010).

Trend/Threats: Population is presumed stable. Potential threats are potential road related maintenance.

Land Ownership: Private

Land Use: Grazing



Species: *Pseudobahia peirsonii*
Status: Presumed Extant
Trend: Declining?

CNDDDB E.O. Number: 30
Last Site Visit: 2010
Plants Last Seen: Jul. 7, 1990

Other Pop. Number: ST 25
By: John Stebbins
Mapping Precision: Specific

Past Documentation: “Fresno County, 0.7 miles northeast of Round Mountain, about 1.6 miles east of Friant-Kern Canal; an observation of 50 plants was made in 1987 by John Stebbins. The site was surveyed again on 4 April, 1990 by John Stebbins. No herbaria collections were made due to the small size of the population” (Stebbins, 1991).

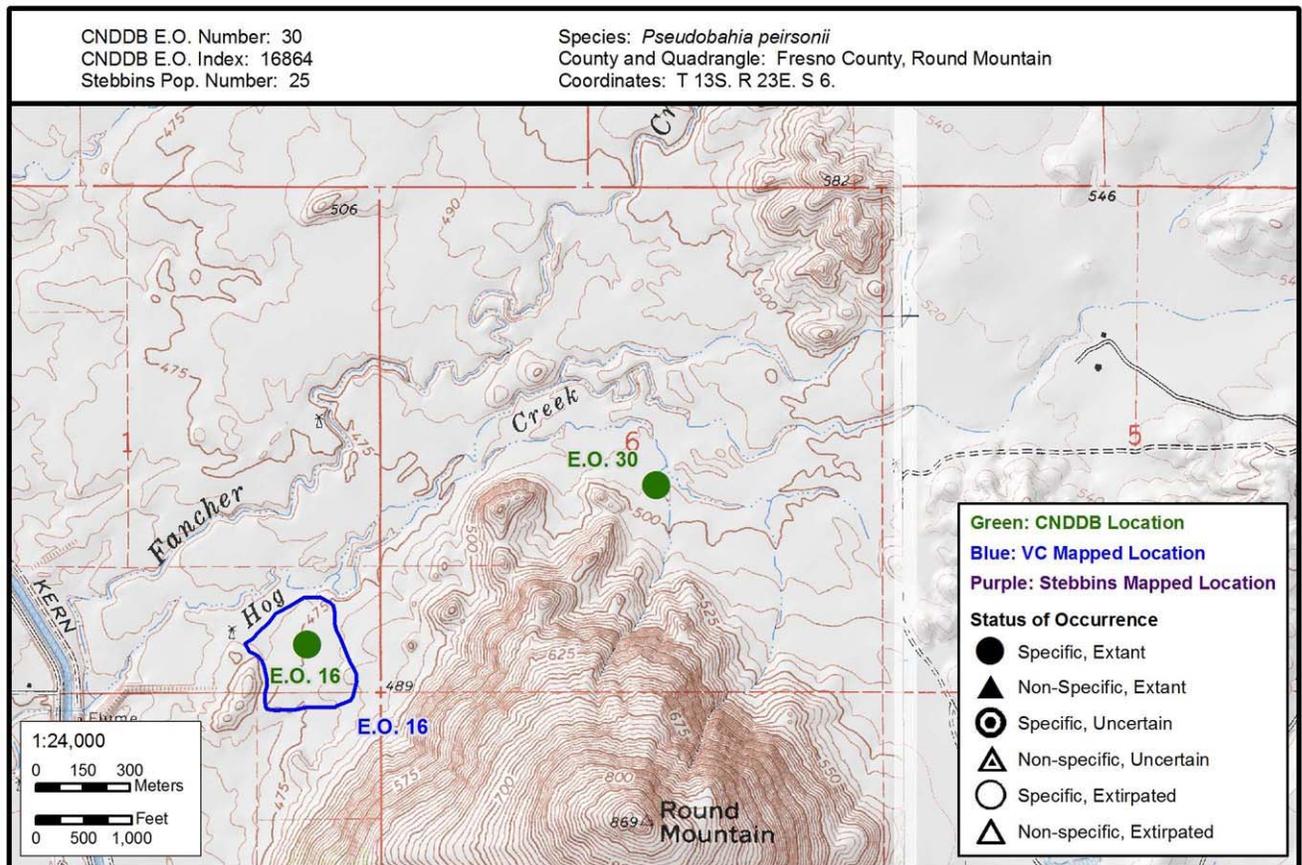
Past Status/Habitat Conditions: Fifty plants were seen in 1987 and 26 were seen in 1990. Area heavily grazed at time of both field visits. Plants are growing on Porterville clay soils in association with *Hordeum leporinum*, *Amsinckia intermedia*, *Erodium cicutarium*, *Lamium amplexicaule*, *Evax caulescens*, *Bromus rubens*, and *Senecio vulgaris* (CNDDDB 2010).

Current Status/Habitat Conditions: Plants not found in 2010. Site was visited and potential habitat is available, but very heavily grazed. Most forbs were removed.

Trend/Threats: Population is possibly declining since no plants were found in 2010. Potential threats include excessive grazing and trampling. Longer term threats include potential incremental land use changes related to nearby rural residential development to the south near Watts Rd. Also, subdivision of the land in a manner similar to that which has occurred near the intersection of Herndon and Madsen Avenues is a possibility.

Land Ownership: Gladys Pollard, 1590 Wrenwood Ave., Fresno, CA 93711

Land Use: Cattle ranching



Species: *Pseudobahia peirsonii*
Status: Extant
Trend: Declining

CNDDDB E.O. Number: 31
Last Site Visit: Mar. 10,2010
Plants Last Seen: Mar. 10,2010

Other Pop. Number: ST 30
By: John Stebbins
Mapping Precision: Specific

Past Documentation: Observed by J. Stebbins in 1990 (CNDDDB 2010).

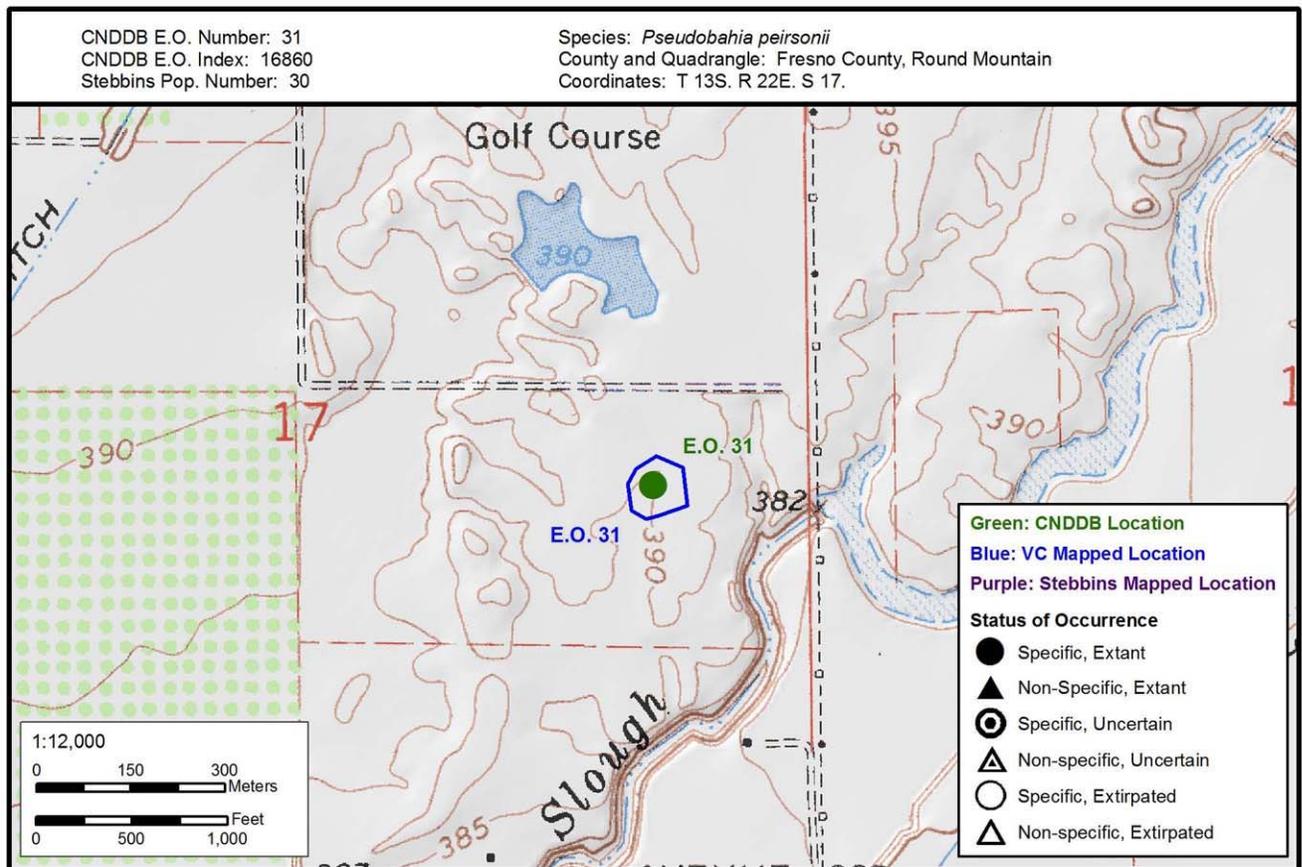
Past Status/Habitat Conditions: Approximately 5000 plants over 3 acres were observed in 1990. Proposed development includes 400 housing units, a golf course, and lakes. The mitigation plan for this population is pending. The site is surrounded by agriculture, recreational water park, and housing. Plants are growing on Centerville clay soils in association with *Bromus mollis*, *Vulpia myuros*, *Hypochaeris glabra*, *Evax caulescens*, *Centaurea melitensis*, and *Scandex pectin-veneris* (CNDDDB 2010).

Current Status/Habitat Conditions: Approximately 50 plants were observed in 2010. Site is located on small (5 acre) "preserve" surrounded by the now present above-mentioned intense development. There are many competing non-natives and thatch; population is declining. Populations is unlikely to survive without direct resource management.

Trend/Threats: Population is declining due to intense development, adverse impacts as described.

Land Ownership: Vintage Associates, 1400 Fashion Island Blvd. #810, San Mateo, CA 94404

Land Use: Residential development



Species: *Pseudobahia peirsonii*
Status: Presumed Extant
Trend: Presumed Stable

CNDDDB E.O. Number: 32
Last Site Visit: Apr. 1, 1990
Plants Last Seen: Apr. 1, 1990

Other Pop. Number: ST 26
By: John Stebbins
Mapping Precision: Specific

Past Documentation: "Tulare County, west and southwest of Road 276, northeast of Porterville, 1.5-2.1 miles north of Rocky Hill, Robert Hansen s.n, 9 April, 1988 (FSC). Other Documentation: Karen Kirkpatrick 90-07, 12 April, 1990 (FSC, UC)" (Stebbins, 1991).

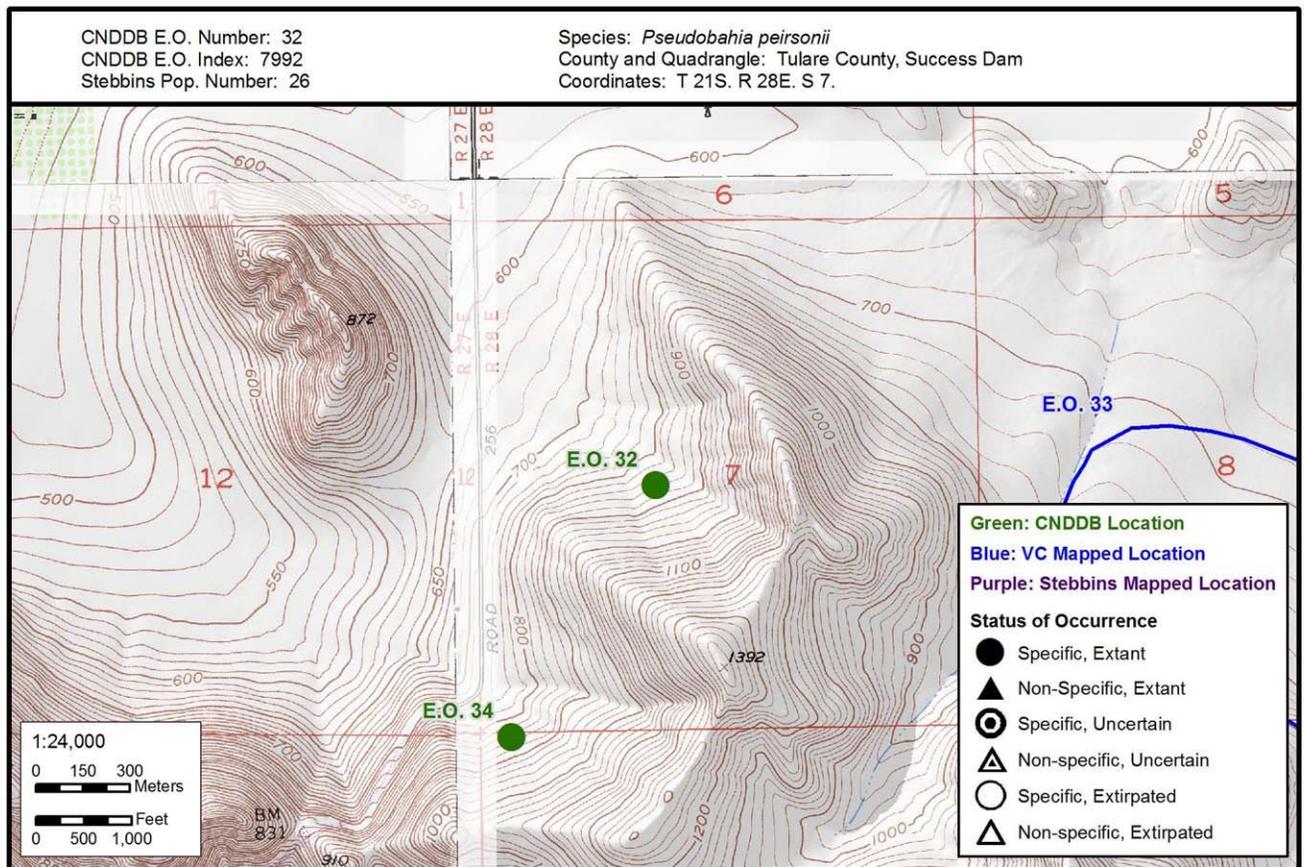
Past Status/Habitat Conditions: "140 plants seen in 1988, 150 seen in 1990...Growing on Porterville cobbly clay and Cibo clay soils. Dominants in non-native grassland include *Hordeum leporinum*, *Vulpia myuros*, *Avena barbata*, *Agroseris heterophylla*, *Erodium moschatum*, *Bromus mollis* and *B. rubens*" (CNDDDB 2010).

