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January 25, 2023

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From: Robert Fisher, Principal Investigator, Western Ecological Research Center

Subject: Western Spadefoot (*Spea hammondi*) Surveys in California, Draft Final, 2022

This memo transmits the U.S. Geological Survey (USGS) Western Ecological Research Center's draft final report entitled Western Spadefoot (*Spea hammondi*) Surveys in California, Draft Final, 2022. This information is provided to fulfill USGS obligations under the U.S. Fish and Wildlife Service Inter/Intra-Agency Agreement (IAA) 4500155784 and 4500146490. We expect to publish these data in early 2025 and a final publication will be distributed when available.

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 to provide scientific information relevant to resource management in southern California. Please direct any questions to Dr. Robert Fisher at (619) 206-5686.

Sincerely,

Principal Investigator



Western Spadefoot (*Spea hammondi*)

Surveys in California, Draft Final, 2022



Western Spadefoot (*Spea hammondi*) Surveys in California, Draft Final, 2022

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U.S. GEOLOGICAL SURVEY
WESTERN ECOLOGICAL RESEARCH CENTER

Data Summary

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Cover photo of western spadefoot by Andrew J. Louros.

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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 January 2023) and is a California Department of Fish and Wildlife (CDFW) Species of Special Concern (CNDDDB 2023). 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 most 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).

STUDY AREA

The study area focused on 57 historic spadefoot breeding locations and 177 novel locations over 200 meters from a historic record with potential for spadefoot breeding 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 spadefoot larvae were either collected whole or had tail tips taken for future 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 from these measurements will be included in a future publication.

RESULTS/DISCUSSION

All pools were surveyed between January-April 2022 (Appendix 1). During that time, the USGS evaluated 234 pool locations for the presence of spadefoot: 64 in northern California (Figures 2-6) and 170 in southern California (Figures 7-13). Spadefoot were detected at 30 of the pools surveyed (4/64 (~6%) in northern California and 26/170 (~15%) in southern California). All of the historic locations in northern California (n = 12) were dry. Spadefoot were found at five of the historic sites in southern California (n = 45), although 28 were dry when surveyed. Other native species detected in or near the pools included Baja California treefrog (*Pseudacris hypochondriaca*), Sierran treefrog (*Pseudacris sierra*), western toad (*Anaxyrus boreas*), two-striped gartersnake (*Thamnophis hammondi*), clam shrimp (*Cyzicus californicus*), fairy shrimp (multiple genera), and seed shrimp (multiple genera). Mosquitofish (*Gambusia affinis*) were the only non-native species detected in or near the pools (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). Low precipitation during the 2022 breeding season may have also contributed to low detection. Precipitation was below average in northern and southern California during the breeding season in 2022, after a very dry January and February (California Nevada River Forecast Center 2022). Forty-eight of the northern California pools (75%) and 72 (~42%) of the southern California pools lacked water at the time of our surveys. One of the northern California pools had spadefoot documented a week prior from the actual survey date when the pool was dry (Appendix 1). At four of the southern California pools, we observed spadefoot in their early tadpole/egg mass stages on the first visit. On the second visit, about 1-2 weeks later, the pools were dry with no spadefoot present (Appendix 1) 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.

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Table 1. Summary of species observed in the Santa Barbara, Carrizo and San Joaquin Valley U.S. Fish and Wildlife Western Spadefoot Regions, California, 2022.

U.S. Fish and Wildlife Region		Santa Barbara		Carrizo		None				San Joaquin Valley				
County		Santa Barbara		San Luis Obispo				Kern			Tulare			
Site		Burton Mesa Ecological Reserve	Vandenberg Space Force Base	Camp Roberts	Carrizo Plain National Monument	Carrizo Plain National Monument	Carrizo Plains Ecological Reserve	Buttongwillow Ecological Reserve	Semitropic Ecological Reserve	Semitropic Ridge Preserve	Pixley Vernal Pools	Allensworth Ecological Reserve	Herbert Wetland Prairie Preserve	Pixley National Wildlife Refuge
Native Species	Western Spadefoot (<i>Spea hammondi</i>)	—	—	X	—	—	—	—	—	X	—	—	X	—
	Baja California Treefrog (<i>Pseudacris hypochondriaca</i>)	—	X	X	—	—	—	—	—	—	—	—	—	—
	Sierran Treefrog (<i>Pseudacris sierra</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—
	Western Toad (<i>Anaxyrus boreas</i>)	—	—	—	—	—	—	—	—	—	—	—	X	—
	Two-Striped Gartersnake (<i>Thamnophis hammondi</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—
	Clam Shrimp (<i>Cyzicus californicus</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—
	Fairy Shrimp	—	—	—	—	—	—	—	—	X	—	X	—	—
	Seed Shrimp	—	—	—	—	—	—	—	—	—	—	—	—	—
Non-Native Species	Mosquitofish (<i>Gambusia affinis</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—

Table 2. Summary of species observed in the Southern Sierra Foothills and Central Coast U.S. Fish and Wildlife Western Spadefoot Regions, California, 2022.

U.S. Fish and Wildlife Region		Southern Sierra Foothills								Central Coast			
County		Tulare	Madera			Fresno					San Benito		Monterey
Site		Stone Corral Ecological Reserve	Ledger Island	San Joaquin Experimental Range	Sycamore Island	Ball Ranch	Jenson River Ranch	Millerton Lake State Recreation Area	Willow Unit	Pleasant Valley Ecological Reserve	LI Livestock Ranch	Sans Topo Ranch	Fort Hunter Liggett
Native Species	Western Spadefoot (<i>Spea hammondi</i>)	—	—	—	—	—	—	—	—	—	—	—	—
	Baja California Treefrog (<i>Pseudacris hypochondriaca</i>)	X	X	X	—	—	—	—	—	—	—	—	—
	Sierran Treefrog (<i>Pseudacris sierra</i>)	—	—	—	—	—	—	—	—	—	X	—	—
	Western Toad (<i>Anaxyrus boreas</i>)	—	—	—	—	—	X	—	—	—	—	—	—
	Two-Striped Gartersnake (<i>Thamnophis hammondi</i>)	—	—	—	—	—	—	—	—	—	—	—	—
	Clam Shrimp (<i>Cyzicus californicus</i>)	—	—	—	—	—	—	—	—	—	—	—	—
	Fairy Shrimp	—	—	—	—	—	—	—	—	—	—	—	—
	Seed Shrimp	—	—	—	—	—	—	—	—	—	—	—	—
Non-Native Species	Mosquitofish (<i>Gambusia affinis</i>)	—	—	—	—	—	—	—	—	—	—	—	—

Table 3. Summary of species observed in the Northwest Ventura and Los Angeles U.S. Fish and Wildlife Western Spadefoot Regions, California, 2022.

U.S. Fish and Wildlife Region		Northwest Ventura and LA												None
County		Ventura County				Los Angeles County								
Site		Boeing Santa Susana Field Laboratory	City of Moorpark Open Space	Happy Camp Canyon Regional Park	Tierra Rejada Vernal Pool	Golden Valley Ranch Open Space	Hasley Canyon	Marple Canyon	Michael D. Antonovich Regional Park at Joughin Ranch	O'Melveny Park	Placerita Canyon	San Francisco Canyon	Sterling Gateway Industrial	East Walker Ranch Open Space
Native Species	Western Spadefoot (<i>Spea hammondi</i>)	—	—	—	—	—	X	—	X	—	—	—	—	—
	Baja California Treefrog (<i>Pseudacris hypochondriaca</i>)	X	X	—	—	—	—	—	X	—	—	X	—	X
	Sierran Treefrog (<i>Pseudacris sierra</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—
	Western Toad (<i>Anaxyrus boreas</i>)	—	X	—	—	—	—	—	—	—	X	—	—	—
	Two-Striped Gartersnake (<i>Thamnophis hammondi</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—
	Clam Shrimp (<i>Cyzicus californicus</i>)	—	X	—	—	—	—	—	—	—	—	—	—	—
	Fairy Shrimp	—	X	—	—	—	X	—	—	—	—	—	—	—
	Seed Shrimp	—	X	—	—	—	—	—	—	—	—	—	—	—
Non-Native Species	Mosquitofish (<i>Gambusia affinis</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—

Table 4. Summary of species observed in the Orange - Los Angeles Basin U.S. Fish and Wildlife Western Spadefoot Region, California, 2022.

U.S. Fish and Wildlife Region		Orange - LA Basin							
County		Los Angeles County				San Bernardino County			
Site		Angeles National Forest	Claremont Hills Wilderness Park	Puente Hills Preserve	San Antonio Dam	Chino Hills State Park	City of Chino Hills Open Space	San Antonio Dam	Sunset Park
Native Species	Western Spadefoot (<i>Spea hammondi</i>)	—	—	—	—	X	—	—	—
	Baja California Treefrog (<i>Pseudacris hypochondriaca</i>)	—	—	—	X	X	—	—	X
	Sierran Treefrog (<i>Pseudacris sierra</i>)	—	—	—	—	—	—	—	—
	Western Toad (<i>Anaxyrus boreas</i>)	—	—	—	—	X	—	—	—
	Two-Striped Gartersnake (<i>Thamnophis hammondi</i>)	—	—	—	—	—	—	—	—
	Clam Shrimp (<i>Cyzicus californicus</i>)	—	—	—	—	—	—	—	—
	Fairy Shrimp	—	—	—	X	X	—	—	—
	Seed Shrimp	—	—	—	—	X	—	—	—
Non-Native Species	Mosquitofish (<i>Gambusia affinis</i>)	—	—	—	—	—	—	—	—

Table 5. Summary of species observed in the Orange - LA Basin U.S. Fish and Wildlife Western Spadefoot Region, California, 2022, *continued*.

U.S. Fish and Wildlife Region		Orange - LA Basin												None	
County		Orange County													
Site		Chino Hills State Park	Crystal Cove State Park	Fremont Canyon Nature Preserve	Irvine Mesa	Laguna Coast Wilderness Park	O'Neil Regional Park	Quail Hill Regional Park	Riley Wilderness Park	Shady Canyon	Shoestring Canyon	Trabuco Rose	Weir Canyon Nature Preserve	Cleveland National Forest	Mariposa Reserve
Native Species	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>)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Western Toad (<i>Anaxyrus boreas</i>)	—	X	—	—	X	—	X	—	—	—	—	—	—	—
	Two-Striped Gartersnake (<i>Thamnophis hammondi</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Clam Shrimp (<i>Cyzicus californicus</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Fairy Shrimp	—	—	—	X	—	—	—	—	—	X	—	—	X	—
	Seed Shrimp	—	X	X	X	X	—	—	—	—	—	—	—	X	X
Non-Native Species	Mosquitofish (<i>Gambusia affinis</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Table 6. Summary of species observed in the Inland Empire and Inland Riverside - San Diego U.S. Fish and Wildlife Western Spadefoot Regions, California, 2022.

U.S. Fish and Wildlife Region		Inland Empire											Inland RSD ¹	None
County		San Bernardino County				Riverside County								
Site		Harmony Property	Mill Creek Groundwater Recharge Facility	Santa Ana River Groundwater Recharge Facility	Sterling Avenue	Cole Creek	Motte Rimrock Reserve	Norton Younglove Reserve	Pooman Reservoir	Potrero Reserve	San Jacinto Wildlife Area	Santa Margarita Ecological Reserve	Cleveland National Forest	Potrero Reserve
Native Species	Western Spadefoot (<i>Spea hammondi</i>)	X	—	—	—	—	—	—	X	—	—	—	—	—
	Baja California Treefrog (<i>Pseudacris hypochondriaca</i>)	—	—	X	—	X	—	—	—	—	X	—	—	—
	Sierran Treefrog (<i>Pseudacris sierra</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—
	Western Toad (<i>Anaxyrus boreas</i>)	—	X	X	—	—	X	—	—	—	—	—	—	—
	Two-Striped Gartersnake (<i>Thamnophis hammondi</i>)	—	—	X	—	—	—	—	—	—	—	—	—	—
	Clam Shrimp (<i>Cyzicus californicus</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—
	Fairy Shrimp	X	—	X	—	—	—	—	X	X	—	—	—	X
	Seed Shrimp	X	—	—	—	—	—	—	—	—	X	—	—	—
Non-Native Species	Mosquitofish (<i>Gambusia affinis</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—

¹ Inland Riverside - San Diego

Table 7. Summary of species observed in the Baja Northeast, Baja Northwest and Inland Riverside - San Diego U.S. Fish and Wildlife Western Spadefoot Regions, California, 2022.

