

San Diego Insect Conservation Update: Hermes Copper, Harbison's Dun Skipper, Pollinators



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UNIVERSITY OF
**CENTRAL
MISSOURI**
LEARNING TO A GREATER DEGREE

Hermes Copper

- Monitoring Protocols
- Distribution
- Population Sizes
- Dispersal
- Captive Rearing
- Translocation Project



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Basic Biology

- Phenology
 - Adults mid-May to mid-July
 - Eggs mid-July to early spring
 - Larvae early spring
 - Pupae late spring
- Male vs. female behavior
- Coastal sage scrub/open chaparral
 - Spiny redberry (*Rhamnus crocea*)

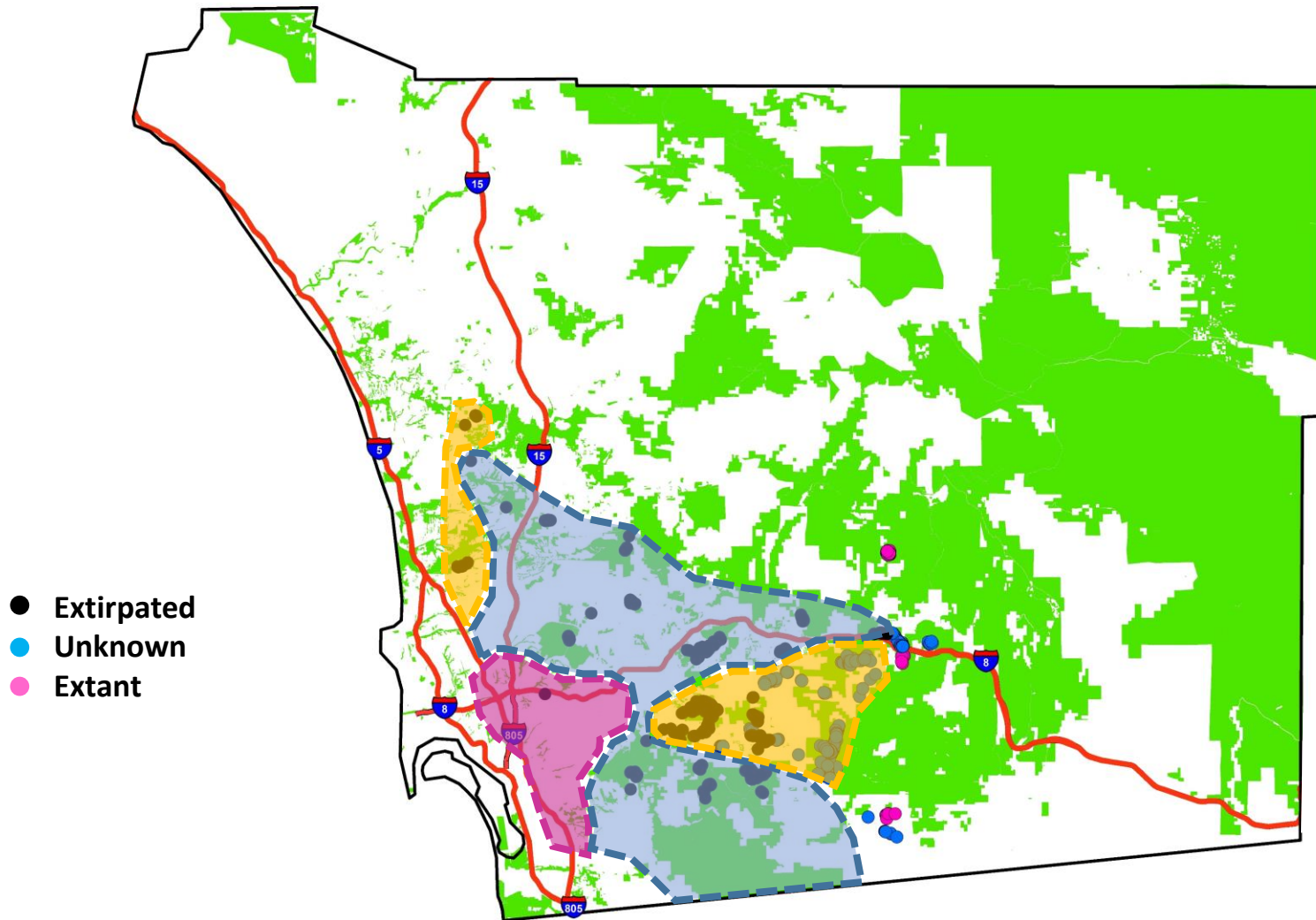


Distribution

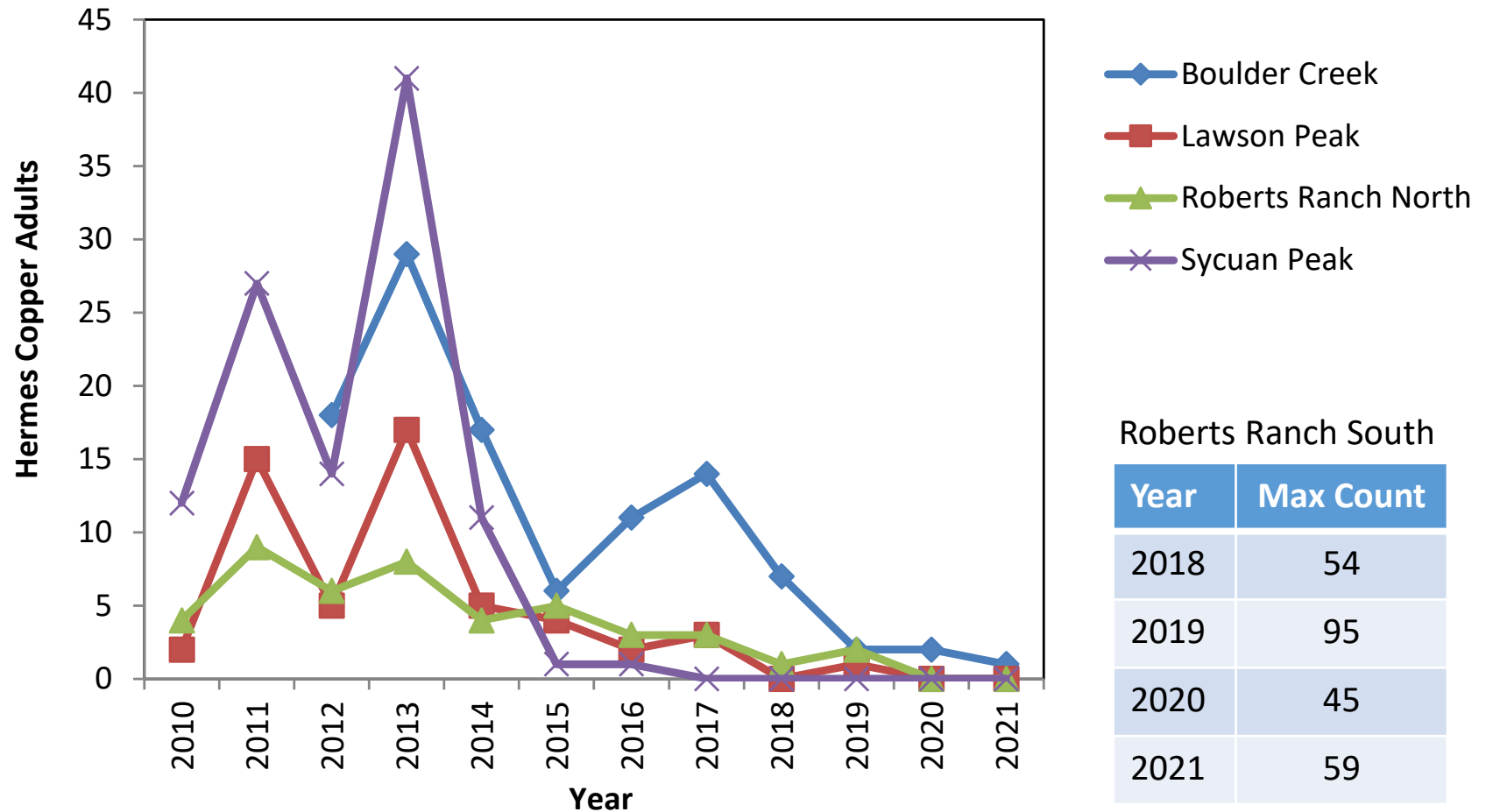
Development (pre-2003)

Fire (2003-2007)

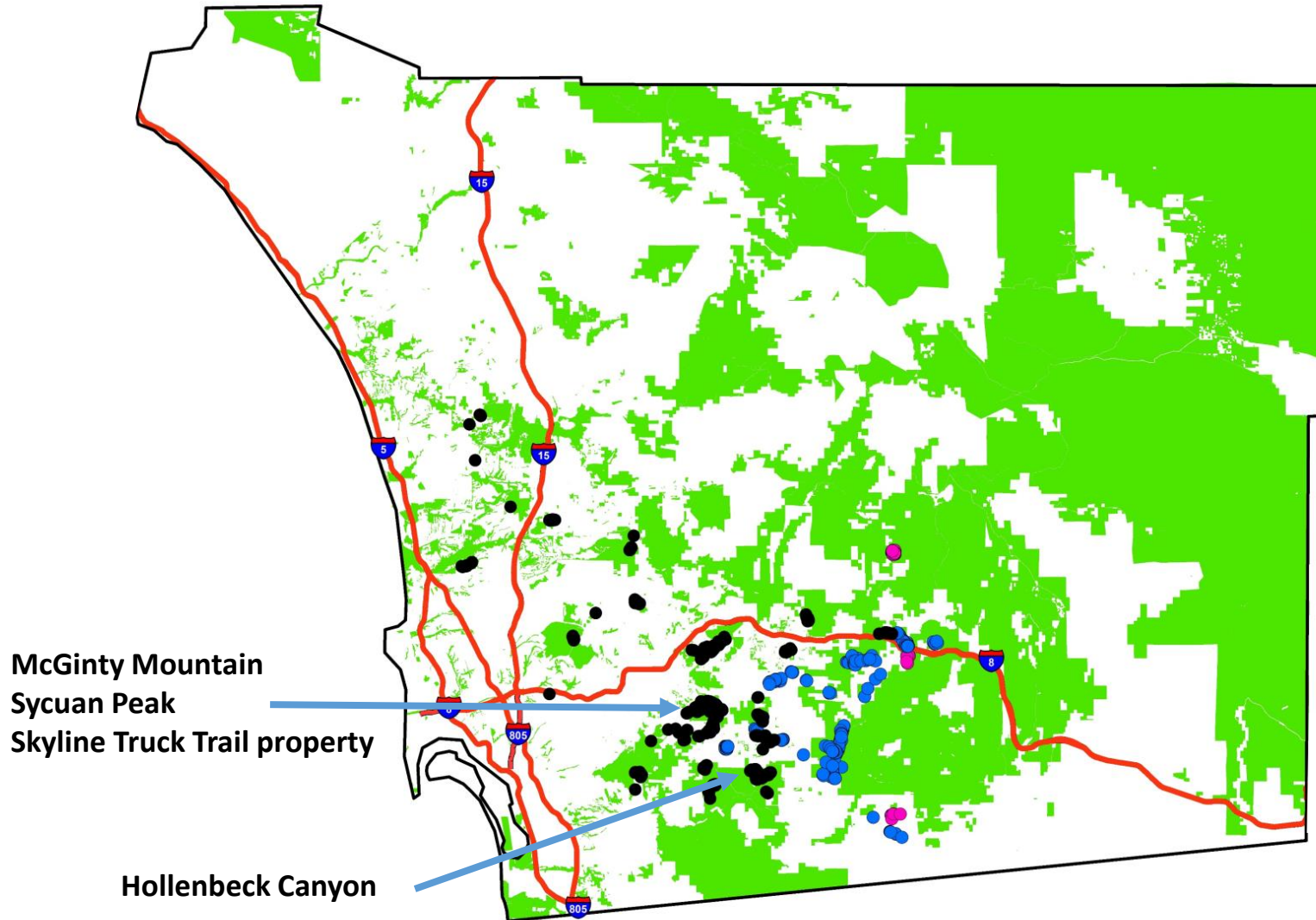
Drought (2015-2021)