Current Status/Habitat Conditions: Population was inaccessible in 2010, but habitat appeared unmodified and suitable in 2010 (from a distance).

Trend/Threats: Population is presumed stable due to suitable habitat. Potential threats include increased or excessive grazing, which would cause trampling and soil erosion.

Land Ownership: Glenfed Financial Corp., 12720 Hillcrest Rd., #700, Dallas, TX 75230

Land Use: Cattle ranching



Species: *Pseudobahia peirsonii*
Status: Extant
Trend: Declining

CNDDDB E.O. Number: 33
Last Site Visit: Apr. 1, 2010
Plants Last Seen: Apr. 1, 2010

Other Pop. Number: ST 26
By: John Stebbins
Mapping Precision: Specific

Past Documentation: "Tulare County, west and southwest of Road 276, northeast of Porterville, 1.5-2.1 miles north of Rocky Hill, Robert Hansen s.n, 9 April, 1988 (FSC). Other Documentation: Karen Kirkpatrick 90-07, 12 April, 1990 (500 plants) (FSC, UC)" (Stebbins, 1991).

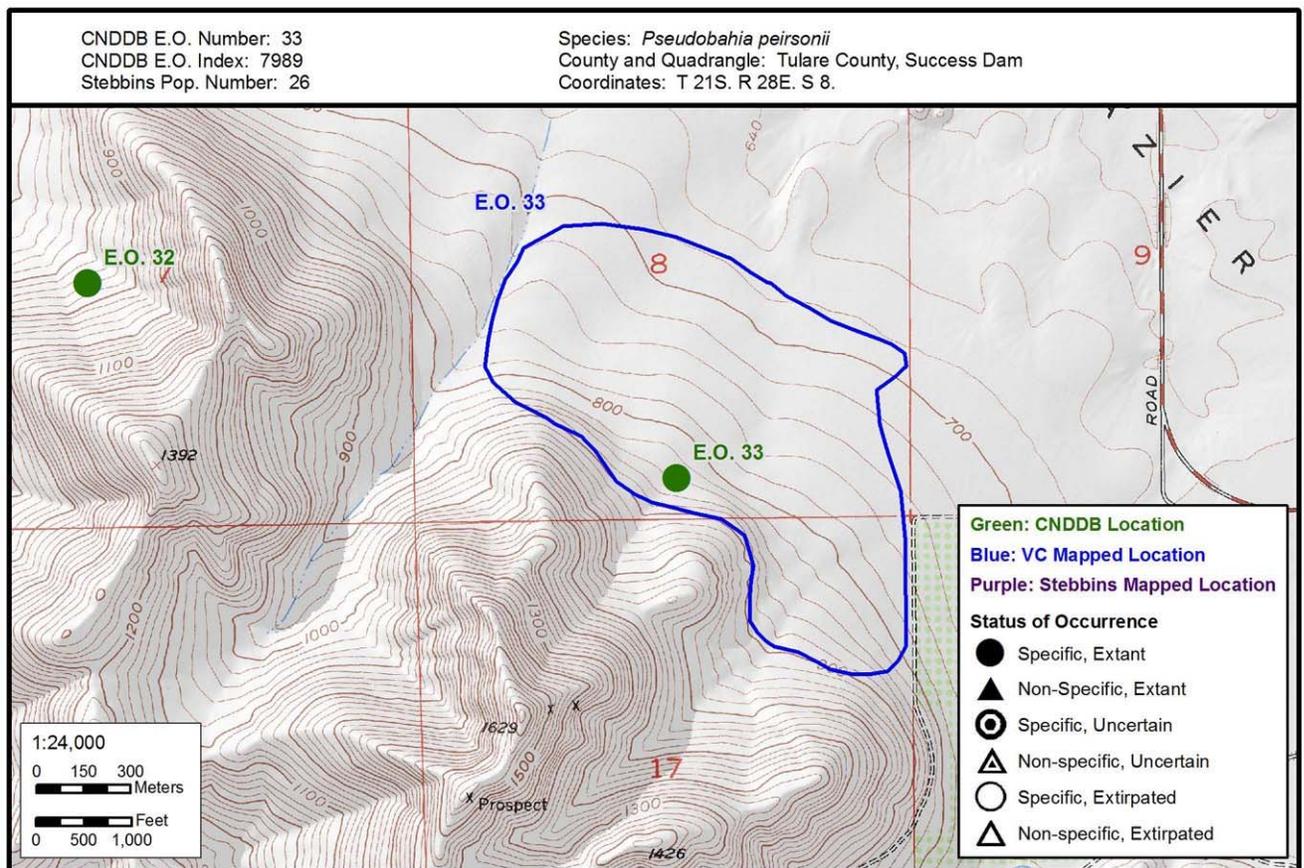
Past Status/Habitat Conditions: "Population is extant. Approximately 500 plants were observed on April 9, 1990. Site consists of a non-native grassland dominated by *Hordeum leporinum*, *Vulpia myuros*, *Avena barbata*, *Agoseris heterophylla*, *Erodium moschatum*, *Bromus mollis*, and *Bromus rubens*. Most of the plants were growing on north-facing slopes. A small population of the rare *Fritillaria striata* was also observed in the southwest quarter of Section 8. The soils are classified as Porterville cobbly clay and Cibo clay (USDA, 1981). The entire area has been routinely grazed for a very long period (Hansen, 1988). It appeared to be grazed at moderate to heavy levels on the survey date" (Stebbins 1991). "Over 5,000 plants were observed in 1988 and about 500 were observed in 1990" (CNDDDB).

Current Status/Habitat Conditions: Approximately 200 plants were observed in 2010.

Trend/Threats: Population is declining. Increased or excessive grazing would cause trampling and soil erosion. Potential conversion to agriculture is a threat, and has already occurred on the lower slopes and on the flats near Road 276.

Land Ownership: Glenfed Financial Corp., 12720 Hillcrest Rd., #700, Dallas, TX 75230

Land Use: Unknown



Species: *Pseudobahia peirsonii*
Status: Presumed Extant
Trend: Presumed Stable

CNDDDB E.O. Number: 34
Last Site Visit: 1988
Plants Last Seen: 1988

Other Pop. Number: N/A
By: R. Hansen
Mapping Precision: Specific

Past Documentation: “West of Frazier Valley, 4 kilometers (2.5 miles) west of Road 276/Avenue 176 junction...located in extreme northwest corner of Section 18, north of Rocky Hill. R. Hansen observed 2 plants in 1988” (CNDDDB 2010).

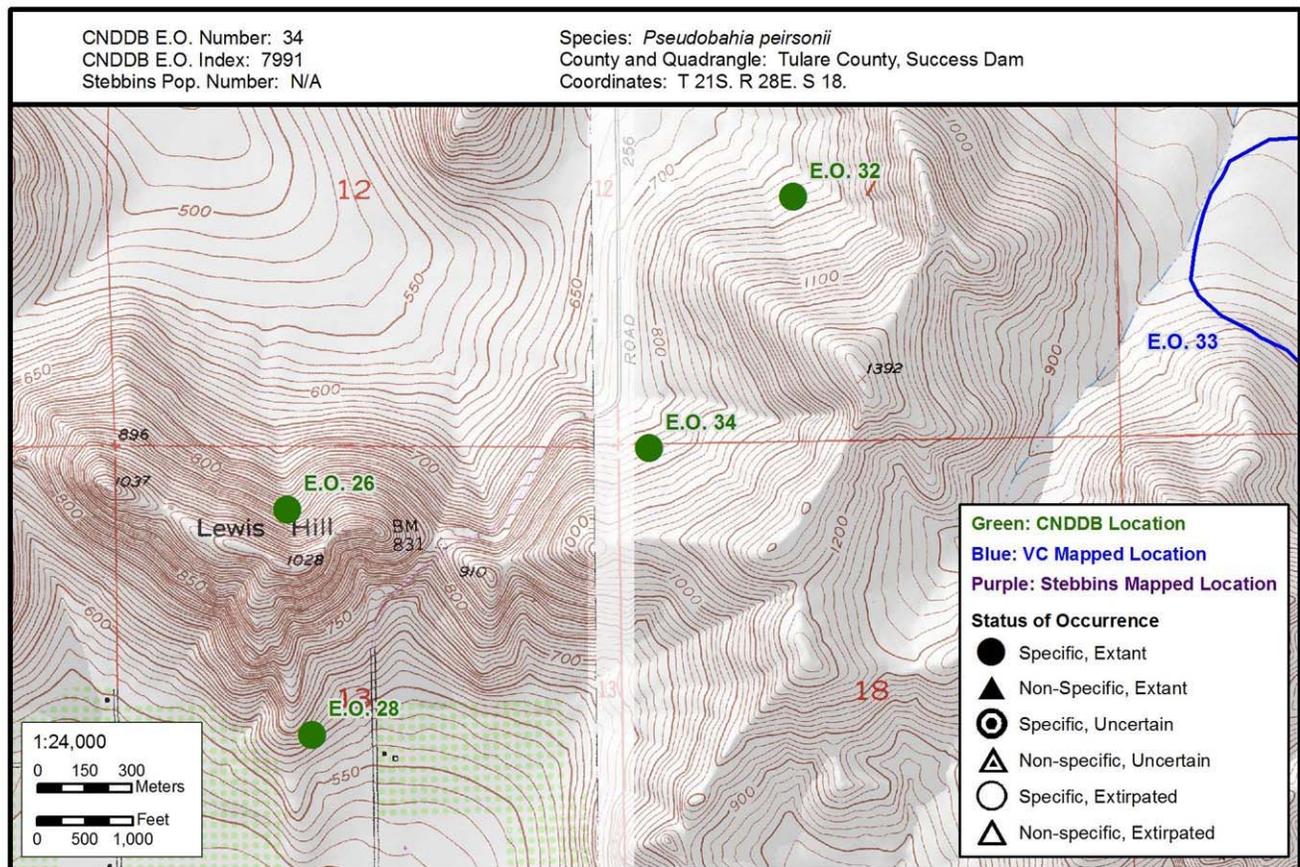
Past Status/Habitat Conditions: “Growing on Porterville Clay/Cibo Clay/Cibo rock outcrop complex soils, associates include *Hordeum leporinum*, *Avena barbata*, *Brodiaea lutea*, *Ranunculus*, *Senecio*, *Amsinckia*, *Bromus mollis*, *Vulpia*, *Medicago*, and *Brassica nigra*” (CNDDDB 2010).

Current Status/Habitat Conditions: Unknown, site was not accessible in 2010.

Trend/Threats: Population is presumed stable. Previously listed threats included increased grazing, conversion to cultivated agriculture and future development (Hansen 1988 in CNDDDB 2010).

Land Ownership: Private

Land Use: Unknown (presumed grazing).



Species: *Pseudobahia peirsonii*
Status: Presumed Extant
Trend: Declining?

CNDDDB E.O. Number: 35
Last Site Visit: 1990
Plants Last Seen: 1990

Other Pop. Number: ST 27
By: John Stebbins
Mapping Precision: Specific

Past Documentation: "Tulare County, 1.5 miles west of Rocky Hill, east of Porterville, observation of 3 plants by Hansen (1988); A field survey of the site was performed by John Stebbins on March 22, 1990" (Stebbins 1991).

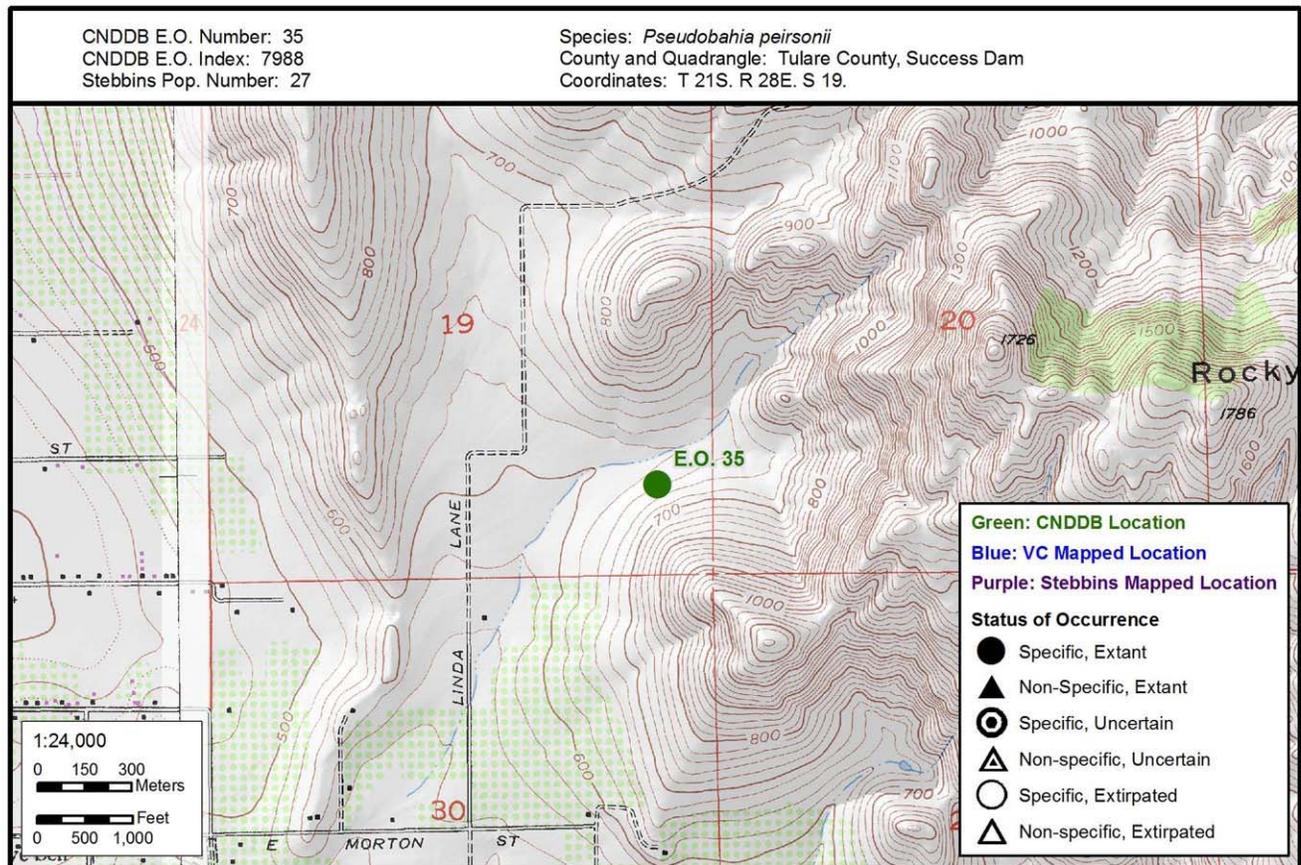
Past Status/Habitat Conditions: "Heavily grazed non-native grassland. Dominant species associated with *P. peirsonii* included *Brassica nigra*, *Stellaria media*, *Medicago polymorpha*, *Vulpia myuros*, and *Amsinckia intermedia*. The soils are classified as Cibo clay (USDA 1981). The plants observed were very colonial on a north-facing slope. It is significant to note that Hansen reported only 3 plants in 1988. This figure, along with the 1990 observation indicated that the population at this site is marginal in terms of viability. No herbaria collections were made due to the small size of the populations" (Stebbins 1990). Habitat conditions were reported as poor in 1990.

