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January 12, 2020

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Dear Drs. Hull, Darst, and Baskerville-Bridges and Mrs. Dyer,

This letter transmits the U.S. Geological Survey (USGS) Western Ecological Research Center's draft data summary entitled Western Spadefoot (*Spea hammondi*) Surveys in California, 2020. This information is provided to fulfill USGS obligations under the U.S. Fish and Wildlife Service Inter/Intra-Agency Agreements (IAA) and the San Bernardino Valley Municipal Water District Technical Assistance Agreement 20ZCTAASBVMWD00. We expect to publish these data in early 2022, at which time a final publication will be distributed.

Please note that this information is preliminary or provisional and is subject to revision. It is being provided to meet the need for timely best science. The information has not received final approval by the USGS and is provided on the condition that neither the USGS nor the U.S.

Government shall be held liable for any damages resulting from the unauthorized use of this draft data for interpretation or resource decision-making.

We appreciate the opportunity to work with the U.S. Fish and Wildlife Service and the San Bernardino Valley Municipal Water District to provide scientific information relevant to resource management in southern California. Please direct any questions to Dr. Robert Fisher at (619) 206-5686.

Sincerely,

Robert Fisher

Principal Investigator



Western Spadefoot (*Spea hammondi*) Surveys in California, Draft Final, 2020



Western Spadefoot (*Spea hammondi*) Surveys in California, Draft Final, 2020

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U.S. GEOLOGICAL SURVEY
WESTERN ECOLOGICAL RESEARCH CENTER

Data Summary

Prepared for:

U.S. Fish and Wildlife Service
San Bernardino Valley Municipal Water District

Research authorized by:

California Department of Fish and Wildlife
Scientific Collecting Permit (Entity): SCP838

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INTRODUCTION

The western spadefoot (*Spea hammondi*, spadefoot) is under review for federal listing by the U.S. Fish and Wildlife Service (ECOS March 2020) and is a California Department of Fish and Wildlife (CDFW) Species of Special Concern (CDFW 2019). The species is also a covered species in the County of Orange Central and Coastal Subregions Natural Community Conservation Plan (NCCP/HCP 1995). In southern California more than 80% of spadefoot habitat has been lost to development (Jennings and Hayes 1994) and suitable habitat in northern California has been significantly reduced (Fisher and Shaffer 1996; Rose et al. 2020). Spadefoot are small, nocturnal, burrowing anurans. The adults spend the majority of their lives burrowed in terrestrial habitat, emerging primarily during rain events to feed and breed. Spadefoot historically breed in vernal pools but are known to take advantage of any seasonal water body, such as road ruts, cattle ponds and created pools due to diminishing and limited vernal pool habitat (Stebbins and McGinnis 2012). Pools must persist for a minimum of 30 days for their larvae to complete development (Morey and Reznick 2004).

This study was conducted to provide the U.S. Fish and Wildlife Service with a current assessment of occupied habitat across California. In southern California these surveys will also be used for a future model of habitat suitability for the species by comparing occupancy of current aquatic breeding sites to formerly documented breeding sites and occurrences recorded during USGS surveys conducted in the early 2000s.

STUDY AREA

The study area focused on historic and possible spadefoot breeding locations throughout the species' range in California (Figure 1). The majority of the sites were within the regions described by the U.S. Fish and Wildlife Service in their assessment of the status for the northern and southern clade of the species (USFWS 2020).

METHODS

To better understand where to focus our surveys, we collected historic information on spadefoot breeding locations in California. We used previous research and museum records. We also spoke with experts and land managers across the region to compile a comprehensive baseline dataset of sites. From this dataset, survey locations were chosen and prioritized based on the potential existence of breeding pools in the area.

In the field, surveys were conducted using a visual encounter survey protocol (USGS 2006), which entailed walking the perimeter of the waterbody searching for spadefoot tadpoles and egg masses. If pools could not be completely surveyed by visual inspection alone, dip netting was used to further search the pool. All species and life stages found were recorded. Amphibian species were swabbed for the presence of the amphibian chytrid fungus (*Batrachochytrium dendrobatidis* - Bd). Chytrid fungus has been associated with amphibian declines and die-offs worldwide (Skerratt et al. 2007). A maximum of 10 of spadefoot larvae were either collected whole or had tail tips taken for phylogenetic analysis.

At all pools with water present, quantitative measurements were taken including: water depth, width and length of the pool, and water quality parameters (temperature, dissolved oxygen, conductivity, pH, turbidity). Upland habitat parameters and distance to roads were also recorded.

RESULTS/DISCUSSION

Several pools were surveyed in 2016, but the majority of surveys took place March–May 2019, and January–June 2020 (Appendix 1). During that time, the USGS evaluated 428 pool locations for the presence of spadefoot: 189 in northern California (Figures 2–7) and 239 in southern California (Figures 8–15). In southern California 22 of the historic pool locations no longer exist. Spadefoot were detected at 100 of the 428 pools surveyed (45/189 (~23%) in northern California and 55/239 (~23%) in southern California. Other native species detected in or near the pools included Baja California treefrog (*Pseudacris hypochondriaca*), Sierran treefrog (*Pseudacris sierra*), western toad (*Anaxyrus boreas*), arroyo toad (*Anaxyrus californicus*), California tiger salamander (*Ambystoma californiense*), California newt (*Taricha torosa*), rough-skinned newt (*Taricha granulosa*), western pond turtle (*Actinemys marmorata*), two-striped gartersnake (*Thamnophis hammondi*), western terrestrial gartersnake (*Thamnophis elegans*), clam shrimp (*Cyzicus* sp. and *Lynceus* sp.), fairy shrimp (multiple species), seed shrimp (multiple species), and tadpole shrimp (*Lepidurus packardii*). Several non-native species were also detected in or near the pools including African clawed frog (*Xenopus laevis*), American bullfrog (*Lithobates catesbeianus*), crayfish (*Procambarus clarkii*), and mosquitofish (*Gambusia affinis*) (see Tables 1–9 for a list of species by site).

The low percentage of spadefoot occupancy during our study was not unexpected given the decline of the species throughout its range (Thomson et al. 2016) and, given precipitation levels in 2019, may not have been due to low precipitation during the spadefoot breeding season. Precipitation in northern California in 2019 was above average, and in southern California it was approximately average in 2020, after a very dry January and February (California Department of Water Resources - Precipitation 2020). Despite the abundant rain, 25 of the northern California pools and 47 of the southern California pools lacked water at the time of our surveys. At two of the southern California pools we found desiccated spadefoot tadpoles, indicating that these pools dried prior to the 30 days minimum inundation time needed for successful metamorphosis. In two of the future scenarios outlined by the U.S. Fish and Wildlife Service assessment (USFWS 2020), climate change was predicted to likely lead to an increase in years with below average precipitation, which could further limit spadefoot breeding opportunities. Within our rapid assessment 17% of the existing pools didn't retain water during these average to above average rainfall years (2019 and 2020) which might indicate that other climate variables such as temperature might be limiting pool duration.

The results of the 2016, 2019, and 2020 surveys will provide baseline data for field testing a new southern California model of habitat suitability for the spadefoot. Like the model presented in Rose et al. (2020) for northern California, this model will potentially identify other gaps in the range of spadefoot across Orange, San Bernardino, Riverside, and San Diego counties.

LITERATURE CITED

- California Department of Fish and Wildlife, Natural Diversity Database. 2019. Special Animals List. Periodic publication. 67 pp.
- California Department of Water Resources - Precipitation. 2020. https://info.water.ca.gov/snow_rain.html (Accessed December 16, 2020).
- ECOS. 2020. <https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=D02Z>. (Accessed March 11, 2020).

- Fisher, R.N. and H.B. Shaffer. 1996. The decline of amphibians in California's Great Central Valley. *Conservation Biology* 10(5):1387–1397.
- Jennings, M.R. and M.P. Hayes. 1994. Amphibian and reptile species of special concern in California. California Department of Fish and Game, Rancho Cordova, USA.
- Morey, S.R. and D.N. Reznick. 2004. The relationship between habitat permanence and larval development in California spadefoot toads: field and laboratory comparisons of developmental plasticity. *Oikos* 104:172–190.
- NCCP/HCP. Natural Community Conservation Plan and Habitat Conservation Plan. County of Orange Central & Coastal Subregion Parts I & II: NCCP/HCP. 1995. Prepared for County of Orange Environmental Management Agency (December 7, 1995). 418 pp.
- Rose, J.P., B.J. Halstead, and R.N. Fisher. 2020. Integrating multiple data sources and multi-scale land-cover data to model the distribution of a declining amphibian. *Biological Conservation* 241:108374.
- Skerratt, L.F., L. Berger, R. Speare, S. Cashins, K.R., McDonald, A.D. Phillott, H.B. Hines, and N. Kenyon. 2007. Spread of chytridiomycosis has caused the rapid global decline and extinction of frogs. *EcoHealth* 4:125–134.
- Stebbins, R.C. and S.M. McGinnis. 2012. Field Guide to Amphibians and Reptiles of California. California Natural History Guides. Revised Edition, University of California Press, USA. pp. 156–158.
- Thomson, R.C., A.N. Wright, and H.B. Shaffer. 2016. California amphibian and reptile species of special concern. University of California Press.
- U.S. Fish and Wildlife Service (USFWS). 2020. Species status assessment report for the western spadefoot (*Spea hammondi*). Draft Report of the U.S. Fish and Wildlife Service, Sacramento Fish and Wildlife Office, Sacramento, California. 86 pp.
- U.S. Geological Survey. 2006. USGS Aquatic species and habitat assessment protocol for south coast ecoregion rivers, streams, and creeks. U.S. Geological Survey protocol. San Diego, CA. 48 pp.

Table 1. Summary of species observed in the northeastern Sacramento Valley, southeastern Sacramento Valley, and Solano - Colusa U.S. Fish and Wildlife regions, California 2019.

U.S. Fish and Wildlife Region		Northeastern Sacramento Valley			None	Northwestern Sacramento Valley		Southeastern Sacramento Valley					Solano-Colusa	
County		Butte County			Glenn County	Tehama County		Yuba County	Placer County		Sacramento County		Solano County	
Management Unit		Bidwell Foothill Preserve	Foothill Preserve	Little Chico Greenway	Black Butte Recreation Area	Black Butte Recreation Area	Thomes Creek	Beale Air Force Base	Beale Air Force Base	Roseville Wetland	Mather Regional Park	Rancho Seco	Rush Ranch	Travis Air Force Base
Native Species	Western Spadefoot (<i>Spea hammondi</i>)	X	—	—	—	—	X	—	—	—	X	X	—	—
	Baja California Treefrog (<i>Pseudacris hypochondriaca</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—
	Sierran Treefrog (<i>Pseudacris sierra</i>)	X	X	X	X	X	X	X	X	X	X	X	X	X
	Arroyo Toad (<i>Anaxyrus californicus</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—
	Western Toad (<i>Anaxyrus boreas</i>)	X	—	X	X	X	X	—	—	—	X	—	—	—
	California Tiger Salamander (<i>Ambystoma californiense</i>)	—	—	—	—	—	—	—	—	—	—	X	—	—
	California Newt (<i>Taricha torosa</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—
	Rough-skinned Newt (<i>Taricha granulosa</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—
	Western Pond Turtle (<i>Actinemys pallida</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—
	Two-striped Gartersnake (<i>Thamnophis hammondi</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—
	Western Terrestrial Gartersnake (<i>Thamnophis elegans</i>)	—	—	—	—	—	X	—	—	—	—	—	—	—
	Clam Shrimp	—	—	—	X	X	—	X	—	—	—	X	X	X
	Fairy Shrimp	—	—	—	—	—	—	—	—	—	—	—	—	—
	Seed Shrimp	—	—	—	—	—	—	—	—	—	—	—	—	—
Tadpole Shrimp	—	—	—	—	—	—	—	—	—	—	—	—	—	
Non-Native Species	African Clawed Frog (<i>Xenopus laevis</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—
	American Bullfrog (<i>Lithobates catesbeianus</i>)	—	—	—	—	X	—	—	—	—	—	—	—	—
	Crayfish (<i>Procambarus clarkii</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—
	Mosquitofish (<i>Gambusia affinis</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—

Table 2. Summary of species observed in the Central Coast U.S. Fish and Wildlife Region, California 2019.

U.S. Fish and Wildlife Region		Central Coast				None			
County		Fresno County	Monterey County	San Benito County		Fresno County	Monterey County	San Benito County	
Management Unit		Pleasant Valley Ecological Reserve	Fort Hunter Liggett	Hollister Hills	Pinnacles National Park	Arroyo Pasajero	Fort Hunter Liggett	Pinnacles National Park	Regan Ranch
Native Species	Western Spadefoot (<i>Spea hammondi</i>)	—	X	—	—	—	X	—	—
	Baja California Treefrog (<i>Pseudacris hypochondriaca</i>)	—	—	—	—	—	—	—	—
	Sierran Treefrog (<i>Pseudacris sierra</i>)	—	X	X	X	—	X	X	X
	Arroyo Toad (<i>Anaxyrus californicus</i>)	—	—	—	—	—	—	—	—
	Western Toad (<i>Anaxyrus boreas</i>)	—	X	—	—	—	X	X	X
	California Tiger Salamander (<i>Ambystoma californiense</i>)	—	X	X	—	—	—	—	—
	California Newt (<i>Taricha torosa</i>)	—	—	X	—	—	—	—	—
	Rough-skinned Newt (<i>Taricha granulosa</i>)	—	—	—	—	—	—	—	—
	Western Pond Turtle (<i>Actinemys pallida</i>)	—	—	—	—	—	—	—	—
	Two-striped Gartersnake (<i>Thamnophis hammondi</i>)	—	—	—	—	—	—	—	—
	Western Terrestrial Gartersnake (<i>Thamnophis elegans</i>)	—	—	—	—	—	—	—	—
	Clam Shrimp	—	X	X	X	—	X	X	X
	Fairy Shrimp	—	—	—	—	—	—	—	—
	Seed Shrimp	—	—	—	—	—	—	—	—
	Tadpole Shrimp	—	—	—	—	—	—	—	—
Non-Native Species	African Clawed Frog (<i>Xenopus laevis</i>)	—	—	—	—	—	—	—	—
	American Bullfrog (<i>Lithobates catesbeianus</i>)	—	—	—	—	—	—	—	—
	Crayfish (<i>Procambarus clarkii</i>)	—	—	—	—	—	—	—	—
	Mosquitofish (<i>Gambusia affinis</i>)	—	—	—	—	—	—	—	—

Table 3. Summary of species observed in the San Joaquin Valley U.S. Fish and Wildlife Region, California 2019.

U.S. Fish and Wildlife Region		San Joaquin Valley		None			San Joaquin Valley													
County		Fresno County			Kern County				Kings County	Merced County					Stanislaus County		Tulare County			
Management Unit		Alkali Sink	Kerman Ecological Reserve	Mendota Wildlife Area	Buttonwillow Ecological Reserve	Semitropic Ecological Reserve	Semitropic Ridge Preserve	City of Bakersfield 2800 Acre Water Bank	Bureau of Land Management Atwell	Great Valley Grasslands State Park	Los Banos Wildlife Area	Merced National Wildlife Refuge	San Luis National Wildlife Refuge	Sandy Mush Preserve	Dos Rios	San Joaquin River National Wildlife Refuge	Allensworth Ecological Reserve	Bureau of Land Management Atwell	Pixley National Wildlife Refuge	Pixley Vernal Pools
Native Species	Western Spadefoot (<i>Spea hammondi</i>)	X	—	—	X	X	—	X	—	X	—	—	X	—	—	X	X	—	X	—
	Baja California Treefrog (<i>Pseudacris hypochondriaca</i>)	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—
	Sierran Treefrog (<i>Pseudacris sierra</i>)	—	—	—	—	—	—	—	—	X	X	X	—	—	X	—	—	X	—	—
	Arroyo Toad (<i>Anaxyrus californicus</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Western Toad (<i>Anaxyrus boreas</i>)	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	X	—	—
	California Tiger Salamander (<i>Ambystoma californiense</i>)	—	—	—	—	—	—	—	—	X	—	—	X	—	—	—	—	—	—	—
	California Newt (<i>Taricha torosa</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Rough-skinned Newt (<i>Taricha granulosa</i>)	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Western Pond Turtle (<i>Actinemys pallida</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Two-striped Gartersnake (<i>Thamnophis hammondi</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Western Terrestrial Gartersnake (<i>Thamnophis elegans</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Clam Shrimp	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Fairy Shrimp	—	X	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Seed Shrimp	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Tadpole Shrimp	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—
Non-Native Species	African Clawed Frog (<i>Xenopus laevis</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	American Bullfrog (<i>Lithobates catesbeianus</i>)	—	—	—	—	—	—	X	—	—	—	—	—	—	—	X	—	—	—	—
	Crayfish (<i>Procambarus clarkii</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Mosquitofish (<i>Gambusia affinis</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Table 4. Summary of species observed in the southern Sierra Foothills U.S. Fish and Wildlife Region, California 2019.

U.S. Fish and Wildlife Region		Southern Sierra Foothills												
County		Fresno County							Madera County				Stanislaus County	
Management Unit		CDFW Willow Unit	Millerton Lake State Recreation Area	San Joaquin River Conservancy Ball Ranch	San Joaquin River Conservancy Beck	San Joaquin River Conservancy Jensen River Ranch	San Joaquin River Conservancy Spano Ranch	Woodward Regional Park	San Joaquin Experimental Range	San Joaquin River Conservancy Ledger Island	San Joaquin River Conservancy Sycamore Island	San Joaquin Conservancy Van Buren	Modesto Reservoir	Stone Corral Ecological Reserve
Native Species	Western Spadefoot (<i>Spea hammondi</i>)	—	—	—	—	—	—	—	X	—	—	—	X	X
	Baja California Treefrog (<i>Pseudacris hypochondriaca</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—
	Sierran Treefrog (<i>Pseudacris sierra</i>)	—	X	X	—	—	—	—	X	—	X	X	X	X
	Arroyo Toad (<i>Anaxyrus californicus</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—
	Western Toad (<i>Anaxyrus boreas</i>)	X	—	—	—	X	—	—	X	X	—	X	X	X
	California Tiger Salamander (<i>Ambystoma californiense</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—
	California Newt (<i>Taricha torosa</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—
	Rough-skinned Newt (<i>Taricha granulosa</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—
	Western Pond Turtle (<i>Actinemys pallida</i>)	—	—	X	—	—	—	—	—	—	—	—	—	—
	Two-striped Gartersnake (<i>Thamnophis hammondi</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—
	Western Terrestrial Gartersnake (<i>Thamnophis elegans</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—
	Clam Shrimp	—	—	—	—	—	—	—	—	—	—	—	—	—
	Fairy Shrimp	—	—	—	—	—	—	—	—	—	—	—	—	—
	Seed Shrimp	—	—	—	—	—	—	—	—	—	—	—	—	—
	Tadpole Shrimp	—	—	—	—	—	—	—	—	—	—	—	—	—
Non-Native Species	African Clawed Frog (<i>Xenopus laevis</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—
	American Bullfrog (<i>Lithobates catesbeianus</i>)	—	—	—	—	—	X	—	X	X	X	X	—	—
	Crayfish (<i>Procambarus clarkii</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—
	Mosquitofish (<i>Gambusia affinis</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—

Table 5. Summary of species observed in the Carrizo and Santa Barbara U.S. Fish and Wildlife regions, California 2019.