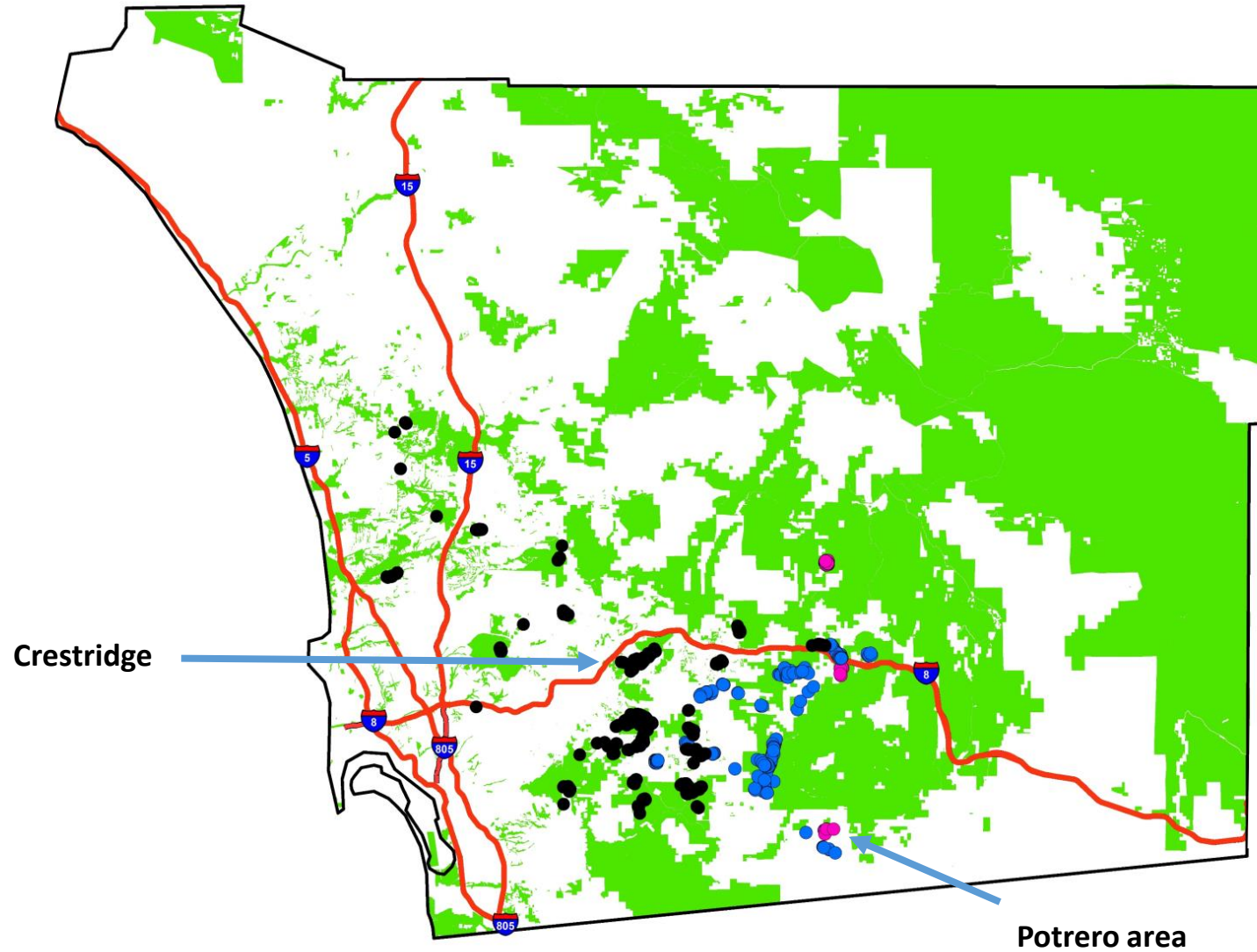
Population Sizes: Reference Sites



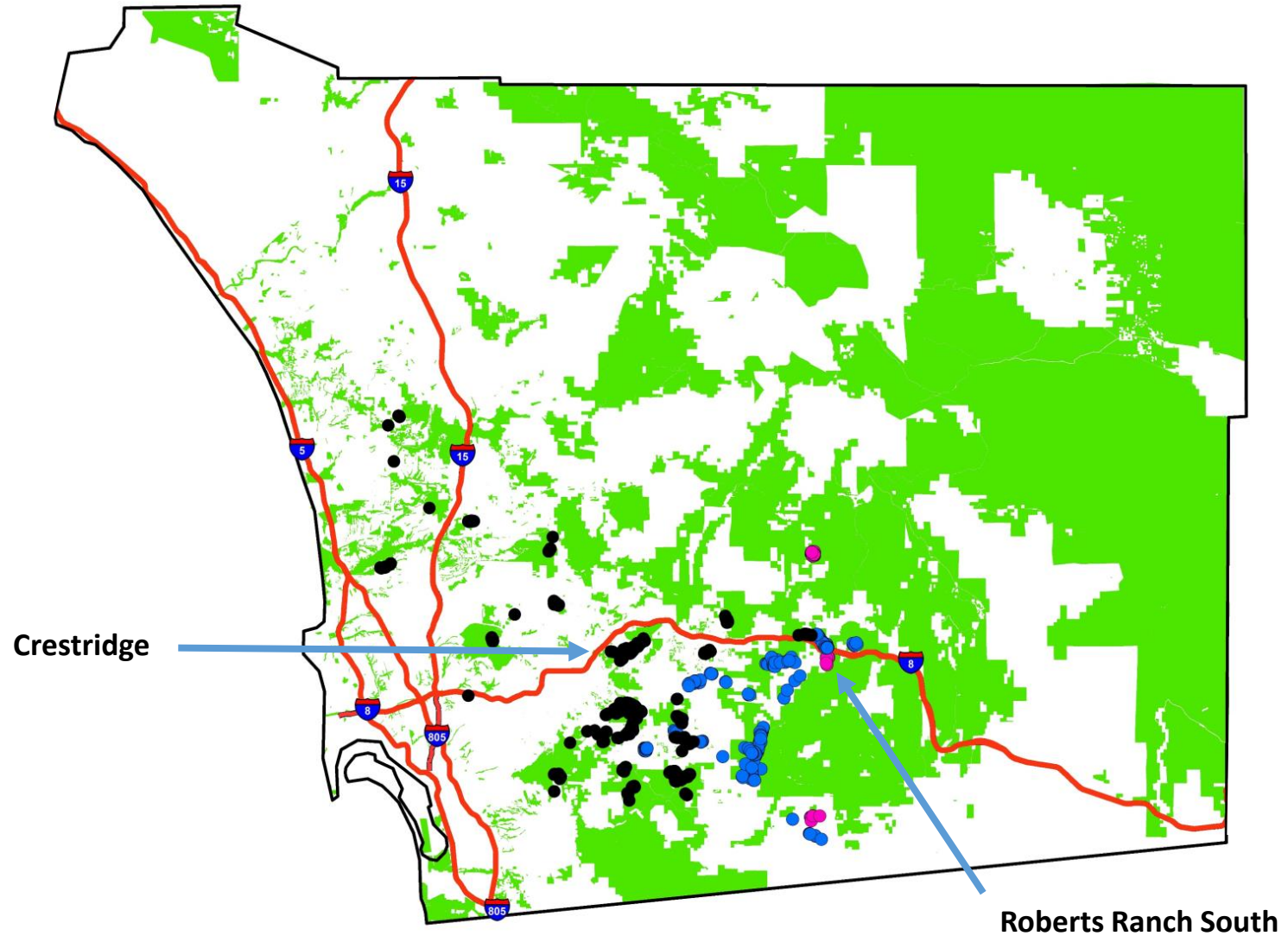
Translocation



Translocation



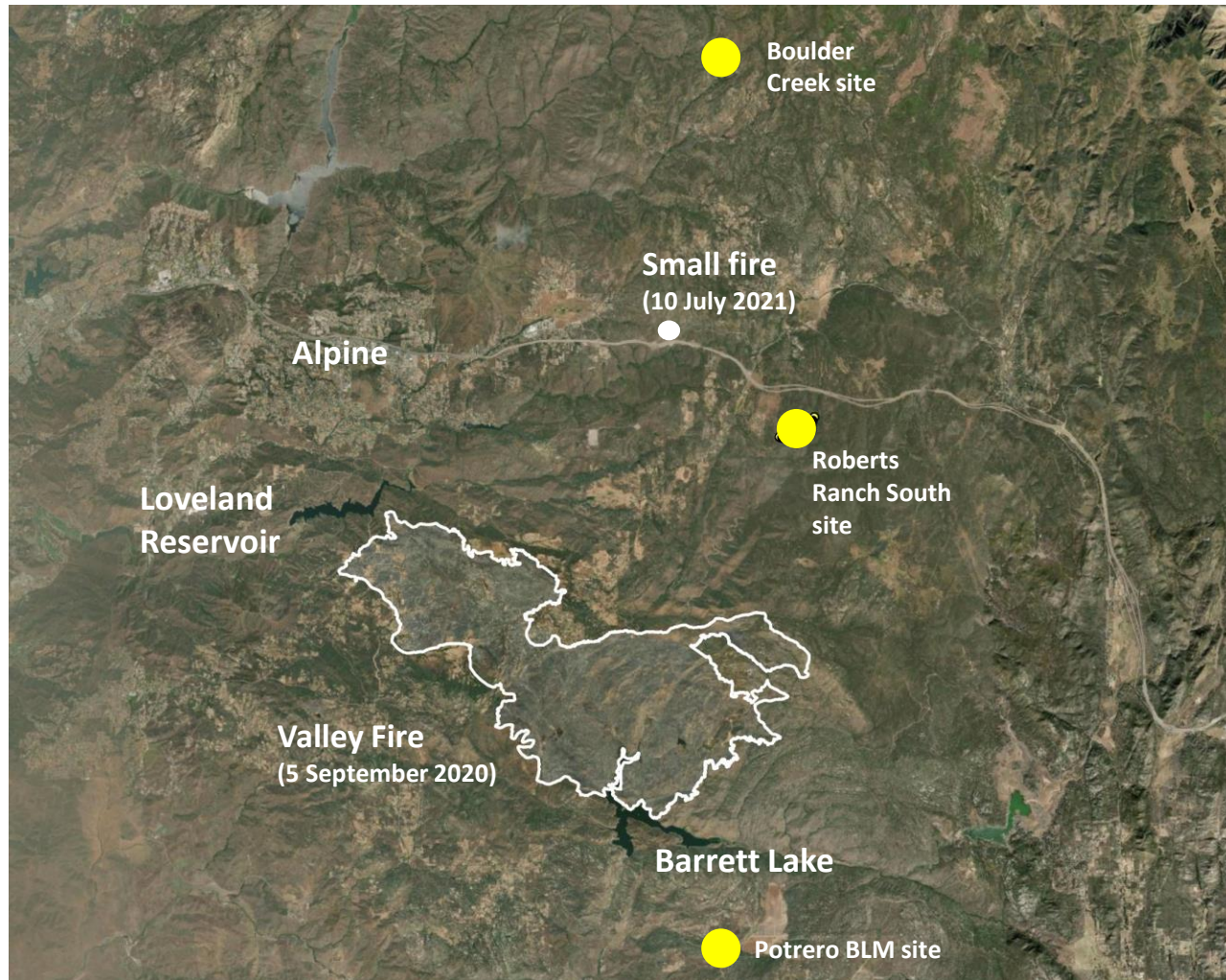
Translocation



Translocation



Translocation



Future Directions

- Monitoring
 - Reference/extant sites
 - Sites most likely to be/become occupied?
- Establish new populations (translocations)
- Captive rearing (in field)?



Questions?