Current Status/Habitat Conditions: Current status is unknown, as access was not granted in 2010. However, habitat appears suitable from the road (Stebbins 2010).

Trend/Threats: Population is possibly declining. Previously listed threats include excessive grazing and the urban expansion of Porterville area leading to land conversion.

Land Ownership: Edward Cornell, PO Box 11, Porterville, CA 93258

Land Use: Unknown



Species: *Pseudobahia peirsonii*
Status: Presumed Extant
Trend: Declining?

CNDDDB E.O. Number: 36
Last Site Visit: 2008
Plants Last Seen: 2008

Other Pop. Number: N/A
By: R. Preston
Mapping Precision: Specific

Past Documentation: “West side of Friant-Kern canal, 0.1-0.6 miles south of Herndon Avenue, 0.7-1.0 miles east of Academy Avenue” (Stebbins 2010). Observed by M. McFall during field survey in 1994 (46 plants across 9 acres) and by R. Preston of Jones and Stokes Associates during field survey in 2008 (1 plant) (CNDDDB 2010).

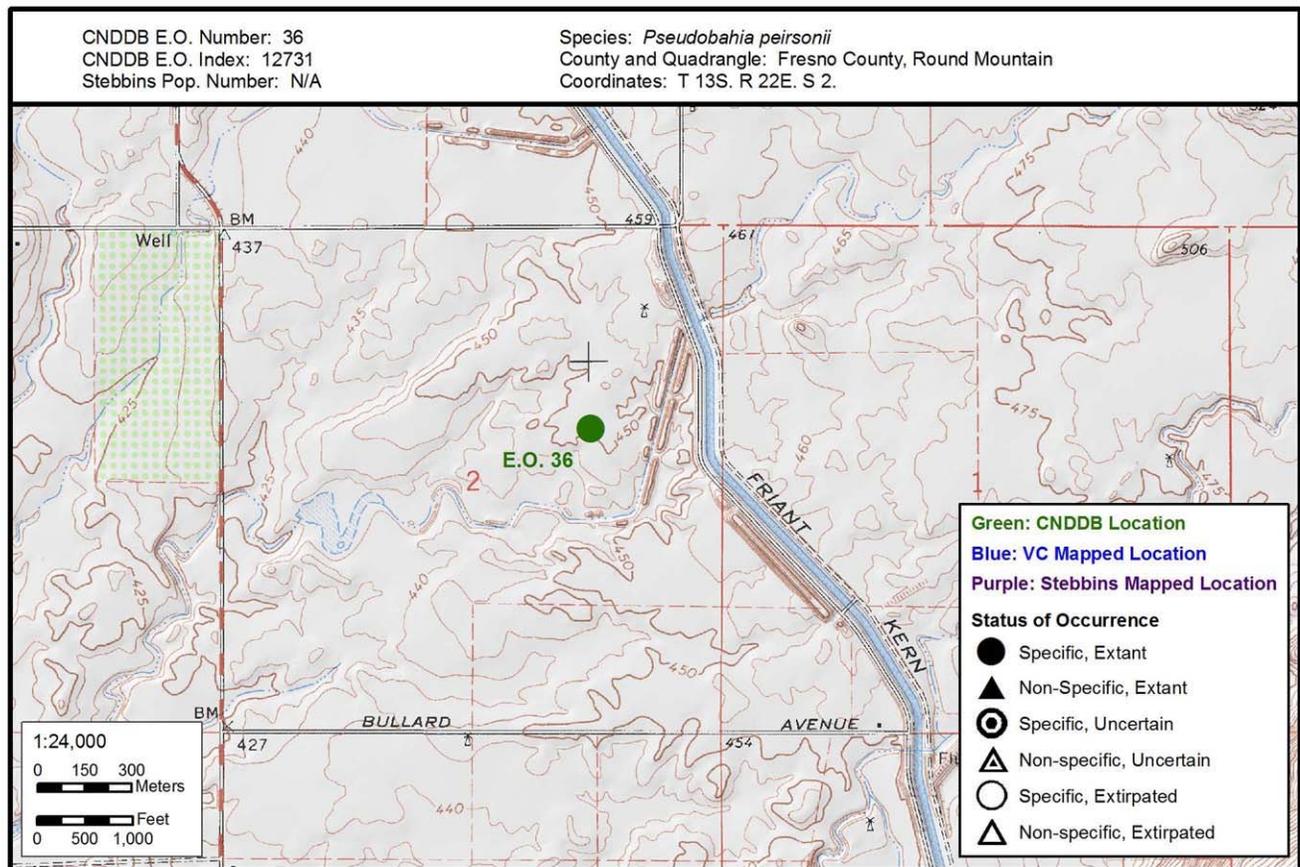
Past Status/Habitat Conditions: Past status appeared to be declining. Plants observed in non-native annual grassland with dominants and associates including *Lolium multiflorum*, *Lepidium nitidum*, *Vicia villosa*, *Lupinus bicolor*, *Trifolium depauperatum*, *Achyracheana mollis*, and *Plagiobothrys fulvus*. In addition, site was reportedly dominated by mustard, and the owner had made a cut in the soil for drainage and site was disked for firebreak. Site was also grazed by cattle.

Current Status/Habitat Conditions: Current status is unknown as site was not accessible in 2010. However, habitat conditions appear suitable based on condition of general vicinity.

Trend/Threats: Population is possibly declining.

Land Ownership: Private

Land Use: Unknown (presumed grazing).



Species: *Pseudobahia peirsonii*
Status: Extirpated
Trend: Extirpated

CNDDDB E.O. Number: 37
Last Site Visit: 1990
Plants Last Seen: 1928

Other Pop. Number: N/A
By: John Stebbins
Mapping Precision: Non-Specific

Past Documentation: Observed by M. Hather in March, 1928 and J. Stebbins in 1990.

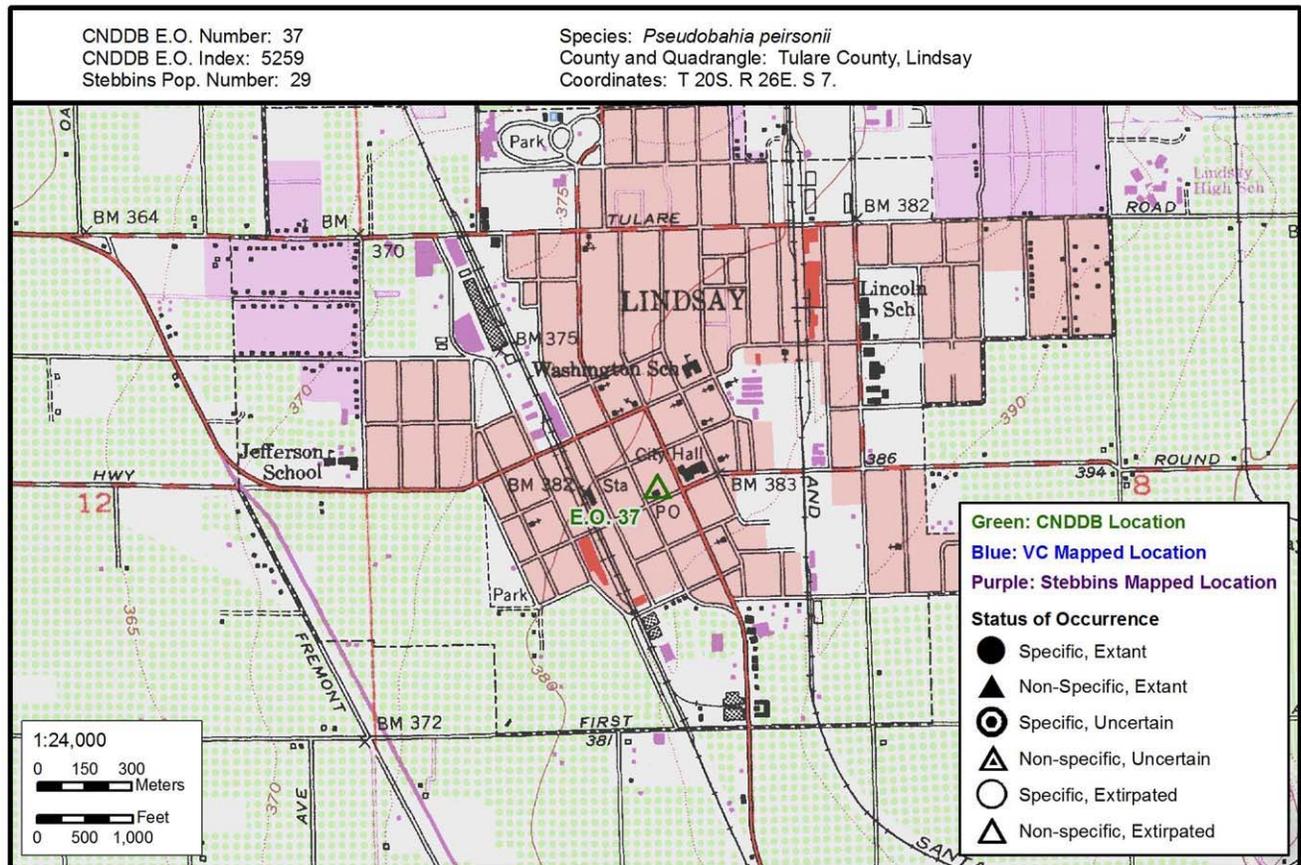
Past Status/Habitat Conditions: “Most of the areas supporting the preferred heavy clay soils have been converted to citrus or olive orchards” (Stebbins 1990, in CNDDDB).

Current Status/Habitat Conditions: “No habitat remains in vicinity, all lands have been converted to residential or agricultural uses” (Stebbins 1990, in CNDDDB).

Trend/Threats: Extirpated

Land Ownership: Private

Land Use: Urban development



Species: *Pseudobahia peirsonii*
Status: Presumed Extant
Trend: Presumed Stable

CNDDDB E.O. Number: 38
Last Site Visit: 1992
Plants Last Seen: 1992

Other Pop. Number: N/A
By: Hathorn and Nordberg
Mapping Precision: Specific

Past Documentation: “On E. side of Old State Road, 2.8 miles north of Fountain Springs intersection. Observed by Hathorn and Nordberg, of Woodward-Clyde Consulting in 1992 as part of focused biological surveys for 8 target species in Tulare County. At least 500 plants...” (CNDDDB 2010).

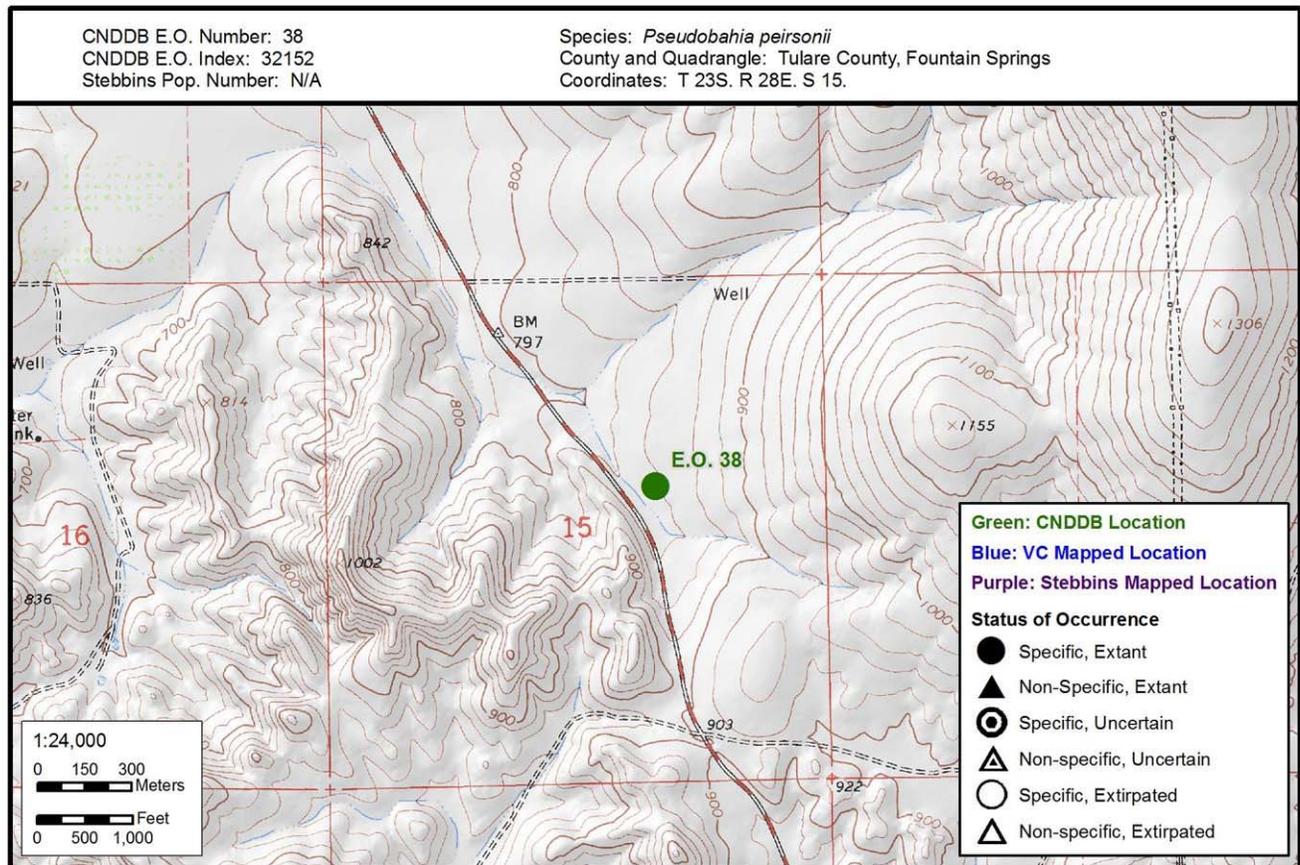
Past Status/Habitat Conditions: Within non-native annual grassland on clay soils, dominants included bromes (*Hordeum*) and milk thistle (*Silybum marianum*) (CNDDDB 2010).

