MEMORANDUM

TO: Robert Fletcher, San Diego Gas & Electric

FROM: Melissa Busby, Busby Biological Services, Inc.

DATE: December 7, 2015

RE: Results of Focused Thread-Leaved Brodiaea (*Brodiaea filifolia*) Surveys Performed for the Proposed Sycamore to Peñasquitos 230 Kilovolt Transmission Line Project

Busby Biological Services, Inc. (BBS) conducted focused special-status plant species surveys as well as a focused habitat assessment and focused surveys for thread-leaved brodiaea (*Brodiaea filifolia*) for the proposed San Diego Gas & Electric Company (SDG&E) Sycamore to Peñasquitos 230 Kilovolt Transmission Line Project (Proposed Project), Application No. 14-04-011.

This memorandum provides background information on the thread-leaved brodiaea surveys that have been conducted for the Proposed Project, a species description of thread-leaved brodiaea, a summary of the methods used for the various thread-leaved brodiaea surveys, and the results of these surveys.

THREAD-LEAVED BRODIAEA SURVEY BACKGROUND

Initially, thread-leaved brodiaea was included as a target species for the special-status plant species surveys that were conducted within the original Biological Survey Area (BSA) for the Proposed Project in late summer/early fall 2013 and spring 2014. The methods and results of the 2013/2014 special-status plant species surveys are summarized in the survey summary report, titled *Special-Status Plant Survey Summary Report for the Proposed San Diego Gas & Electric Company Sycamore to Peñasquitos 230 Kilovolt Transmission Line Project, San Diego County, California* and dated June 2014 (BBS 2014b).

Following observations of thread-leaved brodiaea during the 2013/2014 focused special-status plant species surveys, the California Public Utilities Commission (CPUC) requested a focused thread-leaved brodiaea habitat assessment within the updated BSA, which included the original BSA plus areas that had been added to the Proposed Project during subsequent project planning efforts. Biologists performed this focused habitat assessment in fall 2014. The methods and results of the focused habitat assessment are summarized in a memorandum to Robert Fletcher (SDG&E) from Melissa Busby (BBS), titled *Response*

to Data Request 105: Provide a habitat assessment for the thread-leaved brodiaea (Bf; Brodiaea filifolia*)* and dated October 29, 2014. This memorandum was submitted to the CPUC as SDG&E's partial response # 3 to Energy Division (ED) Data Request 2, Question 105.

Based on the results of the 2013/2014 focused special-status plants species surveys combined with the results of the 2014 focused habitat assessment, biologists performed focused thread-leaved brodiaea surveys during spring 2015 within potentially suitable habitat located within the current BSA.

THREAD-LEAVED BRODIAEA – SPECIES INFORMATION

Thread-leaved brodiaea is a federally listed threatened, state-listed endangered, California Rare Plant Rank (CRPR) 1B.1, and *SDG&E Subregional NCCP*-covered species. This species is a perennial, bulbiferous herb that regrows annually from an underground corm. Typically, not all thread-leaved brodiaea individuals in a population emerge and/or flower each year. Thus, many non-emergent corms may remain dormant below the ground.

Thread-leaved brodiaea is typically found in habitats that range from grasslands to ephemeral wetlands, such as vernal pools at low elevations and meadows in montane habitat (CNPS 2014). Specifically, thread-leaved brodiaea grows in open areas within herbaceous communities, including valley needlegrass grassland, valley sacaton grassland, non-native grassland, alkali playa, southern interior basalt vernal pools, San Diego mesa hardpan vernal pools, and San Diego mesa claypan vernal pools. It often grows in interstitial areas (often narrow bands of habitat surrounded by other vegetation) in association with coastal sage scrub when suitable soils and site conditions are present. Thread-leaved brodiaea is associated with clay soils, subsurface clay soils, or clay lenses within loamy, silty loam, loamy sand, silty deposits with cobbles, or alkaline soils (USFWS 2009).

Thread-leaved brodiaea is distributed in southern California from San Diego to Los Angeles counties and east to the San Bernardino Mountains. In San Diego County, thread-leaved brodiaea occurs at elevations ranging from 80 feet to 2,400 feet above mean sea level.