U.S. Fish and Wildlife Region		Baja Northeast			Baja Northwest	Inland Riverside - San Diego			
County		San Diego County							
Site		Empire Springs	Jewell Valley	Little Valley	Otay Lakes	Chihuahua Creek Spring	Combs Camp	Sky Oaks	Twin Lakes
Native Species	Western Spadefoot (<i>Spea hammondi</i>)	—	X	X	X	—	—	—	—
	Baja California Treefrog (<i>Pseudacris hypochondriaca</i>)	X	X	—	—	X	—	—	—
	Sierran Treefrog (<i>Pseudacris sierra</i>)	—	—	—	—	—	—	—	—
	Western Toad (<i>Anaxyrus boreas</i>)	—	—	—	—	—	—	—	—
	Two-Striped Gartersnake (<i>Thamnophis hammondi</i>)	—	—	—	—	—	—	—	—
	Clam Shrimp (<i>Cyzicus californicus</i>)	—	—	—	—	—	—	—	—
	Fairy Shrimp	—	—	—	X	—	—	—	—
	Seed Shrimp	—	—	—	—	—	—	—	—
Non-Native Species	Mosquitofish (<i>Gambusia affinis</i>)	X	—	—	—	—	—	—	—

Table 8. Summary of species observed in the Central San Diego U.S. Fish and Wildlife Western Spadefoot Region, California, 2022.

U.S. Fish and Wildlife Region		Central San Diego													None			
County		San Diego County																
Site		Chicken Ranch	Dulzura Creek	Little Tecate	Marine Corps Air Station Miramar	Montecito Ranch	Pala Reservation	Proctor Valley	Rancho Jumul Ecological Reserve	Skyline	Spring Canyon	Tecate Peak	Ulrich	Wright's Field	Long Potrero	Proctor Valley	Otay Lakes	Otay Mountain Ecological Reserve
Native Species	Western Spadefoot (<i>Spea hammondi</i>)	—	—	—	—	—	—	X	—	—	—	—	—	X	X	—	—	—
	Baja California Treefrog (<i>Pseudacris hypochondriaca</i>)	—	X	—	X	—	—	X	—	—	—	—	—	—	X	—	—	—
	Sierran Treefrog (<i>Pseudacris sierra</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Western Toad (<i>Anaxyrus boreas</i>)	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—
	Two-Striped Gartersnake (<i>Thamnophis hammondi</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Clam Shrimp (<i>Cyzicus californicus</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Fairy Shrimp	X	—	—	—	X	—	X	—	—	X	—	—	—	—	—	X	X
	Seed Shrimp	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Non-Native Species	Mosquitofish (<i>Gambusia affinis</i>)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

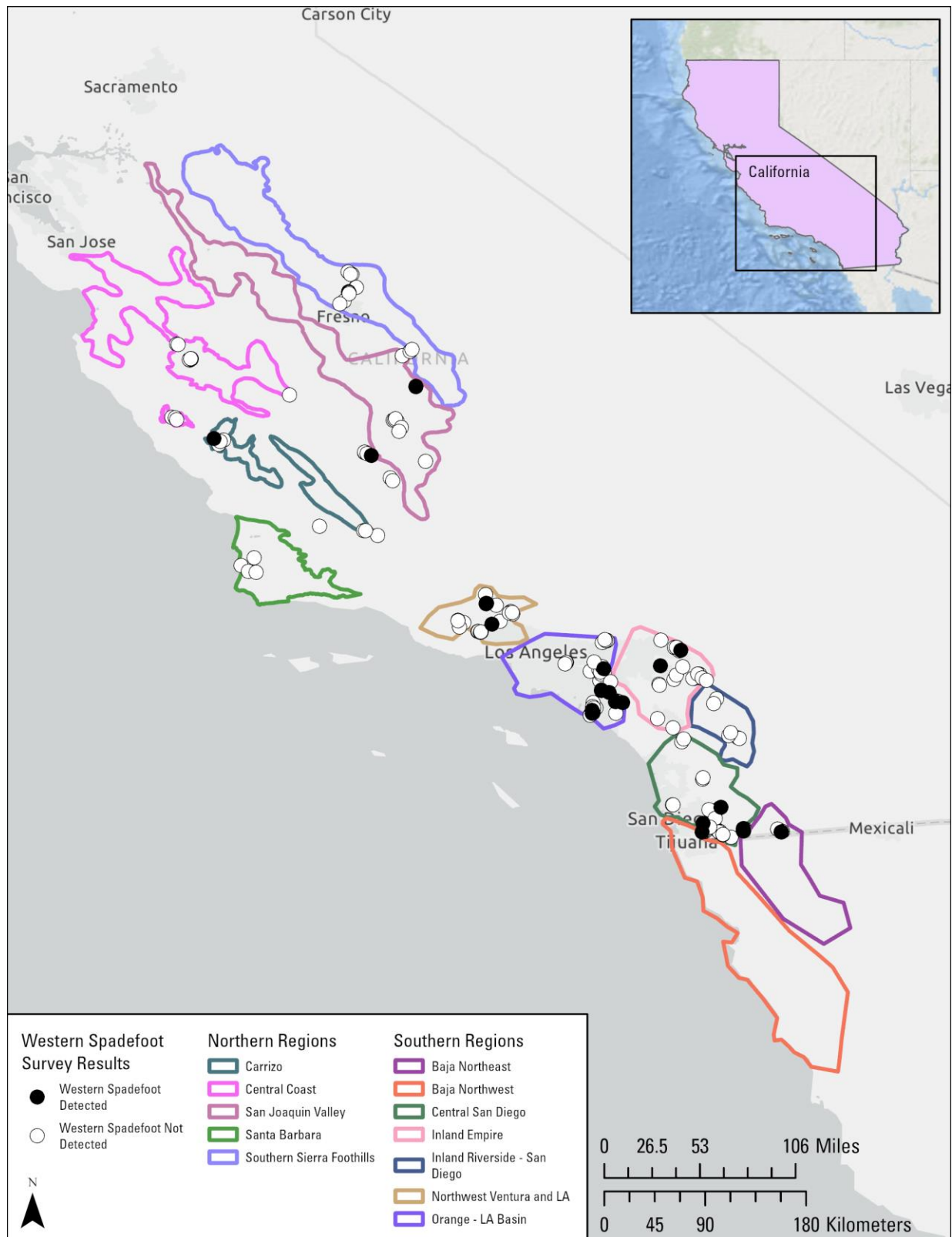


Figure 1. Overview of western spadefoot (*Spea hammondi*) surveys in California, 2022. Polygons are boundaries of U.S. Fish and Wildlife Service Western Spadefoot Regions.

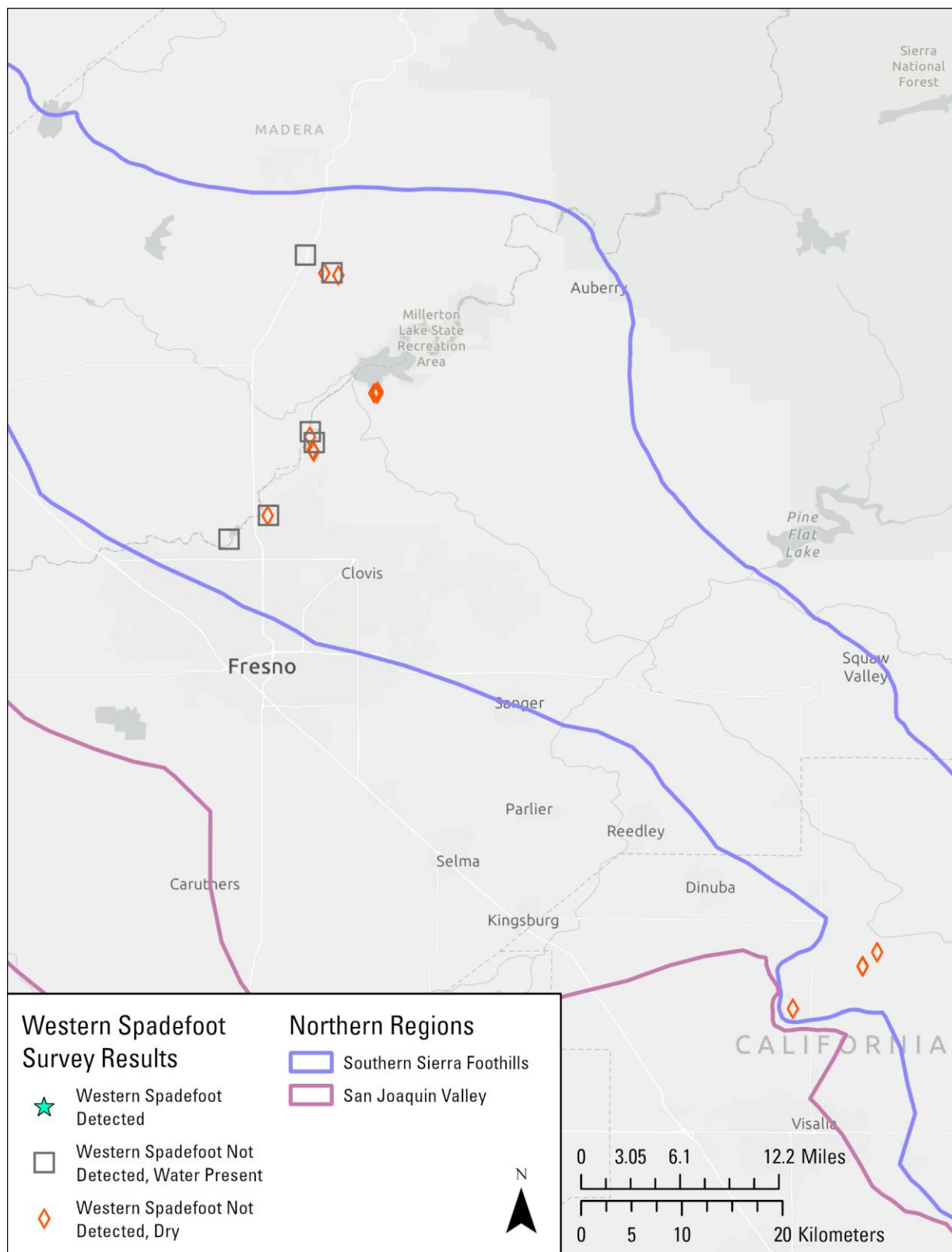


Figure 2. Western spadefoot (*Spea hammondi*) survey results in the Southern Sierra Foothills, 2022. Polygons are boundaries of U.S. Fish and Wildlife Service Western Spadefoot Regions.