U.S. Fish and Wildlife Region		Carrizo		None		Santa Barbara								
County		San Luis Obispo County				Santa Barbara County								
Management Unit		Camp Roberts	Carrizo Plain National Monument	Carrizo Plain National Monument	Carrizo Plains Ecological Reserve	Betteravia Property	Burton Mesa Ecological Reserve	Laguna County Sanitation District	Newlove Property	Orcu	Premiere Partners Property	Purisima Conservation Bank	Sisq	Vandenberg Air Force Base
Native Species	Western Spadefoot (<i>Spea hammondi</i>)	X	X	—	X	X	—	—	X	X	X	X	X	—
	Baja California Treefrog (<i>Pseudacris hypochondriaca</i>)	—	X	—	X	X	X	—	X	X	X	X	X	X
	Sierran Treefrog (<i>Pseudacris sierra</i>)	X	—	—	—	—	—	—	—	—	—	—	—	—
	Arroyo Toad (<i>Anaxyrus californicus</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—
	Western Toad (<i>Anaxyrus boreas</i>)	—	X	—	X	—	—	X	—	—	X	X	—	X
	California Tiger Salamander (<i>Ambystoma californiense</i>)	—	—	—	—	X	—	X	X	—	X	X	X	—
	California Newt (<i>Taricha torosa</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—
	Rough-skinned Newt (<i>Taricha granulosa</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—
	Western Pond Turtle (<i>Actinemys pallida</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—
	Two-striped Gartersnake (<i>Thamnophis hammondi</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—
	Western Terrestrial Gartersnake (<i>Thamnophis elegans</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—
	Clam Shrimp	X	—	—	—	X	X	X	X	—	X	X	X	X
	Fairy Shrimp	—	—	—	—	—	—	—	—	—	—	—	—	—
	Seed Shrimp	—	—	—	—	—	—	—	—	—	—	—	—	—
	Tadpole Shrimp	—	—	—	—	—	—	—	—	—	—	—	—	—
Non-Native Species	African Clawed Frog (<i>Xenopus laevis</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—
	American Bullfrog (<i>Lithobates catesbeianus</i>)	—	—	—	—	—	—	—	—	X	—	—	—	—
	Crayfish (<i>Procambarus clarkii</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—
	Mosquitofish (<i>Gambusia affinis</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—

Table 6. Summary of species observed in the northwest Ventura and L.A. U.S. Fish and Wildlife regions, California 2020.

U.S Fish and Wildlife Region		Northwest Ventura and LA								
County		Los Angeles County							Ventura County	
Management Unit		Gopher Canyon	Hansen Dam	Marple Canyon	San Francisco	Sterling	Vulcan Mine	Whitney Canyon Park	Happy Camp Regional Park	Rocky Peak Park
Native Species	Western Spadefoot (<i>Spea hammondi</i>)	—	—	—	—	X	—	X	—	—
	Baja California Treefrog (<i>Pseudacris hypochondriaca</i>)	—	X	—	—	—	X	X	—	X
	Sierran Treefrog (<i>Pseudacris sierra</i>)	—	—	—	—	—	—	—	—	—
	Arroyo Toad (<i>Anaxyrus californicus</i>)	—	—	—	—	—	—	—	—	—
	Western Toad (<i>Anaxyrus boreas</i>)	X	X	X	—	—	X	X	—	X
	California Tiger Salamander (<i>Ambystoma californiense</i>)	—	—	—	—	—	—	—	—	—
	California Newt (<i>Taricha torosa</i>)	—	—	—	—	—	—	—	—	—
	Rough-skinned Newt (<i>Taricha granulosa</i>)	—	—	—	—	—	—	—	—	—
	Western Pond Turtle (<i>Actinemys pallida</i>)	—	—	—	—	—	—	—	—	—
	Two-striped Gartersnake (<i>Thamnophis hammondi</i>)	—	—	—	—	—	—	—	—	—
	Western Terrestrial Gartersnake (<i>Thamnophis elegans</i>)	—	—	—	—	—	—	—	—	—
	Clam Shrimp	—	—	—	—	—	—	—	—	—
	Fairy Shrimp	—	—	—	—	—	—	—	—	—
	Seed Shrimp	—	—	—	—	—	—	—	—	—
	Tadpole Shrimp	—	—	—	—	—	—	—	—	—
Non-native Species	African Clawed Frog (<i>Xenopus laevis</i>)	—	—	—	—	—	—	—	—	—
	American Bullfrog (<i>Lithobates catesbeianus</i>)	—	—	—	—	—	—	—	—	—
	Crayfish (<i>Procambarus clarkii</i>)	—	X	—	—	—	—	—	—	—
	Mosquitofish (<i>Gambusia affinis</i>)	—	X	—	—	—	—	—	—	—

Table 7. Summary of species observed in the Orange – L.A. Basin U.S. Fish and Wildlife regions, California 2020.

U.S. Fish and Wildlife Region		Orange - LA Basin																		
County		Orange County																		San Bernardino
Management Unit		Casper's Wilderness Park	Crystal Cove State Park	East Orange	El Toro	Fairview Park	Fremont Canyon	Irvine Mesa	Irvine Regional Park	Laguna Coast Wilderness Park	Limestone Canyon	O'Neil Regional Park	Quail Hill Regional Park	Riley Wilderness Park	Santiago Oaks Regional Park	Shady Canyon	Shoestring Canyon	Whiting Ranch	Chino Hills State Park	Chino Hills State Park
Native Species	Western Spadefoot (<i>Spea hammondi</i>)	X	X	—	—	—	X	X	—	X	X	—	—	—	X	—	X	—	—	X
	Baja California Treefrog (<i>Pseudacris hypochondriaca</i>)	X	X	—	X	X	X	X	—	X	X	X	—	—	—	X	X	X	—	X
	Sierran Treefrog (<i>Pseudacris sierra</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Arroyo Toad (<i>Anaxyrus californicus</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Western Toad (<i>Anaxyrus boreas</i>)	X	X	—	X	—	—	X	—	X	X	X	X	—	—	X	X	X	—	X
	California Tiger Salamander (<i>Ambystoma californiense</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	California Newt (<i>Taricha torosa</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Rough-skinned Newt (<i>Taricha granulosa</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Western Pond Turtle (<i>Actinemys pallida</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Two-striped Gartersnake (<i>Thamnophis hammondi</i>)	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—
	Western Terrestrial Gartersnake (<i>Thamnophis elegans</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Clam Shrimp	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Fairy Shrimp	X	X	—	—	—	—	X	—	X	—	—	—	—	—	—	X	—	—	—
	Seed Shrimp	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—
	Tadpole Shrimp	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Non-Native Species	African Clawed Frog (<i>Xenopus laevis</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	American Bullfrog (<i>Lithobates catesbeianus</i>)	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Crayfish (<i>Procambarus clarkii</i>)	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—
	Mosquitofish (<i>Gambusia affinis</i>)	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Table 8. Summary of species observed in the Inland Empire U.S. Fish and Wildlife Region, California 2020.

U.S. Fish and Wildlife Region		Inland Empire												None	
County		Riverside County									San Bernardino County				Los Angeles
Management Unit		Alberhill Creek	Box Springs Mountain Reserve	El Sobrante HCP	Harford Springs Reserve	Lake Mathews Ecological Reserve	Potrero Reserve	Santa Ana River Wildlife Area	Santa Rosa Plateau Ecological Reserve	Steele Peak Reserve	Badger Canyon	Borea Canyon	Sweetwater Basin	Mojave River	San Francisco
Natives	Western Spadefoot (<i>Spea hammondi</i>)	—	X	X	—	X	X	—	—	X	—	—	X	—	—
	Baja California Treefrog (<i>Pseudacris hypochondriaca</i>)	—	X	X	X	X	X	—	X	—	X	—	—	X	—
	Sierran Treefrog (<i>Pseudacris sierra</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Arroyo Toad (<i>Anaxyrus californicus</i>)	—	—	—	—	—	—	—	—	—	—	—	—	X	—
	Western Toad (<i>Anaxyrus boreas</i>)	—	—	X	—	X	—	—	X	—	X	—	—	X	—
	California Tiger Salamander (<i>Ambystoma californiense</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	California Newt (<i>Taricha torosa</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Rough-skinned Newt (<i>Taricha granulosa</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Western Pond Turtle (<i>Actinemys pallida</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Two-striped Gartersnake (<i>Thamnophis hammondi</i>)	—	—	—	—	—	—	—	X	—	—	—	—	—	—
	Western Terrestrial Gartersnake (<i>Thamnophis elegans</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Clam Shrimp	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Fairy Shrimp	—	—	X	—	X	—	—	—	—	—	—	—	—	—
	Seed Shrimp	—	—	—	—	—	—	—	X	—	—	—	—	—	—
	Tadpole Shrimp	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Non-Natives	African Clawed Frog (<i>Xenopus laevis</i>)	—	—	—	—	—	—	X	—	—	—	—	—	—	—
	American Bullfrog (<i>Lithobates catesbeianus</i>)	—	—	—	—	—	—	—	—	—	—	—	—	X	—
	Crayfish (<i>Procambarus clarkii</i>)	—	—	—	—	—	—	—	—	—	—	—	—	X	—
	Mosquitofish (<i>Gambusia affinis</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Table 9. Summary of species observed in the Baja Northeast, Coastal Military, and Central San Diego U.S. Fish and Wildlife Region, California 2020.

U.S. Fish and Wildlife Region		Baja Northeast	Coastal Military	Central San Diego										None	
County		San Diego County													
Management Unit		Clover Flats	Camp Pendleton	Barrett Reservoir Open Space	Carlsbad Oaks North Habitat Conservation	Corte Madera Valley	Marron Valley Mitigation Bank	Olay Mountain Wilderness Area	Rancho La Costa Habitat Conservation Area	San Diego National Wildlife Refuge	Long Potrero	San Diego Mountain Ranch			
Natives	Western Spadefoot (<i>Spea hammondi</i>)	—	X	—	—	—	—	—	X	X	—	—			
	Baja California Treefrog (<i>Pseudacris hypochondriaca</i>)	—	—	X	—	X	X	X	X	X	X	X			
	Sierran Treefrog (<i>Pseudacris sierra</i>)	—	—	—	—	—	—	—	—	—	—	—			
	Arroyo Toad (<i>Anaxyrus californicus</i>)	—	—	—	—	—	—	—	—	—	—	—			
	Western Toad (<i>Anaxyrus boreas</i>)	X	—	—	—	—	—	X	—	—	X	—			
	California Tiger Salamander (<i>Ambystoma californiense</i>)	—	—	—	—	—	—	—	—	—	—	—			
	California Newt (<i>Taricha torosa</i>)	—	—	—	—	—	—	—	—	—	—	—			
	Rough-skinned Newt (<i>Taricha granulosa</i>)	—	—	—	—	—	—	—	—	—	—	—			
	Western Pond Turtle (<i>Actinemys pallida</i>)	—	—	—	—	—	—	—	—	—	—	—			
	Two-striped Gartersnake (<i>Thamnophis hammondi</i>)	—	—	—	—	X	—	X	—	—	X	—			
	Western Terrestrial Gartersnake (<i>Thamnophis elegans</i>)	—	—	—	—	—	—	—	—	—	—	—			
	Clam Shrimp	—	—	—	—	—	—	—	—	—	—	—			
	Fairy Shrimp	—	—	—	—	—	—	—	—	—	—	—			
	Seed Shrimp	—	—	—	—	—	—	—	—	—	—	—			
	Tadpole Shrimp	—	—	—	—	—	—	—	—	—	—	—			
Non-Natives	African Clawed Frog (<i>Xenopus laevis</i>)	—	—	—	—	—	—	X	—	—	—	—			
	American Bullfrog (<i>Lithobates catesbeianus</i>)	—	—	—	X	—	—	—	—	—	—	—			
	Crayfish (<i>Procambarus clarkii</i>)	—	—	—	X	—	X	—	X	—	—	—			
	Mosquitofish (<i>Gambusia affinis</i>)	—	—	—	—	—	X	—	—	—	—	—			

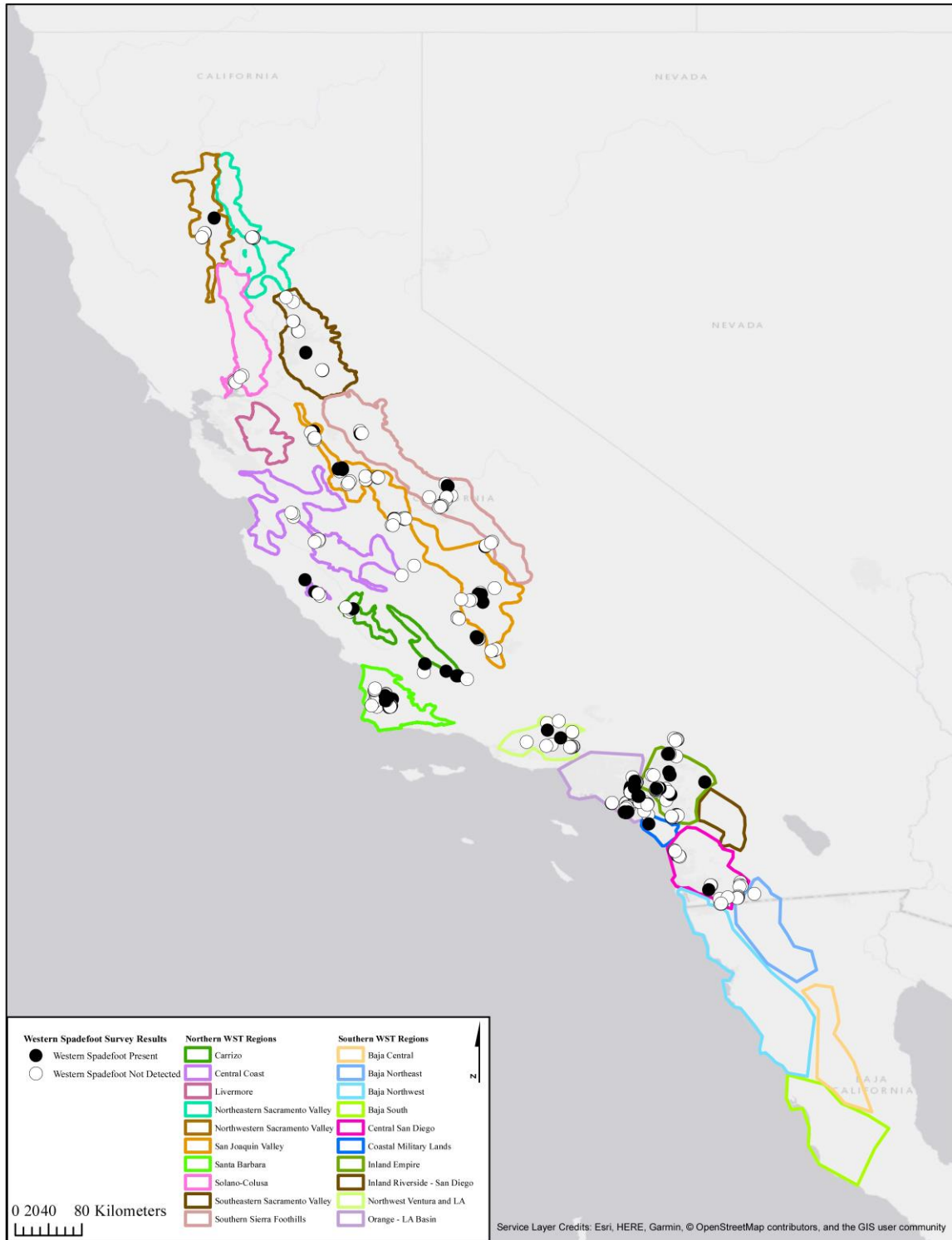


Figure 1. Overview of western spadefoot (*Spea hammondi*) surveys in California, 2016, 2019 and 2020. Polygons are boundaries of U.S. Fish and Wildlife Service spadefoot regions.