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Harbison's Dun Skipper

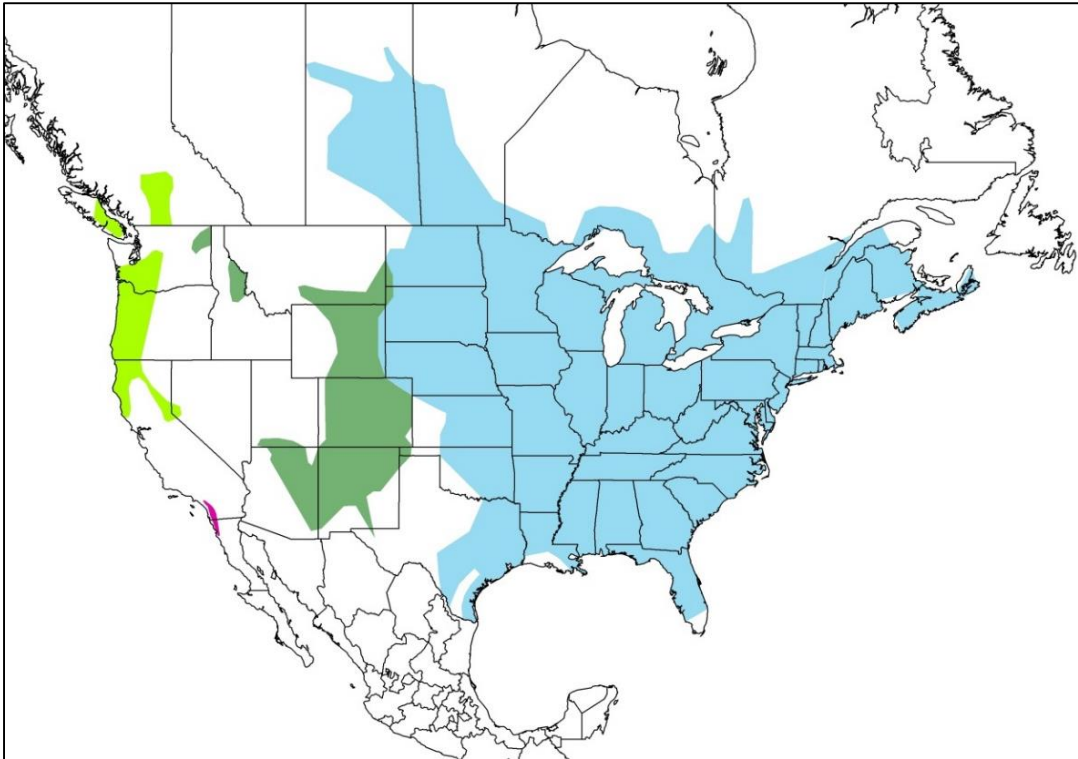
- Monitoring Protocols
- Distribution
- Population Sizes
- Habitat Characteristics



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Distribution



Peterson Field Guides: Western Butterflies



Legend

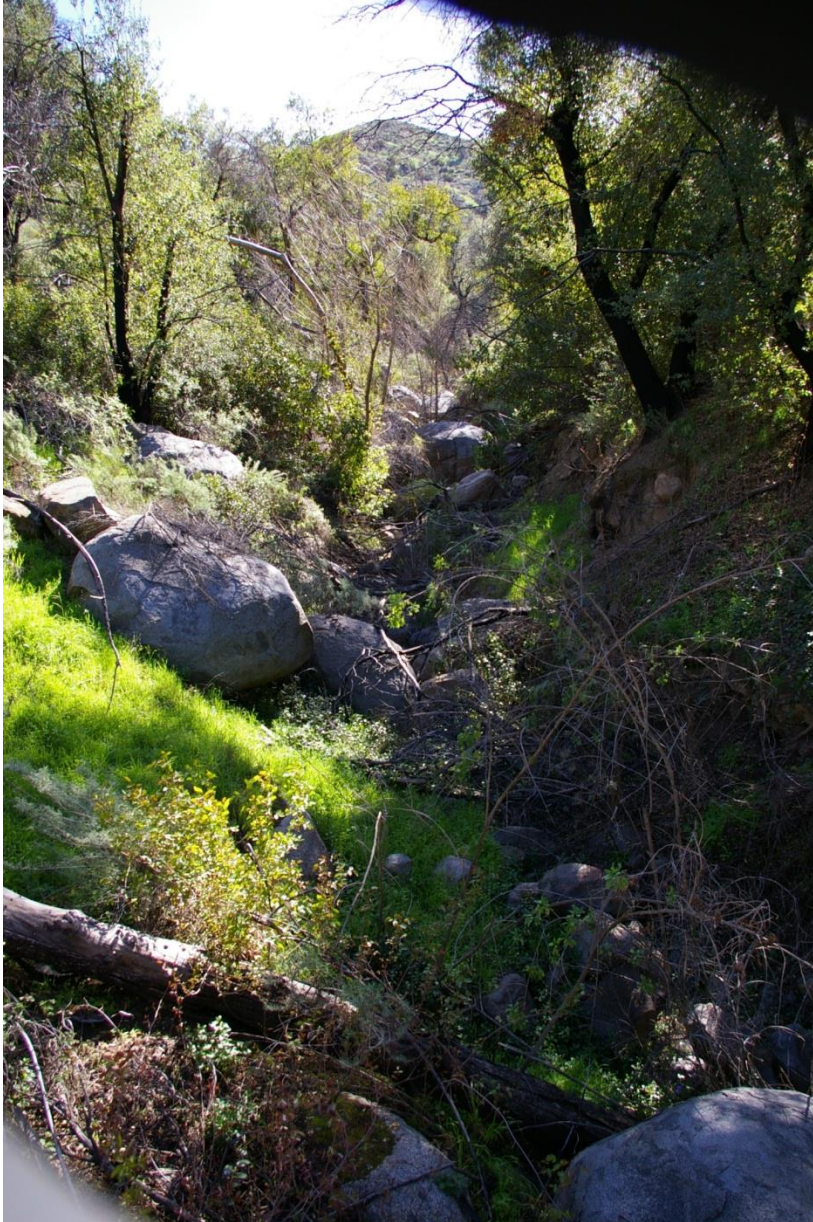
-  *Euphyes_vestris_vestris*
-  *Euphyes_vestris_metacomet*
-  *Euphyes_vestris_kiowah*
-  *Euphyes_vestris_harbisoni*