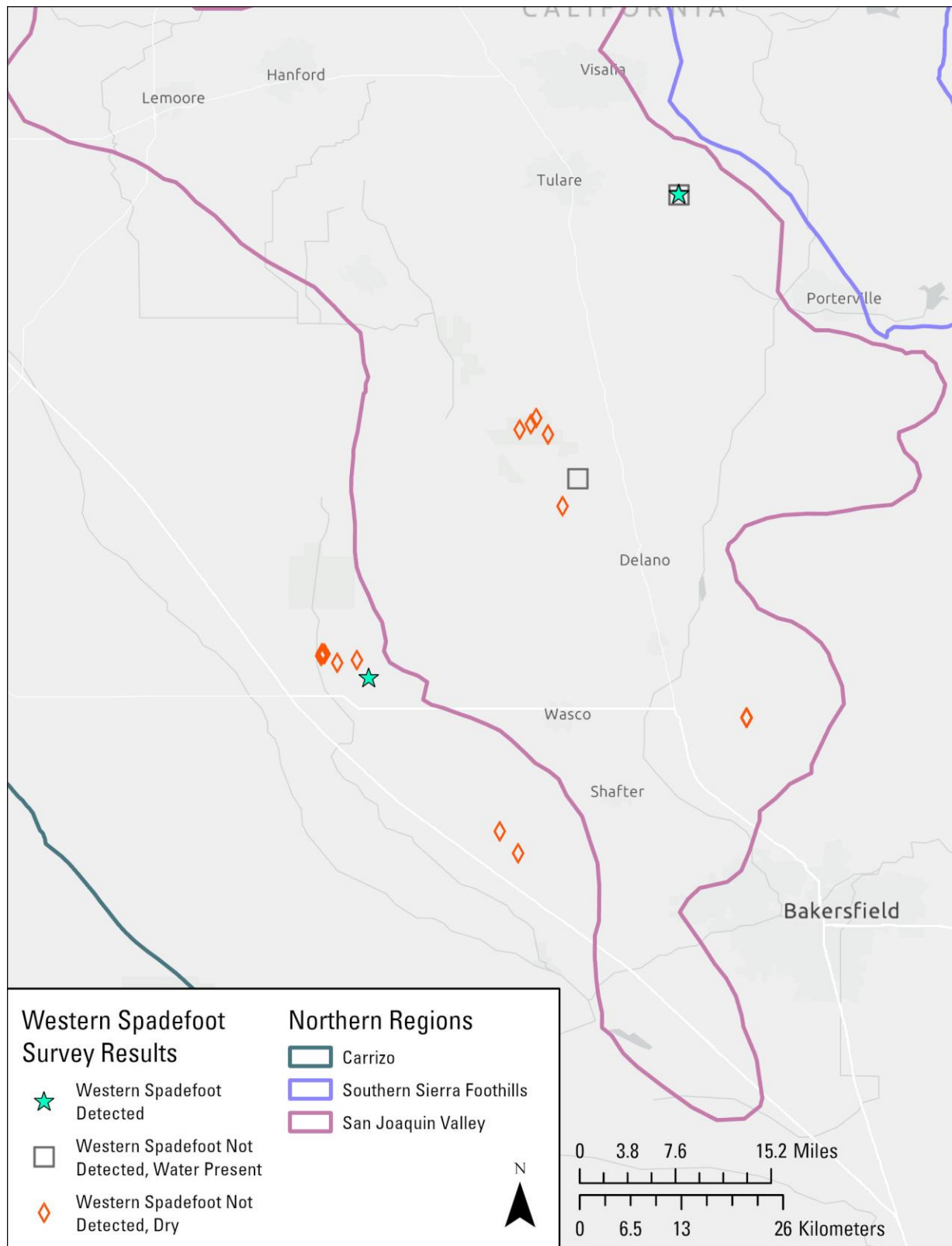


Figure 3. Western spadefoot (*Spea hammondi*) survey results in the San Joaquin Valley, 2022. Polygons are boundaries of U.S. Fish and Wildlife Service Western Spadefoot Regions.

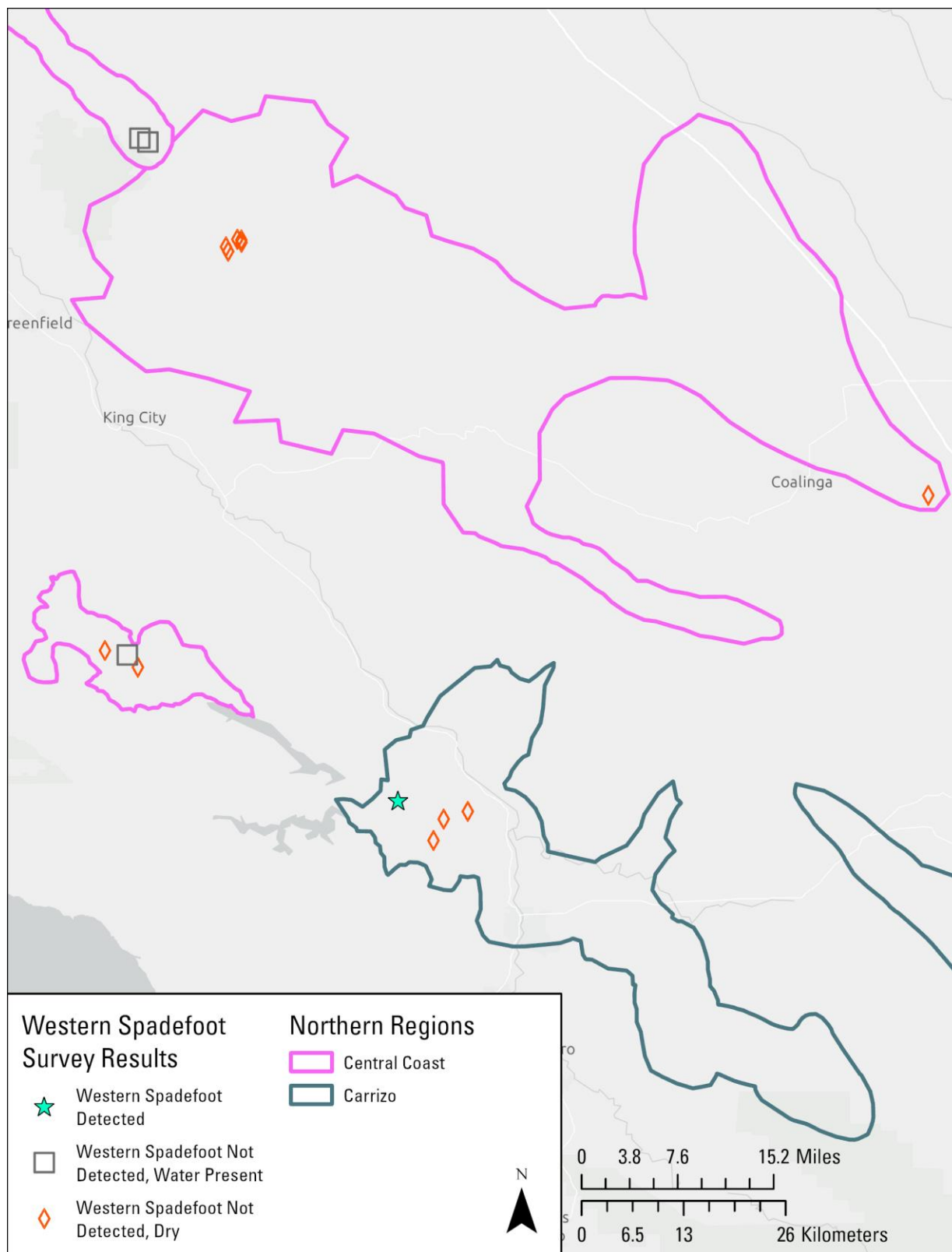


Figure 4. Western spadefoot (*Spea hammondi*) survey results in the Central Coast, 2022. Polygons are boundaries of U.S. Fish and Wildlife Service Western Spadefoot Regions.

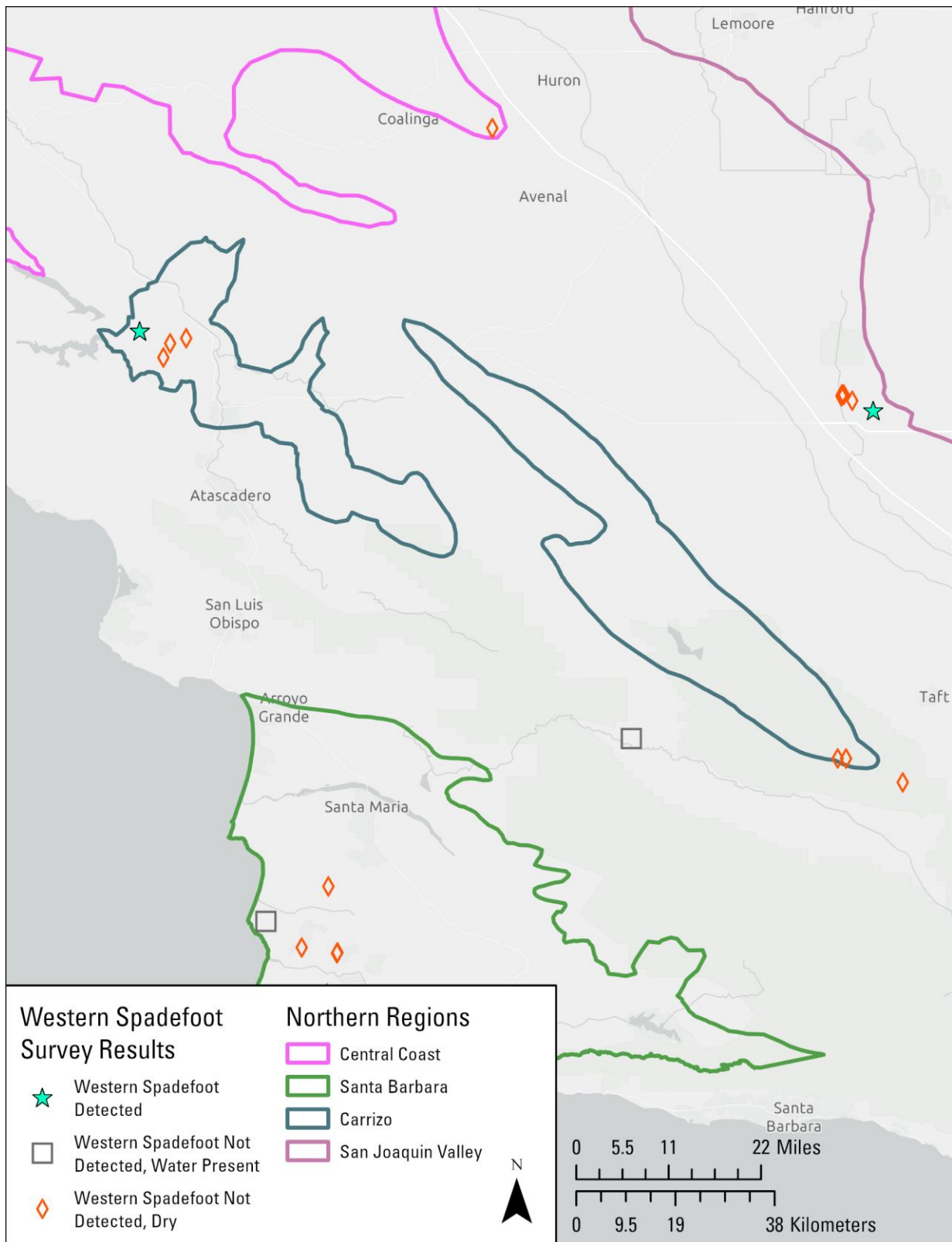


Figure 5. Western spadefoot (*Spea hammondi*) survey results in Carrizo, 2022. Polygons are boundaries of U.S. Fish and Wildlife Service Western Spadefoot Regions.