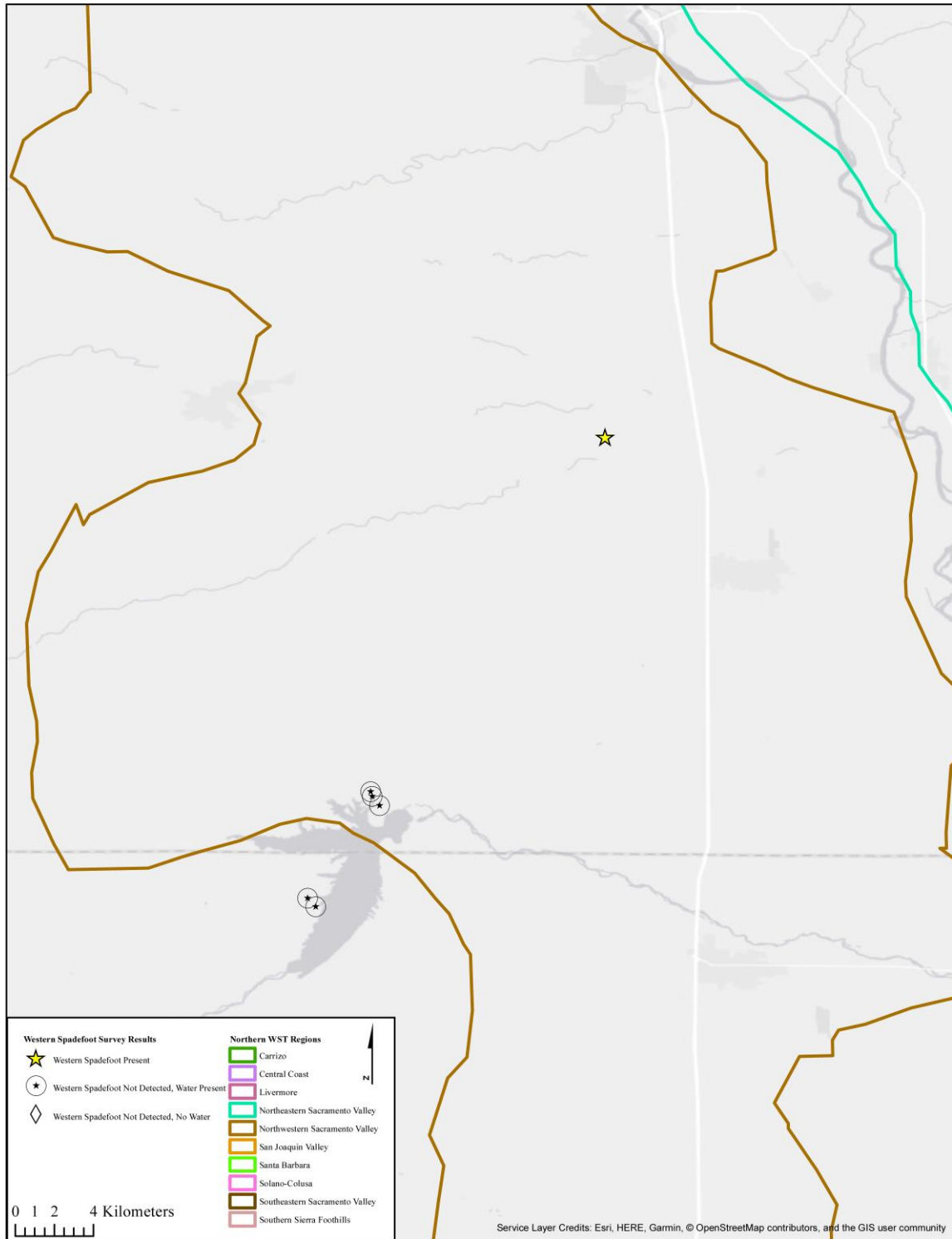


Figure 2. Western spadefoot (*Spea hammondi*) survey results in northwestern Sacramento Valley, 2019. Polygons are boundaries of U.S. Fish and Wildlife Service spadefoot regions.

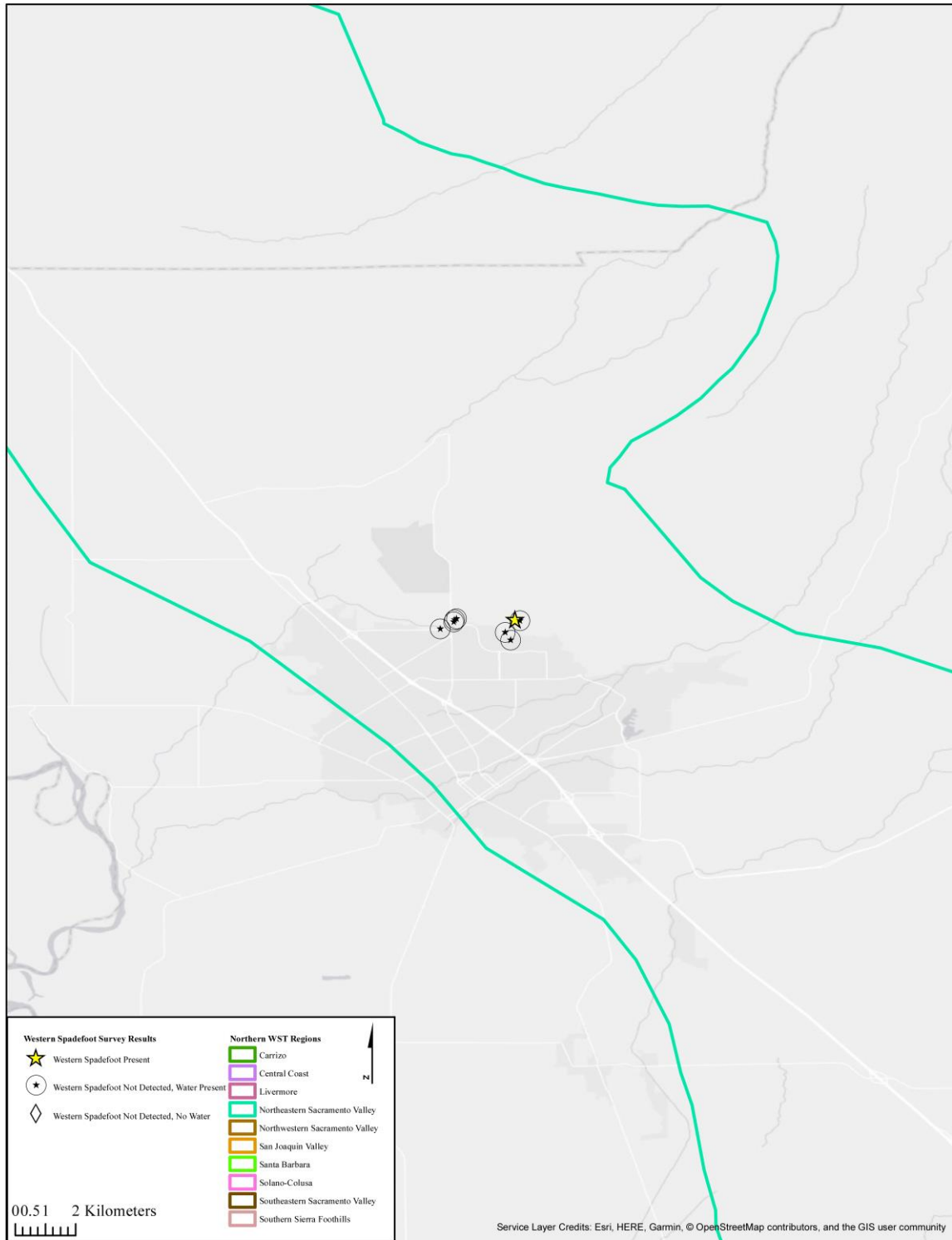


Figure 3. Western spadefoot (*Spea hammondi*) survey results in northeastern Sacramento Valley, 2019. Polygons are boundaries of U.S. Fish and Wildlife Service spadefoot regions.

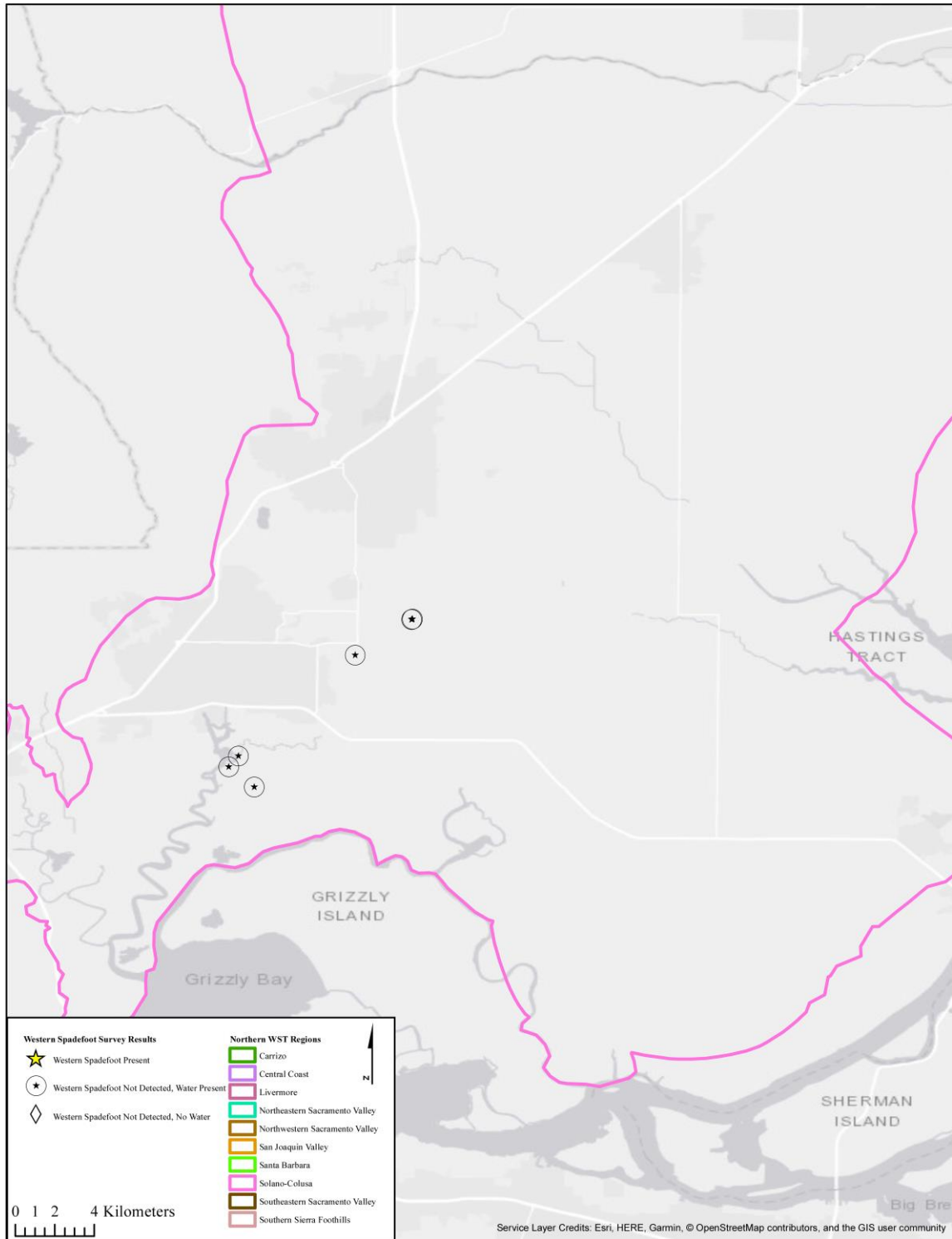


Figure 4. Western spadefoot (*Spea hammondi*) survey results in Solano - Colusa, 2019. Polygons are boundaries of U.S. Fish and Wildlife Service spadefoot regions.

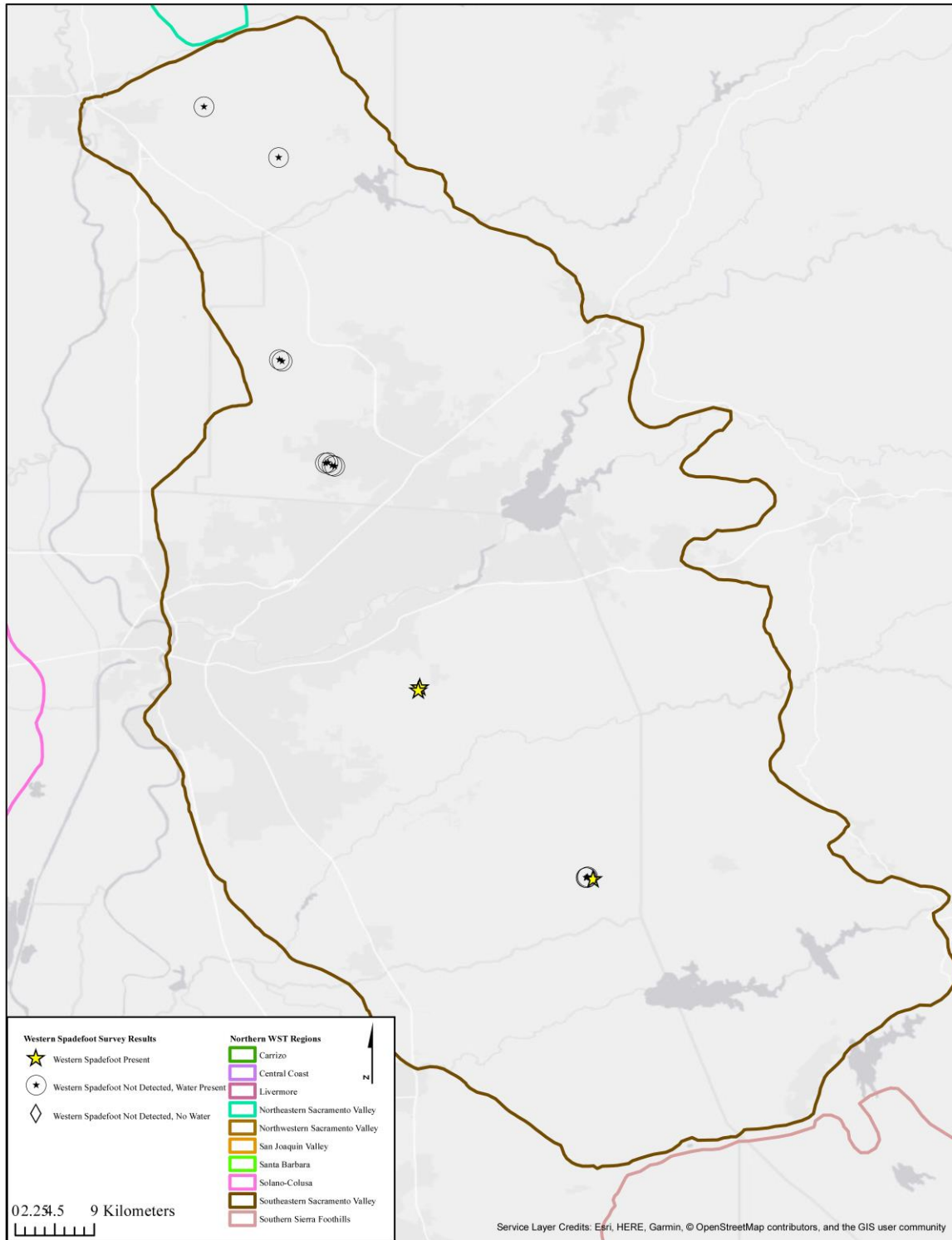


Figure 5. Western spadefoot (*Spea hammondi*) survey results in southeastern Sacramento Valley, 2019. Polygons are boundaries of U.S. Fish and Wildlife Service spadefoot regions.

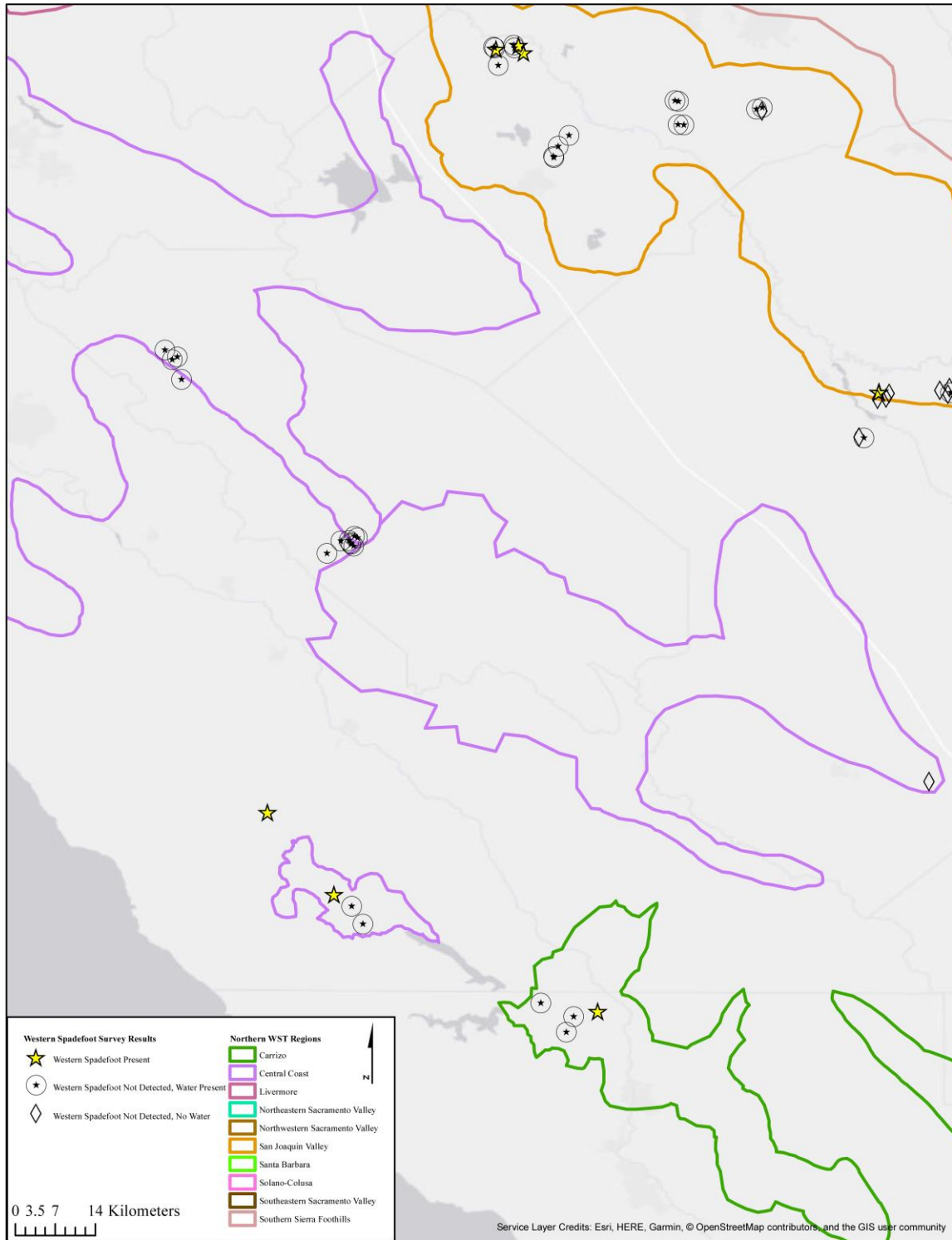


Figure 6. Western spadefoot (*Spea hammondi*) survey results in the Central Coast, 2019. Polygons are boundaries of U.S. Fish and Wildlife Service spadefoot regions.