Threats to thread-leaved brodiaea include loss of habitat from urbanization, agricultural conversion, alteration of hydrology and impacts from livestock grazing, unauthorized off-highway vehicle (OHV) use, discing for fire suppression, and competition from nonnative plants. Thread-leaved brodiaea was state-listed as endangered in 1982 (CNPS 2014) and federally listed as threatened in 1998. When the species was listed in 1998, there were only 39 extant occurrences; however, by 2009 this number increased to about 68 extant occurrences (USFWS 2009).

Thread-leaved brodiaea occurs within the BSA and Proposed Project vicinity according to historical occurrence data (California Department of Fish and Wildlife [CDFW] 2014) and as documented by the results of the focused special-status plant species surveys conducted for the Proposed Project.

METHODS

To determine the locations within the current BSA that support thread-leaved brodiaea, a literature and database review was performed, the special status-plant species survey summary report prepared in 2014 for the Proposed Project (BBS 2014b) was reviewed, a focused habitat assessment was conducted in the BSA during fall 2014, and focused thread-leaved brodiaea surveys were conducted during spring 2015. The methods for each of these are described in detail below.

Literature & Database Review

A literature review for thread-leaved brodiaea was conducted to supplement the information provided in the Biological Technical Report (BBS 2014a). In addition, historical occurrence databases (e.g., California Natural Diversity Database [CNDDB], SanGIS, SDG&E's internal Sunrise Powerlink database) were searched, and other references were consulted to better understand the historical location data and distribution of this species in San Diego County.

2013/2014 Special-Status Plant Species Surveys

Three rounds of focused special-status plant species surveys were conducted within the original BSA for the Proposed Project. These surveys were conducted in late summer/fall 2013, early spring 2014, and late spring 2014 by walking meandering transects throughout the original BSA. The original BSA included (1) a 500-foot-wide survey corridor along the approximately 16.5-mile alignment, (2) the existing Sycamore Canyon and Peñasquitos Substations, and (3) the proposed Sycamore and Stowe construction yards.

Thread-leaved brodiaea was included in the target species list for the focused special-status plant species surveys conducted within the original BSA for the Proposed Project. Areas with clay soils were assessed during the special-status plant species surveys for potentially suitable habitat by highly qualified botanists who are familiar with this species and its phenology. No focused habitat assessment was conducted for thread-leaved brodiaea prior to or during these surveys; however, botanists noted the locations of clay soils in the alignment because of the soils' high potential to support many special-status species, including thread-leaved brodiaea, and thoroughly surveyed these areas during the special-status plant species surveys.

2014 Focused Habitat Assessment

A focused habitat assessment for thread-leaved brodiaea was conducted in fall 2014 to evaluate the current BSA for areas that have a potential to support thread-leaved brodiaea. The current BSA includes areas in the original BSA that were previously surveyed for special-status plant species as well as areas that were not part of the original BSA and, therefore, were not previously surveyed, but that have been added to the Proposed Project during project planning efforts.

During the focused thread-leaved brodiaea habitat assessment, potentially suitable habitats with clay soils in grassland vegetation communities were assessed for the potential to support thread-leaved brodiaea. Potentially suitable habitats were mapped in the field using aerial imagery of the BSA (1 inch = 200 feet) and handheld Global Positioning Systems (GPS) units. Potentially suitable habitat areas were digitized using Google™ Earth based on field notes and waypoints collected in the field.

2015 Focused Thread-Leaved Brodiaea Surveys

Based on the results of the literature and database review, 2013/2014 special-status plant species surveys, and the focused thread-leaved brodiaea habitat assessment, biologists performed focused thread-leaved brodiaea surveys within potentially suitable habitat located within the current BSA during spring 2015.

Before initiating the focused thread-leaved brodiaea surveys, biologists monitored the thread-leaved brodiaea reference population – the thread-leaved brodiaea population that occurs within and adjacent to the current BSA – during spring 2015 to determine when the species had emerged and was observable within BSA.