Basic Biology

- Phenology
 - Adults mid-May to mid-July
 - Eggs late summer
 - Larvae October to April
 - Pupae April to May
- Oak riparian woodlands
 - San Diego sedge (*Carex spissa*)



Dun Skipper Habitat



Life History

male



female



Life History

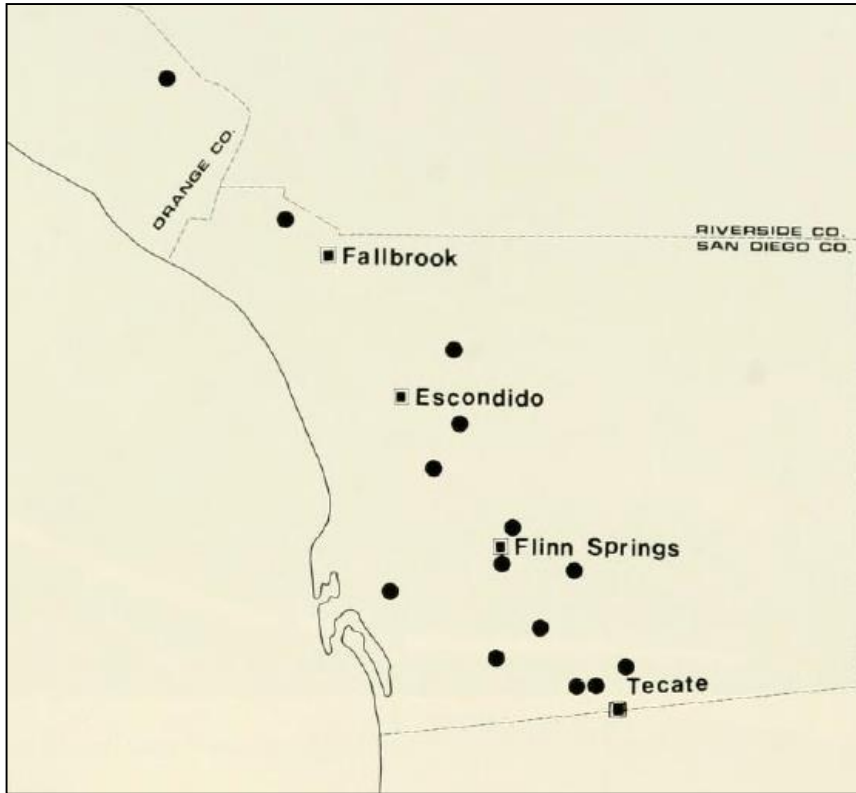


Monitoring Protocol

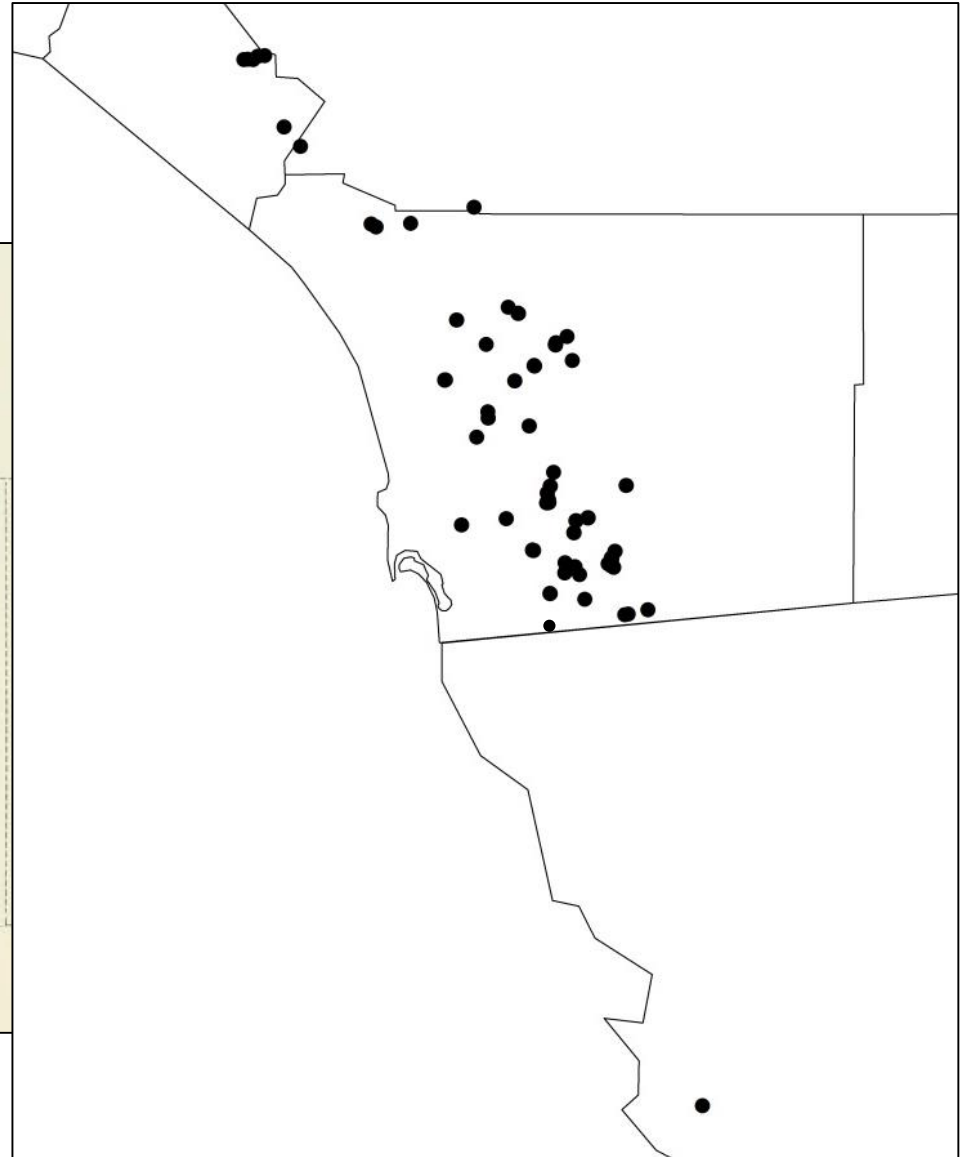
- Presence/Absence: Larval surveys
- Population Size: Adult surveys
 - Flowers near *Carex spissa* (white, pink, purple)
 - In sun
 - At least 75°F
 - 8:20am - early afternoon