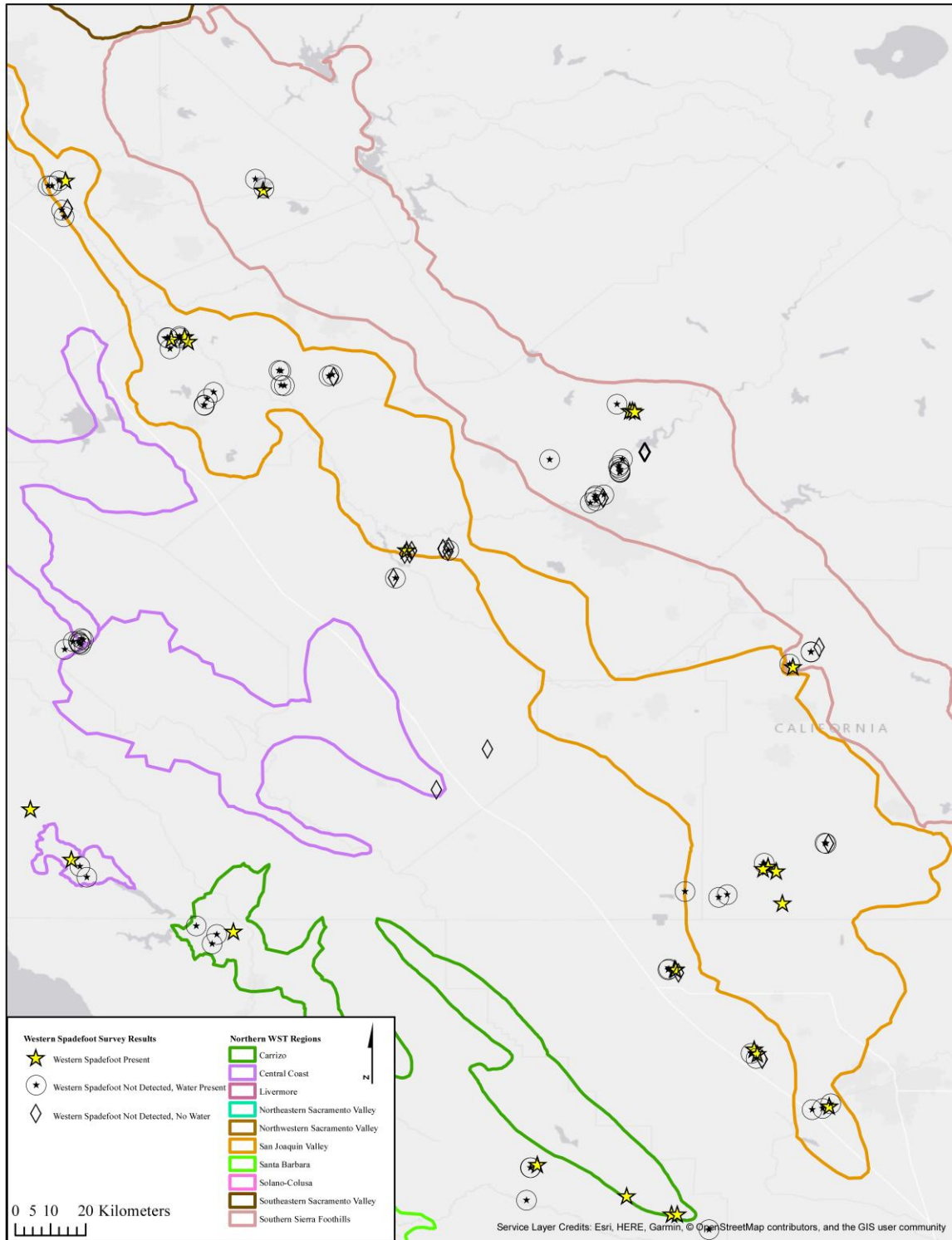


Figure 7. Western spadefoot (*Spea hammondi*) survey results in San Joaquin Valley and southern Sierra Foothills, 2019. Polygons are boundaries of U.S. Fish and Wildlife Service spadefoot regions.

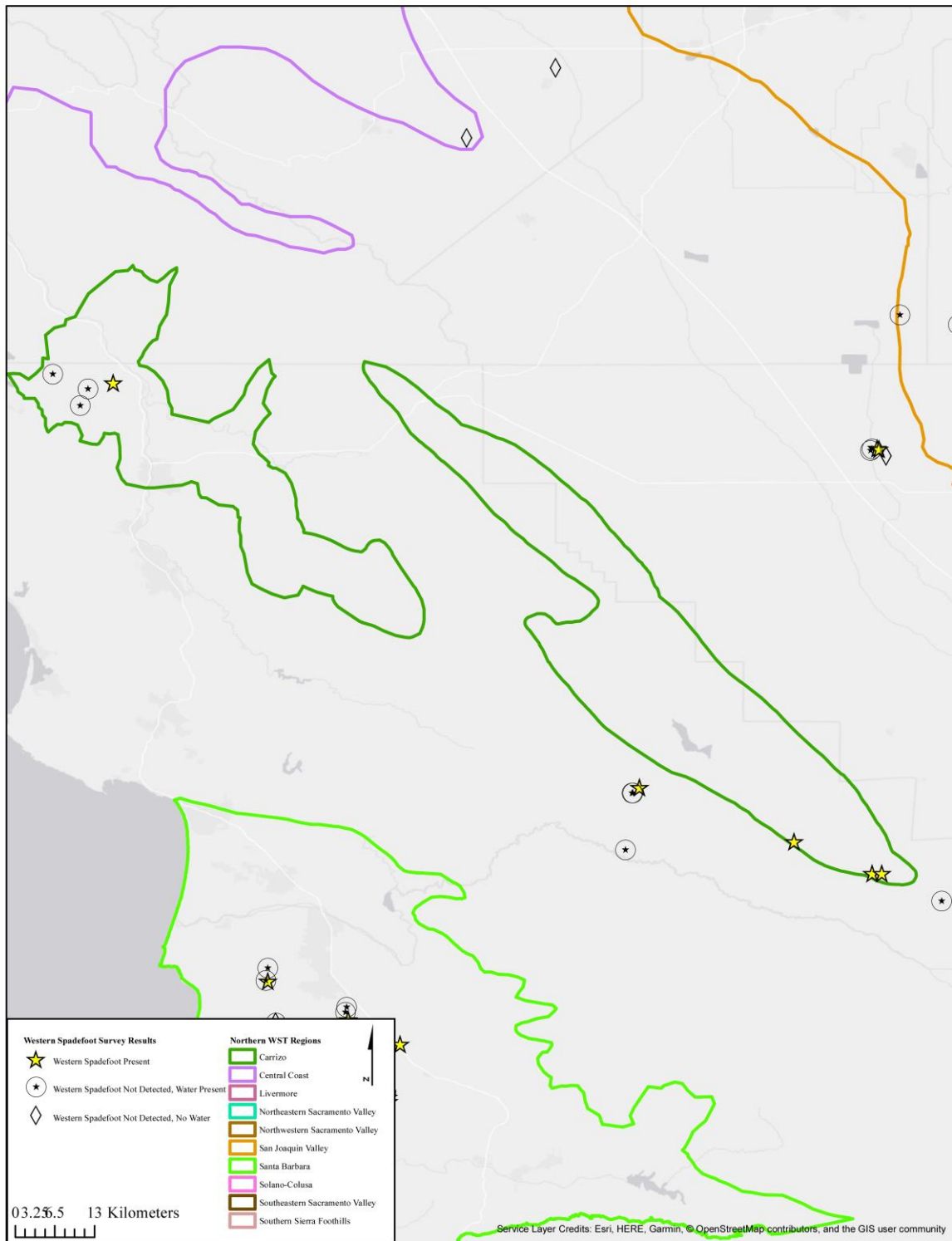


Figure 8. Western spadefoot (*Spea hammondi*) survey results in the Carrizo Plain, 2019. Polygons are boundaries of U.S. Fish and Wildlife Service spadefoot regions.

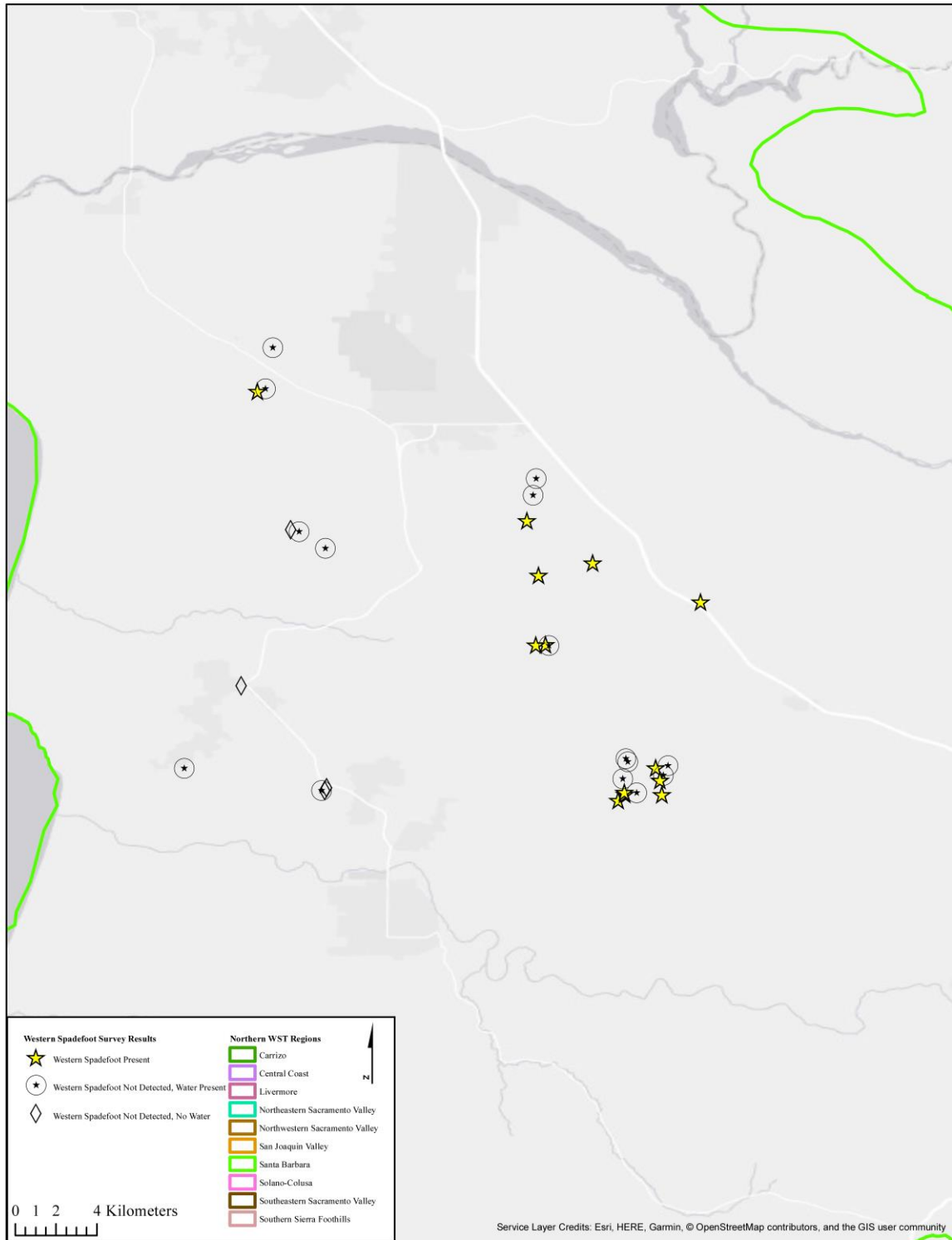


Figure 9. Western spadefoot (*Spea hammondi*) survey results in Santa Barbara County 2019. Polygons are boundaries of U.S. Fish and Wildlife Service spadefoot regions.

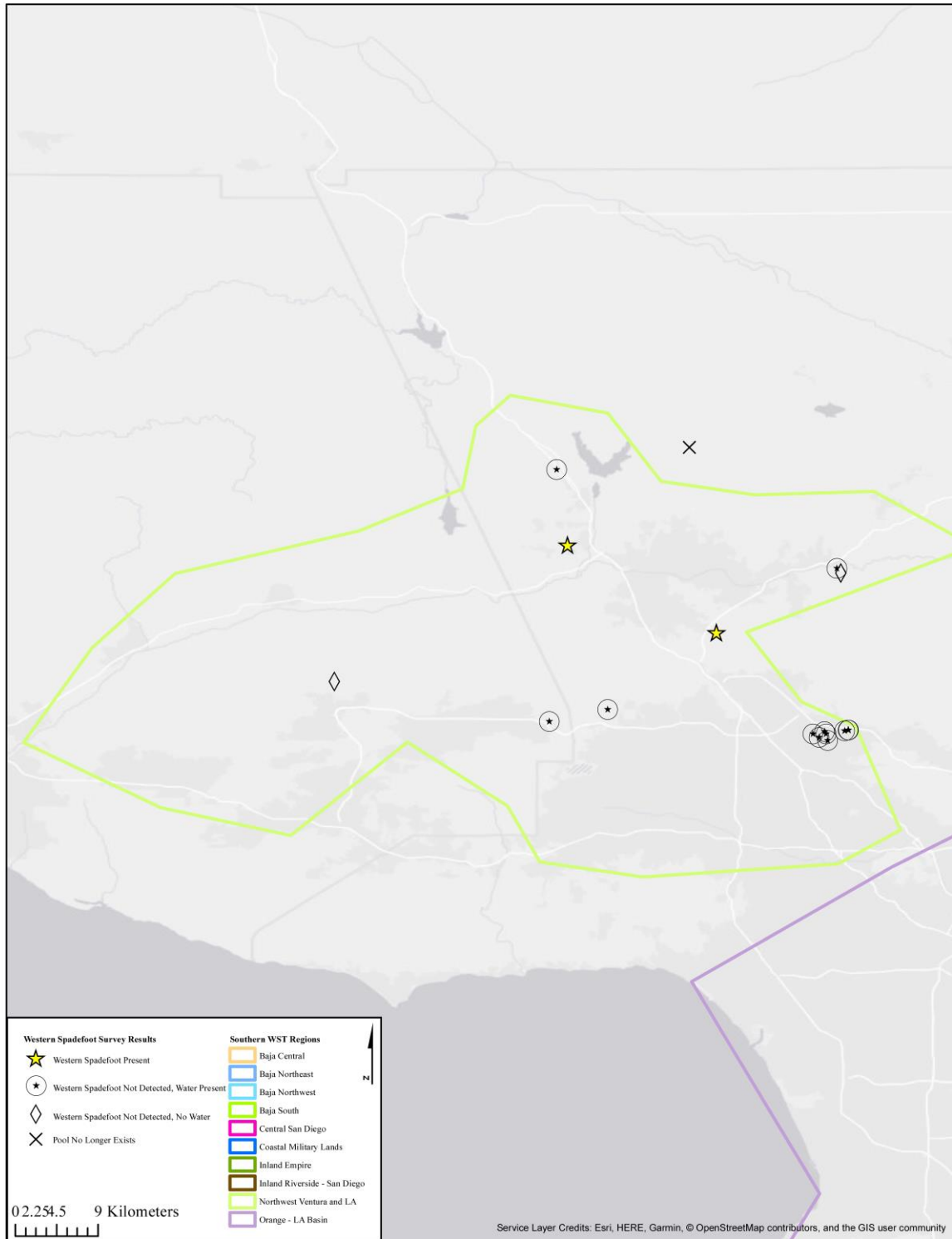


Figure 10. Western spadefoot (*Spea hammondi*) survey results in northwest Ventura and Los Angeles counties, 2020. Polygons are boundaries of U.S. Fish and Wildlife Service spadefoot regions.

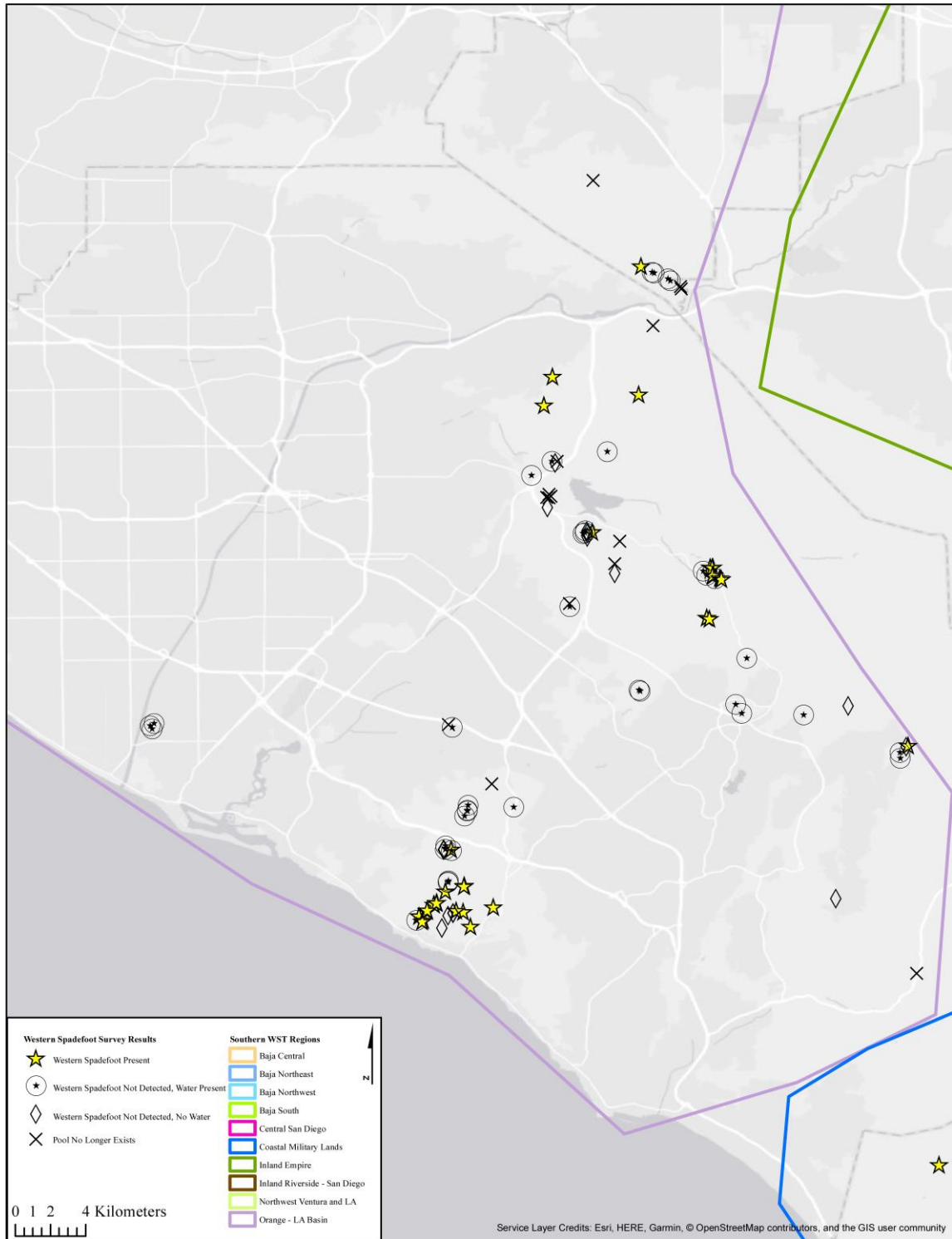


Figure 11. Western spadefoot (*Spea hammondi*) survey results in Orange County – Los Angeles Basin, 2016 and 2020. Polygons are boundaries of U.S. Fish and Wildlife Service spadefoot regions.