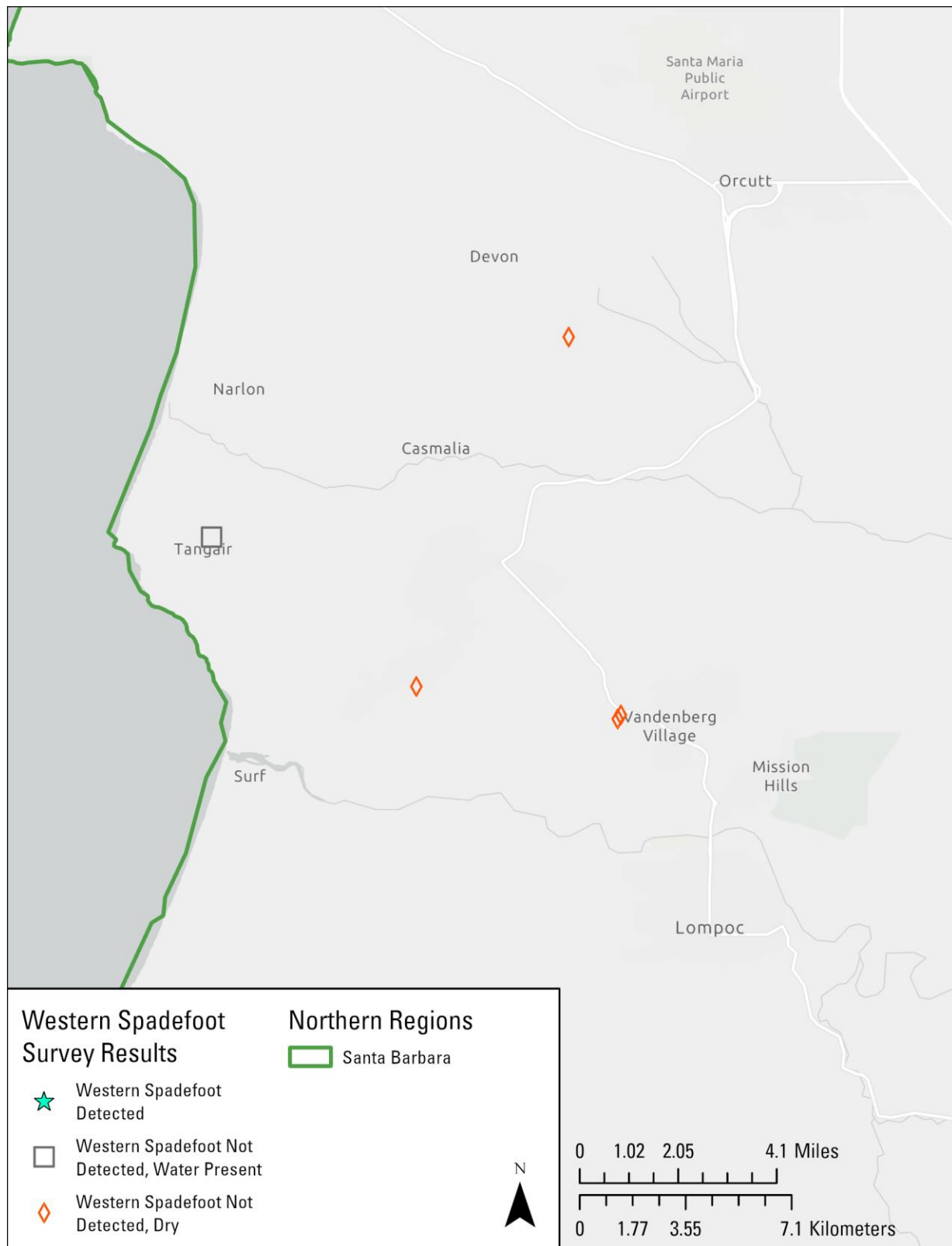


Figure 6. Western spadefoot (*Spea hammondi*) survey results in Santa Barbara, 2022. Polygons are boundaries of U.S. Fish and Wildlife Service Western Spadefoot Regions.

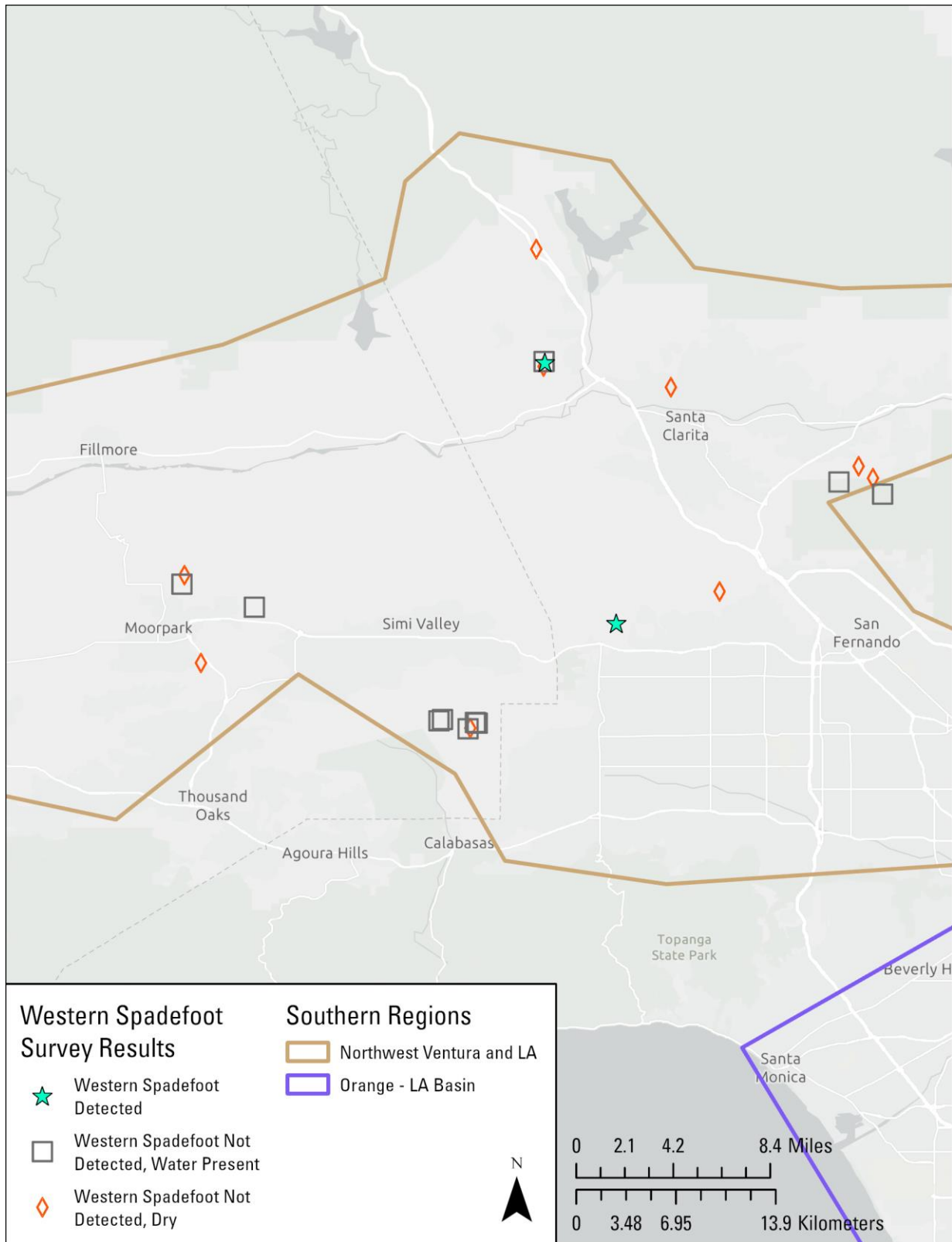


Figure 7. Western spadefoot (*Spea hammondi*) survey results in Northwest Ventura and Los Angeles, 2022. Polygons are boundaries of U.S. Fish and Wildlife Service Western Spadefoot Regions.

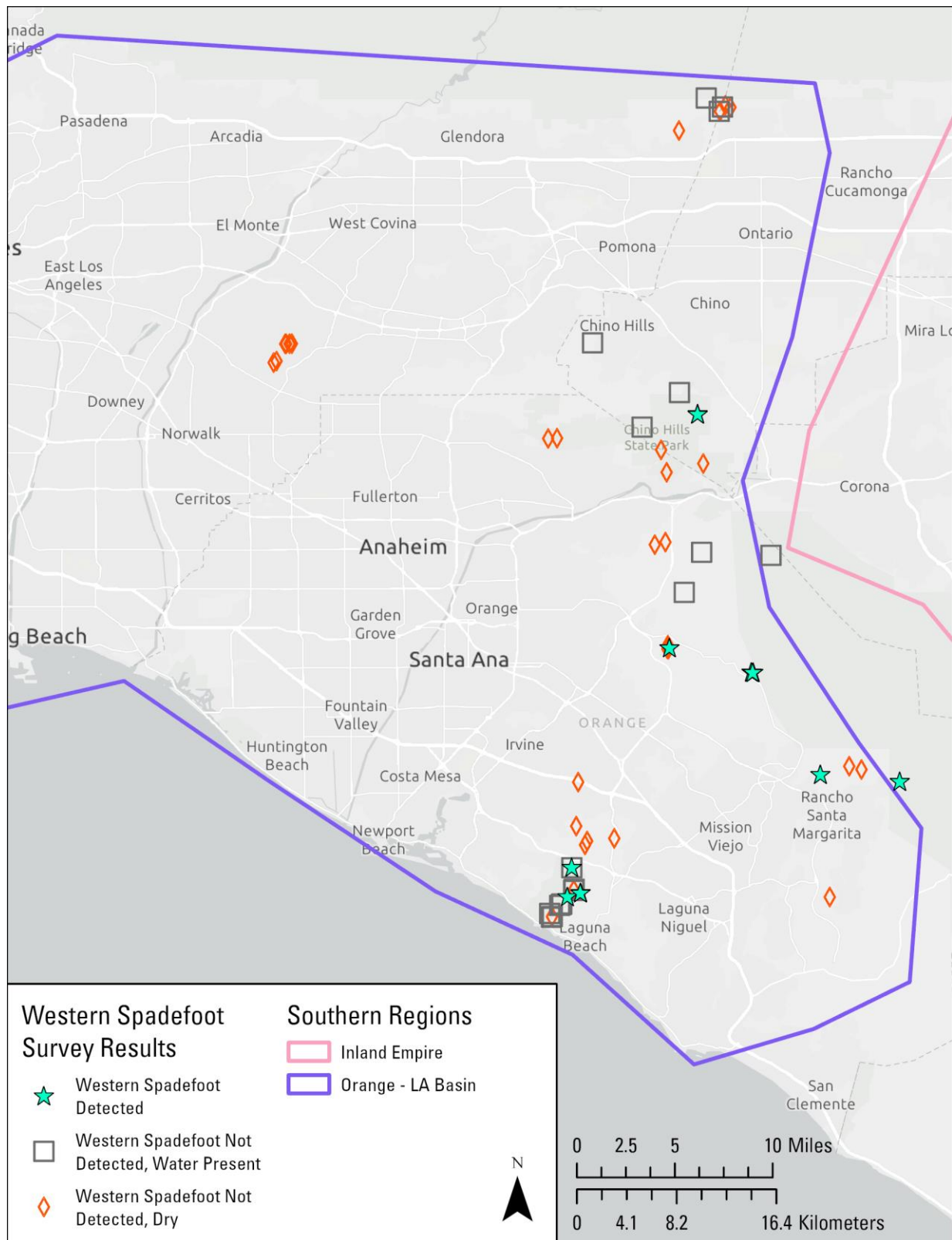


Figure 8. Western spadefoot (*Spea hammondi*) survey results in the Orange - Los Angeles Basin, 2022. Polygons are boundaries of U.S. Fish and Wildlife Service Western Spadefoot Regions.