Current Status/Habitat Conditions: Presumed extant, unknown habitat conditions. Site was not accessible in 2010, however conditions of vicinity appear unchanged.

Trend/Threats: Population is presumed stable. Possible threats include overgrazing and competition from ruderal species (CNDDDB 2010).

Land Ownership: Private

Land Use: Cattle ranching



Species: *Pseudobahia peirsonii*
Status: Presumed Extant
Trend: Presumed Stable

CNDDDB E.O. Number: 39
Last Site Visit: 1992
Plants Last Seen: 1992

Other Pop. Number: N/A
By: Hathorn and Nordberg
Mapping Precision: Specific

Past Documentation: “2.1 miles south of Avenue 56 on Road 256. Observed by Hathorn and Nordberg of Woodward-Clyde Consulting in 1992 as part of focused biological surveys for 8 target species in Tulare County. Unknown number of plants were observed in 1992” (CNDDDB 2010).

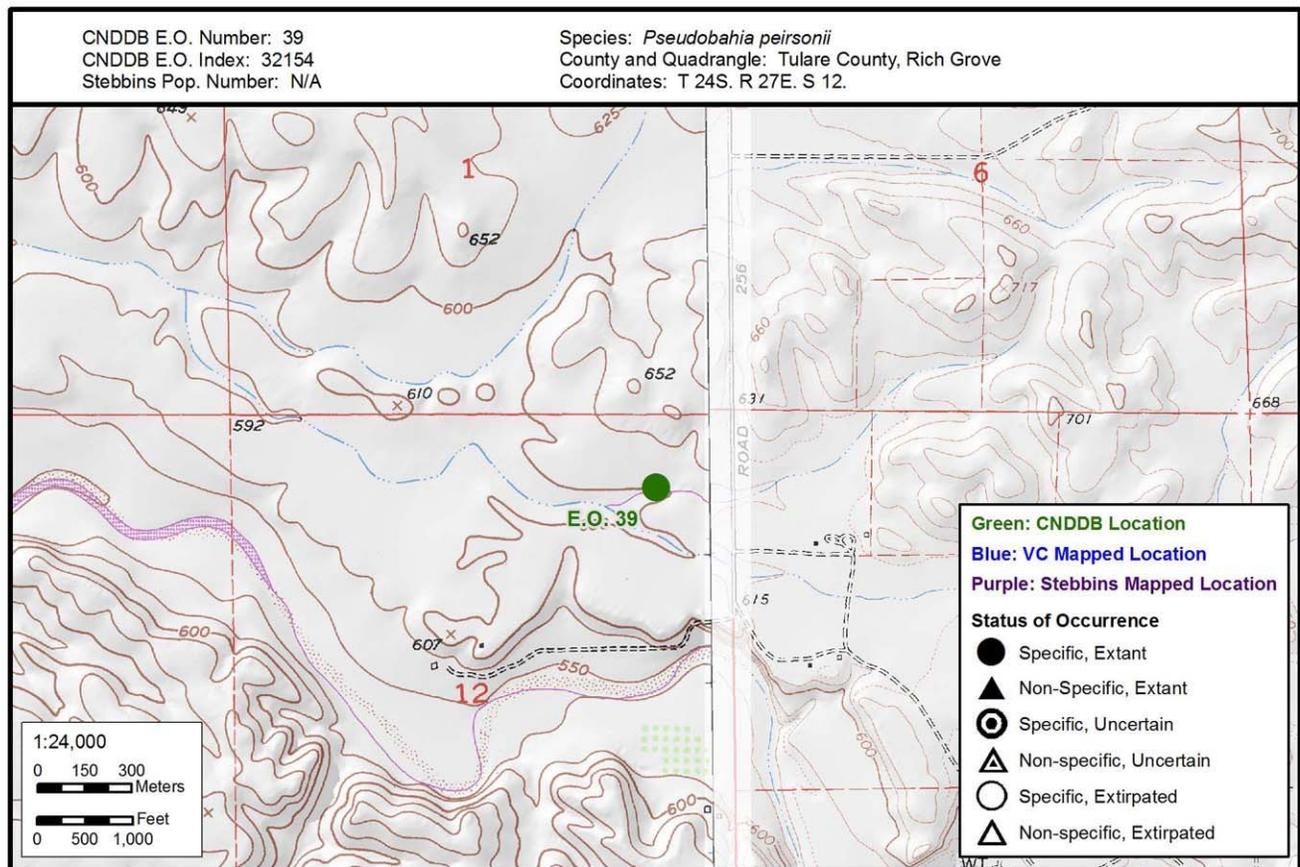
Past Status/Habitat Conditions: Dry, gentle, rolling hills in clay soils with dominant species including bromes (*Hordeum*), thistle (*Senecio*) and shepherds purse (*Capsella bursa-pastoris*) (CNDDDB 2010).

Current Status/Habitat Conditions: Presumed extant, unknown habitat conditions. Site was not accessible in 2010, however conditions of vicinity appear unchanged.

Trend/Threats: Population is presumed stable. Possible threats include overgrazing.

Land Ownership: Private

Land Use: During last visit, land use was grazing. Current aerial photos suggest area is still undeveloped.



Species: *Pseudobahia peirsonii*
Status: Presumed Extant
Trend: Presumed Stable

CNDDDB E.O. Number: 40
Last Site Visit: 1992
Plants Last Seen: 1992

Other Pop. Number: N/A
By: Hathorn and Nordberg
Mapping Precision: Non-specific

Past Documentation: “Southwest slope of Bald Mountain, on east side of Old State Road, 0.8 miles south of junction with Mountain 12 Road (aka Grapevine Road?)” (CNDDDB 2010). Observed by Hathorn and Nordberg, of Woodward-Clyde Consulting, in 1992 as part of focused biological surveys for 8 target species in Tulare County. Unknown how many plants observed (CNDDDB 2010).

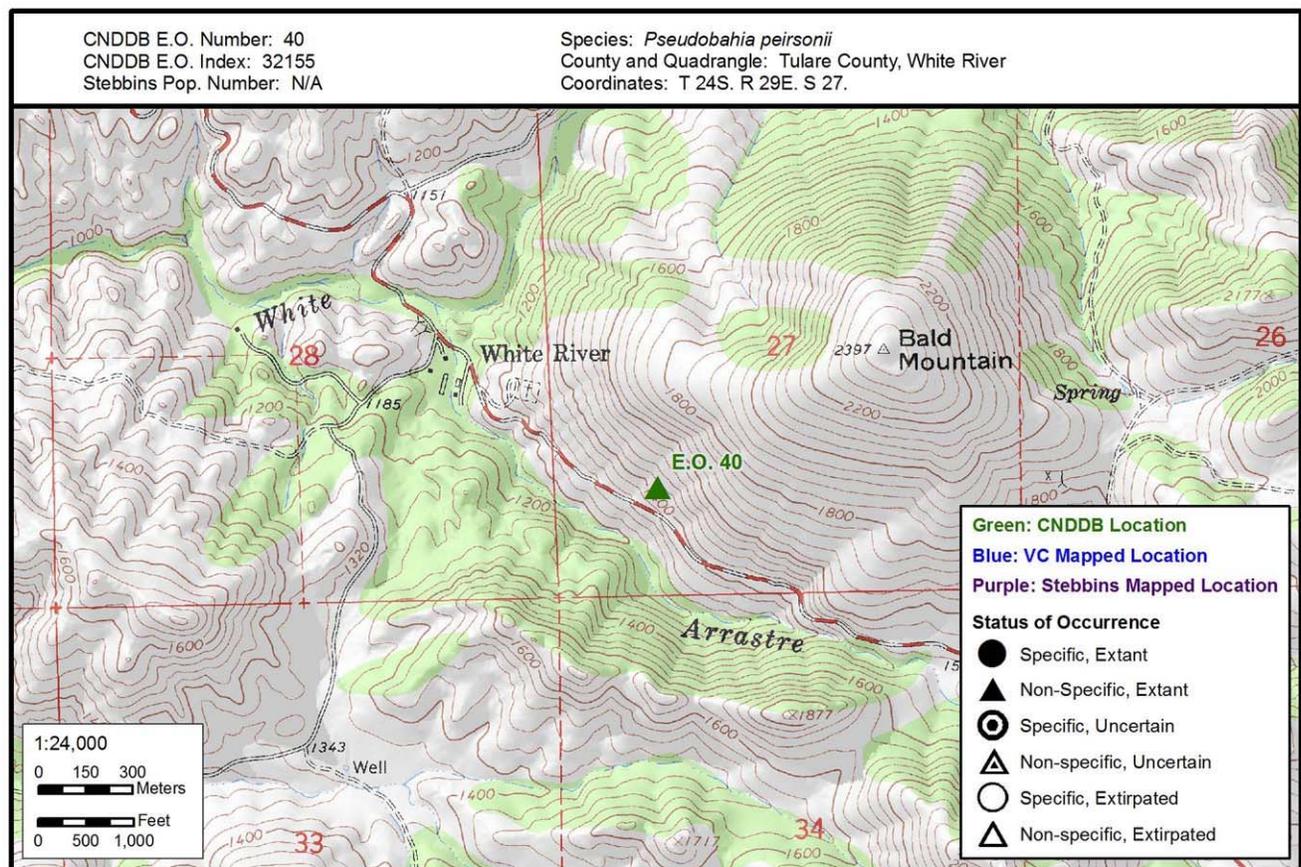
Past Status/Habitat Conditions: On roadcut with lupines (*Lupinus benthamii*), California poppy (*Eschscholzia californica*), and phacelia (*Phacelia* sp.).

Current Status/Habitat Conditions: Presumed extant, unknown habitat conditions. Record is potentially misidentified *P. heermanii*.

Trend/Threats: Population is presumed stable. Possible threats include roadside maintenance (spraying, slope stabilization, and scraping).

Land Ownership: Private

Land Use: Unknown



Species: *Pseudobahia peirsonii*
Status: Presumed Extant
Trend: Presumed Stable

CNDDDB E.O. Number: 41
Last Site Visit: 1992
Plants Last Seen: 1992

Other Pop. Number: N/A
By: Hathorn and Nordberg
Mapping Precision: Specific

Past Documentation: “2.1 miles north-northwest of Quincy School (site), 1.8 miles of junction Avenue 56 and Road 272” (CNDDDB 2010). Observed by Hathorn and Nordberg, of Woodward-Clyde Consulting, in 1992 as part of focused biological surveys for 8 target species in Tulare County (CNDDDB 2010).

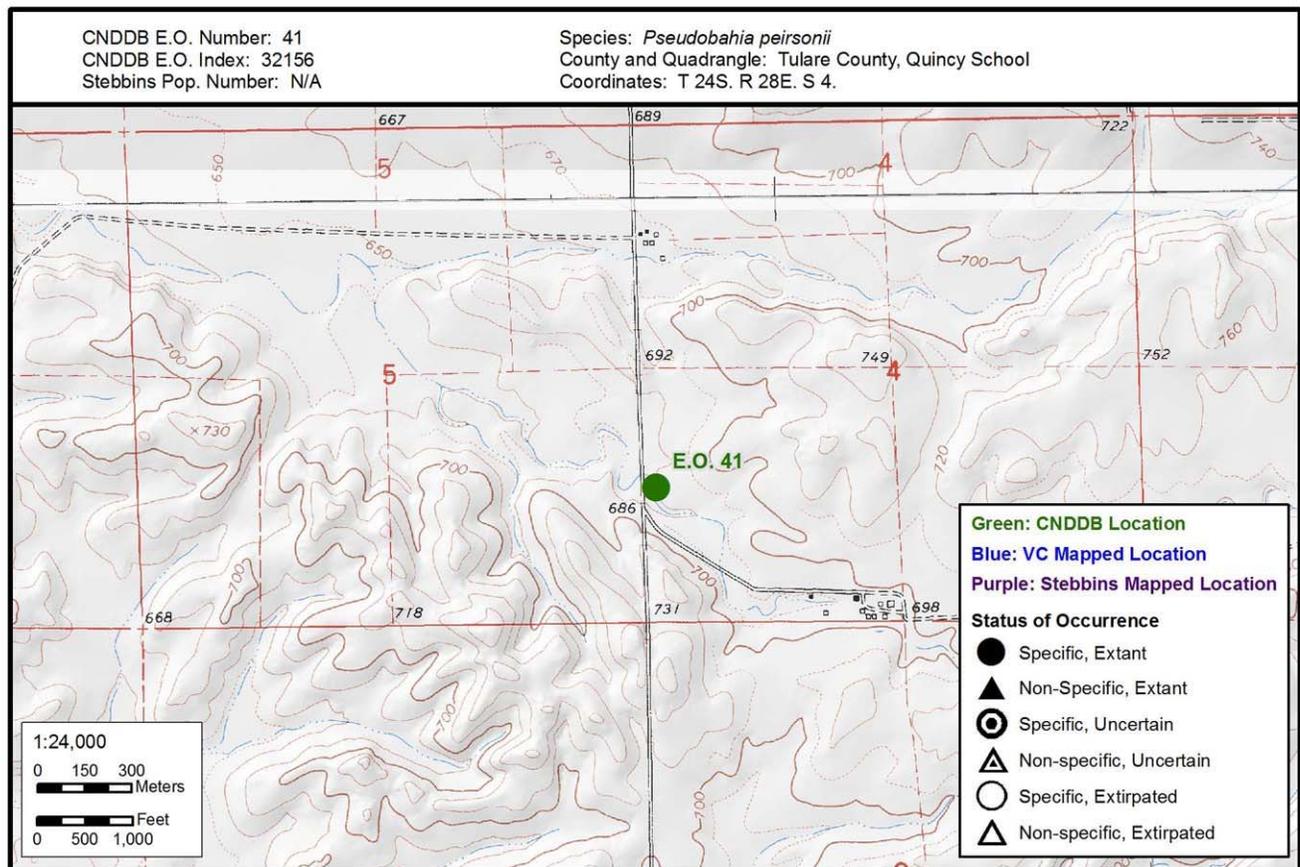
Past Status/Habitat Conditions: In roadcut with ruderal species including *Brassica*, *Avena*, *Erodium*, *Senecia* and *Phacelia* on clay soils along dry, rolling hills (CNDDDB 2010).