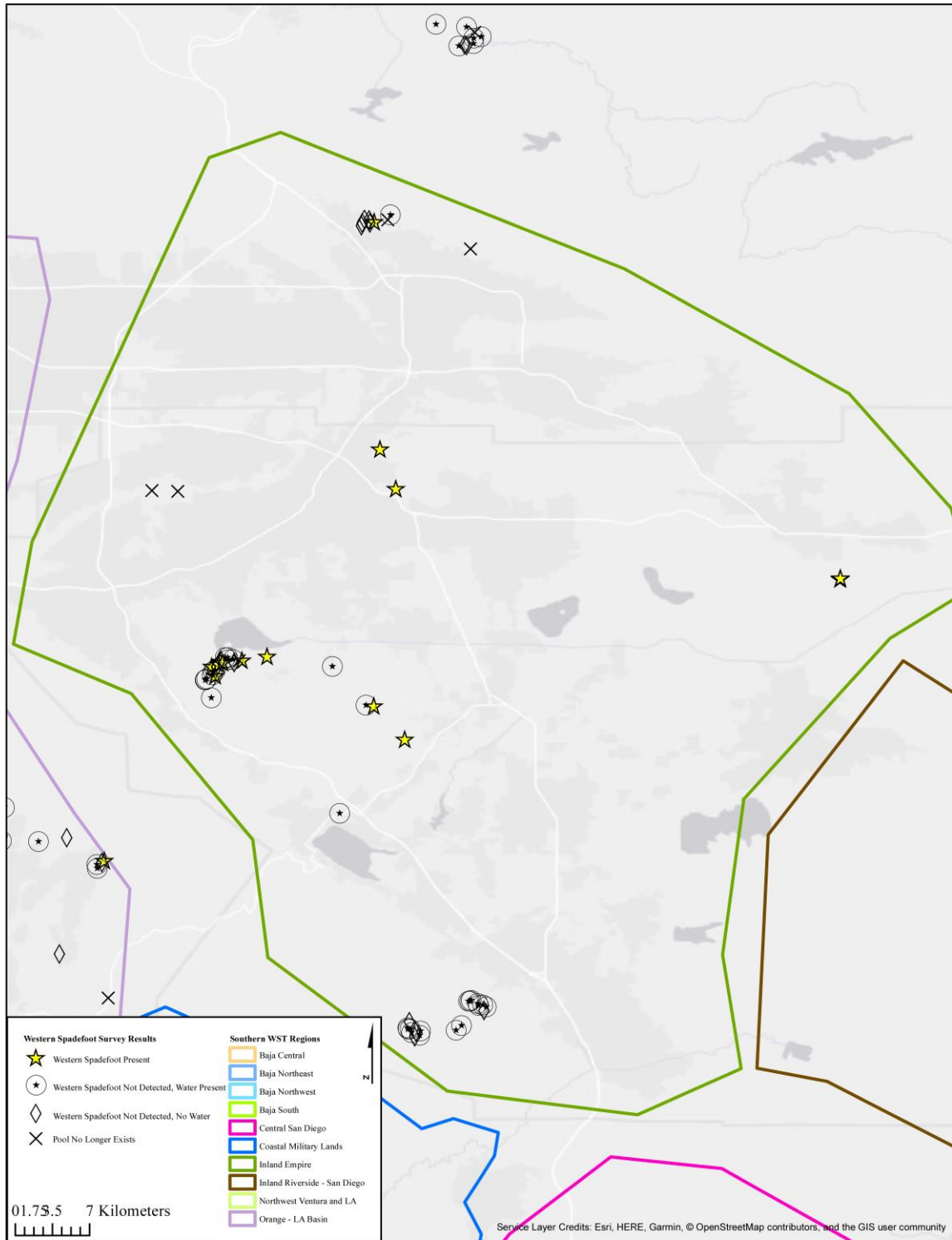


Figure 12. Western spadefoot (*Spea hammondi*) survey results in the Inland Empire, 2020. Polygons are boundaries of U.S. Fish and Wildlife Service spadefoot regions.

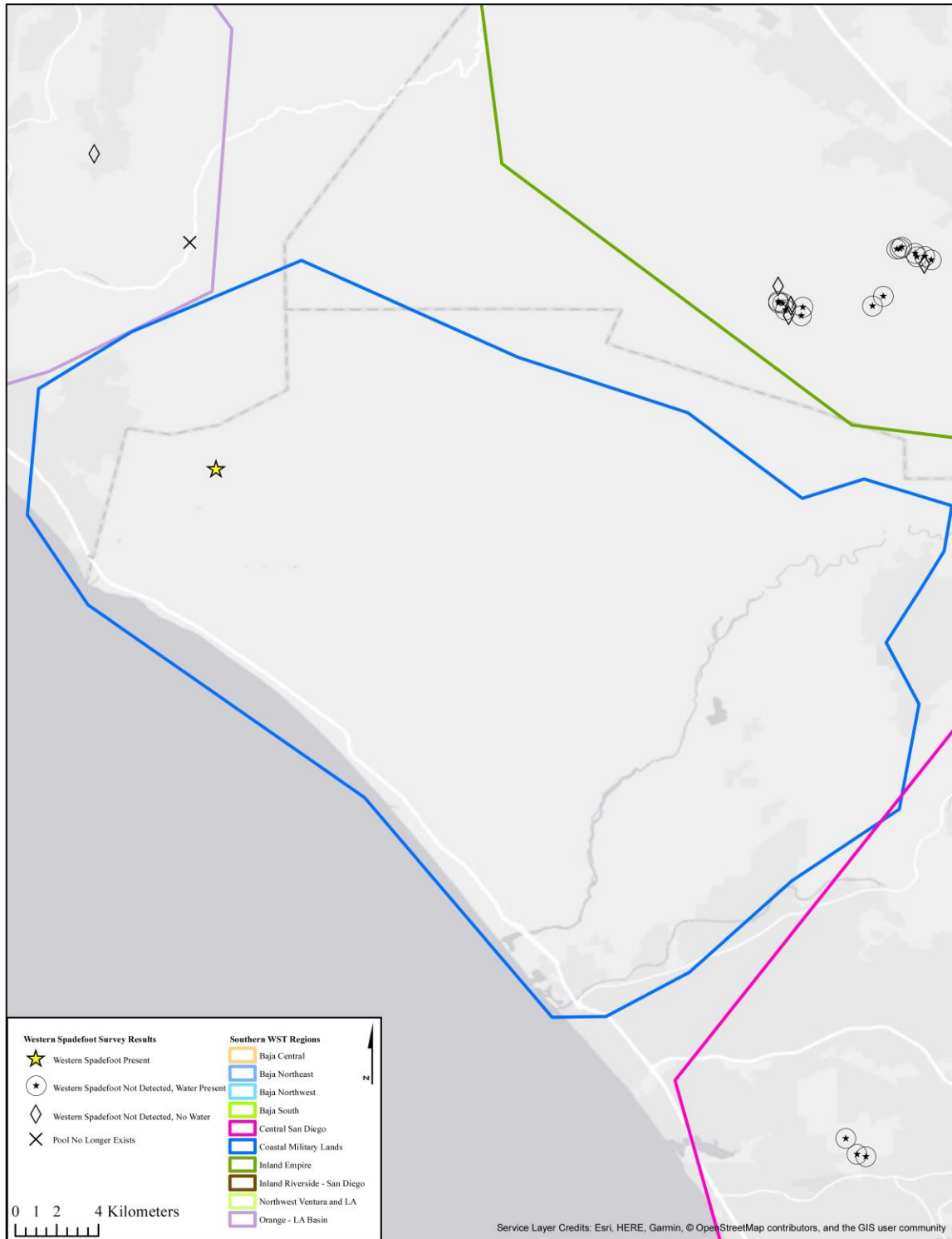


Figure 13. Western spadefoot (*Spea hammondi*) survey results in Coastal Military Lands, 2016 and 2020. Polygons are boundaries of U.S. Fish and Wildlife Service spadefoot regions.

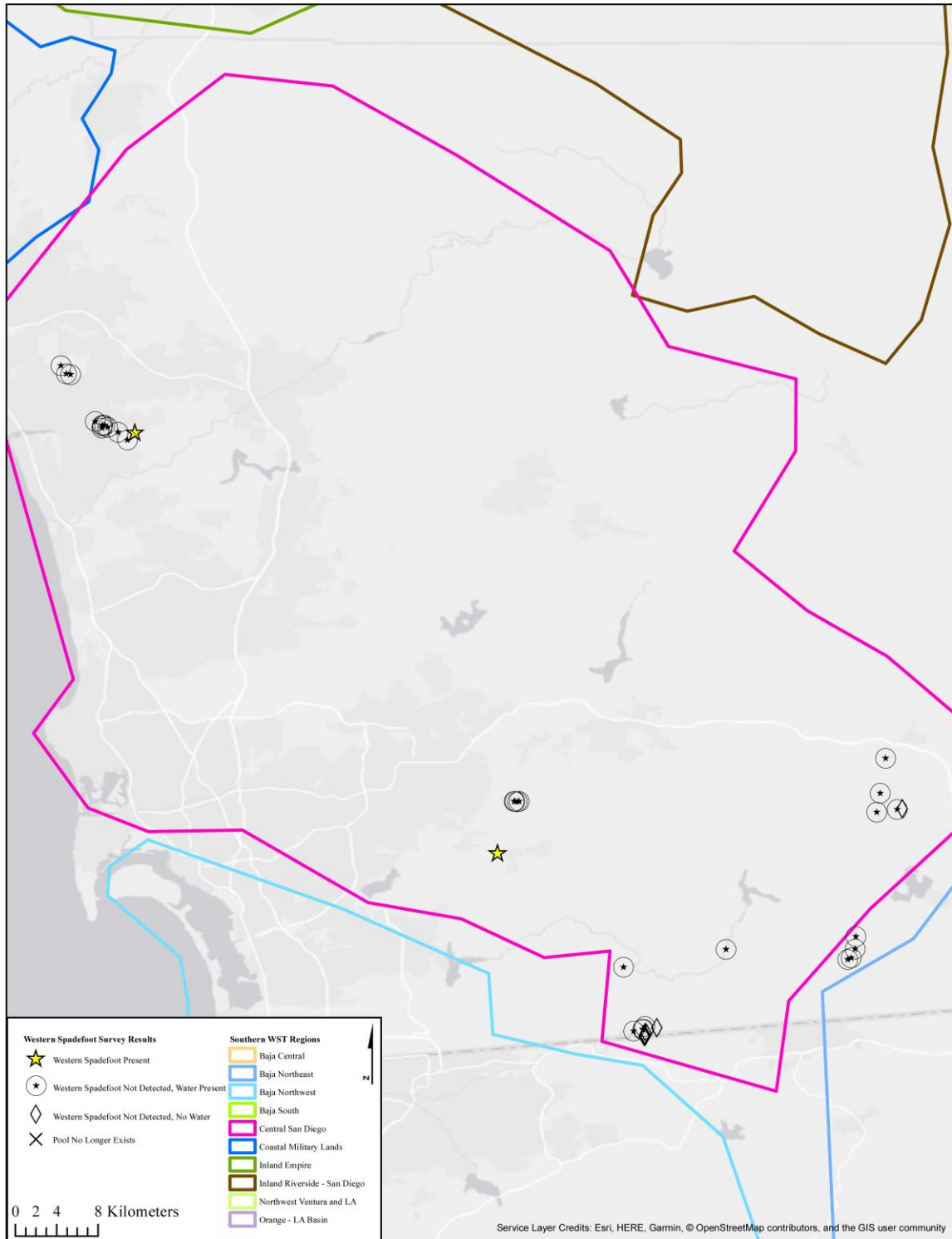


Figure 14. Western spadefoot (*Spea hammondi*) survey results in central San Diego, 2020. Polygons are boundaries of U.S. Fish and Wildlife Service spadefoot regions.

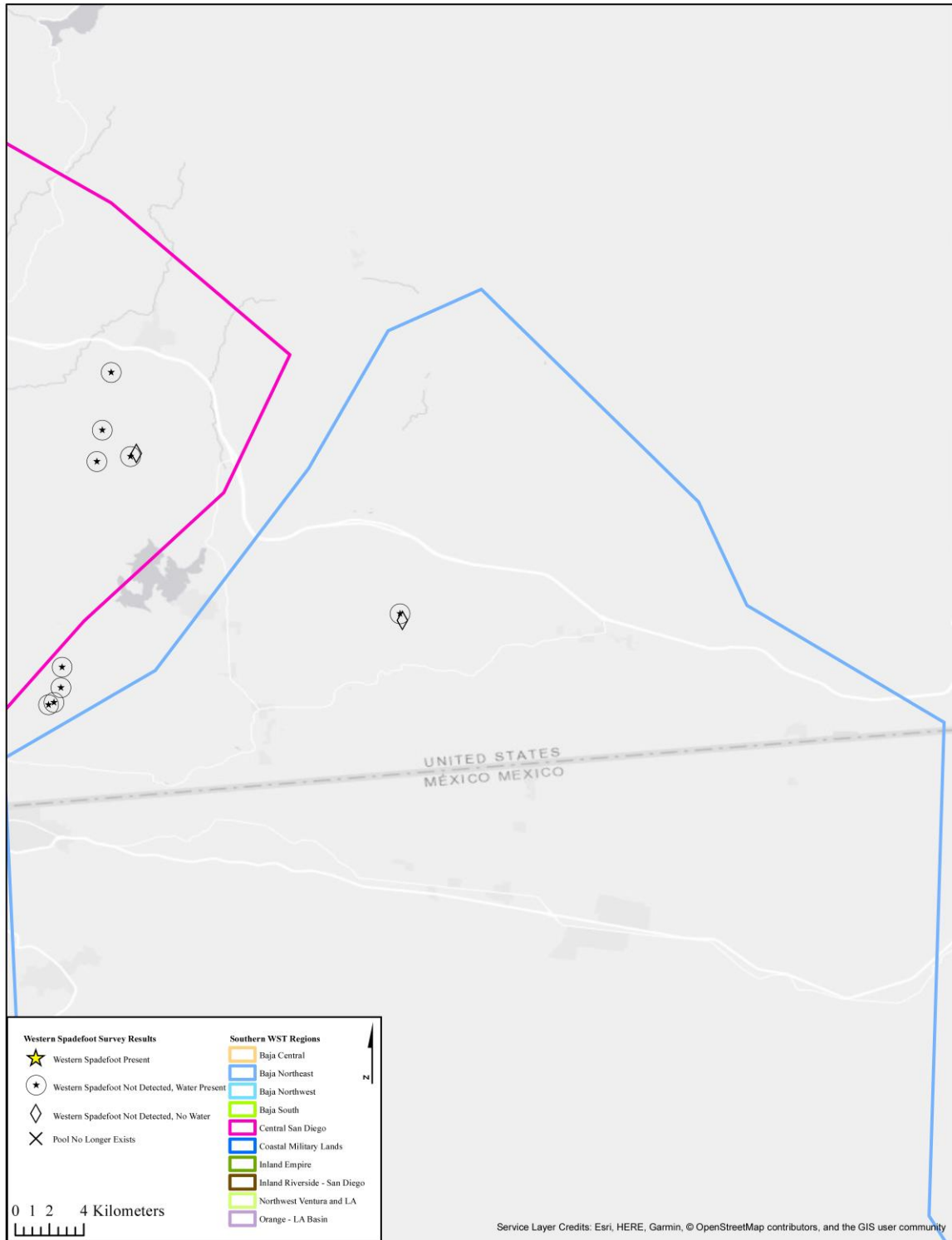


Figure 15. Western spadefoot (*Spea hammondi*) survey results in Baja Northeast, 2020. Polygons are boundaries of U.S. Fish and Wildlife Service spadefoot regions.

Appendix 1. Summary of western spadefoot (*Spea hammondi*) survey results in California, 2016, 2019, and 2020.

U.S. Fish and Wildlife Western Spadefoot Region	County	Management Unit	Pool Name	Date of Survey	Latitude ¹	Longitude ¹	Water Present	Pool Exists	Spadefoot Detected
Northeastern Sacramento Valley	Butte County	Bidwell Foothill Preserve	Bidwell Foothill Preserve 1	5/6/2019	39.77882	-121.82568	Yes	Yes	Yes
		Bidwell Foothill Preserve	Bidwell Foothill Preserve 3	5/6/2019	39.77266	-121.82510	Yes	Yes	No
		Foothill Preserve	Foothill Preserve 2	5/6/2019	39.77836	-121.82227	Yes	Yes	No
		Foothill Preserve	Foothill Preserve 4	5/6/2019	39.77486	-121.82674	Yes	Yes	No
		Little Chico Greenway	Little Chico Greenway 1	5/9/2019	39.77599	-121.84611	Yes	Yes	No
		Little Chico Greenway	Little Chico Greenway 2	5/9/2019	39.77801	-121.84201	Yes	Yes	No
		Little Chico Greenway	Little Chico Greenway 3	5/9/2019	39.77857	-121.84178	Yes	Yes	No
Northwestern Sacramento Valley	Tehama County	Black Butte Recreation Area	Black Butte Recreation Area 1	5/7/2019	39.82081	-122.34991	Yes	Yes	No
		Black Butte Recreation Area	Black Butte Recreation Area 2	5/7/2019	39.82503	-122.35318	Yes	Yes	No
		Black Butte Recreation Area	Black Butte Recreation Area 3	5/7/2019	39.82708	-122.35400	Yes	Yes	No
		Black Butte Recreation Area	Black Butte Recreation Area 4	5/8/2019	39.82708	-122.35400	Yes	Yes	No
Solano-Colusa	Solano County	Thomes Creek	Thomes Creek 1	5/10/2019	39.99014	-122.24885	Yes	Yes	Yes
		Rush Ranch	Rush Ranch 1	4/15/2019	38.21642	-122.02695	Yes	Yes	No
		Rush Ranch	Rush Ranch 2	4/15/2019	38.22126	-122.02253	Yes	Yes	No
		Rush Ranch	Rush Ranch 3	4/15/2019	38.20714	-122.01533	Yes	Yes	No
		Travis Air Force Base	Travis AFB 1	4/30/2019	38.28335	-121.94320	Yes	Yes	No
		Travis Air Force Base	Travis AFB 2	4/30/2019	38.28334	-121.94353	Yes	Yes	No
Southeastern Sacramento Valley	Placer County	Travis Air Force Base	Travis AFB 3	4/30/2019	38.26703	-121.96935	Yes	Yes	No
		Travis Air Force Base	Beale AFB 3	4/29/2019	38.86917	-121.39220	Yes	Yes	No
		Travis Air Force Base	Beale AFB 4	4/29/2019	38.87077	-121.39507	Yes	Yes	No
		Roseville Wetland	Roseville Wetland 1	4/1/2019	38.76472	-121.34792	Yes	Yes	No
		Roseville Wetland	Roseville Wetland 2	4/1/2019	38.76514	-121.34521	Yes	Yes	No
		Roseville Wetland	Roseville Wetland 3	4/1/2019	38.76256	-121.34117	Yes	Yes	No
	Sacramento County	Roseville Wetland	Roseville Wetland 4	4/1/2019	38.76164	-121.33843	Yes	Yes	No
		Mather Regional Park	Mather Regional Park 1	4/12/2019	38.53291	-121.25890	Yes	Yes	Yes
		Mather Regional Park	Mather Regional Park 2	4/12/2019	38.53592	-121.25749	Yes	Yes	Yes
		Rancho Seco	Rancho Seco 1	4/26/2019	38.34035	-121.07972	Yes	Yes	No
		Rancho Seco	Rancho Seco 2	4/26/2019	38.33963	-121.07964	Yes	Yes	Yes
Yuba County	Yuba County	Rancho Seco	Rancho Seco 3	4/26/2019	38.34127	-121.07892	Yes	Yes	No
		Rancho Seco	Rancho Seco 4	4/26/2019	38.34049	-121.08047	Yes	Yes	No
		Beale Air Force Base	Beale AFB 1	4/29/2019	39.07811	-121.39571	Yes	Yes	No
		Beale Air Force Base	Beale AFB 2	4/29/2019	39.13007	-121.47233	Yes	Yes	No

¹Locations obtained in WGS84 datum in decimal degrees

Appendix 1. continued.