Once thread-leaved brodiaea was observed at the reference population, a focused thread-leaved brodiaea survey was conducted in the potentially suitable habitat within the current BSA. Biologists mapped the locations of and counted all thread-leaved brodiaea individuals observed. For all thread-leaved brodiaea observations, biologists mapped the observation by hand onto the aerial photograph (either a point or a polygon), estimated the number of individuals, and collected a GPS point for the plant/population location.

RESULTS

The results of the literature and database review, the thread-leaved brodiaea observations during the 2013/2014 special-status plant species surveys, the fall 2014 focused habitat assessment, and the spring 2015 focused thread-leaved brodiaea surveys are provided, below.

Literature & Database Review

The results of the detailed literature and database review were used to prepare the thread-leaved brodiaea species information provided above. CNDDB occurrence 89 is located adjacent to the eastern boundary of the BSA (Figure 1), and a new population of thread-leaved brodiaea was documented within the original BSA during the late spring 2014 plant surveys (Figure 2a). Extant CNDDB occurrences 66, 70, 84, and 90 also occur north of the BSA, within approximately 5 miles of the BSA (Figure 1).

2013/2014 Focused Special-Status Plant Species Surveys

Potentially suitable thread-leaved brodiaea habitat was surveyed during the fall 2013, early spring 2014, and late spring 2014 surveys. During spring 2014 surveys, thread-leaved brodiaea was found in one location within the BSA adjacent to a known location (Figure 1: CNDDB occurrence 89), which is located outside of and adjacent to the BSA (Figure 2a) and is the southern-most record for this species across its entire range (Figure 1). Approximately 62 flowering individuals were observed within the original BSA growing in deep clay soils (Figure 2a), within a mix of native and non-native grassland, at the City of San Diego's Black Mountain Open Space Preserve.

Photograph 1, below, shows thread-leaved brodiaea in bloom in the Black Mountain Open Space Preserve. This photograph was taken on May 12, 2014, during the focused special-status plant species surveys conducted for the Proposed Project.

Photograph 1: Thread-leaved brodiaea in bloom during focused surveys for the Proposed Project (Spring 2014)

2014 Focused Habitat Assessment

Potentially suitable thread-leaved brodiaea habitat with appropriate clay soils was mapped during the fall 2014 focused habitat assessment (Figures 2a and 2b). All of the potential thread-leaved brodiaea habitat included clay soils in grassland habitat adjacent to coastal sage scrub habitat.

Potentially suitable habitat was mapped at two primary locations, in the Black Mountain Open Space Preserve (Figure 2a) and near the junction of Carmel Valley Road and Black Mountain Road (Figure 2b). These areas include both the areas where thread-leaved brodiaea was observed during the spring 2014 surveys (Figure 2a) as well as areas within the BSA that contain potentially suitable habitat, but where thread-leaved brodiaea was not observed during the previous surveys (Figures 2a and 2b). Photographs 2 and 3, below, provide examples of suitable habitat within the BSA. No suitable habitat was identified during the fall 2014 habitat assessment in areas that were previously not surveyed.

Photograph 2, below, shows potentially suitable thread-leaved brodiaea habitat within the Black Mountain Open Space Preserve. This photograph was taken during the fall 2014 habitat assessment. The green arrow indicates the location of the thread-leaved brodiaea population that was observed during the spring 2014 focused special-status plant species surveys. The red arrows point to potentially suitable habitat where thread-leaved brodiaea was not observed during any of the focused special-status plant species surveys conducted for the Proposed Project.

Photograph 2: Black Mountain Open Space Preserve (Fall 2014), locations of thread-leaved brodiaea (green arrow) and potentially suitable habitat (red arrows).

Photograph 3, below, shows the potentially suitable thread-leaved brodiaea habitat that was identified during the fall 2014 habitat assessment near the junction of Black Mountain Road and Carmel Valley Road. This photograph was taken during the fall 2014 habitat assessment. No thread-leaved brodiaea was observed in this habitat during any of the special-status plant species surveys conducted for the Proposed Project.

Photograph 3: Black Mountain Road and Carmel Valley Road (Fall 2014)

2015 Focused Thread-Leaved Brodiaea Surveys

Two thread-leaved brodiaea reference site checks were conducted during spring 2015. The first reference site check was performed on March 30, 2015, and determined that the species had not yet emerged and was not yet observable. The second reference site check was conducted on April 20, 2015, and several individuals were observed. Therefore, because the species was observable within the BSA, the focused survey was initiated.