Current Status/Habitat Conditions: Presumed extant, habitat conditions are poor.

Trend/Threats: Population is presumed stable. Possible threats include roadside maintenance (spraying, slope stabilization, and scraping).

Land Ownership: Private

Land Use: Unknown



Species: *Pseudobahia peirsonii*
Status: Presumed Extant
Trend: Presumed Stable

CNDDDB E.O. Number: 42
Last Site Visit: 1992
Plants Last Seen: 1992

Other Pop. Number: N/A
By: Hathorn and Nordberg
Mapping Precision: Specific

Past Documentation: “0.3 miles south of Avenue 460 (Sand Creek Drive), just east of Road 136” (CNDDDB 2010). Observed by Hathorn and Nordberg, of Woodward-Clyde Consulting, in 1992 as part of focused biological surveys for 8 target species in Tulare County (CNDDDB 2010).

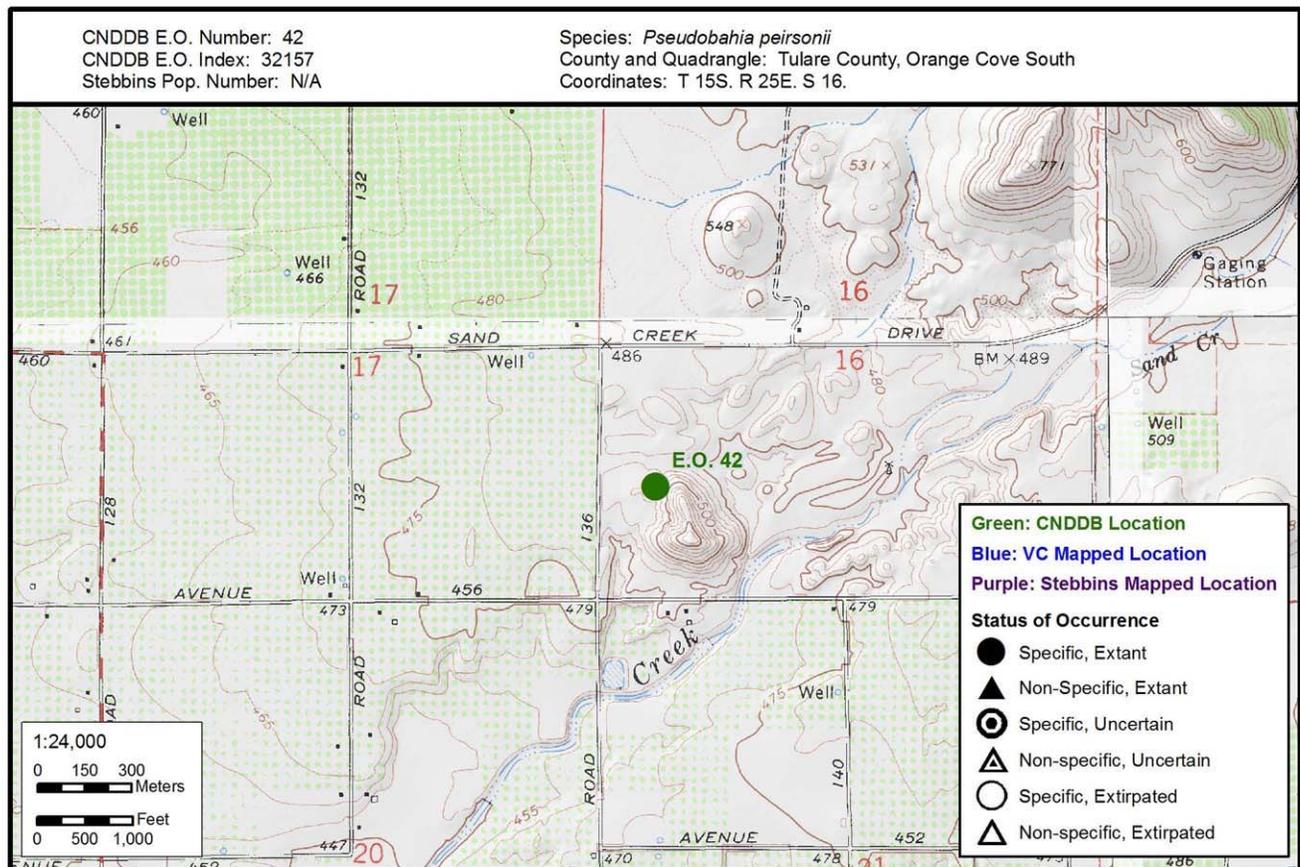
Past Status/Habitat Conditions: In grasslands on Cibo clay soils, with vernal pools in surrounding area. Dominant species include (*Brassica kaber*), filaree (*Erodium cicutarium*), plantain (*Plantago erecta*) and blow wives (*Achyrrachaena mollis*) (CNDDDB 2010).

Current Status/Habitat Conditions: Presumed extant, unknown habitat conditions. Site was not accessible in 2010, however conditions of vicinity appear unchanged.

Trend/Threats: Population is presumed stable. Threats include overgrazing.

Land Ownership: Private.

Land Use: Unknown, was formerly used for grazing.



Species: *Pseudobahia peirsonii*
Status: Presumed Extant
Trend: Presumed Stable

CNDDDB E.O. Number: 43
Last Site Visit: 1992
Plants Last Seen: 1992

Other Pop. Number: N/A
By: Hathorn and Nordberg
Mapping Precision: Specific

Past Documentation: “Northwest facing slope of Stokes Mountain, 1.6 miles south-southeast of junction Avenue 416 (Highway 63) and Road 152” (CNDDDB 2010). Observed by Hathorn and Nordberg, of Woodward-Clyde Consulting, in 1992 as part of focused biological surveys for 8 target species in Tulare County (CNDDDB 2010).

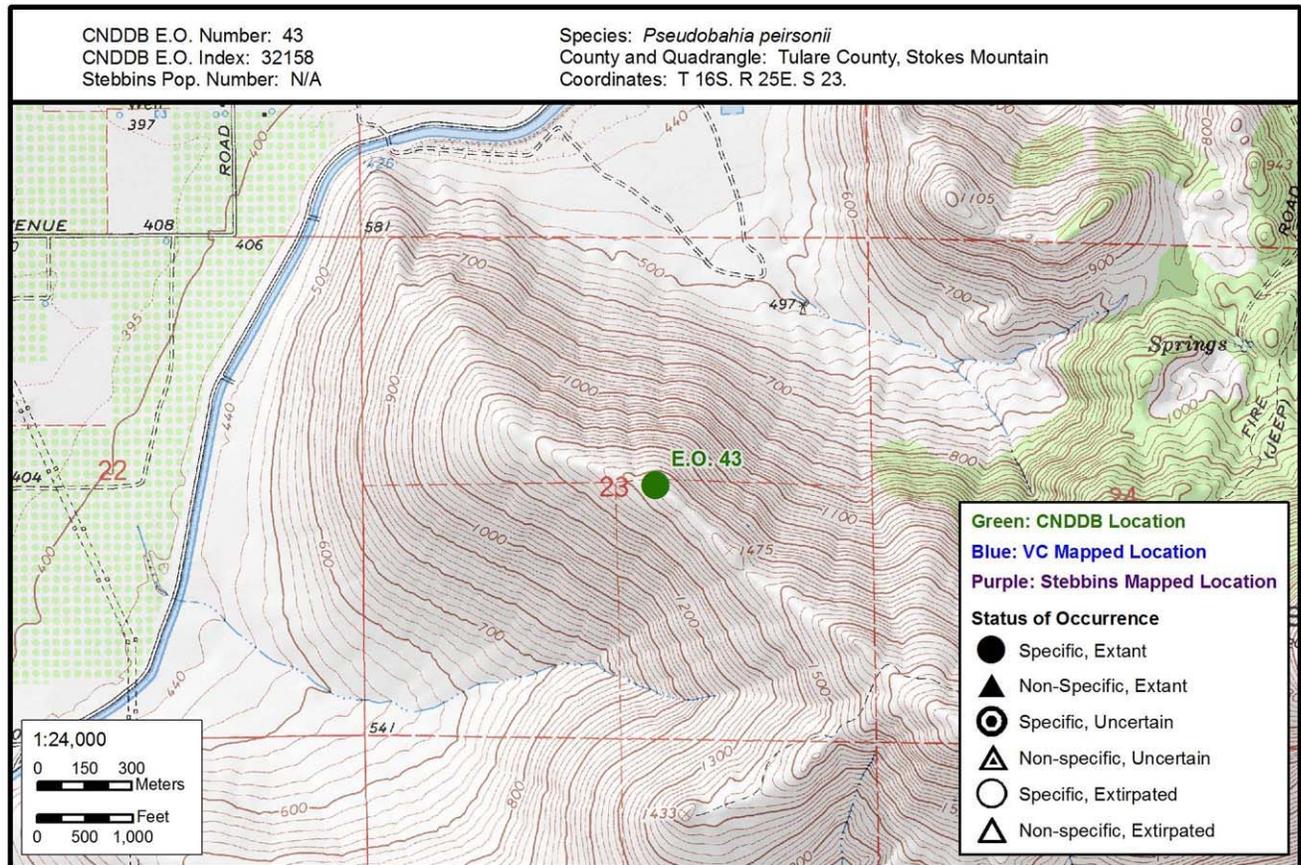
Past Status/Habitat Conditions: Only 2 plants observed in 1992. Plants observed on rock outcrop in grasslands grazed by cattle on clay soils with ruderal dominants (CNDDDB 2010).

Current Status/Habitat Conditions: Presumed extant, unknown current habitat conditions. Site visited but could not locate 2010. Presence is assumed based on habitat conditions. However, there is a possibility species was misidentified in 1992 and is actually *P. heermanii* (Stebbins 2010).

Trend/Threats: Population is presumed stable. Potential threats include overgrazing.

Land Ownership: Private

Land Use: Unknown, has historically been grazed.



Species: *Pseudobahia peirsonii*
Status: Presumed Extant
Trend: Presumed Stable

CNDDDB E.O. Number: 44
Last Site Visit: 1992
Plants Last Seen: 1992

Other Pop. Number: N/A
By: Hathorn and Nordberg
Mapping Precision: Specific

Past Documentation: "Wutchumna Hill, on east crest" (CNDDDB 2010). Observed by Hathorn and Nordberg, of Woodward-Clyde Consulting, in 1992 as part of focused biological surveys for 8 target species in Tulare County (CNDDDB 2010).

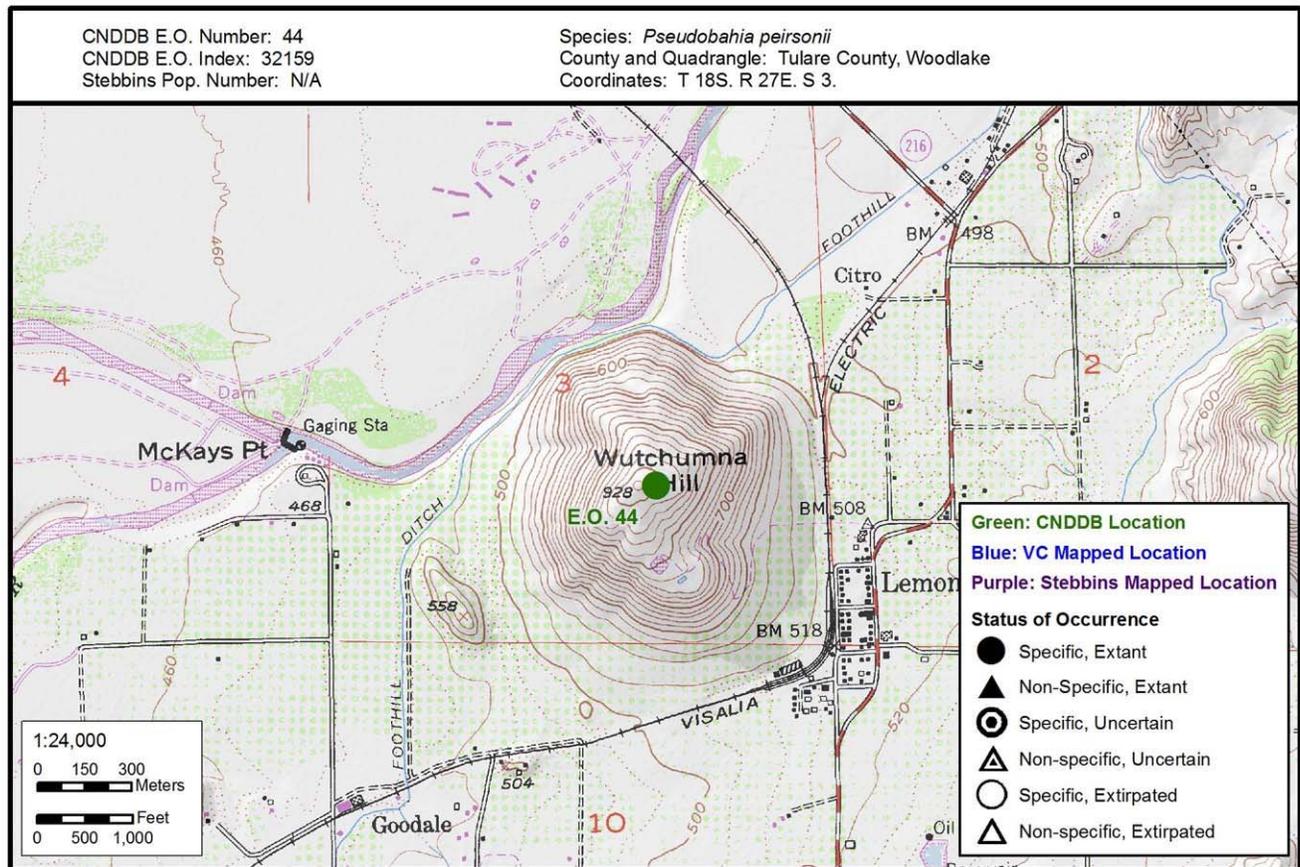
Past Status/Habitat Conditions: Approximately 53 plants observed between two chain-link water cisterns. Occurrences on Cibo clay, in grazed non-native grasslands dominated by ruderal species and annual grasses (CNDDDB 2010).