U.S. Fish and Wildlife Western Spadefoot Region	County	Management Unit	Pool Name	Date of Survey	Latitude ¹	Longitude ¹	Water Present	Pool Exists	Spadefoot Detected
San Joaquin Valley	Merced County	San Luis National Wildlife Refuge	San Luis NWR 1	4/17/2019	37.27728	-120.89733	Yes	Yes	No
		San Luis National Wildlife Refuge	San Luis NWR 2	4/17/2019	37.27827	-120.89872	Yes	Yes	No
		San Luis National Wildlife Refuge	San Luis NWR 3	4/17/2019	37.27509	-120.90488	Yes	Yes	Yes
		San Luis National Wildlife Refuge	San Luis NWR 4	4/17/2019	37.24975	-120.89171	Yes	Yes	No
		Sandy Mush Preserve	Sandy Mush Preserve 1	5/2/2019	37.18069	-120.48459	Yes	Yes	No
		Sandy Mush Preserve	Sandy Mush Preserve 2	5/2/2019	37.17798	-120.48069	No	Yes	No
		Sandy Mush Preserve	Sandy Mush Preserve 3	5/2/2019	37.18336	-120.47567	Yes	Yes	No
	Stanislaus County	Dos Rios	Dos Rios 1	4/8/2019	37.60470	-121.16954	Yes	Yes	No
		Dos Rios	Dos Rios 2	4/8/2019	37.58778	-121.16287	Yes	Yes	No
		Dos Rios	Dos Rios 3	4/8/2019	37.60842	-121.16204	No	Yes	No
		Dos Rios	Dos Rios 4	4/8/2019	37.60841	-121.16203	No	Yes	No
		San Joaquin River National Wildlife Refuge	San Joaquin 1	4/3/2019	37.68108	-121.17562	Yes	Yes	Yes
		San Joaquin River National Wildlife Refuge	San Joaquin 2	4/3/2019	37.67944	-121.17630	Yes	Yes	No
		San Joaquin River National Wildlife Refuge	San Joaquin 3	4/3/2019	37.66694	-121.20367	Yes	Yes	No
		San Joaquin River National Wildlife Refuge	San Joaquin 4	4/3/2019	37.66704	-121.19447	Yes	Yes	No
	Tulare County	Allensworth Ecological Reserve	Allensworth ER 1	4/3/2019	35.83392	-119.33964	Yes	Yes	Yes
		Bureau of Land Management Atwell	Atwell BLM 1	4/11/2019	35.85473	-119.46479	Yes	Yes	No
		Bureau of Land Management Atwell	Atwell BLM 3	4/25/2019	35.84784	-119.48708	Yes	Yes	No
		Pixley National Wildlife Refuge	Pixley NWR 1	4/3/2019	35.92180	-119.38889	Yes	Yes	Yes
		Pixley National Wildlife Refuge	Pixley NWR 2	4/3/2019	35.91593	-119.35513	Yes	Yes	Yes
		Pixley National Wildlife Refuge	Pixley NWR 3	4/3/2019	35.93510	-119.36987	Yes	Yes	No
		Pixley National Wildlife Refuge	Pixley NWR 4	4/3/2019	35.92807	-119.37602	Yes	Yes	Yes
		Pixley Vernal Pools	Pixley Vernal Pools 1	4/10/2019	35.98531	-119.21381	No	Yes	No
		Pixley Vernal Pools	Pixley Vernal Pools 2	4/10/2019	35.98576	-119.21450	Yes	Yes	No
		Pixley Vernal Pools	Pixley Vernal Pools 3	4/10/2019	35.98494	-119.21188	Yes	Yes	No

¹Locations obtained in WGS84 datum in decimal degrees

Appendix 1. continued.

U.S. Fish and Wildlife Western Spadefoot Region	County	Management Unit	Pool Name	Date of Survey	Latitude ¹	Longitude ¹	Water Present	Pool Exists	Spadefoot Detected
San Joaquin Valley	Fresno County	Alkali Sink	Alkali Sink 1	4/9/2019	36.73364	-120.28067	No	Yes	No
		Alkali Sink	Alkali Sink 2	4/9/2019	36.72631	-120.28557	No	Yes	No
		Alkali Sink	Alkali Sink 3	4/9/2019	36.73635	-120.30140	Yes	Yes	Yes
		Alkali Sink	Alkali Sink 4	4/9/2019	36.73571	-120.30204	Yes	Yes	Yes
		Kerman Ecological Reserve	Kerman Ecological Reserve 1	4/10/2019	36.73865	-120.20073	No	Yes	No
		Kerman Ecological Reserve	Kerman Ecological Reserve 2	4/10/2019	36.73233	-120.18762	No	Yes	No
		Kerman Ecological Reserve	Kerman Ecological Reserve 3	4/10/2019	36.74249	-120.18562	No	Yes	No
		Kerman Ecological Reserve	Kerman Ecological Reserve 4	4/10/2019	36.73491	-120.17847	Yes	Yes	No
		Mendota Wildlife Area	Mendota Wildlife Area 1	4/16/2019	36.72445	-120.29851	No	Yes	No
		Mendota Wildlife Area	Mendota Wildlife Area 2	4/16/2019	36.66469	-120.32781	No	Yes	No
		Mendota Wildlife Area	Mendota Wildlife Area 3	4/16/2019	36.66349	-120.31508	Yes	Yes	No
	Kern County	City of Bakersfield 2800 Acre Water Bank	2800 Acre 1	4/26/2019	35.30824	-119.22064	Yes	Yes	No
		City of Bakersfield 2800 Acre Water Bank	2800 Acre 2	4/26/2019	35.31447	-119.21989	Yes	Yes	Yes
		City of Bakersfield 2800 Acre Water Bank	2800 Acre 3	4/26/2019	35.31975	-119.19940	Yes	Yes	No
		City of Bakersfield 2800 Acre Water Bank	2800 Acre 4	4/26/2019	35.30457	-119.24690	Yes	Yes	No
	Kings County	Bureau of Land Management Atwell	Atwell BLM 2	4/25/2019	35.86209	-119.57323	Yes	Yes	No
	Merced County	Great Valley Grasslands State Park	Great Valley Grasslands SP 1	4/19/2019	37.28151	-120.86990	Yes	Yes	Yes
		Great Valley Grasslands State Park	Great Valley Grasslands SP 2	4/19/2019	37.27737	-120.86610	Yes	Yes	No
		Great Valley Grasslands State Park	Great Valley Grasslands SP 3	4/19/2019	37.26963	-120.86177	Yes	Yes	Yes
		Great Valley Grasslands State Park	Great Valley Grasslands SP 4	4/19/2019	37.28148	-120.86724	Yes	Yes	No
		Los Banos Wildlife Area	Los Banos Wildlife Area 1	4/18/2019	37.10477	-120.80386	Yes	Yes	No
		Los Banos Wildlife Area	Los Banos Wildlife Area 2	4/18/2019	37.10648	-120.80472	Yes	Yes	No
		Los Banos Wildlife Area	Los Banos Wildlife Area 3	4/18/2019	37.12246	-120.79723	Yes	Yes	No
		Los Banos Wildlife Area	Los Banos Wildlife Area 4	4/18/2019	37.13922	-120.77989	Yes	Yes	No
		Merced National Wildlife Refuge	Merced National Wildlife Refuge 1	4/11/2019	37.15571	-120.59928	Yes	Yes	No
		Merced National Wildlife Refuge	Merced National Wildlife Refuge 2	4/11/2019	37.15668	-120.60826	Yes	Yes	No
		Merced National Wildlife Refuge	Merced National Wildlife Refuge 3	4/11/2019	37.19296	-120.60793	Yes	Yes	No
		Merced National Wildlife Refuge	Merced National Wildlife Refuge 4	4/11/2019	37.19446	-120.61320	Yes	Yes	No

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Appendix 1. continued.

U.S. Fish and Wildlife Western Spadefoot Region	County	Management Unit	Pool Name	Date of Survey	Latitude ¹	Longitude ¹	Water Present	Pool Exists	Spadefoot Detected
Southern Sierra Foothills	Fresno County	CDFW Willow Unit	Willow 1	4/19/2019	36.93356	-119.73958	Yes	Yes	No
		Millerton Lake State Recreation Area	Millerton Lake 1	4/18/2019	36.9868	-119.68266	No	Yes	No
		Millerton Lake State Recreation Area	Millerton Lake 2	4/18/2019	36.98561	-119.6856	No	Yes	No
		Millerton Lake State Recreation Area	Millerton Lake 3	4/18/2019	36.98518	-119.68304	No	Yes	No
		San Joaquin River Conservancy Ball Ranch	Ball Ranch 1	4/18/2019	36.93488	-119.74056	Yes	Yes	No
		San Joaquin River Conservancy Ball Ranch	Ball Ranch 2	4/18/2019	36.9369	-119.74051	Yes	Yes	No
		San Joaquin River Conservancy Ball Ranch	Ball Ranch 3	4/18/2019	36.94161	-119.73909	Yes	Yes	No
		San Joaquin River Conservancy Beck	Beck 1	4/18/2019	36.96757	-119.73331	Yes	Yes	No
		San Joaquin River Conservancy Jensen River Ranch	Jensen River Ranch 1	4/17/2019	36.87654	-119.7807	Yes	Yes	No
		San Joaquin River Conservancy Spano Ranch	Spano Ranch 1	4/17/2019	36.86161	-119.80091	Yes	Yes	No
	Madera County	Woodward Regional Park	Woodward 1	4/17/2019	36.86862	-119.79063	No	Yes	No
		McKinney Private Property	McKinney 1	4/16/2019	36.96683	-119.91996	Yes	Yes	No
		San Joaquin Experimental Range	San Joaquin 1	4/16/2019	37.09058	-119.71767	Yes	Yes	Yes
		San Joaquin Experimental Range	San Joaquin 2	4/16/2019	37.09285	-119.72335	Yes	Yes	Yes
		San Joaquin Experimental Range	San Joaquin 3	4/16/2019	37.1086	-119.74702	Yes	Yes	No
		San Joaquin Experimental Range	San Joaquin 4	4/16/2019	37.09251	-119.73018	Yes	Yes	Yes
		San Joaquin River Conservancy Ledger Island	Ledger Island 1	4/19/2019	36.95129	-119.74268	Yes	Yes	No
		San Joaquin River Conservancy Ledger Island	Ledger Island 2	4/19/2019	36.9469	-119.743	Yes	Yes	No
		San Joaquin River Conservancy Sycamore Island	Sycamore Island 1	4/17/2019	36.85555	-119.81518	Yes	Yes	No
		San Joaquin River Conservancy Van Buren	Van Buren 1	4/17/2019	36.87002	-119.80518	Yes	Yes	No
		San Joaquin River Conservancy Van Buren	Van Buren 2	4/17/2019	36.874	-119.80144	Yes	Yes	No
	Stanislaus County	Modesto Reservoir	Modesto Reservoir 1	5/1/2019	37.66064	-120.65166	Yes	Yes	No
		Modesto Reservoir	Modesto Reservoir 2	5/1/2019	37.68349	-120.67315	Yes	Yes	No
		Modesto Reservoir	Modesto Reservoir 3	5/1/2019	37.65627	-120.66872	Yes	Yes	Yes
	Tulare County	Stone Corral Ecological Reserve	Stone Corral 1	4/23/2019	36.48765	-119.23707	No	Yes	No
		Stone Corral Ecological Reserve	Stone Corral 2	4/23/2019	36.47535	-119.24995	Yes	Yes	No
		Stone Corral Ecological Reserve	Stone Corral 2	4/23/2019	36.47489	-119.25001	Yes	Yes	No
		Stone Corral Ecological Reserve	Stone Corral 2	4/23/2019	36.43736	-119.31218	Yes	Yes	Yes
		Stone Corral Ecological Reserve	Stone Corral 2	4/23/2019	36.44335	-119.30502	Yes	Yes	No

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Appendix 1. continued.

U.S. Fish and Wildlife Western Spadefoot Region	County	Management Unit	Pool Name	Date of Survey	Latitude ¹	Longitude ¹	Water Present	Pool Exists	Spadefoot Detected
Carrizo	San Luis Obispo County	Camp Roberts	Camp Roberts 1	4/25/2019	35.77426	-120.82485	Yes	Yes	No
		Camp Roberts	Camp Roberts 2	4/25/2019	35.7618	-120.74498	Yes	Yes	Yes
		Camp Roberts	Camp Roberts 3	4/25/2019	35.753	-120.7726	Yes	Yes	No
		Camp Roberts	Camp Roberts 4	4/25/2019	35.72851	-120.78427	Yes	Yes	No
		Carrizo Plain National Monument	Carrizo Plain NM 2	4/4/2019	35.03864	-119.60912	Yes	Yes	Yes
		Carrizo Plain National Monument	Carrizo Plain NM 3	4/4/2019	35.0388	-119.62354	Yes	Yes	Yes
		Carrizo Plain National Monument	Carrizo Plain NM 4	4/4/2019	35.08551	-119.73884	Yes	Yes	Yes
Central Coast	Fresno County	Pleasant Valley Ecological Reserve	Pleasant Valley ER 1	4/24/2019	36.12329	-120.21796	No	Yes	No
	Monterey County	Fort Hunter Liggett	Fort Hunter Liggett 1	3/28/2019	35.9458	-121.16026	Yes	Yes	Yes
		Fort Hunter Liggett	Fort Hunter Liggett 3	3/28/2019	35.8988	-121.10477	Yes	Yes	No
		Fort Hunter Liggett	Fort Hunter Liggett 4	3/28/2019	35.92669	-121.12256	Yes	Yes	No
	San Benito County	Hollister Hills	Hollister Hills 1	4/22/2019	36.79114	-121.39751	Yes	Yes	No
		Hollister Hills	Hollister Hills 2	4/22/2019	36.78638	-121.40566	Yes	Yes	No
		Hollister Hills	Hollister Hills 3	4/22/2019	36.80172	-121.41718	Yes	Yes	No
		Pinnacles National Park	Pinnacles 2	4/24/2019	36.50889	-121.11858	Yes	Yes	No
		Pinnacles National Park	Pinnacles 3	4/24/2019	36.50625	-121.11343	Yes	Yes	No
None	Fresno County	Arroyo Pasajero	Arroyo Pasajero 1	4/24/2019	36.22658	-120.08697	No	Yes	No
	Glenn County	Black Butte Recreation Area	Black Butte Recreation Area 5	5/8/2019	39.77429	-122.37929	Yes	Yes	No
		Black Butte Recreation Area	Black Butte Recreation Area 6	5/8/2019	39.77812	-122.38294	Yes	Yes	No
		Buttonwillow Ecological Reserve	Buttonwillow ER 1	4/11/2019	35.44844	-119.40321	Yes	Yes	Yes
	Kern County	Buttonwillow Ecological Reserve	Buttonwillow ER 2	4/11/2019	35.4485	-119.40344	Yes	Yes	No
		Buttonwillow Ecological Reserve	Buttonwillow ER 3	4/11/2019	35.46073	-119.41176	Yes	Yes	Yes
		Buttonwillow Ecological Reserve	Buttonwillow ER 4	4/11/2019	35.43557	-119.39069	Yes	Yes	No
		Buttonwillow Ecological Reserve	Buttonwillow ER 5	4/11/2019	35.43324	-119.3831	No	Yes	No
		Semitropic Ecological Reserve	Semitropic ER 1	4/2/2019	35.66199	-119.61685	Yes	Yes	No
		Semitropic Ecological Reserve	Semitropic ER 2	4/2/2019	35.66448	-119.6143	Yes	Yes	No
		Semitropic Ecological Reserve	Semitropic ER 3	4/2/2019	35.66443	-119.61293	Yes	Yes	Yes
		Semitropic Ecological Reserve	Semitropic ER 4	4/2/2019	35.66526	-119.61579	Yes	Yes	Yes
		Semitropic Ridge Preserve	Semitropic Ridge Preserve 1	4/10/2019	35.65415	-119.59827	No	Yes	No
	Monterey County	Fort Hunter Liggett	Fort Hunter Liggett 2	3/28/2019	36.07483	-121.26527	Yes	Yes	Yes
	San Benito County	Hollister Hills	Hollister Hills 4	4/22/2019	36.75536	-121.39108	Yes	Yes	No
		Pinnacles National Park	Pinnacles 1	4/24/2019	36.50205	-121.12701	Yes	Yes	No
		Pinnacles National Park	Pinnacles 4	4/25/2019	36.48183	-121.16152	Yes	Yes	No
		Pinnacles National Park	Pinnacles 5	4/25/2019	36.50115	-121.13954	Yes	Yes	No
		Regan Ranch	Regan Ranch 1	4/24/2019	36.4984	-121.12383	Yes	Yes	No
		Regan Ranch	Regan Ranch 2	4/24/2019	36.49627	-121.1233	Yes	Yes	No
		Regan Ranch	Regan Ranch 3	4/24/2019	36.49353	-121.1197	Yes	Yes	No
	San Luis Obispo County	Carrizo Plain National Monument	Carrizo Plain NM 1	4/4/2019	34.9976	-119.51154	Yes	Yes	No
		Carrizo Plains Ecological Reserve	Carrizo Plains ER 1	5/2/2019	35.07291	-119.97871	Yes	Yes	No
		Carrizo Plains Ecological Reserve	Carrizo Plains ER 2	5/2/2019	35.1655	-119.9671	Yes	Yes	Yes
		Carrizo Plains Ecological Reserve	Carrizo Plains ER 3	5/2/2019	35.15688	-119.9692	Yes	Yes	No
		Carrizo Plains Ecological Reserve	Carrizo Plains ER 4	5/2/2019	35.15689	-119.96812	Yes	Yes	No

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Appendix 1. continued.