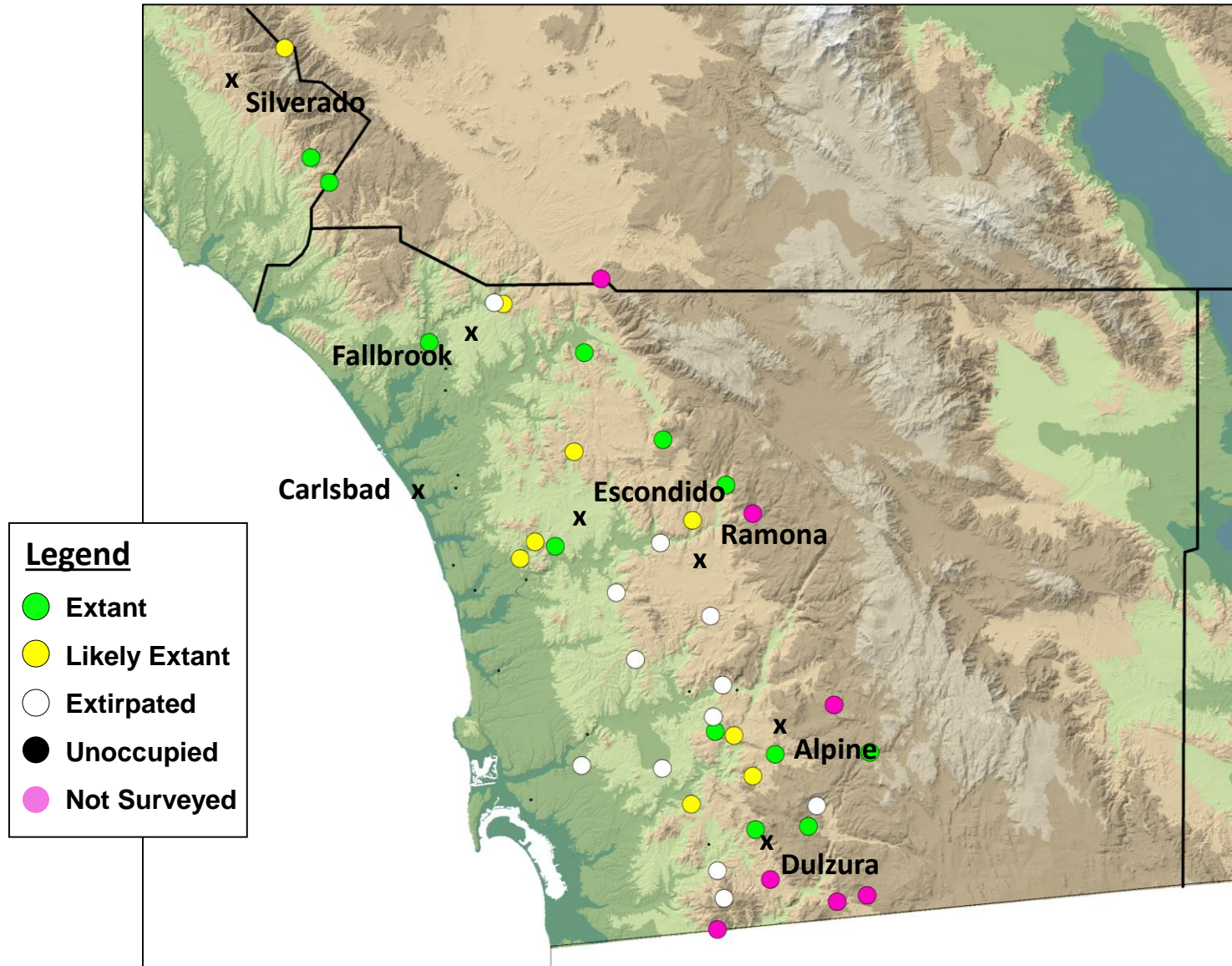
Distribution



Brown & McGuire (1983)



Current Distribution



Population Sizes

Location	2013	2014	2016	2017	2021
Barrett Lake	6-8	4	11	1	2
Boden Canyon Ecological Reserve	5-6	1	1	1	0
Crestridge Ecological Reserve	1	0	0	0	2
Daley Ranch	1	2	4	-	0
Hellhole Canyon County Park	4	1	1	0	2
Hollenbeck Canyon Wildlife Area	6-10	5-6	2	3-4	2
Lake Hodges	5-6	4	15-20	-	4
Loveland Reservoir	8	4-5 or 3-6	3	2	-
Pamo Valley (CNF)	1-2	2-3	0	2	2
Red Mountain	1	-	0	-	0
SDNWR- Las Montanas (South)	2	1	0	-	0
San Pasqual Academy	0-1	-	0	-	0
Skye Valley Road	2	2	15-17	1	0
Sycuan Peak Ecological Reserve	5-6	2	8-12	-	0

Bold = weekly surveys

Threats

- Small populations, restricted distribution
- Habitat alteration
- Fire
- Drought
- Goldspotted oak borer
- Grazing



Habitat Alteration



Drought



Future Directions

- Continue surveys
 - Update status of recent populations
 - Calibrate survey counts with marking study
 - Quantify habitat characteristics
 - Assess connectivity and subspecies status (genetics)
- Restoration- *Carex spissa* & nectar source plantings



Questions?