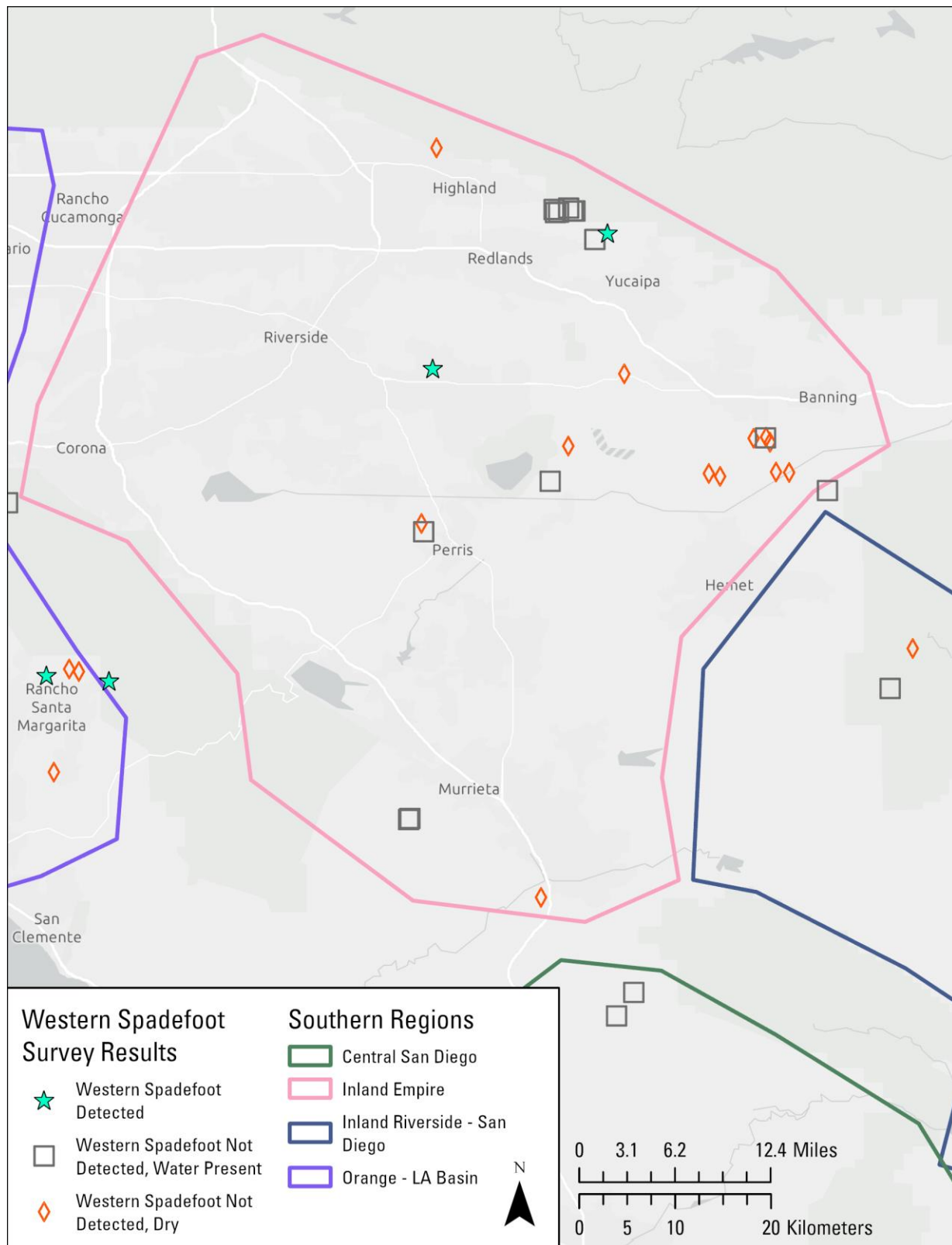


Figure 9. Western spadefoot (*Spea hammondi*) survey results in the Inland Empire, 2022. Polygons are boundaries of U.S. Fish and Wildlife Service Western Spadefoot Regions.

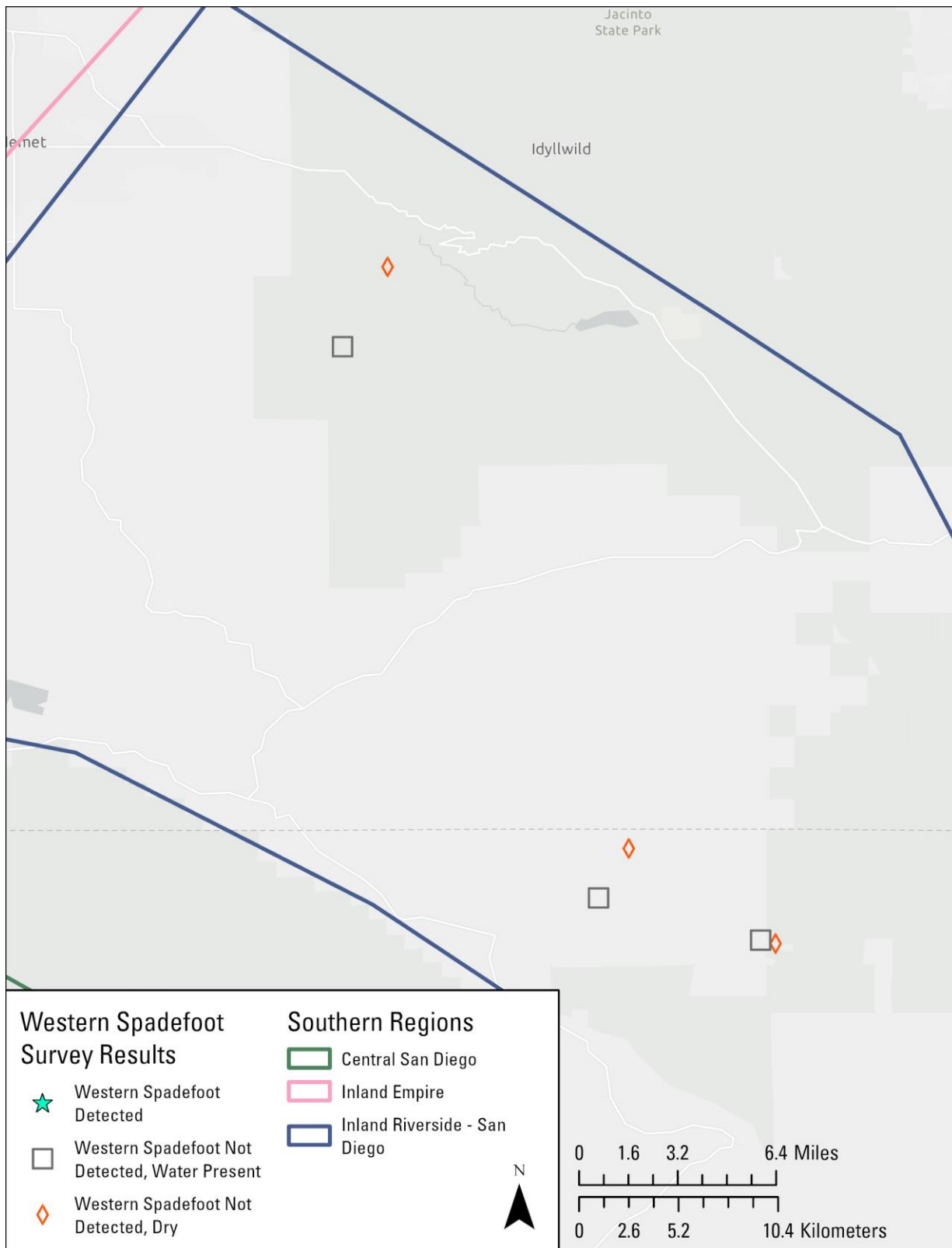


Figure 10. Western spadefoot (*Spea hammondi*) survey results in Inland Riverside - San Diego, 2022. Polygons are boundaries of U.S. Fish and Wildlife Service Western Spadefoot Regions.

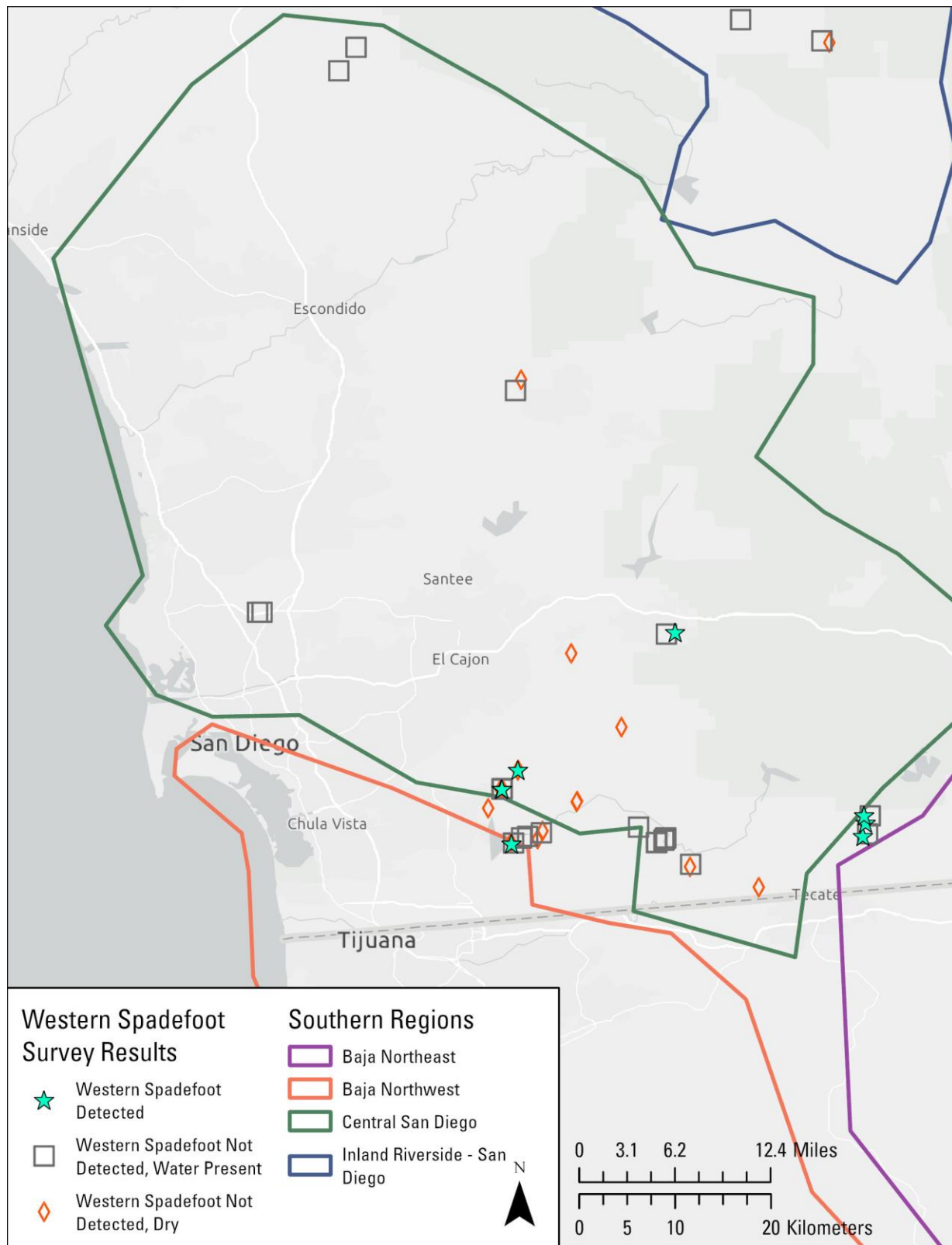


Figure 11. Western spadefoot (*Spea hammondi*) survey results in Central San Diego, 2022. Polygons are boundaries of U.S. Fish and Wildlife Service Western Spadefoot Regions.