Current Status/Habitat Conditions: Presumed extant, unknown habitat conditions. Site was not accessible in 2010; however conditions of vicinity appear unchanged.

Trend/Threats: Population is presumed stable. Potential threats include overgrazing and trampling.

Land Ownership: Private

Land Use: Area appears undeveloped (2010 aerial imagery) and is likely still used for grazing.



Species: *Pseudobahia peirsonii*
Status: Presumed Extant
Trend: Declining

CNDDDB E.O. Number: 45
Last Site Visit: 2006
Plants Last Seen: 2006

Other Pop. Number: N/A
By: E. Dean
Mapping Precision: Specific

Past Documentation: "Southern portion of Boat Island, Lake Success" (CNDDDB 2010). Observed by E. Dean in 2006 (CNDDDB 2010).

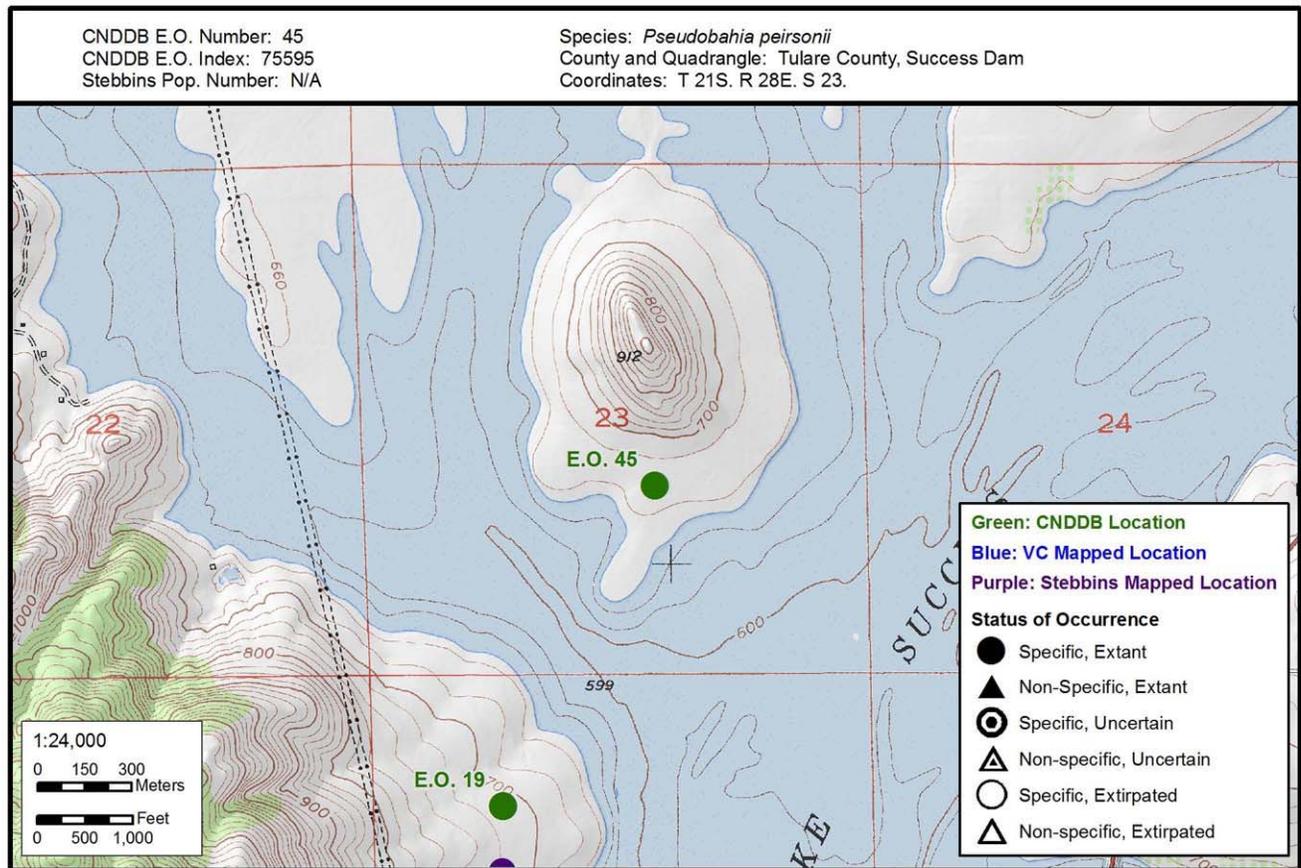
Past Status/Habitat Conditions: Approximately 45 plants were observed in tall wild oat (*Avena fatua*) dominated, ungrazed grasslands. Plants were observed in gently-sloping south facing alluvial fan (CNDDDB 2010).

Current Status/Habitat Conditions: Current status is presumed extant, current habitat conditions are unknown.

Trend/Threats: Population is likely declining. Threats include potential for area to be used as borrow site for Success Dam remediation project. Habitat quality is very poor and subject to flooding and many other impacts since lake level has been raised.

Land Ownership: Department of Defense and Army Corps of Engineers

Land Use: Island within reservoir



Species: *Pseudobahia peirsonii*
Status: Uncertain
Trend: Presumed Declining

CNDDDB E.O. Number: 46
Last Site Visit: 2010
Plants Last Seen: 2006

Other Pop. Number: N/A
By: E. Dean
Mapping Precision: Specific

Past Documentation: "Rocky Hill Recreation Area, on north side of Worth Road, northwest side of Dam at Lake Success" (CNDDDB 2010). Observed by E. Dean in 2006 (CNDDDB 2010).

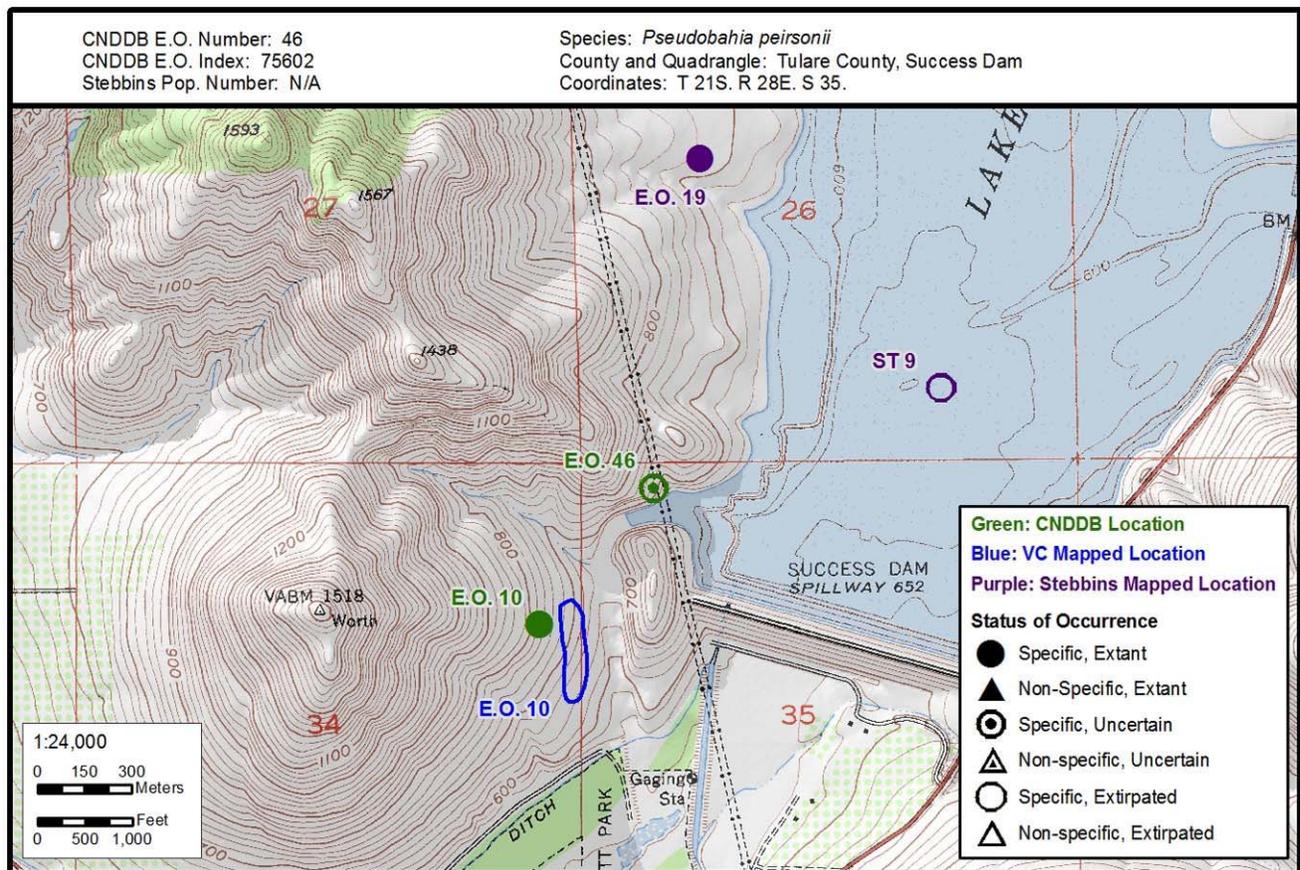
Past Status/Habitat Conditions: Approximately 120 plants were observed on a southeast facing slope on heavy clay Las Posas-rock outcrop soils. Dominant and associate species include milkweed (*Asclepias speciosa*), foxtail chess (*Bromus madritensis rubens*), lesser hawkbit (*Leontodon taraxicoides*), rusty popcorn flower (*Plagiobothrys nothofulvus*) and the rare small flowered morning glory (*Convolvulus simulans*).

Current Status/Habitat Conditions: Current status is uncertain; no plants were observed in 2010. Site has been heavily modified and is adjacent to Lake Success.

Trend/Threats: Population is presumed declining. Threats include potential for area to be used as borrow site for Success Dam remediation project, rising levels from Lake Success and recreation.

Land Ownership: Department of Defense and Army Corps of Engineers

Land Use: Grazing



Species: *Pseudobahia peirsonii*
Status: Extant
Trend: Stable

CNDDDB E.O. Number: N/A
Last Site Visit: 2010
Plants Last Seen: 2010

Other Pop. Number: VC 1
By: John Stebbins
Mapping Precision: Specific

Past Documentation: None

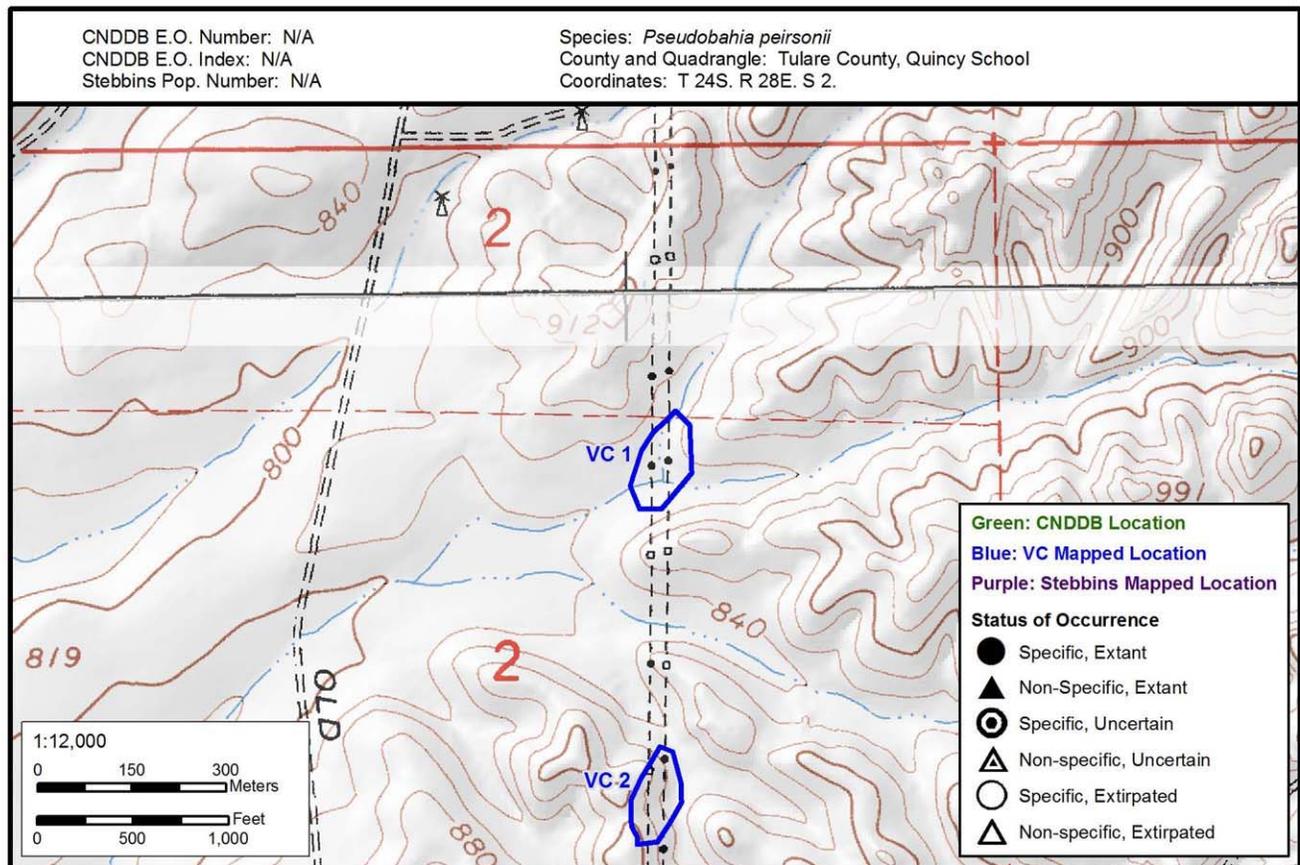
Past Status/Habitat Conditions: N/A

Current Status/Habitat Conditions: Approximately 600 plants observed on moderately grazed clay soils. Distribution spans approximately five acres. Dominant and associate species include blue dicks (*Dichelostemma*), lupine (*Lupinus bicolor*), wild oats (*Avena*), filaree (*Erodium*) and fescue (*Vulpia*). Habitat conditions appear to be good.