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San Diego Pollinator Monitoring

- Three phases
 - Process samples
 - Analyze data and develop monitoring protocols
 - Pilot study

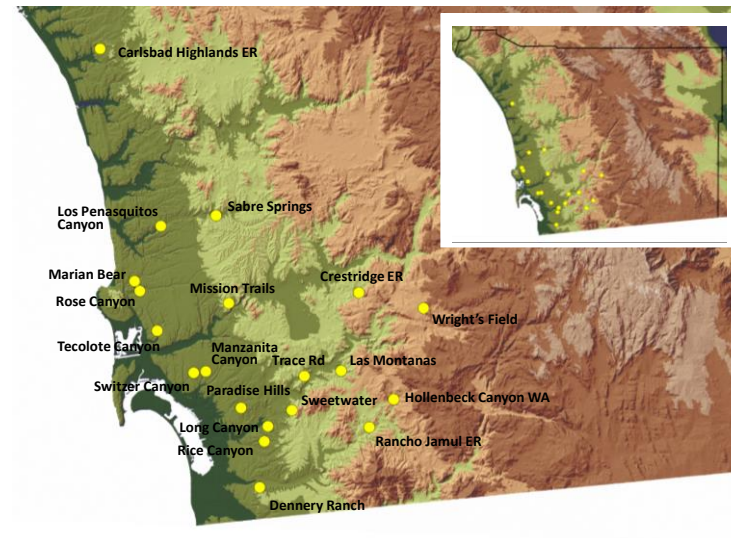


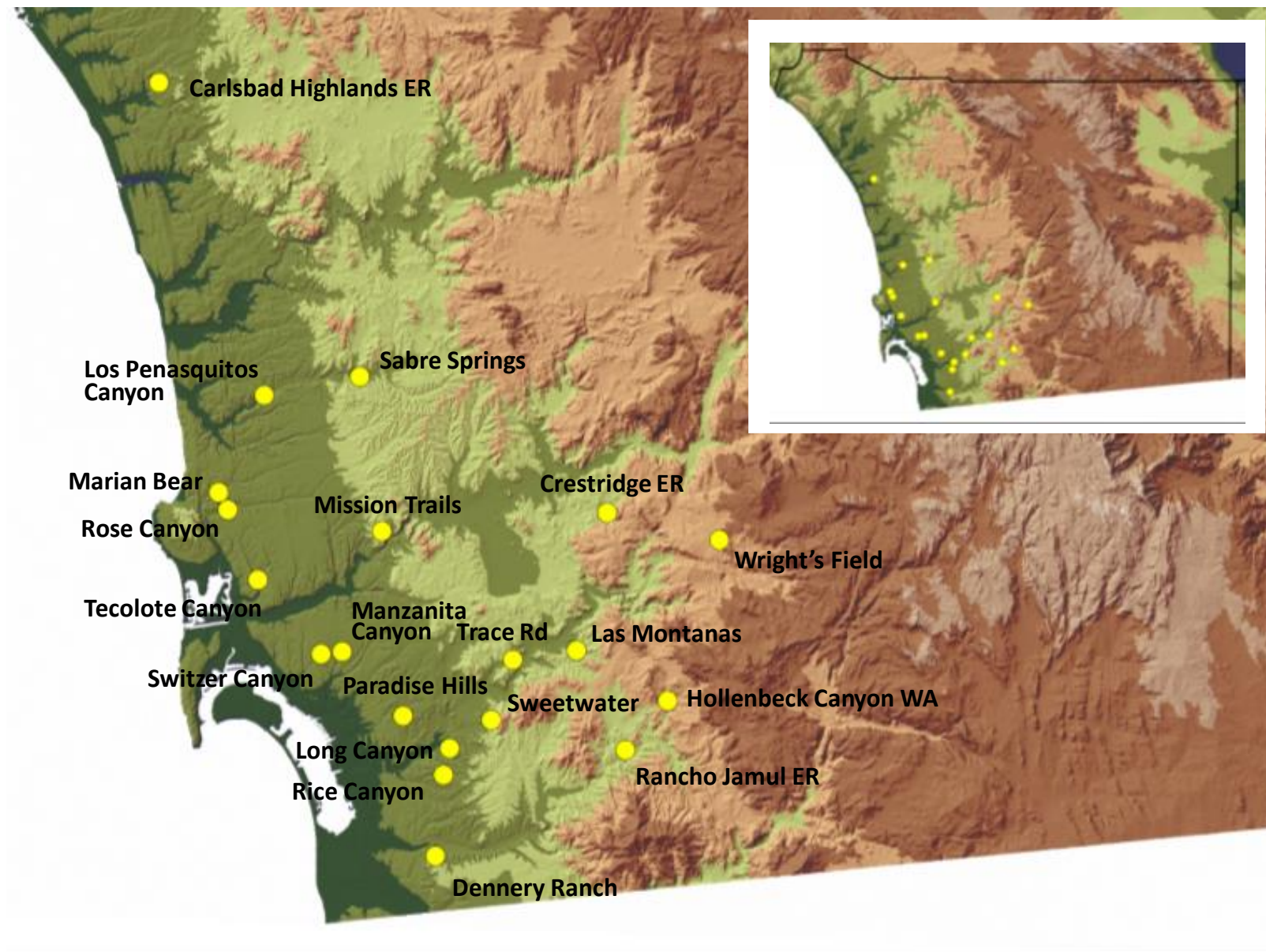
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San Diego Pollinator Monitoring

- Specimens (previously collected)
 - Point Loma in 2009 (SD Natural History Museum)
 - Monthly data
 - Coastal San Diego County 2015-2017
 - 2015-2017: Otoy tarplant at Rice Canyon & Rancho Jamul ER
 - 2015: California buckwheat at 17 preserves





Initial Goals

- Variability across time
 - Weeks/months
- Variability across space
 - Meters/kilometers
- Trap height/color
- Species relationship with habitat quality



Decomposition (highlights)

- Used small mammal carcasses
- Same approach as pollinator work (same sites)
- Negative correlation between urbanization and CCS/Chaparral
- Beetles involved with decomposition avoided urban areas
- Decomposition rate:
 - Decreased with more urban land cover
 - Increased with more native shrub cover

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