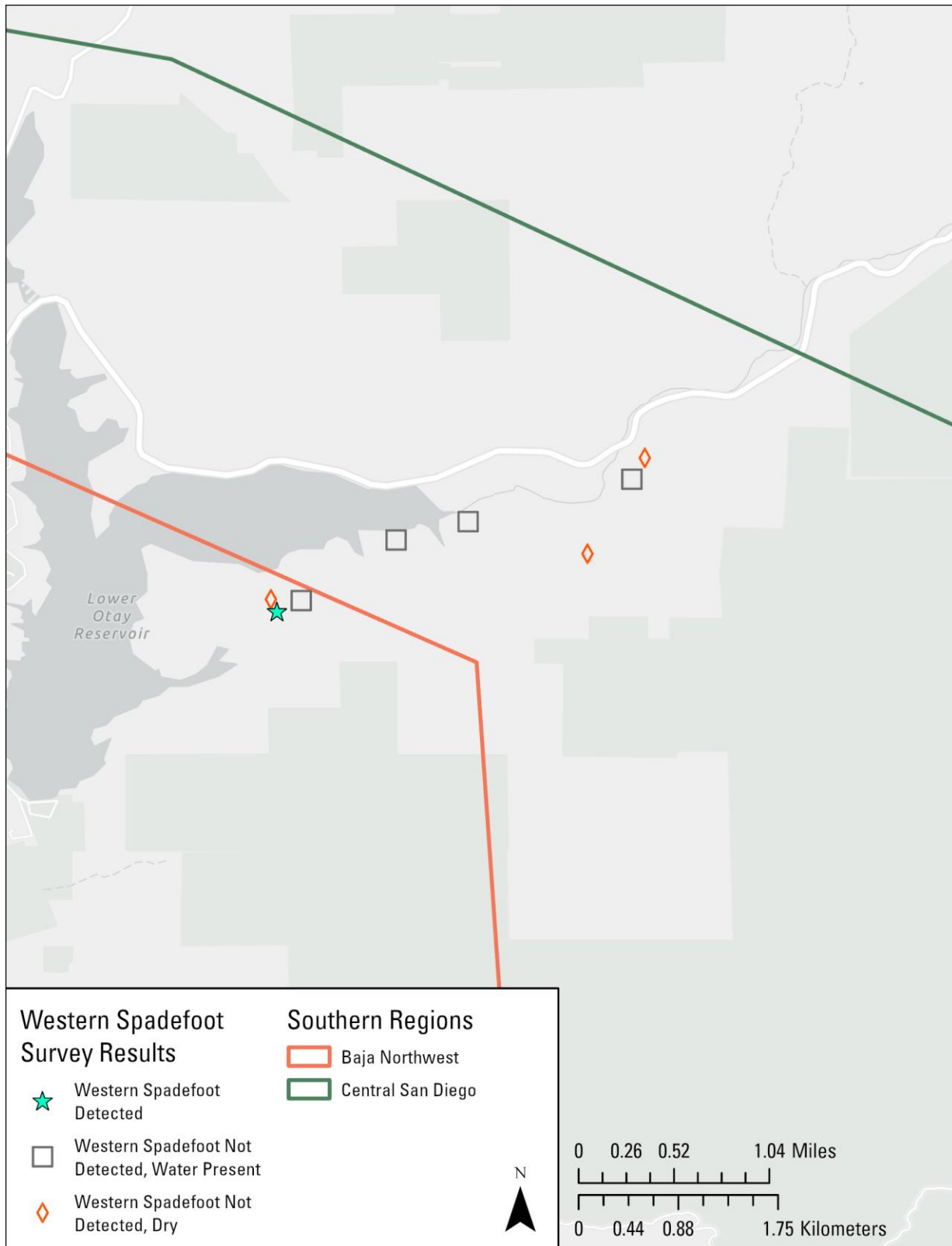


Figure 12. Western spadefoot (*Spea hammondi*) survey results in the Baja Northwest, 2022. Polygons are boundaries of U.S. Fish and Wildlife Service Western Spadefoot Regions.

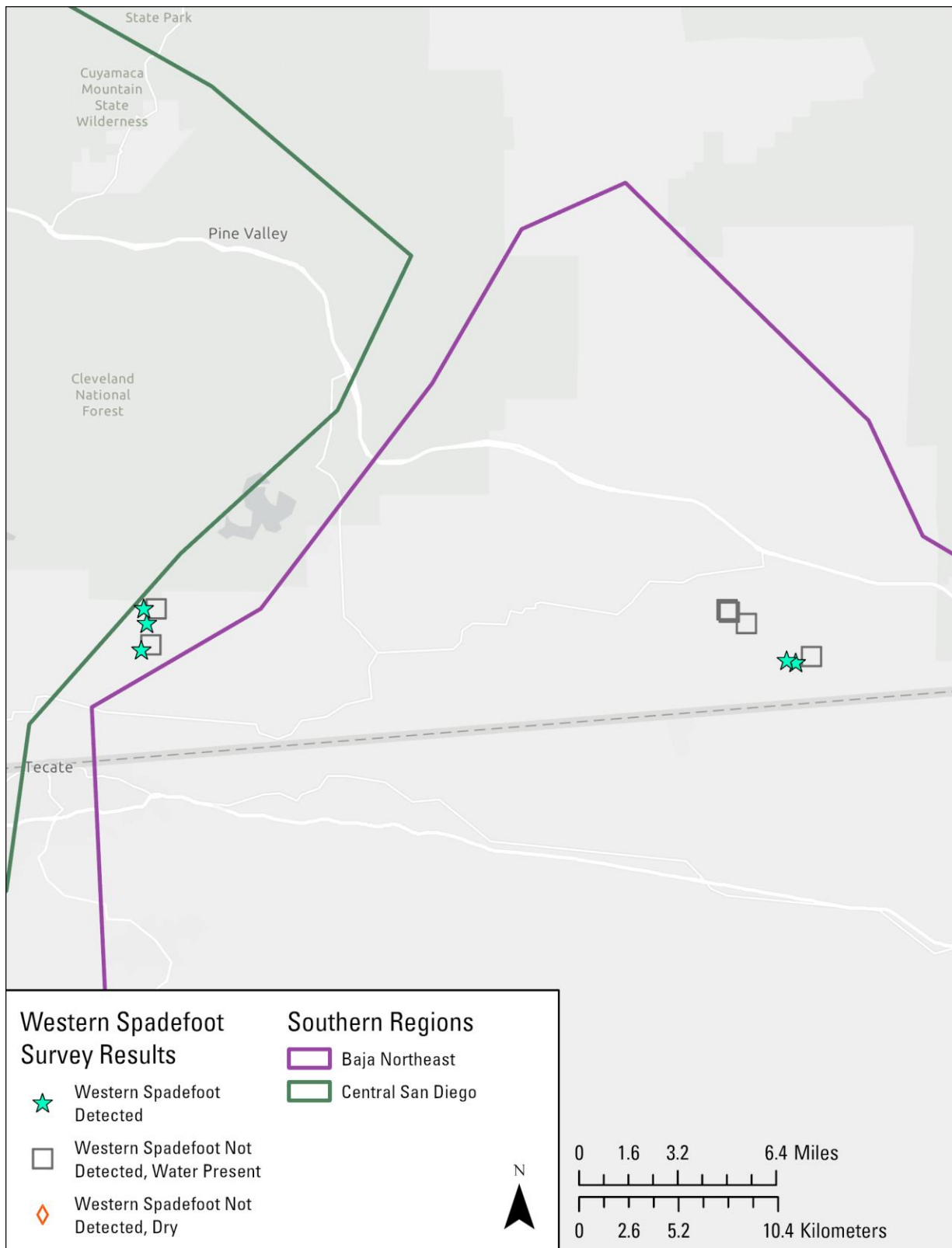


Figure 13. Western spadefoot (*Spea hammondi*) survey results in the Baja Northeast, 2022. Polygons are boundaries of U.S. Fish and Wildlife Service Western Spadefoot Regions.

Appendix 1. Summary of western spadefoot (*Spea hammondi*) survey results in California, 2022.

U.S. Fish and Wildlife Western Spadefoot Region	County	Site	Pool Name	Survey Date	Latitude ¹	Longitude ¹	Water Present	Pool Exists	Spadefoot Detected
Santa Barbara	Santa Barbara	Burton Mesa Ecological Reserve	Burton Mesa 3	4/21/2022	34.70370	-120.48550	No	Yes	No
			Burton Mesa 4	4/21/2022	34.70491	-120.48453	No	Yes	No
		Vandenberg Space Force Base	Vandenberg 1	4/21/2022	34.81862	-120.50024	No	Yes	No
			Vandenberg 4	4/21/2022	34.71347	-120.54610	No	Yes	No
			Vandenberg 5	4/21/2022	34.75842	-120.60775	Yes	Yes	No
Carrizo	San Luis Obispo	Camp Roberts	Camp Roberts 1	4/20/2022	35.77426	-120.82485	Yes	Yes	Yes
			Camp Roberts 2	4/20/2022	35.03864	-119.60912	No	Yes	No
			Camp Roberts 3	4/20/2022	35.03880	-119.62354	No	Yes	No
			Camp Roberts 4	4/20/2022	35.72851	-120.78427	No	Yes	No
		Carrizo Plain National Monument	Carrizo NM 2	4/15/2022	35.03864	-119.60912	No	Yes	No
			Carrizo NM 3	4/15/2022	35.03880	-119.62354	No	Yes	No
San Joaquin Valley	Kern	Pixley Vernal Pools	Pixley Vernal Pool 1	4/11/2022	35.59114	-119.12805	No	Yes	No
			Pixley Vernal Pool 2	4/11/2022	35.59122	-119.12863	No	Yes	No
	Tulare	Allensworth Ecological Reserve	Allensworth ER 0	4/13/2022	35.86542	-119.32204	Yes	Yes	No
			Allensworth ER 1	4/13/2022	35.83392	-119.33964	No	Yes	No
		Herbert Wetland Prairie Reserve	Herbert WPR 1	4/12/2022	36.19308	-119.20613	Yes	Yes	Yes
			Herbert WPR 2	4/12/2022	36.19221	-119.20620	Yes	Yes	Yes
			Herbert WPR 3	4/12/2022	36.19120	-119.20596	Yes	Yes	No
		Pixley National Wildlife Refuge	Pixley NWR 1	4/13/2022	35.92180	-119.38889	No	Yes	No
			Pixley NWR 2	4/13/2022	35.91611	-119.35635	No	Yes	No
			Pixley NWR 3	4/13/2022	35.93510	-119.36987	No	Yes	No
			Pixley NWR 4	4/13/2022	35.92807	-119.37602	No	Yes	No
			Pixley NWR 5	4/13/2022	35.91610	-119.35639	No	Yes	No

¹ Locations obtained in WGS84 datum in decimal degrees.

Appendix 1. Summary of western spadefoot (*Spea hammondi*) survey results in California, 2022, *continued*.

U.S. Fish and Wildlife Western Spadefoot Region	County	Site	Pool Name	Survey Date	Latitude ¹	Longitude ¹	Water Present	Pool Exists	Spadefoot Detected
Sothorn Sierra Foothills	Tulare	Stone Corral Ecological Reserve	Stone Corral ER 1	4/14/2022	36.48765	-119.23707	No	Yes	No
			Stone Corral ER 2	4/14/2022	36.47489	-119.25001	No	Yes	No
			Stone Corral ER 3	4/14/2022	36.47535	-119.24995	No	Yes	No
			Stone Corral ER 4	4/14/2022	36.43736	-119.31218	No	Yes	No
	Madera	Ledger Island	Ledger 1	4/27/2022	36.95129	-119.74268	Yes	Yes	No
			Ledger 2	4/27/2022	36.94690	-119.74300	No	Yes	No
		San Joaquin Experimental Range	San Joaquin Experimental Range 1	4/25/2022	37.09058	-119.71767	No	Yes	No
			San Joaquin Experimental Range 2	4/25/2022	37.09285	-119.72335	Yes	Yes	No
			San Joaquin Experimental Range 3	4/25/2022	37.10860	-119.74702	Yes	Yes	No
			San Joaquin Experimental Range 4	4/25/2022	37.09251	-119.73018	No	Yes	No
		Sycamore Island	Sycamore Island 1	4/27/2022	36.85555	-119.81518	Yes	Yes	No
	Fresno	Ball Ranch	Ball Ranch 1	4/27/2022	36.93488	-119.74056	No	Yes	No
			Ball Ranch 3	4/27/2022	36.94161	-119.73909	Yes	Yes	No
		Jenson River Ranch	Jenson 1	4/26/2022	36.87654	-119.78070	No	Yes	No
			Jenson 2	4/26/2022	36.87679	-119.77998	Yes	Yes	No
		Millerton Lake State Recreation Area	Millerton Lake SRA 1	4/26/2022	36.98680	-119.68266	No	Yes	No
			Millerton Lake SRA 2	4/26/2022	36.98561	-119.68560	No	Yes	No
			Millerton Lake SRA 3	4/26/2022	36.98518	-119.68304	No	Yes	No
		Willow Unit	Willow 1	4/27/2022	36.93356	-119.73958	No	Yes	No

¹ Locations obtained in WGS84 datum in decimal degrees.

Appendix 1. Summary of western spadefoot (*Spea hammondi*) survey results in California, 2022, *continued*.