Trend/Threats: Population is stable. Potential threats include powerline construction and maintenance.

Land Ownership: Located within Southern California Edison power line right of way.

Land Use: Grazing, within SCE power line right of way easements.



Species: *Pseudobahia peirsonii*
Status: Extant
Trend: Stable

CNDDDB E.O. Number: N/A
Last Site Visit: 2010
Plants Last Seen: 2010

Other Pop. Number: VC 2
By: John Stebbins
Mapping Precision: Specific

Past Documentation: None

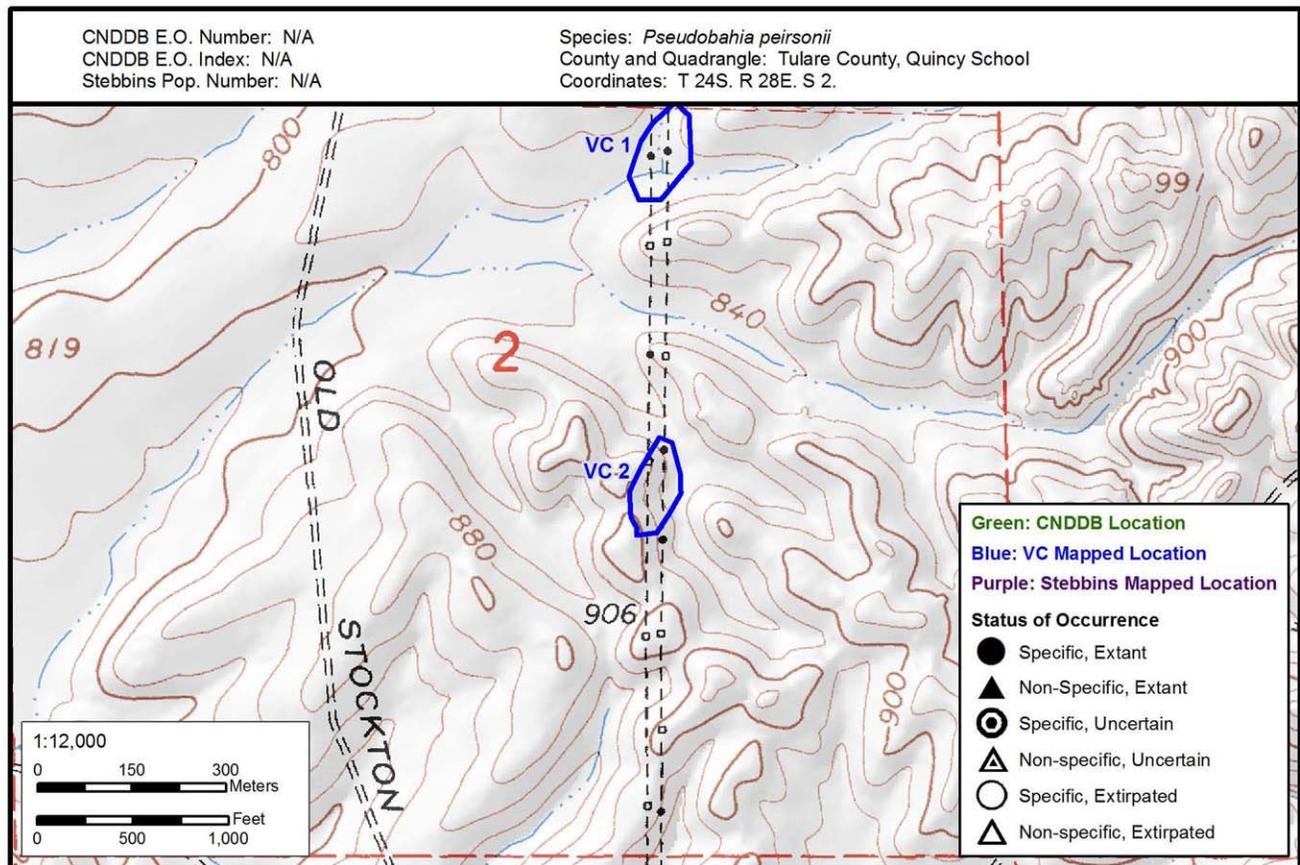
Past Status/Habitat Conditions: N/A

Current Status/Habitat Conditions: Approximately 200 plants observed on heavily grazed clay soils. Distribution spans approximately two acres. Dominant and associate species include blue dicks (*Dichelostemma*), lupine (*Lupinus bicolor*), wild oats (*Avena*), filaree (*Erodium*) and fescue (*Vulpia*). Habitat conditions appear to be good.

Trend/Threats: Population is stable. Potential threats include overgrazing, construction, and maintenance.

Land Ownership: Located within Southern California Edison power line right of way.

Land Use: Grazing, within SCE power line right of way easement.



Species: *Pseudobahia peirsonii*
Status: Extant
Trend: Stable

CNDDDB E.O. Number: N/A
Last Site Visit: 2010
Plants Last Seen: 2010

Other Pop. Number: VC 3
By: John Stebbins
Mapping Precision: Specific

Past Documentation: None

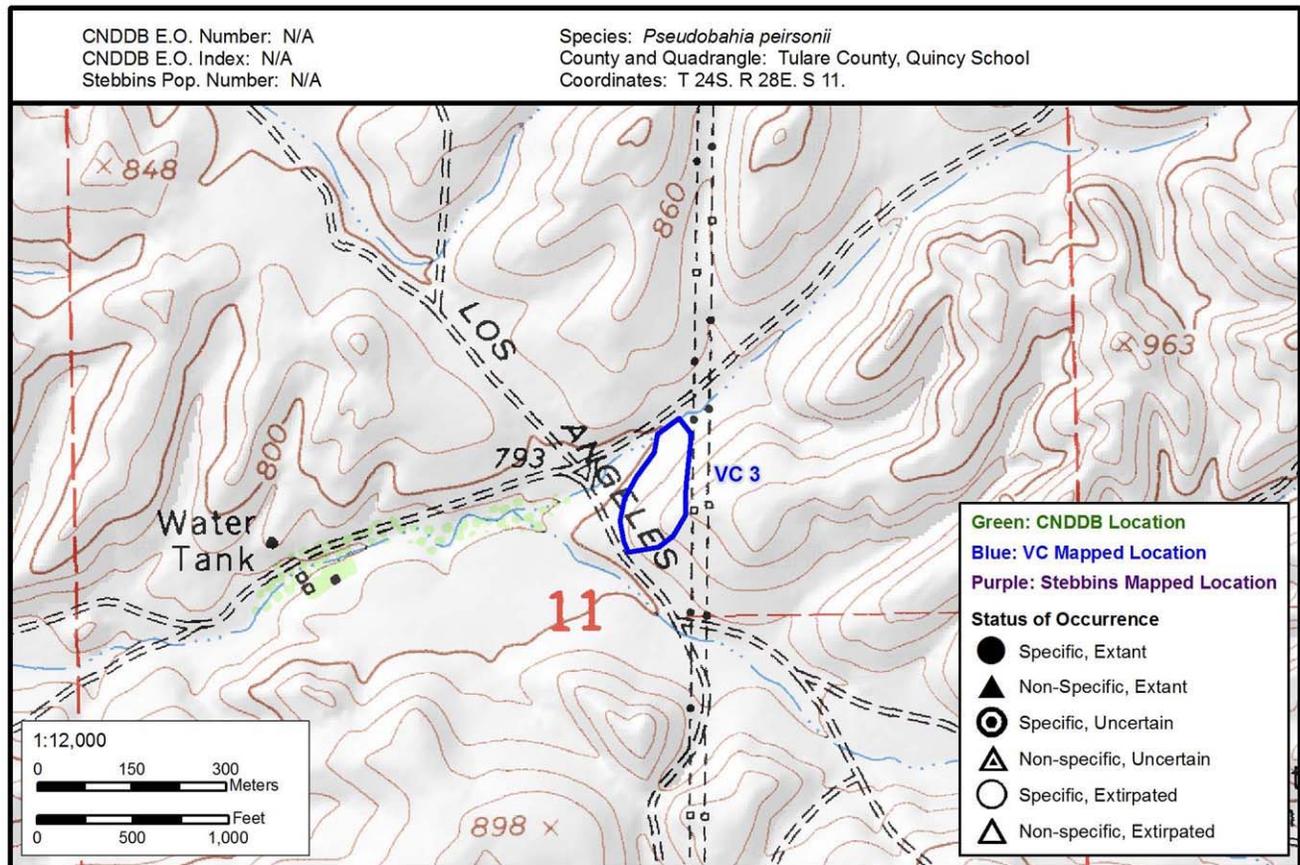
Past Status/Habitat Conditions: N/A

Current Status/Habitat Conditions: Approximately 400 plants observed on grazed clay soils. Distribution spans approximately two acres. Dominant and associate species include wild oats (*Avena*), filaree (*Erodium*), and fescue (*Vulpia*). Habitat conditions appear to be fair.

Trend/Threats: Population is stable. Potential threats include overgrazing, maintenance, and road work.

Land Ownership: Located within Southern California Edison power line right of way.

Land Use: Grazing, within SCE power line right of way easements.



Species: *Pseudobahia peirsonii*
Status: Extant
Trend: Stable

CNDDDB E.O. Number: N/A
Last Site Visit: 2010
Plants Last Seen: 2010

Other Pop. Number: VC 4
By: John Stebbins
Mapping Precision: Specific

Past Documentation: None

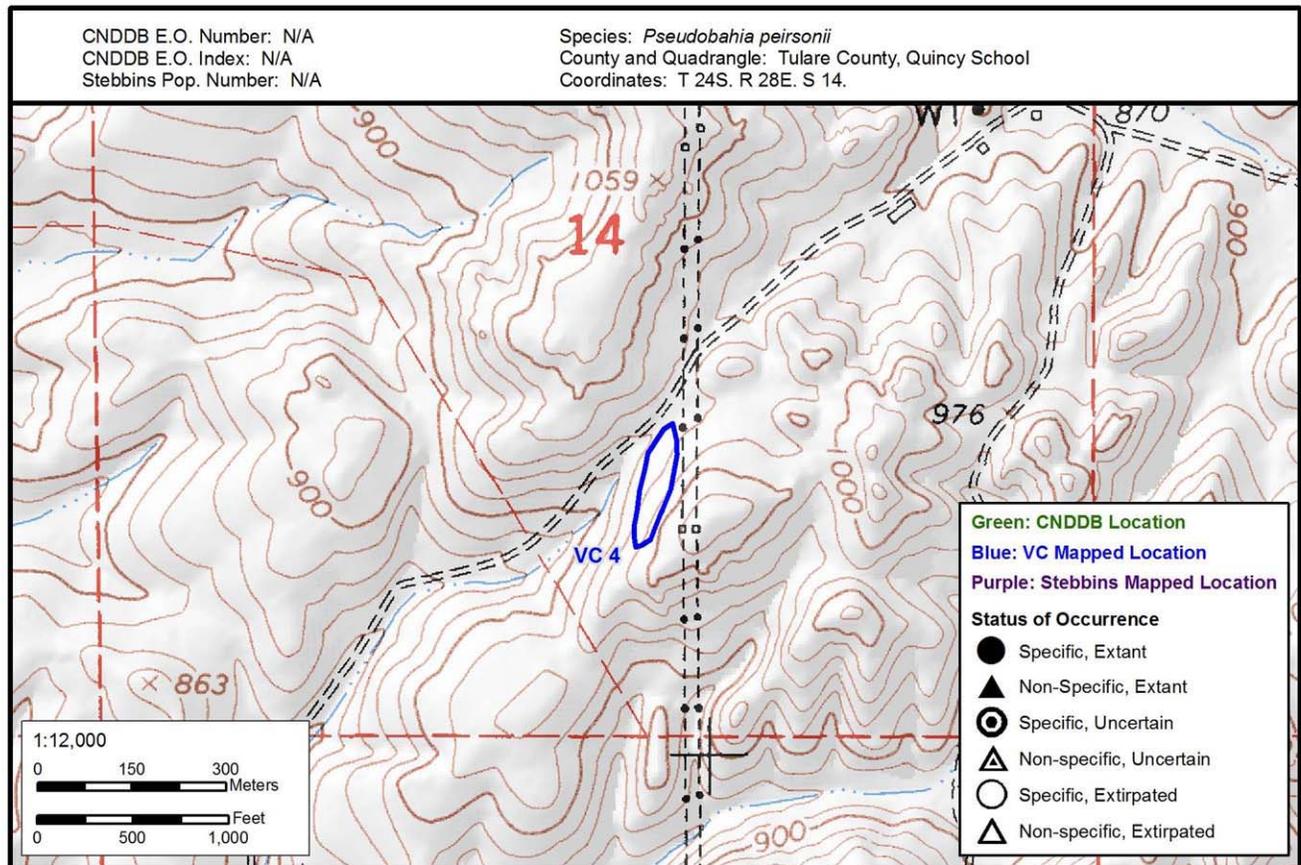
Past Status/Habitat Conditions: N/A

Current Status/Habitat Conditions: Approximately 100 plants observed on heavily grazed clay soils. Dominant and associate species include lupine (*Lupinus succulentus*), red brome (*Bromus rubens*), wild oats (*Avena*), filaree (*Erodium*), and fescue (*Vulpia*). Habitat conditions appear to be fair.