U.S. Fish and Wildlife Western Spadefoot Region	County	Management Unit	Pool Name	Date of Survey	Latitude ¹	Longitude ¹	Water Present	Pool Exists	Spadefoot Detected
Santa Barbara	Santa Barbara County	Betteravia Property	Betteravia Property 1	5/1/2019	34.87969	-120.51654	Yes	Yes	Yes
		Betteravia Property	Betteravia Property 2	5/1/2019	34.88074	-120.51018	Yes	Yes	No
		Burton Mesa Ecological Reserve	Burton Mesa ER 1	4/9/2019	34.74972	-120.52238	No	Yes	No
		Burton Mesa Ecological Reserve	Burton Mesa ER 2	4/9/2019	34.70370	-120.48550	No	Yes	No
		Burton Mesa Ecological Reserve	Burton Mesa ER 3	4/9/2019	34.70370	-120.48550	Yes	Yes	No
		Burton Mesa Ecological Reserve	Burton Mesa ER 4	4/9/2019	34.70491	-120.48453	No	Yes	No
		Laguna County Sanitation District	Laguna County Sanitation District 3	5/1/2019	34.89888	-120.50705	Yes	Yes	No
		Newlove Property	Newlove Property 3	4/30/2019	34.84119	-120.39066	Yes	Yes	No
		Newlove Property	Newlove Property 12	4/30/2019	34.82275	-120.39752	No	Yes	Yes
		Newlove Property	Newlove Property 13	4/30/2019	34.83384	-120.39215	Yes	Yes	No
		Orcu	Orcu 5	5/1/2019	34.79871	-120.39248	Yes	Yes	Yes
		Orcu	Orcu 8	5/1/2019	34.76759	-120.38509	Yes	Yes	No
		Orcu	Orcu 9	5/1/2019	34.76804	-120.38935	Yes	Yes	Yes
		Orcu	Orcu 10	5/1/2019	34.76797	-120.39355	Yes	Yes	Yes
		Premiere Partners Property	Premiere Partners Property 3	4/30/2019	34.78688	-120.32093	Yes	Yes	Yes
		Purisima Conservation Bank	Purisima Conservation Bank 14	5/6/2019	34.71769	-120.35110	Yes	Yes	No
		Purisima Conservation Bank	Purisima Conservation Bank 15	5/6/2019	34.71633	-120.35034	Yes	Yes	No
		Purisima Conservation Bank	Purisima Conservation Bank 16	5/6/2019	34.71385	-120.34079	Yes	Yes	Yes
		Purisima Conservation Bank	Purisima Conservation Bank 17	5/6/2019	34.70831	-120.33887	Yes	Yes	Yes
		Purisima Conservation Bank	Purisima Conservation Bank 33	5/6/2019	34.69951	-120.35728	Yes	Yes	Yes
		Purisima Conservation Bank	Purisima Conservation Bank 34	5/6/2019	34.70295	-120.35452	Yes	Yes	Yes
		Purisima Conservation Bank	Purisima Conservation Bank 35	5/6/2019	34.70214	-120.35435	Yes	Yes	Yes
		Purisima Conservation Bank	Purisima Conservation Bank 36	5/6/2019	34.70264	-120.34626	Yes	Yes	No
		Purisima Conservation Bank	Purisima Conservation Bank 37	5/6/2019	34.70891	-120.35240	Yes	Yes	No
		Purisima Conservation Bank	Purisima Conservation Bank 39	5/6/2019	34.71040	-120.33454	Yes	Yes	No
		Purisima Conservation Bank	Purisima Conservation Bank 53	5/6/2019	34.71465	-120.33253	Yes	Yes	No
		Purisima Conservation Bank	Purisima Conservation Bank 60	5/6/2019	34.70203	-120.33796	Yes	Yes	Yes
		Sisq	Sisq 11	5/1/2019	34.80410	-120.36858	Yes	Yes	Yes
		Vandenberg Air Force Base	Vandenberg AFB 1	4/9/2019	34.81852	-120.50051	No	Yes	No
		Vandenberg Air Force Base	Vandenberg AFB 2	4/9/2019	34.81045	-120.48370	Yes	Yes	No
		Vandenberg Air Force Base	Vandenberg AFB 3	4/9/2019	34.81770	-120.49532	Yes	Yes	No
		Vandenberg Air Force Base	Vandenberg AFB 4	4/29/2019	34.71347	-120.54610	Yes	Yes	No

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Appendix 1. continued.

U.S. Fish and Wildlife Western Spadefoot Region	County	Management Unit	Pool Name	Date of Survey	Latitude ¹	Longitude ¹	Water Present	Pool Exists	Spadefoot Detected
Northwest Ventura and LA	Ventura County	Happy Camp Canyon Regional Park	Happy Camp 1	5/1/2020	34.32068	-118.86575	No	Yes	No
		Rocky Peak Park	Rocky Peak 1	5/25/2020	34.27870	-118.65274	Yes	Yes	No
	Los Angeles County	Schweitzer Park	Gopher Canyon 1	4/20/2020	34.29065	-118.59538	Yes	Yes	No
		Marple Canyon	Marple Canyon 1	4/28/2020	34.52460	-118.64529	Yes	Yes	No
		Sterling	Sterling 1	4/28/2020	34.45137	-118.64090	No	Yes	Yes
		Vulcan Mine	Vulcan Mine 1	4/28/2020	34.42676	-118.37040	No	Yes	No
		Vulcan Mine	Vulcan Mine 2	4/28/2020	34.42840	-118.37131	Yes	Yes	No
		Whitney Canyon Park	Whitney Canyon 1	4/28/2020	34.36601	-118.49518	Yes	Yes	Yes
		Hansen Dam Recreation Area	Hansen Dam 1	4/16/2020	34.27059	-118.36007	Yes	Yes	No
		Hansen Dam Recreation Area	Hansen Dam 2	4/16/2020	34.27061	-118.36015	Yes	Yes	No
		Hansen Dam Recreation Area	Hansen Dam 3	4/16/2020	34.26972	-118.36380	Yes	Yes	No
		Hansen Dam Recreation Area	Hansen Dam 4	4/16/2020	34.26030	-118.38046	Yes	Yes	No
		Hansen Dam Recreation Area	Hansen Dam 5	4/16/2020	34.26915	-118.38335	Yes	Yes	No
		Hansen Dam Recreation Area	Hansen Dam 6	4/16/2020	34.26689	-118.38180	Yes	Yes	No
		Hansen Dam Recreation Area	Hansen Dam 7	4/16/2020	34.26347	-118.38866	Yes	Yes	No
		Hansen Dam Recreation Area	Hansen Dam 8	4/16/2020	34.26673	-118.39486	Yes	Yes	No
		Angeles National Forest	San Francisquito 3	4/16/2020	34.54606	-118.51878	No	No	No
None	San Bernardino County	Mojave River	Mojave Forks 1	5/5/2020	34.34260	-117.24930	No	Yes	No
		Mojave River	Mojave Forks 2	5/5/2020	34.34214	-117.24770	No	Yes	No
		Mojave River	Mojave Forks 3	5/5/2020	34.35058	-117.24084	No	No	No
		Mojave River	Mojave Forks 4	5/5/2020	34.34688	-117.23260	Yes	Yes	No
		Mojave River	Deep Creek 1	5/21/2020	34.34112	-117.23902	Yes	Yes	No
		Mojave River	Mojave River 1	5/21/2020	34.35525	-117.24492	Yes	Yes	No
		Mojave River	Mojave River 2	5/5/2020	34.35727	-117.27090	Yes	Yes	No
		Mojave River	Mojave River 3	5/21/2020	34.34566	-117.23893	Yes	Yes	No
	San Diego County	Mojave River	Deep Creek 2	5/21/2020	34.33904	-117.25162	Yes	Yes	No
		Long Potrero	Long Potrero 1	4/24/2020	32.65118	-116.57382	Yes	Yes	No
		Long Potrero	Long Potrero 2	4/24/2020	32.64054	-116.57440	Yes	Yes	No
		Long Potrero	Long Potrero 3	4/24/2020	32.63270	-116.57790	Yes	Yes	No
		San Diego Mountain Ranch	Long Potrero 4	4/24/2020	32.63155	-116.58077	Yes	Yes	No

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Appendix 1. continued.

U.S. Fish and Wildlife Western Spadefoot Region	County	Management Unit	Pool Name	Date of Survey	Latitude ¹	Longitude ¹	Water Present	Pool Exists	Spadefoot Detected
Orange - LA Basin	Orange County	Casper's Wilderness Park	Dove Canyon 1	4/3/2020	33.65137	-117.55649	No	Yes	No
		Casper's Wilderness Park	San Juan Creek 1	4/3/2020	33.53404	-117.55124	No	No	No
		Casper's Wilderness Park	Dove Canyon 2	4/3/2020	33.65061	-117.55710	Yes	Yes	Yes
		Casper's Wilderness Park	Dove Canyon 3	4/3/2020	33.64696	-117.55817	Yes	Yes	No
		Casper's Wilderness Park	Dove Canyon 4	4/3/2020	33.64380	-117.55791	Yes	Yes	No
		Chino Hills State Park	Coal Canyon 1	4/22/2020	33.86491	-117.68630	No	No	No
		Crystal Cove State Park	Moro Ridge Natural 1	3/30/2020	33.56340	-117.80766	Yes	Yes	Yes
		Crystal Cove State Park	Moro Ridge Road Rut 1	4/20/2020	33.56602	-117.80347	Yes	Yes	Yes
		Crystal Cove State Park	Moro Ridge Natural 2	3/30/2020	33.51205	-117.73518	Yes	Yes	Yes
		Crystal Cove State Park	Moro Ridge Road Rut 2	4/20/2020	33.56939	-117.80008	Yes	Yes	Yes
		Crystal Cove State Park	Moro Ridge Natural 3	4/20/2020	33.57607	-117.79423	Yes	Yes	Yes
		Crystal Cove State Park	Moro Ridge LPVC 3	4/20/2020	33.58055	-117.78975	Yes	Yes	No
		Crystal Cove State Park	Moro Ridge Sclay 3	4/20/2020	33.58081	-117.78966	Yes	Yes	No
		Crystal Cove State Park	Moro Ridge SPVC 3	4/20/2020	33.58134	-117.78938	Yes	Yes	No
		Crystal Cove State Park	Moro Ridge LPVC 4	4/20/2020	33.57052	-117.79855	Yes	Yes	Yes
		Crystal Cove State Park	Moro Ridge SPVC 4	4/20/2020	33.57016	-117.79881	Yes	Yes	Yes
		Crystal Cove State Park	Moro Ridge LPVC 5	4/20/2020	33.56133	-117.80548	Yes	Yes	Yes
		Crystal Cove State Park	Moro Ridge Sclay 5	4/20/2020	33.56119	-117.80577	Yes	Yes	No
		Crystal Cove State Park	Moro Ridge SPVC 5	4/20/2020	33.56074	-117.80618	Yes	Yes	Yes
		Crystal Cove State Park	Moro Ridge	4/30/2020	33.56637	-117.80356	Yes	Yes	Yes
		East Orange	East Orange 4	5/9/2016	33.77714	-117.74074	No	No	No
		East Orange	East Orange 7	5/9/2016	33.77695	-117.73957	No	No	No
		East Orange	East Orange 9	5/9/2016	33.77878	-117.73964	No	No	No
		East Orange	East Orange 11	5/9/2016	33.77361	-117.74031	No	Yes	No
		East Orange	East Orange 12	5/9/2016	33.77785	-117.73855	No	No	No
		El Toro	El Toro 1	3/26/2020	33.67878	-117.69177	Yes	Yes	No
		El Toro	El Toro 2	3/26/2020	33.67821	-117.69125	Yes	Yes	No
		Fairview Park	Fairview Park 1	1/29/2020	33.66063	-117.94210	Yes	Yes	No
		Fairview Park	Fairview Park 2	1/29/2020	33.65886	-117.94123	Yes	Yes	No
		Fairview Park	Fairview Park 3	1/29/2020	33.66170	-117.94015	Yes	Yes	No
		Fremont Canyon	Fremont Canyon 1	4/23/2020	33.80051	-117.70814	Yes	Yes	No
		Fremont Canyon	Fremont Canyon 2	4/1/2020	33.83003	-117.69523	Yes	Yes	Yes
		Hicks Haul	Hicks Haul 1	3/26/2020	33.72299	-117.72898	No	No	No
		Hicks Haul	Hicks Haul Road 1	3/26/2020	33.74337	-117.70579	No	No	No
		Hicks Haul	Hicks Haul 2	3/26/2020	33.72142	-117.72719	Yes	Yes	No
		Hicks Haul	Hicks Haul Road 2	3/26/2020	33.75476	-117.70339	No	No	No
		Hicks Haul	Hicks Haul 3	3/26/2020	33.73998	-117.70587	No	Yes	No

¹Locations obtained in WGS84 datum in decimal degrees

Appendix 1. continued.

U.S. Fish and Wildlife Western Spadefoot Region	County	Management Unit	Pool Name	Date of Survey	Latitude ¹	Longitude ¹	Water Present	Pool Exists	Spadefoot Detected
Orange - LA Basin	Orange County	Irvine Mesa	Irvine Mesa 1	4/23/2020	33.74165	-117.65722	Yes	Yes	Yes
		Irvine Mesa	Irvine Mesa 2	4/23/2020	33.74173	-117.65850	Yes	Yes	Yes
		Irvine Mesa	Irvine Mesa 3	4/23/2020	33.74151	-117.65753	Yes	Yes	Yes
		Irvine Mesa	Irvine Mesa 4	3/10/2016	33.73952	-117.65904	Yes	Yes	No
		Irvine Mesa	Irvine Mesa 6	4/23/2020	33.73757	-117.65684	Yes	Yes	Yes
		Irvine Mesa	Irvine Mesa 7	4/23/2020	33.73763	-117.65670	Yes	Yes	Yes
		Irvine Mesa	Irvine Mesa 8	4/23/2020	33.73756	-117.65718	Yes	Yes	Yes
		Irvine Mesa	Irvine Mesa 9	4/23/2020	33.73770	-117.65699	Yes	Yes	Yes
		Irvine Mesa	Irvine Mesa 10	4/23/2020	33.73745	-117.65712	Yes	Yes	No
		Irvine Mesa	Irvine Mesa 12	4/23/2020	33.73755	-117.65729	Yes	Yes	Yes
		Irvine Mesa	Irvine Mesa 13	3/17/2016	33.73554	-117.65272	Yes	Yes	No
		Irvine Mesa	Irvine Mesa 14	4/23/2020	33.73623	-117.65370	Yes	Yes	Yes
		Irvine Mesa	Irvine Mesa 15	4/23/2020	33.73581	-117.65299	Yes	Yes	Yes
		Irvine Mesa	Irvine Mesa 16	4/23/2020	33.73566	-117.65286	Yes	Yes	Yes
		Irvine Regional Park	Santiago Hills 2	4/1/2020	33.78851	-117.74684	Yes	Yes	No
		Irvine Regional Park	Santiago Creek 3	4/1/2020	33.79558	-117.73545	No	No	No
		Irvine Regional Park	Santiago Creek 4	4/1/2020	33.79562	-117.73630	Yes	Yes	No
		Irvine Regional Park	Santiago Creek 5	4/1/2020	33.79644	-117.73646	No	Yes	No
		Laguna Coast Wilderness Park	Laguna Canyon 1	4/23/2020	33.61892	-117.75605	Yes	Yes	No
		Laguna Coast Wilderness Park	Bommer Ridge LPVC 1	4/20/2020	33.59761	-117.79116	Yes	Yes	Yes
		Laguna Coast Wilderness Park	Serrano Ridge 1	4/22/2020	33.63087	-117.76882	No	No	No
		Laguna Coast Wilderness Park	Bommer Ridge SPVC 1	4/20/2020	33.59726	-117.79109	Yes	Yes	No
		Laguna Coast Wilderness Park	Emerald Canyon LPVC 2	4/20/2020	33.57905	-117.78458	Yes	Yes	Yes
		Laguna Coast Wilderness Park	Emerald Canyon SPVC 2	4/20/2020	33.57879	-117.78479	Yes	Yes	Yes
		Laguna Coast Wilderness Park	Bommer Ridge Pilot 3	4/30/2020	33.59670	-117.78789	Yes	Yes	No
		Laguna Coast Wilderness Park	Bommer Ridge Tanaja 3	3/30/2020	33.59908	-117.79090	Yes	Yes	No
		Laguna Coast Wilderness Park	Upper Boat Canyon Created 4A	1/14/2020	33.56620	-117.78861	No	Yes	No
		Laguna Coast Wilderness Park	Upper Boat Canyon Created 4B	4/20/2020	33.56629	-117.78864	Yes	Yes	Yes
		Laguna Coast Wilderness Park	Upper Boat Canyon Created 4C	1/14/2020	33.56638	-117.78867	No	Yes	No
		Laguna Coast Wilderness Park	Upper Boat Canyon Road Rut 4	1/14/2020	33.56512	-117.79130	No	Yes	No
		Laguna Coast Wilderness Park	Upper Boat Canyon Road Rut 6	1/14/2020	33.55880	-117.79443	No	Yes	No
		Laguna Coast Wilderness Park	Bommer Ridge Created 19A	1/14/2020	33.59881	-117.79364	No	Yes	No
		Laguna Coast Wilderness Park	Bommer Ridge Created 19B	1/14/2020	33.59888	-117.79350	No	Yes	No
		Laguna Coast Wilderness Park	Bommer Ridge Created 19C	1/14/2020	33.59877	-117.79349	No	Yes	No
		Laguna Coast Wilderness Park	Big Bend 1	4/20/2020	33.56807	-117.76974	Yes	Yes	Yes
		Laguna Coast Wilderness Park	Laguna Bowl 1	4/20/2020	33.55815	-117.78136	Yes	Yes	Yes
		Laguna Coast Wilderness Park	Water Tank Road Rut 1	4/20/2020	33.56560	-117.78519	Yes	Yes	Yes
		Limestone Canyon	Limestone Canyon Sinks 1	4/2/2020	33.71603	-117.66035	Yes	Yes	Yes
		Limestone Canyon	Limestone Canyon Sinks 2	3/12/2019	33.71531	-117.76590	Yes	Yes	Yes
		O'Neil Regional Park	O'Neil Regional Park 1	4/2/2020	33.66614	-117.60750	Yes	Yes	No

¹Locations obtained in WGS84 datum in decimal degrees

Appendix 1. continued.