U.S. Fish and Wildlife Western Spadefoot Region	County	Site	Pool Name	Survey Date	Latitude ¹	Longitude ¹	Water Present	Pool Exists	Spadefoot Detected
Central Coast	Fresno	Pleasant Valley Ecological Reserve	Pleasant Valley ER 1	4/18/2022	36.12329	-120.21796	No	Yes	No
	San Benito	LI Livestock Ranch	LI Livestock Ranch 1	3/30/2022	36.53168	-121.12035	Yes	Yes	No
			LI Livestock Ranch 2	3/30/2022	36.52734	-121.11107	Yes	Yes	No
		Sans Topo Ranch	Sans Topo Ranch 1	4/14/2022	36.40226	-121.01919	No	Yes	No
			Sans Topo Ranch 2	4/14/2022	36.40753	-121.02176	No	Yes	No
			Sans Topo Ranch 3	4/14/2022	36.41258	-121.00391	No	Yes	No
			Sans Topo Ranch 4	4/14/2022	36.41530	-121.00414	No	Yes	No
			Sans Topo Ranch 5	4/14/2022	36.41608	-121.00877	No	Yes	No
	Monterey	Fort Hunter Liggett	Fort Hunter Liggett 1	4/19/2022	35.94580	-121.16026	No	Yes	No
			Fort Hunter Liggett 4	4/19/2022	35.94073	-121.13464	Yes	Yes	No
			Fort Hunter Liggett 5	4/19/2022	35.92669	-121.12256	No	Yes	No
None	San Luis Obispo	Carrizo Plains Ecological Reserve	Carrizo Plain Ecological Reserve 1	4/22/2022	35.07291	-119.97871	Yes	Yes	No
		Carrizo Plain National Monument	Carrizo Plains NM 1 ²	4/15/2022	34.99760	-119.51154	No	Yes	No
	Kern	Buttonwillow Ecological Reserve	Buttonwillow ER 3	5/2/2022	35.46073	-119.41176	No	Yes	No
			Buttonwillow ER 4	5/2/2022	35.43557	-119.39069	No	Yes	No
		Semitropic Ecological Reserve	Semitropic ER 1	4/12/2022	35.66199	-119.61685	No	Yes	No
			Semitropic ER 2	4/12/2022	35.66448	-119.61430	No	Yes	No
			Semitropic ER 3	4/12/2022	35.66443	-119.61293	No	Yes	No
			Semitropic ER 4	4/12/2022	35.66526	-119.61579	No	Yes	No
			Semitropic ER 5	4/12/2022	35.65731	-119.57581	No	Yes	No
		Semitropic Ridge Preserve	CNLM 1	4/12/2022	35.63732	-119.56219	Yes	Yes	Yes
			Semitropic Ridge Preserve 2	4/12/2022	35.65415	-119.59839	No	Yes	No

¹ Locations obtained in WGS84 datum in decimal degrees.

² Western spadefoot (*Spea hammondi*) tadpoles documented a week prior to survey.

Appendix 1. Summary of western spadefoot (*Spea hammondi*) survey results in California, 2022, *continued*.

U.S. Fish and Wildlife Western Spadefoot Region	County	Site	Pool Name	Date of Survey	Latitude ¹	Longitude ¹	Water Present	Pool Exists	Spadefoot Detected
Northwest Ventura and LA	Ventura	Boeing Santa Susana Field Laboratory	Boeing 2	1/19/2022	34.22820	-118.68246	Yes	Yes	No
			Boeing 4	1/19/2022	34.22855	-118.68360	Yes	Yes	No
			Boeing 6	1/19/2022	34.22506	-118.68685	No	Yes	No
			Boeing 7	1/19/2022	34.22459	-118.68821	Yes	Yes	No
			Boeing 8	1/19/2022	34.23040	-118.70423	Yes	Yes	No
			Boeing 9	1/19/2022	34.22961	-118.70643	Yes	Yes	No
			Pool next to Boeing 2	1/19/2022	34.22850	-118.68340	Yes	Yes	No
		City of Moorpark Open Space	Moorpark 1	1/27/2022	34.30070	-118.82203	Yes	Yes	No
		Happy Camp Canyon Regional Park	Happy Camp 1	1/19/2022	34.32077	-118.86580	No	Yes	No
			Happy Camp Road Rut 1	1/19/2022	34.31513	-118.86738	Yes	Yes	No
		Tierra Rejada Vernal Pool	Moorpark 2	1/19/2022	34.26583	-118.85549	No	Yes	No
	Los Angeles	Golden Valley Ranch Open Space	Nadeu 1	1/19/2022	34.38894	-118.44363	No	No	No
			Golden Valley Ranch 1	1/19/2022	34.38140	-118.43465	No	Yes	No
		Hasley Canyon	Sterling 2	1/19/2022	34.45386	-118.64004	Yes	Yes	Yes
			Sterling 3	1/19/2022	34.54483	-118.64062	Yes	Yes	No
		Marple Canyon	Marple Canyon 1	1/19/2022	34.52489	-118.64549	No	No	No
		Michael D. Antonovich Regional Park at Joughin Ranch	Gopher Canyon Pond 1 ²	1/19/2022	34.29065	-118.59538	Yes	Yes	Yes
		O'Melveny Park	O'Melveny Park 1	1/27/2022	34.31054	-118.53071	No	No	No
		Placerita Canyon	Placerita Canyon 2	1/19/2022	34.37911	-118.45597	Yes	Yes	No
		San Francisquito Canyon	San Francisquito Canyon Pool 1	1/19/2022	34.43827	-118.56124	No	No	No
		Sterling Gateway Industrial	Sterling Pond 1	1/19/2022	34.45136	-118.64091	No	Yes	No
None		East Walker Ranch Open Space	Placerita Canyon 1	1/19/2022	34.37140	-118.42864	Yes	Yes	No

¹ Locations obtained in WGS84 datum in decimal degrees.² Pool dried before western spadefoot (*Spea hammondi*) reached metamorphosis.

Appendix 1. Summary of western spadefoot (*Spea hammondi*) survey results in California, 2022, *continued*.

U.S. Fish and Wildlife Western Spadefoot Region	County	Site	Pool Name	Date of Survey	Latitude ¹	Longitude ¹	Water Present	Pool Exists	Spadefoot Detected
Orange - LA Basin	Los Angeles	Angeles National Forest	Potato Mountain	1/20/2022	34.16541	-117.69183	Yes	Yes	No
		Claremont Hills Wilderness Park	Burbank Canyon 1	1/26/2022	34.14141	-117.71195	No	Yes	No
		Puente Hills Preserve	Puente Hills 1	1/18/2022	33.98394	-118.00275	No	Yes	No
			Puente Hills 2	1/18/2022	33.98407	-117.99783	No	Yes	No
			Puente Hills 3	1/18/2022	33.96988	-118.01132	No	No	No
			Puente Hills 4	1/18/2022	33.98386	-117.99955	No	No	No
			Puente Hills 5	1/18/2022	33.98390	-118.00194	No	No	No
			Puente Hills 6	1/18/2022	33.97128	-118.00913	No	No	No
		San Antonio Dam	San Antonio 3	1/20/2022	34.15562	-117.68166	No	Yes	No
			San Antonio 5	1/20/2022	34.15556	-117.68227	Yes	Yes	No
	San Bernardino	Chino Hills State Park	Aliso Canyon 9	1/18/2022	33.89563	-117.69407	No	No	No
			McDermont Spring 1	1/18/2022	33.92242	-117.73915	Yes	Yes	No
			Bane Canyon 1 ²	1/18/2022	33.93252	-117.69818	Yes	Yes	Yes
			Bane Canyon 2	1/18/2022	33.93212	-117.69819	Yes	Yes	Yes
		City of Chino Hills Open Space	Sidewinder 1	2/1/2022	33.94797	-117.71157	Yes	Yes	No
		San Antonio Dam	San Antonio 1	1/20/2022	34.15877	-117.68059	No	Yes	No
			San Antonio 2	1/20/2022	34.16003	-117.67767	No	Yes	No
			San Antonio 4	1/20/2022	34.15854	-117.67395	No	Yes	No
		Sunset Park	Sunset Park 1	2/1/2022	33.98458	-117.77576	Yes	Yes	No

¹ Locations obtained in WGS84 datum in decimal degrees.

² Pool dried before western spadefoot (*Spea hammondi*) reached metamorphosis.

Appendix 1. Summary of western spadefoot (*Spea hammondi*) survey results in California, 2022, *continued*.

U.S. Fish and Wildlife Western Spadefoot Region	County	Site	Pool Name	Date of Survey	Latitude ¹	Longitude ¹	Water Present	Pool Exists	Spadefoot Detected
Orange - LA Basin	Orange	Chino Hills State Park	Telegraph Canyon 1	1/18/2022	33.91432	-117.80202	No	Yes	No
			Telegraph Canyon 2	1/18/2022	33.91408	-117.80858	No	No	No
			Chino Hills Lake 1	1/18/2022	33.88913	-117.72107	No	Yes	No
			Wire Springs Canyon 1	1/18/2022	33.90568	-117.72527	No	Yes	No
		Crystal Cove State Park	Moro Ridge Natural Pool 2	1/12/2022	33.56948	-117.80012	Yes	Yes	No
			Moro Ridge Natural Pool 1	1/12/2022	33.56352	-117.80740	Yes	Yes	No
			Moro Ridge Natural Pool 3 ²	1/12/2022	33.57607	-117.79433	Yes	Yes	Yes
			Large PVC 3	1/12/2022	33.58054	-117.78974	Yes	Yes	No
			Small Clay 3	1/12/2022	33.58080	-117.78964	Yes	Yes	No
			Small PVC 3	1/12/2022	33.58136	-117.78938	Yes	Yes	No
			Large PVC 4	1/12/2022	33.57051	-117.79854	Yes	Yes	No
			Small PVC 4	1/12/2022	33.57016	-117.79881	Yes	Yes	No
			Large PVC 5	1/12/2022	33.56131	-117.80547	Yes	Yes	No
			Small Clay 5	1/12/2022	33.56119	-117.80577	Yes	Yes	No
			Small PVC 5	1/12/2022	33.56074	-117.80616	Yes	Yes	No
		Fremont Canyon Nature Preserve	Fremont Canyon Pool 1	1/25/2022	33.80051	-117.70807	Yes	Yes	No
			Fremont Canyon Pool 2	1/25/2022	33.83008	-117.69523	Yes	Yes	No
		Irvine Mesa	Mesa 1	1/13/2022	33.74163	-117.65713	Yes	Yes	Yes
			Mesa 2	1/13/2022	33.74173	-117.65849	Yes	Yes	Yes
			Mesa 3	1/13/2022	33.74150	-117.65751	Yes	Yes	Yes

¹ Locations obtained in WGS84 datum in decimal degrees.² Pool dried before western spadefoot (*Spea hammondi*) reached metamorphosis.

Appendix 1. Summary of western spadefoot (*Spea hammondi*) survey results in California, 2022, *continued*.