The focused thread-leaved brodiaea survey was conducted on April 27, 2015. All potentially suitable thread-leaved brodiaea habitat within the current BSA was surveyed. Eight individuals were documented during the spring 2015 survey (Figure 2a); these eight individuals were within and adjacent to the observable individuals documented during the spring 2014 surveys.

DISCUSSION

As discussed above, not all individuals of thread-leaved brodiaea emerge and/or flower each year. Many corms remain dormant underground and are not observable during focused special-status plant species surveys. As such, a thread-leaved brodiaea population may often be much larger than the number of individuals observed in a given year.

During the spring 2014 surveys, thread-leaved brodiaea was found in one location within the original BSA and adjacent to a known historical location located outside of and adjacent to the BSA (CNDDB occurrence 89, Figures 1 and 2a). This occurrence is the southern-most record for this species across its entire range (Figure 1). Approximately 62 flowering individuals were observed growing in clay soils, within a mix of native and non-native grassland, at the City of San Diego's Black Mountain Open Space Preserve.

During the spring 2015 surveys, all potentially suitable habitat within the current BSA that was identified during the fall 2014 focused thread-leaved brodiaea habitat assessment (Figures 2a and 2b) was surveyed for thread-leaved brodiaea. Eight flowering individuals were observed within and adjacent to the same location as those observed in spring 2014. These individuals were also growing in clay soils, within a mix of native and nonnative grassland, at the City of San Diego's Black Mountain Open Space Preserve. No additional populations were observed during these focused surveys.

Based on the phenology of the thread-leaved brodiaea and the recent drought conditions, the population size at the documented location within the Proposed Project area (Figure 2a) likely contains many more individuals than what has been observed to date during the surveys conducted for the Proposed Project.

REFERENCES

Busby Biological Services, Inc. (BBS)

2014a Biological Technical Report for Sycamore to Peñasquitos 230 Kilovolt Transmission Line Project, City of San Diego, San Diego County, California. March 2014.

2014b Special-Status Plant Survey Summary Report for the Proposed San Diego Gas & Electric Company Sycamore to Peñasquitos 230 Kilovolt Transmission Line Project, San Diego County, California. June 2014.

California Department of Fish and Wildlife (CDFW)