U.S. Fish and Wildlife Western Spadefoot Region	County	Management Unit	Pool Name	Date of Survey	Latitude ¹	Longitude ¹	Water Present	Pool Exists	Spadefoot Detected
Orange - LA Basin	Orange County	Quail Hill	Quail Hill 2	4/22/2020	33.65983	-117.78756	Yes	Yes	No
		Quail Hill	Quail Hill 1	4/22/2020	33.66110	-117.79108	No	No	No
		Riley Wilderness Park	Riley Wilderness 3	4/3/2020	33.57386	-117.59258	No	Yes	No
		Santiago Oaks Regional Park	Anaheim Hills 1	4/1/2020	33.83915	-117.68192	Yes	Yes	Yes
		Santiago Oaks Regional Park	Weir Canyon 6	4/1/2020	33.82461	-117.74377	No	Yes	Yes
		Shady Canyon	Shady Canyon 2	4/22/2020	33.61993	-117.77935	Yes	Yes	No
		Shady Canyon	Shady Canyon 3	4/22/2020	33.61442	-117.78117	Yes	Yes	No
		Shady Canyon	Shady Canyon 4	4/22/2020	33.61742	-117.77984	Yes	Yes	No
		Shady Canyon	Shady Canyon 5	4/22/2020	33.61702	-117.77980	Yes	Yes	No
		Shoestring Canyon	Shoestring Canyon 1	1/13/2020	33.76033	-117.71988	No	Yes	No
		Shoestring Canyon	Shoestring Canyon 2	1/13/2020	33.76018	-117.71936	Yes	Yes	No
		Shoestring Canyon	Shoestring Canyon 3	4/2/2020	33.75973	-117.71900	Yes	Yes	Yes
		Shoestring Canyon	Shoestring Canyon 4	4/2/2020	33.75879	-117.72055	Yes	Yes	No
		Shoestring Canyon	Shoestring Canyon 5	1/13/2020	33.75920	-117.71948	Yes	Yes	No
		Shoestring Canyon	Shoestring Canyon 6	1/13/2020	33.75855	-117.71987	No	Yes	No
		Shoestring Canyon	Shoestring Canyon 8	1/13/2020	33.76148	-117.72012	No	Yes	No
		Trabuco Canyon	Trabuco Rose 1	4/3/2020	33.67216	-117.58625	No	Yes	No
		Whiting Ranch Wilderness Park	Whiting Ranch 1	4/2/2020	33.66689	-117.63910	Yes	Yes	No
		Whiting Ranch Wilderness Park	Whiting Ranch 2	4/2/2020	33.69501	-117.63655	Yes	Yes	No
		Whiting Ranch Wilderness Park	Whiting Ranch 4	4/2/2020	33.67134	-117.64236	Yes	Yes	No
	San Bernardino County	Chino Hills State Park	Aliso Canyon 1	4/22/2020	33.88370	-117.67184	No	No	No
		Chino Hills State Park	Aliso Canyon 2	4/22/2020	33.88486	-117.67231	No	No	No
		Chino Hills State Park	Aliso Canyon 4	4/22/2020	33.93911	-117.71694	No	No	No
		Chino Hills State Park	Aliso Canyon 5	4/22/2020	33.88788	-117.67588	Yes	Yes	No
		Chino Hills State Park	Aliso Canyon 6	4/22/2020	33.88879	-117.67700	Yes	Yes	No
		Chino Hills State Park	Aliso Canyon 7	4/22/2020	33.89177	-117.68401	Yes	Yes	No
		Chino Hills State Park	Aliso Canyon 8	4/22/2020	33.89223	-117.68501	Yes	Yes	No
		Chino Hills State Park	Aliso Canyon 9	4/22/2020	33.89563	-117.69407	Yes	Yes	Yes

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Appendix 1. continued.

U.S. Fish and Wildlife Western Spadefoot Region	County	Management Unit	Pool Name	Date of Survey	Latitude ¹	Longitude ¹	Water Present	Pool Exists	Spadefoot Detected
Inland Empire	Riverside County	Alberhill Creek	Alberhill 1	3/31/2020	33.69027	-117.35250	Yes	Yes	No
		Box Springs Mountain Reserve	Box Springs 1	3/31/2020	33.96488	-117.31033	Yes	Yes	Yes
		Box Springs Mountain Reserve	Box Springs 2	3/31/2020	33.99845	-117.32363	Yes	Yes	Yes
		El Sobrante HCP	Dawson Creek 1	4/21/2020	33.78784	-117.46138	Yes	Yes	No
		El Sobrante HCP	El Sobrante 3	4/21/2020	33.81465	-117.46618	Yes	Yes	Yes
		El Sobrante HCP	El Sobrante 4	4/21/2020	33.80667	-117.46322	Yes	Yes	Yes
		El Sobrante HCP	El Sobrante 5	4/21/2020	33.80722	-117.46066	Yes	Yes	No
		El Sobrante HCP	El Sobrante 6	4/21/2020	33.80331	-117.46625	Yes	Yes	No
		El Sobrante HCP	El Sobrante 7	4/21/2020	33.80292	-117.46649	Yes	Yes	No
		El Sobrante HCP	El Sobrante 9	4/21/2020	33.81016	-117.45959	Yes	Yes	No
		El Sobrante HCP	El Sobrante 11	4/21/2020	33.80378	-117.46512	Yes	Yes	No
		Harford Springs Reserve	Harford Springs 1	3/31/2020	33.81433	-117.35857	Yes	Yes	No
		Lake Mathews Ecological Reserve	Lake Mathews 2	4/21/2020	33.82241	-117.45605	No	Yes	No
		Lake Mathews Ecological Reserve	Lake Mathews 3	4/21/2020	33.81626	-117.45939	No	Yes	No
		Lake Mathews Ecological Reserve	Lake Mathews 4	4/21/2020	33.81674	-117.45939	No	Yes	No
		Lake Mathews Ecological Reserve	Lake Mathews 5	4/21/2020	33.82186	-117.44944	Yes	Yes	No
		Lake Mathews Ecological Reserve	Lake Mathews 6	4/21/2020	33.82003	-117.44731	Yes	Yes	No
		Lake Mathews Ecological Reserve	Lake Mathews 7	4/21/2020	33.82012	-117.44445	No	Yes	No
		Lake Mathews Ecological Reserve	Lake Mathews 8	4/21/2020	33.82014	-117.44294	Yes	Yes	No
		Lake Mathews Ecological Reserve	Lake Mathews 9	4/21/2020	33.81980	-117.44063	Yes	Yes	Yes
		Lake Mathews Ecological Reserve	Lake Mathews 10	4/21/2020	33.81933	-117.44044	No	No	No
		Lake Mathews Ecological Reserve	Lake Mathews 11	4/21/2020	33.82326	-117.41925	Yes	Yes	Yes
		Lake Mathews Ecological Reserve	Lake Mathews 12	4/21/2020	33.82178	-117.44746	Yes	Yes	No
		Lake Mathews Ecological Reserve	Lake Mathews 13	4/21/2020	33.81890	-117.45888	Yes	Yes	Yes
		Lake Mathews Ecological Reserve	Lake Mathews 14	4/21/2020	33.81664	-117.46013	Yes	Yes	Yes
		Lake Mathews Ecological Reserve	Lake Mathews 15	4/21/2020	33.81112	-117.45791	Yes	Yes	No
		Lake Mathews Ecological Reserve	Lake Mathews 16	4/21/2020	33.81782	-117.45695	Yes	Yes	Yes
		Potrero Reserve	Potrero 1	3/31/2020	33.88868	-116.93388	Yes	Yes	Yes
		Potrero Reserve	Potrero 2	3/31/2020	33.88932	-116.93347	Yes	Yes	Yes
		Santa Ana River Wildlife Area	Hidden Valley 1	3/27/2020	33.96312	-117.51418	No	No	No
		Santa Ana River Wildlife Area	Hidden Valley 2	3/27/2020	33.96226	-117.49244	No	No	No

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Appendix 1. continued.

U.S. Fish and Wildlife Western Spadefoot Region	County	Management Unit	Pool Name	Date of Survey	Latitude ¹	Longitude ¹	Water Present	Pool Exists	Spadefoot Detected
Inland Empire	Riverside County	Santa Rosa Plateau Ecological Reserve	Mesa De Burro 1	4/29/2020	33.53134	-117.24349	Yes	Yes	No
		Santa Rosa Plateau Ecological Reserve	Mesa De Colorado 1	4/29/2020	33.50609	-117.28413	Yes	Yes	No
		Santa Rosa Plateau Ecological Reserve	Punta Mesa 1	5/7/2020	33.50665	-117.25400	Yes	Yes	No
		Santa Rosa Plateau Ecological Reserve	Mesa De Burro 2	4/29/2020	33.53144	-117.24210	Yes	Yes	No
		Santa Rosa Plateau Ecological Reserve	Mesa De Colorado 2	5/7/2020	33.50241	-117.28483	Yes	Yes	No
		Santa Rosa Plateau Ecological Reserve	Punta Mesa 2	5/7/2020	33.51080	-117.24933	Yes	Yes	No
		Santa Rosa Plateau Ecological Reserve	Mesa De Burro 3	4/29/2020	33.53213	-117.24128	Yes	Yes	No
		Santa Rosa Plateau Ecological Reserve	Mesa De Colorado 3	5/7/2020	33.50390	-117.29160	No	Yes	No
		Santa Rosa Plateau Ecological Reserve	Mesa De Burro 4	4/29/2020	33.52936	-117.23560	Yes	Yes	No
		Santa Rosa Plateau Ecological Reserve	Mesa De Colorado 4	5/7/2020	33.50496	-117.29167	Yes	Yes	No
		Santa Rosa Plateau Ecological Reserve	Mesa De Burro 5	4/29/2020	33.52788	-117.23478	Yes	Yes	No
		Santa Rosa Plateau Ecological Reserve	Mesa De Colorado 5	4/29/2020	33.50780	-117.29282	Yes	Yes	No
		Santa Rosa Plateau Ecological Reserve	Mesa De Burro 6	4/29/2020	33.52609	-117.23290	No	Yes	No
		Santa Rosa Plateau Ecological Reserve	Mesa De Colorado 6	4/29/2020	33.50791	-117.29469	Yes	Yes	No
		Santa Rosa Plateau Ecological Reserve	Mesa De Burro 7	4/29/2020	33.52808	-117.23134	Yes	Yes	No
		Santa Rosa Plateau Ecological Reserve	Mesa De Colorado 7	4/29/2020	33.50867	-117.29477	Yes	Yes	No
		Santa Rosa Plateau Ecological Reserve	Mesa De Burro 8	4/29/2020	33.52655	-117.22853	Yes	Yes	No
		Santa Rosa Plateau Ecological Reserve	Mesa De Colorado 8	5/7/2020	33.50818	-117.29061	No	Yes	No
		Santa Rosa Plateau Ecological Reserve	Mesa De Colorado 9	4/29/2020	33.51654	-117.29624	No	Yes	No
	San Bernardino County	Steele Peak Reserve	Steele Peak 3	3/31/2020	33.78130	-117.32881	Yes	Yes	Yes
		Steele Peak Reserve	Steele Peak 4	3/31/2020	33.75304	-117.30260	Yes	Yes	Yes
		Steele Peak Reserve	Steele Peak 5	3/31/2020	33.78161	-117.33019	Yes	Yes	No
		Badger Canyon	Badger Canyon 1	3/27/2020	34.19616	-117.30976	Yes	Yes	No
		Badger Canyon	Badger Canyon 2	3/27/2020	34.19210	-117.31442	No	No	No
		Borea Canyon	Borea Canyon 1	3/27/2020	34.16737	-117.24457	No	No	No
		Sweetwater Percolation Basin	Sweetwater Basin 1	3/27/2020	34.19447	-117.33022	No	Yes	No
		Sweetwater Percolation Basin	Sweetwater Basin 2	3/27/2020	34.18954	-117.33694	No	Yes	No
		Sweetwater Percolation Basin	Sweetwater Basin 3	3/27/2020	34.19194	-117.33625	No	Yes	No
		Sweetwater Percolation Basin	Sweetwater Basin 4	3/27/2020	34.19507	-117.33432	No	Yes	No
		Sweetwater Percolation Basin	Sweetwater Basin 5	3/27/2020	34.19208	-117.32943	No	Yes	No
		Sweetwater Percolation Basin	Sweetwater Basin 6	3/27/2020	34.19073	-117.32844	Yes	Yes	Yes

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U.S. Fish and Wildlife Western Spadefoot Region	County	Management Unit	Pool Name	Date of Survey	Latitude ¹	Longitude ¹	Water Present	Pool Exists	Spadefoot Detected
Baja Northeast		San Diego Mountain Ranch	Clover Flats 1	4/24/2020	32.67745	-116.39648	No	Yes	No
		San Diego Mountain Ranch	Clover Flats 2	4/24/2020	32.67923	-116.39618	Yes	Yes	No
Central San Diego	San Diego County	Barrett Reservoir Open Space	Marron Valley 16	4/22/2020	32.64008	-116.68677	Yes	Yes	No
		Carlsbad Oaks North Habitat Conservation Area	La Costa 6	4/28/2020	33.14668	-117.26550	Yes	Yes	No
		Carlsbad Oaks North Habitat Conservation Area	La Costa 7	4/28/2020	33.13972	-117.26061	Yes	Yes	No
		Carlsbad Oaks North Habitat Conservation Area	La Costa 8	4/28/2020	33.13888	-117.25683	Yes	Yes	No
		Corte Madera Valley	Corte Madera	10/9/2020	32.76496	-116.53625	No	Yes	No
		Corte Madera Valley	Corte Madera 1	4/24/2020	32.80592	-116.54801	Yes	Yes	No
		Corte Madera Valley	Corte Madera 12	4/24/2020	32.77562	-116.55261	Yes	Yes	No
		Corte Madera Valley	Corte Madera 6	4/24/2020	32.76172	-116.53771	Yes	Yes	No
		Corte Madera Valley	Corte Madera 7	6/16/2020	32.75911	-116.55553	Yes	Yes	No
		Marron Valley Mitigation Bank	Marron Valley 1	4/22/2020	32.56745	-116.75965	No	Yes	No
		Marron Valley Mitigation Bank	Marron Valley 2	4/22/2020	32.56812	-116.75980	No	Yes	No
		Marron Valley Mitigation Bank	Marron Valley 3	4/22/2020	32.56748	-116.76068	No	Yes	No
		Marron Valley Mitigation Bank	Marron Valley 4	4/22/2020	32.56765	-116.75971	No	Yes	No
		Marron Valley Mitigation Bank	Marron Valley 5	4/22/2020	32.56871	-116.76027	No	Yes	No
		Marron Valley Mitigation Bank	Marron Valley 6	4/22/2020	32.57041	-116.75927	Yes	Yes	No
		Marron Valley Mitigation Bank	Marron Valley 7	4/22/2020	32.56887	-116.76023	No	Yes	No
		Marron Valley Mitigation Bank	Marron Valley 8	4/22/2020	32.56898	-116.76003	No	Yes	No
		Marron Valley Mitigation Bank	Marron Valley 9	4/22/2020	32.57091	-116.75897	Yes	Yes	No
		Marron Valley Mitigation Bank	Marron Valley 10	4/22/2020	32.57062	-116.75922	No	Yes	No
		Marron Valley Mitigation Bank	Marron Valley 11	4/22/2020	32.57474	-116.74977	No	Yes	No
		Marron Valley Mitigation Bank	Marron Valley 12	4/22/2020	32.57085	-116.75885	Yes	Yes	No
		Marron Valley Mitigation Bank	Marron Valley 13	4/22/2020	32.56900	-116.76732	Yes	Yes	No
		Marron Valley Mitigation Bank	Marron Valley 14	4/22/2020	32.57477	-116.74980	No	Yes	No
		Marron Valley Mitigation Bank	Lower Cottonwood Creek	4/22/2020	32.57309	-116.75752	Yes	Yes	No
		Otay Mountain Wilderness Area	Marron Valley 15	4/22/2020	32.62473	-116.77603	Yes	Yes	No
		Racho La Costa Habitat Conservation Area	La Costa 1	4/20/2020	33.09833	-117.23552	Yes	Yes	No
		Racho La Costa Habitat Conservation Area	La Costa 2	4/20/2020	33.09482	-117.22731	Yes	Yes	No
		Racho La Costa Habitat Conservation Area	La Costa 3	4/20/2020	33.09514	-117.22890	Yes	Yes	No
		Racho La Costa Habitat Conservation Area	La Costa 4	4/20/2020	33.09416	-117.22928	Yes	Yes	No
		Racho La Costa Habitat Conservation Area	La Costa 5	4/20/2020	33.09263	-117.22975	Yes	Yes	No
		Racho La Costa Habitat Conservation Area	La Costa 6	4/21/2020	33.08906	-117.20652	Yes	Yes	Yes
		Racho La Costa Habitat Conservation Area	La Costa 7	4/21/2020	33.08207	-117.20748	Yes	Yes	No
		Racho La Costa Habitat Conservation Area	La Costa 8	4/21/2020	33.09308	-117.22461	Yes	Yes	No
		Racho La Costa Habitat Conservation Area	La Costa 5	4/28/2020	33.08897	-117.21545	Yes	Yes	No
		San Diego National Wildlife Refuge	McGinty Mesa 1	4/29/2020	32.76846	-116.86666	Yes	Yes	No
		San Diego National Wildlife Refuge	McGinty Mesa 2	4/29/2020	32.76824	-116.86847	Yes	Yes	No
		San Diego National Wildlife Refuge	McGinty Mesa 3	4/29/2020	32.76862	-116.87048	Yes	Yes	No
		San Diego National Wildlife Refuge	McGinty Mesa 4	4/29/2020	32.76847	-116.87096	Yes	Yes	No
		San Diego National Wildlife Refuge	Vista Sage	4/21/2020	32.72435	-116.89108	Yes	Yes	Yes
Coastal Military Lands		Camp Pendleton	Camp Pendleton 2	3/30/2016	33.43643	-117.54124	Yes	Yes	Yes

¹Locations obtained in WGS84 datum in decimal degrees