U.S. Fish and Wildlife Western Spadefoot Region	County	Site	Pool Name	Date of Survey	Latitude ¹	Longitude ¹	Water Present	Pool Exists	Spadefoot Detected
Orange - LA Basin	Orange	Laguna Coast Wilderness Park	Large PVC 1	1/25/2022	33.59762	-117.79116	Yes	Yes	Yes
			Small PVC 1	1/12/2022	33.59726	-117.79110	Yes	Yes	No
			Large PVC 2	1/12/2022	33.57904	-117.78458	Yes	Yes	Yes
			Small PVC 2	1/12/2022	33.57879	-117.78480	Yes	Yes	Yes
			Laguna Coast Wilderness Pool 1	1/24/2022	33.61897	-117.75610	Yes	Yes	No
			Laguna Coast Wilderness Pool 2	1/24/2022	33.61896	-117.75977	No	Yes	No
		O'Neil Regional Park	O'Neil Regional Park Pool 1	1/25/2022	33.66623	-117.60752	Yes	Yes	Yes
		Quail Hill Regional Park	Quail Hill 2	1/24/2022	33.66046	-117.78640	No	Yes	No
		Riley Wilderness Park	Riley Wilderness Park 1	1/25/2022	33.57563	-117.60063	No	Yes	No
		Shady Canyon	Shady Canyon Pool 1	1/24/2022	33.62799	-117.78786	No	No	No
			Shady Canyon Pool 3	1/24/2022	33.61413	-117.78133	No	Yes	No
			Shady Canyon Pool 5	1/24/2022	33.61703	-117.77980	No	Yes	No
		Shoestring Canyon	Shoestring 1	1/13/2022	33.76033	-117.71988	No	Yes	No
			Shoestring 2	1/13/2022	33.76018	-117.71934	No	Yes	No
			Shoestring 3 ²	1/13/2022	33.75975	-117.71900	Yes	Yes	Yes
			Shoestring 4	1/13/2022	33.75879	-117.72051	No	Yes	No
			Shoestring 5	1/13/2022	33.75918	-117.71949	No	Yes	No
			Shoestring 6	1/13/2022	33.75852	-117.71987	No	Yes	No
			Shoestring 8	1/13/2022	33.76150	-117.72018	No	Yes	No
		Trabuco Rose	Trabuco Rose 1	1/25/2022	33.67216	-117.58625	No	Yes	No
			Trabuco Rose 2	1/25/2022	33.66979	-117.57721	No	Yes	No
		Weir Canyon Nature Preserve	Weir Canyon 1	1/25/2022	33.83762	-117.72196	No	Yes	No
			Weir Canyon 2	1/25/2022	33.83576	-117.72983	No	Yes	No
None	Cleveland National Forest	Bell View Trail 1	1/25/2022	33.66109	-117.54893	Yes	Yes	Yes	
	Mariposa Reserve	Fremont Canyon Pond 5	2/1/2022	33.82791	-117.64404	Yes	Yes	No	

¹ Locations obtained in WGS84 datum in decimal degrees.

² Pool dried before western spadefoot (*Spea hammondi*) reached metamorphosis.

Appendix 1. Summary of spadefoot (*Spea hammondi*) survey results in California, 2022, *continued*.

U.S. Fish and Wildlife Western Spadefoot Region	County	Site	Pool Name	Date of Survey	Latitude ¹	Longitude ¹	Water Present	Pool Exists	Spadefoot Detected
Inland Empire	San Bernardino	Harmony Property	Mill Creek 2	3/22/2022	34.08043	-117.08189	Yes	Yes	Yes
		Mill Creek Groundwater Recharge Facility	South Mill Creek 1	3/22/2022	34.16418	-117.99903	Yes	Yes	No
		Santa Ana River Groundwater Recharge Facility	Old Number 3	3/22/2022	34.10376	-117.11841	Yes	Yes	No
			Seven Oaks Dam 6	3/22/2022	34.10057	-117.12697	Yes	Yes	No
			Seven Oaks Dam 9	3/22/2022	34.09958	-117.13069	Yes	Yes	No
			Seven Oaks Dam 11	3/22/2022	34.10243	-117.13201	Yes	Yes	No
			Seven Oaks Dam 13	1/20/2022	34.10082	-117.11430	Yes	Yes	No
			Seven Oaks Dam 14	1/20/2022	34.10094	-117.11341	No	Yes	No
			Seven Oaks Dam 15	1/20/2022	34.10112	-117.11265	No	Yes	No
		Sterling Avenue	Sterling Ave 1	1/26/2022	34.16002	-117.24213	No	No	No
	Riverside	Cole Creek	Artificial Pool 1	5/25/2022	33.53122	-117.26825	Yes	Yes	No
			Artificial Pool 2	5/25/2022	33.53220	-117.26710	Yes	Yes	No
		Motte Rimrock Reserve	Motte Rimrock 1	1/24/2022	33.80844	-117.25625	No	No	No
			Motte Rimrock 2	1/24/2022	33.80069	-117.25417	Yes	Yes	No
		Norton Younglove Reserve	Norton 1	2/1/2022	33.95279	-117.05931	No	No	No
		Poorman Reservoir	Poorman Reservoir 1	1/27/2022	33.95363	-117.24566	Yes	Yes	Yes
		Potrero Reserve	Potrero 1	2/1/2022	33.88860	-116.93398	Yes	Yes	No
			Potrero 4	2/1/2022	33.85664	-116.92412	No	No	No
			Potrero 9	1/27/2022	33.85618	-116.91182	No	Yes	No
		San Jacinto Wildlife Area	Potrero 2	2/1/2022	33.88933	-116.93347	No	Yes	No
			Potrero 3	2/1/2022	33.88441	-116.92978	No	Yes	No
			Potrero 5	2/1/2022	33.85252	-116.97650	No	No	No
			Potrero 6	2/1/2022	33.85522	-116.98704	No	No	No
			Potrero 7	2/1/2022	33.88817	-116.94509	No	No	No
			Lake Perris 1	2/1/2022	33.84817	-117.13593	Yes	Yes	No
			Lake Perris 2	2/1/2022	33.88101	-117.11875	No	Yes	No
		Santa Margarita Ecological Reserve	SMER 1	1/26/2022	33.45825	-117.14425	Yes	Yes	No
Inland Riverside - San Diego	Riverside	Cleveland National Forest	Bautista Canyon Road Rut 1	1/24/2022	33.65394	-116.81719	Yes	Yes	No
			Forest Route 5S15 Pond	1/24/2022	33.69091	-116.79608	No	Yes	No
None	Riverside	Potrero Reserve	Potrero 8	1/27/2022	33.83926	-116.87589	Yes	Yes	No

¹ Locations obtained in WGS84 datum in decimal degrees.

Appendix 1. Summary of western spadefoot (*Spea hammondi*) survey results in California, 2022, *continued*.

U.S. Fish and Wildlife Western Spadefoot Region	County	Site	Pool Name	Date of Survey	Latitude ¹	Longitude ¹	Water Present	Pool Exists	Spadefoot Detected
Baja Northeast	San Diego	Empire Spings	Empire Spring 1	4/4/2022	32.64271	-116.29834	Yes	Yes	No
			Empire Spring 2	4/4/2022	32.64919	-116.30741	Yes	Yes	No
			Empire Spring Gun Range 1	4/4/2022	32.64803	-116.30640	Yes	Yes	No
		Jewell Valley	Jewell Valley Road Rut 1	4/5/2022	32.62446	-116.27515	Yes	Yes	Yes
			Jewell Valley Pool 2	4/5/2022	32.62720	-116.26777	Yes	Yes	No
Little Valley		Little Valley Road Rut 1	4/5/2022	32.62546	-116.27940	Yes	Yes	Yes	
Baja Northwest		Otay Lakes	Otay Lakes 86	3/11/2022	32.62424	-116.91210	No	Yes	No
			Otay Lakes Road Rut 2	3/11/2022	32.62328	-116.91162	Yes	Yes	Yes
			Otay Road Rut 3	3/11/2022	32.62414	-116.90971	Yes	Yes	No
Inland Riverside - San Diego		Chihuahua Creek Spring	Chihuahua Creek Spring 1	3/22/2022	33.39519	-116.69700	Yes	Yes	No
		Combs Camp	Combs Camp 1	3/22/2022	33.37378	-116.61388	No	Yes	No
		Sky Oaks	Sky Oaks 1	3/22/2022	33.37538	-116.62089	No	Yes	No
		Twin lakes	Twin Lakes	3/22/2022	33.41839	-116.68281	No	Yes	No
Central San Diego		Chicken Ranch	Chicken Ranch Pond	3/17/2022	32.62444	-116.77599	No	Yes	No
			Chicken Ranch Road Rut 1	3/17/2022	32.62465	-116.77559	Yes	Yes	No
		Dulzura Creek	Dulzura Creek Reach 56	3/17/2022	32.62889	-116.76709	Yes	Yes	No
			Dulzura Creek Reach 57	3/17/2022	32.62819	-116.76772	Yes	Yes	No
			Dulzura Creek Reach 58	3/17/2022	32.62671	-116.76886	Yes	Yes	No
		Little Tecate	Little Tecate Road Rut 1	3/21/2022	32.60186	-116.74439	No	Yes	No
			Little Tecate Road Rut 2	3/21/2022	32.60419	-116.74382	Yes	Yes	No
		Marine Corps Air Station Miramar	Miramar Landfill Pool 1	4/5/2022	32.84019	-117.14957	Yes	Yes	No
			Miramar Landfill Pool 2	4/5/2022	32.84020	-117.14541	Yes	Yes	No
		Montecito Ranch	Montecito Ranch 1	3/3/2022	33.04789	-116.90790	Yes	Yes	No
			Montecito Ranch NE 1	3/3/2022	33.05807	-116.90267	No	Yes	No

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Appendix 1. Summary of western spadefoot (*Spea hammondi*) survey results in California, 2022, *continued*.

U.S. Fish and Wildlife Western Spadefoot Region	County	Site	Pool Name	Date of Survey	Latitude ¹	Longitude ¹	Water Present	Pool Exists	Spadefoot Detected
Central San Diego	San Diego	Pala Reservation	San Diego County Road Rut 1	3/10/2022	33.34731	-117.07347	Yes	Yes	No
			San Diego County Road Rut 2	3/10/2022	33.36933	-117.05734	Yes	Yes	No
		Proctor Valley	PV Vernal Pool 2	1/6/2022	32.69237	-116.90563	Yes	Yes	Yes
			PV Vernal Pool 3	1/6/2022	32.69245	-116.90543	No	Yes	No
			PV Vernal Pool 4	1/6/2022	32.69226	-116.90569	No	Yes	No
			PV Vernal Pool 9	1/11/2022	32.67449	-116.92105	Yes	Yes	Yes
			PV Vernal Pool 10	1/11/2022	32.67506	-116.92052	No	Yes	No
			PV Vernal Pool 11	1/11/2022	32.67515	-116.92036	Yes	Yes	No
			PV Vernal Pool 20	1/11/2022	32.67458	-116.92059	Yes	Yes	No
			PV Vernal Pool 21	1/11/2022	32.67453	-116.92057	Yes	Yes	Yes
			PV Vernal Pool 28	1/11/2022	32.67424	-116.92187	No	Yes	No
		Rancho Jamul Ecological Reserve	Canyon Pond	1/21/2022	32.66335	-116.85021	No	Yes	No
			RJER Aqueduct	1/21/2022	32.66264	-116.85063	No	No	No
		Skyline	San Diego County 3	3/11/2022	32.73263	-116.80866	No	Yes	No
		Spring Canyon	Spring Canyon 1	1/21/2022	32.63890	-116.79261	Yes	Yes	No
		Tecate Peak	San Diego County Pool 1	3/21/2022	32.82475	-116.66713	No	Yes	No
		Ulrich	Ulrich Property	2/28/2022	32.80177	-116.85572	No	No	No
		Wright's Field	Wright's Field 1	2/28/2022	32.82134	-116.75834	Yes	Yes	Yes
			Wright's Field 2	2/28/2022	32.81979	-116.76654	Yes	Yes	No
None	San Diego	Long Potrero	Long Potrero Private 1	3/15/2022	32.63038	-116.58244	Yes	Yes	Yes
			Potrero Pond	3/15/2022	32.63270	-116.57799	Yes	Yes	No
			Potrero Road Rut 1	3/15/2022	32.64284	-116.57987	Yes	Yes	Yes
			Potrero Road Rut 2	3/15/2022	32.64979	-116.58128	Yes	Yes	Yes
			Potrero Vernal Pool	3/15/2022	32.64957	-116.57552	Yes	Yes	No
		Proctor Valley	PV Vernal Pool 1	1/11/2022	32.65672	-116.93354	No	Yes	No
		Otay Lakes	Otay Lakes Road Rut 4	3/11/2022	32.62891	-116.90223	Yes	Yes	No
			Otay Lakes Road Rut 5	3/11/2022	32.63036	-116.89655	Yes	Yes	No
		Otay Mountain Ecological Reserve	Airport Pond	3/11/2022	32.62783	-116.88714	No	Yes	No
			San Diego County	3/11/2022	32.63538	-116.88262	No	Yes	No
			San Diego County Road Rut 2	3/11/2022	32.63370	-116.88364	Yes	Yes	No

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