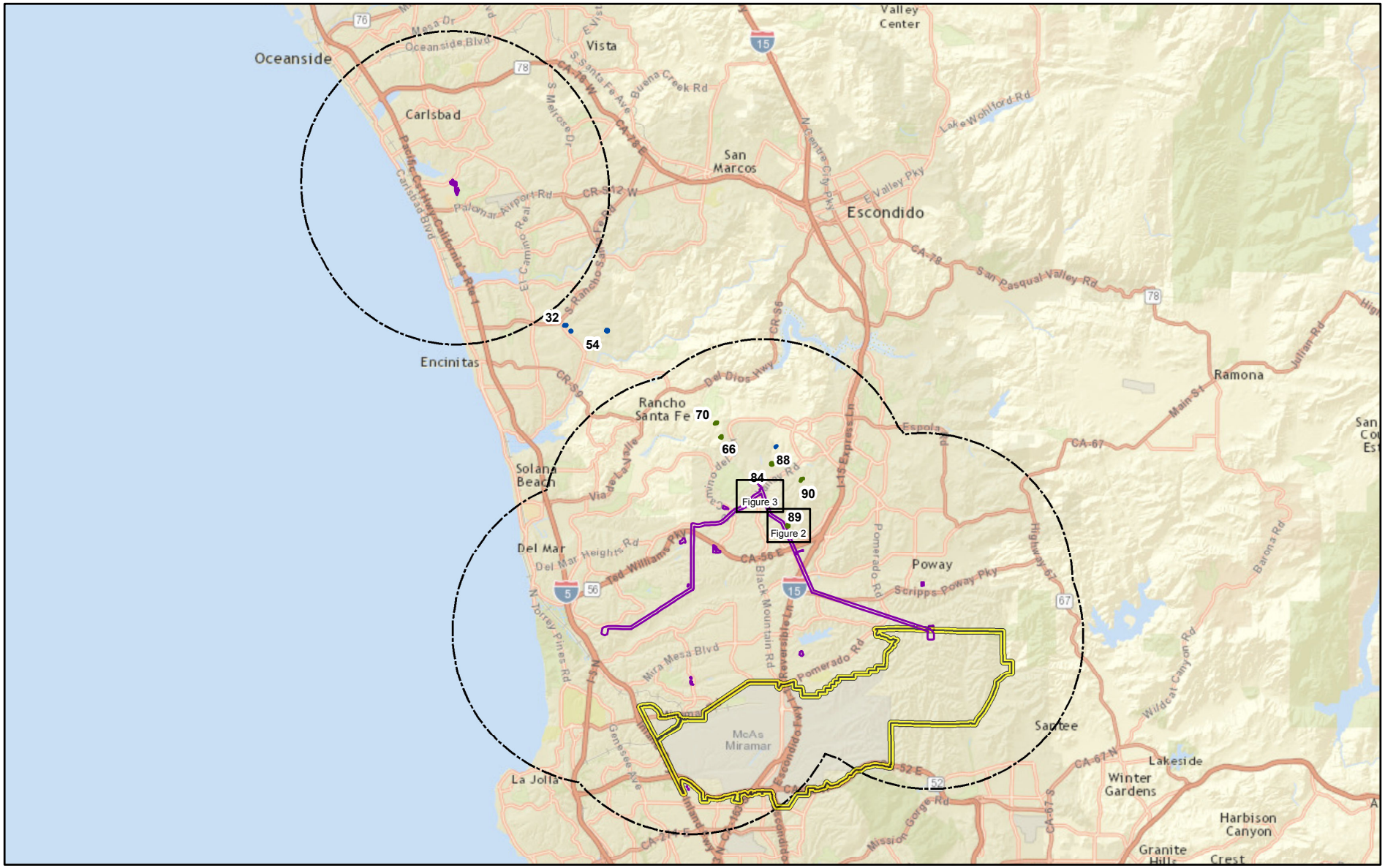
2014 Natural Diversity Data Base. Nongame-Heritage Program, California Department of Fish and Wildlife, Sacramento.

California Native Plant Society (CNPS)

2014 Rare Plant Program. Inventory of Rare and Endangered Plants (online edition, v8-02). California Native Plant Society, Sacramento, CA. Website http://www.rareplants.cnps.org [accessed 20 October 2014].

U.S. Fish and Wildlife Service (USFWS)

2009 *Brodiaea filifolia* (thread-leaved brodiaea). Carlsbad Fish and Wildlife Office, CA August 13, 2009. 47 pgs.



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Extirpated CNDDB Occurrence
Extant CNDDB Occurrence
MCAS Miramar
EncinaSurveyArea_5mileBuffer

CNDDB Occurrence Number
BSA
5-Mile Buffer Around BSA

Sycamore to Peñasquitos 230 kV Transmission Line Project
Historical *Brodiaea filifolia* Locations
Figure 1

0 3 6 9 Miles

Sources: CNDDB October 2014 Database, CA Dept. Fish and Wildlife; Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

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BSA

Potentially Suitable Habitat

Sycamore to Peñasquitos 230 kV Transmission Line Project

Potentially Suitable Habitat for *Brodiaea filifolia* in BSA

Figure 2b

0 200 400 600 Feet

SDGE

A Sempra Energy utility

Sources: CNDDB October 2014 Database, CA Dept. Fish and Wildlife; Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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- Brodiaea filifolia documented during 2015 plant surveys
- BSA
- Potentially Suitable Habitat
- Population of *Brodiaea filifolia* documented during 2014 plant surveys - 62 Individuals Observed
- Extant CNDDB Occurrence (#89)

0 180 360 540 Feet

Sycamore to Peñasquitos 230 kV Transmission Line Project

Potentially Suitable Habitat for *Brodiaea filifolia* in BSA

Figure 2a

SDGE A Sempra Energy utility

Sources: CNDDB October 2014 Database, CA Dept. Fish and Wildlife; Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community