Trend/Threats: Population is stable. Potential threats are overgrazing, construction and maintenance.

Land Ownership: Located within Southern California Edison power line right of way.

Land Use: Grazing, within SCE power line right of way easements.



Species: *Pseudobahia peirsonii*
Status: Extant
Trend: Stable

CNDDDB E.O. Number: N/A
Last Site Visit: 2010
Plants Last Seen: 2010

Other Pop. Number: VC 5
By: John Stebbins
Mapping Precision: Specific

Past Documentation: None

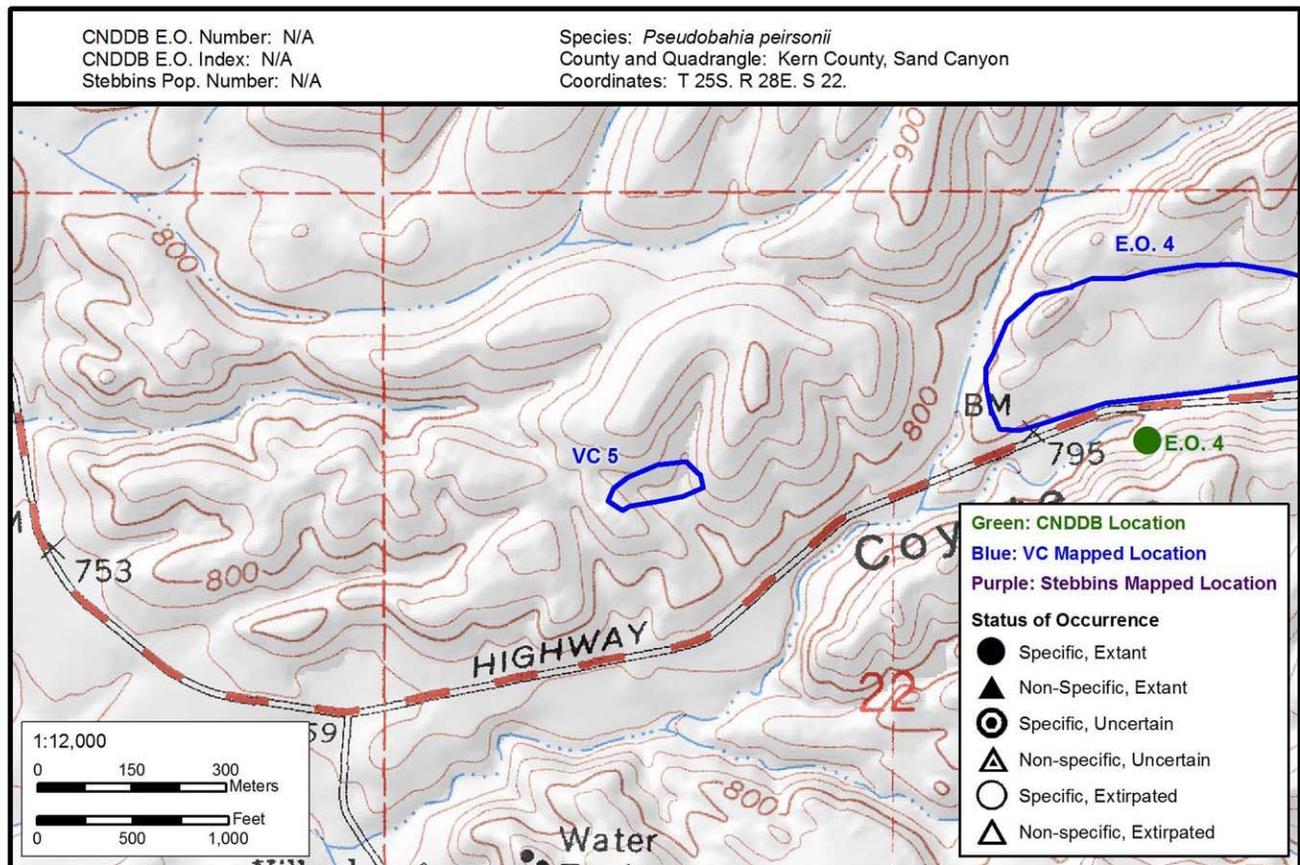
Past Status/Habitat Conditions: N/A

Current Status/Habitat Conditions: Approximately 2,000 plants observed grazed non-native annual grassland. Dominant and associate species include soft chess (*Bromus hordeaceus*), blow wives (*Achyrrachaena mollis*) and fescue (*Vulpia*). Habitat conditions appear to be good.

Trend/Threats: Population is stable. Potential threats include conversion to agriculture and rural development. New rural residences were identified nearby in the north near EO 4

Land Ownership: Private

Land Use: Grazing



Species: *Pseudobahia peirsonii*
Status: Extant
Trend: Stable

CNDDDB E.O. Number: N/A
Last Site Visit: 2010
Plants Last Seen: 2010

Other Pop. Number: VC 6
By: John Stebbins
Mapping Precision: Specific

Past Documentation: None

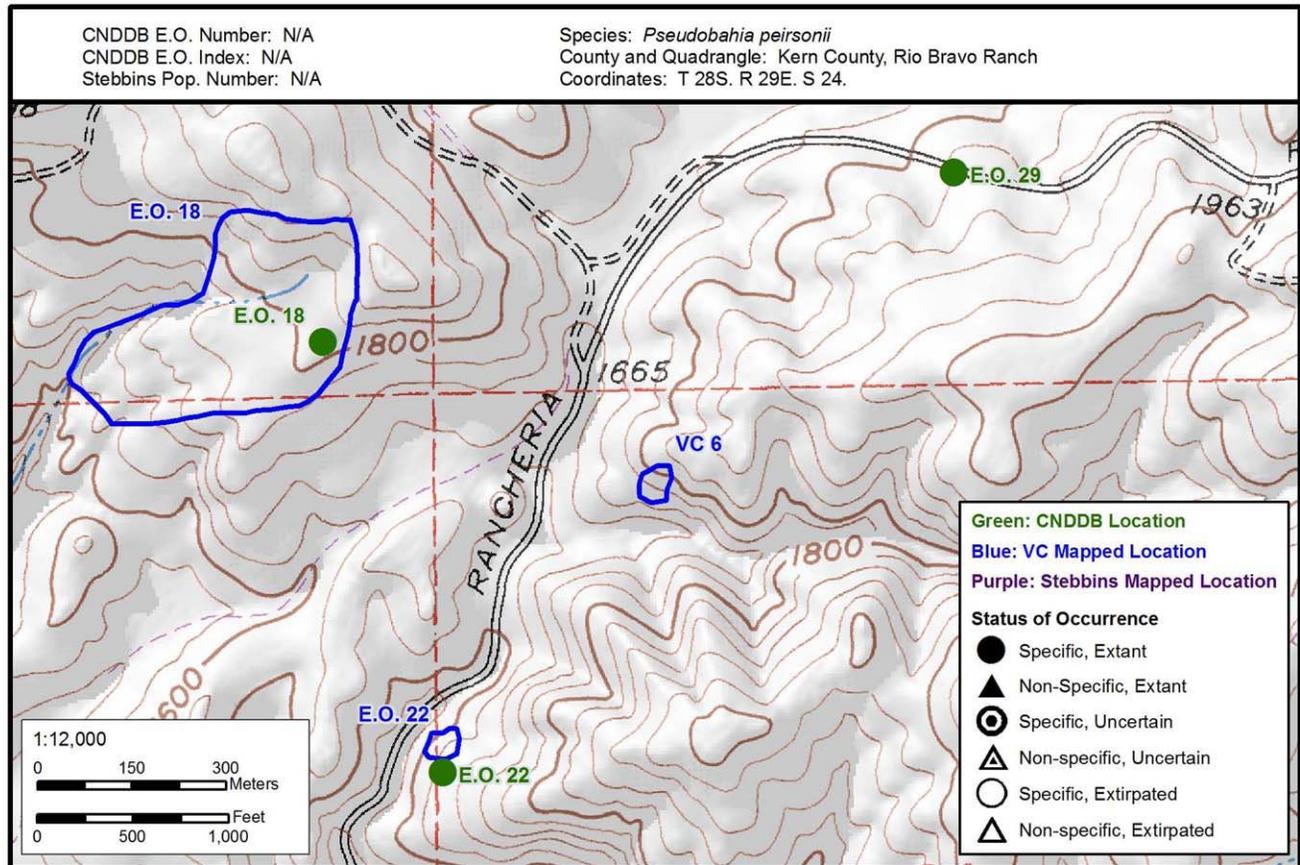
Past Status/Habitat Conditions: N/A

Current Status/Habitat Conditions: Approximately 200 plants observed in non-native annual grassland on gentle north facing slope. Dominant and associate species include soft chess (*Bromus hordeaceus*), wild oats (*Avena*), and red brome (*Bromus rubens*) and rat's-tail fescue (*Vulpia myuros*). Habitat conditions appear to be good.

Trend/Threats: Population is stable. No threats identified.

Land Ownership: Unknown

Land Use: Unknown



APPENDIX E

**REPRESENTATIVE PHOTOGRAPHS OF
SPECIES AND HABITAT SETTINGS**

**Appendix E: Representative Photographs of *Pseudobahia bahiifolia* and *P. peirsonii*.
Photos Taken and Compiled by Vollmar Consulting and John Stebbins, 2010.**



Photo 1a: *Pseudobahia bahiifolia*, April 2010



Photo 1b: *Pseudobahia bahiifolia*, April 2010

**Appendix E: Representative Photographs of *Pseudobahia bahiifolia* and *P. peirsonii*.
Photos Taken and Compiled by Vollmar Consulting and John Stebbins, 2010.**



Photo 2a: *Pseudobahia peirsonii*, April 2010



Photo 2b: *Pseudobahia peirsonii*, April 2010

**Appendix E: Representative Photographs of *Pseudobahia bahiifolia* and *P. peirsonii*.
Photos Taken and Compiled by Vollmar Consulting and John Stebbins, 2010.**



Photo 3: *Pseudobahia heermannii*, April 2010



Photo 4: Typical soils associated with *Pseudobahia bahiifolia*, April 2010

**Appendix E: Representative Photographs of *Pseudobahia bahiifolia* and *P. peirsonii*.
Photos Taken and Compiled by Vollmar Consulting and John Stebbins, 2010.**



Photo 5a: Seasonal creek habitat with *Pseudobahia peirsonii*, April 2010



Photo 5b: Cliff habitat with *Pseudobahia bahiifolia*, April 2010

**Appendix E: Representative Photographs of *Pseudobahia bahiifolia* and *P. peirsonii*.
Photos Taken and Compiled by Vollmar Consulting and John Stebbins, 2010.**

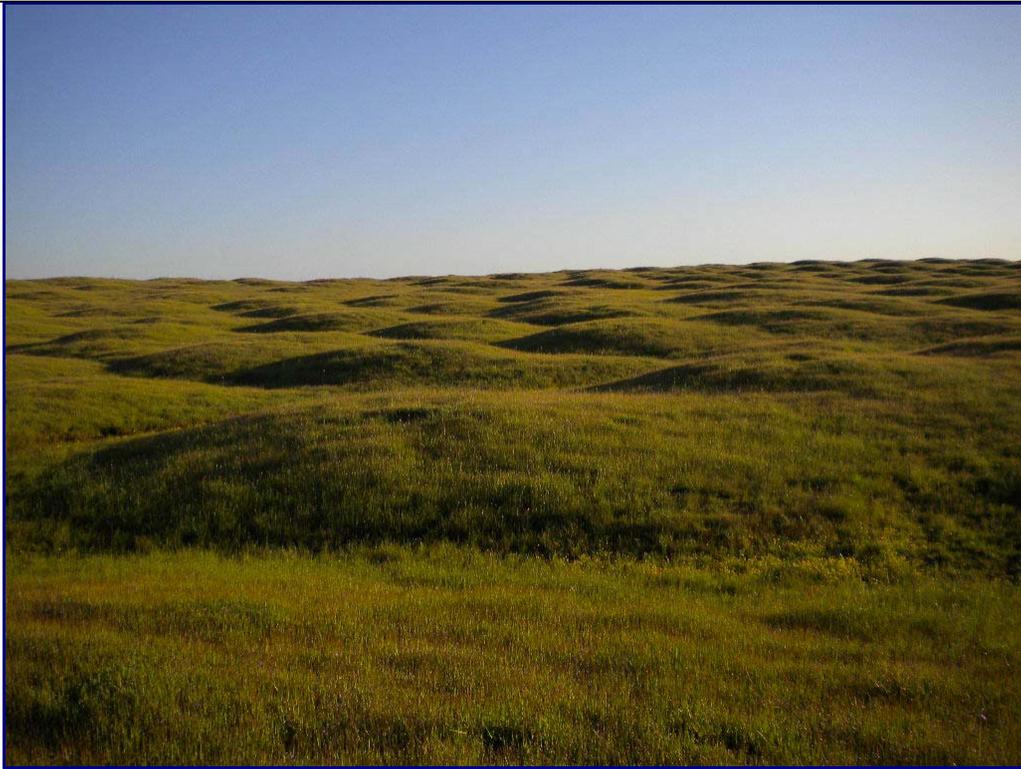


Photo 5c: Mima mounds habitat with *Pseudobahia bahiifolia*, April 2010



Photo 5d: Hillock habitat with *Pseudobahia bahiifolia*, April 2010