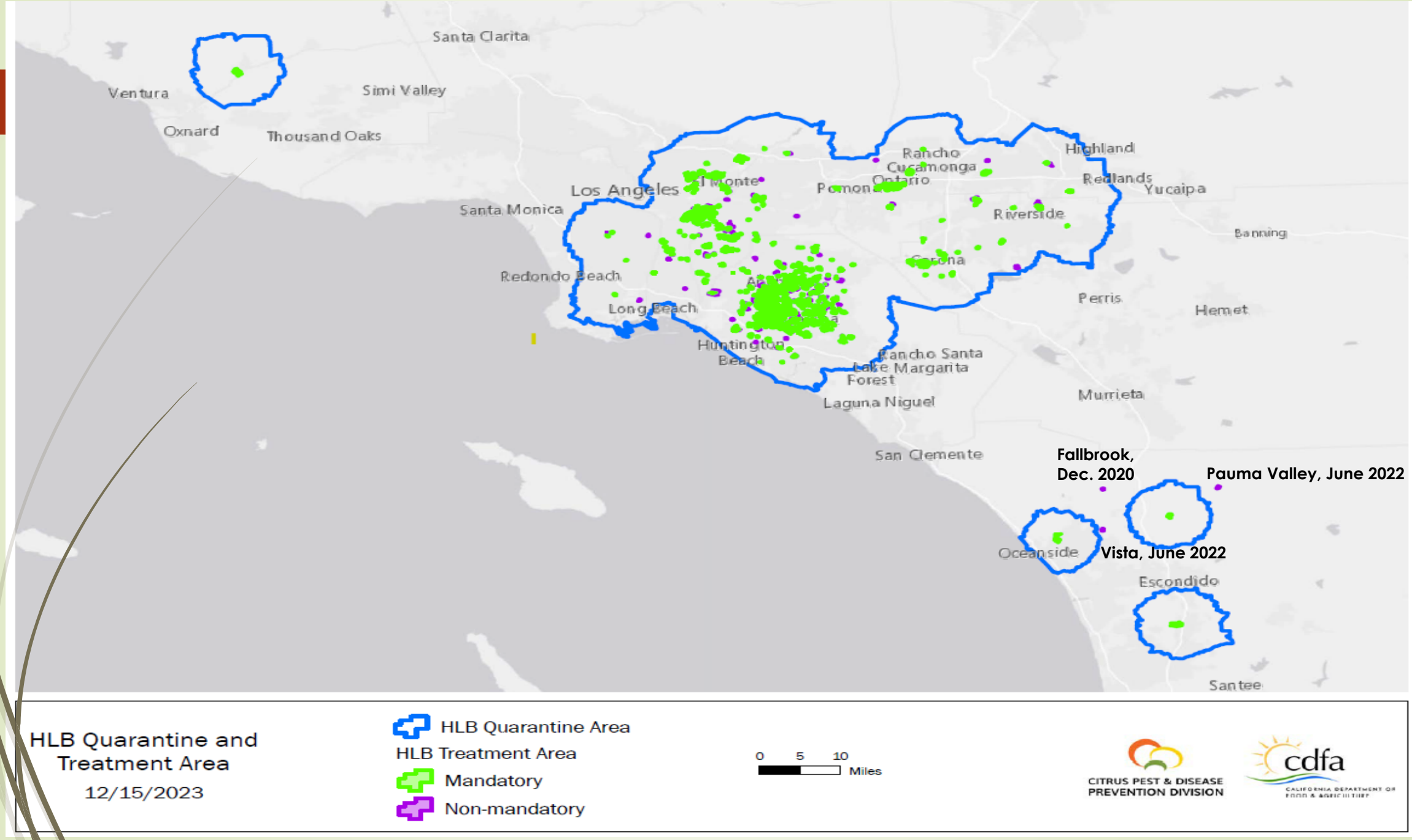
HLB Detection, Delimitation, and Tree Removal Updates

Southern District

January 10, 2024


Santa Clarita
Ventura
Simi Valley
Oxnard
Thousand Oaks
Los Angeles
Monte
Pomona
Rancho Cucamonga
Ontario
Highland
Redlands
Yucaipa
Riverside
Banning
Santa Monica
Corona
Redondo Beach
Perris
Hemet
Long Beach
Huntington Beach
Rancho Santa Margarita
Lake Forest
Laguna Niguel
Murrieta
San Clemente
Fallbrook, Dec. 2020
Pauma Valley, June 2022
Oceanside
Vista, June 2022
Escondido
Santee
HLB Quarantine and Treatment Area
12/15/2023
HLB Quarantine Area
HLB Treatment Area
Mandatory
Non-mandatory
0 5 10
Miles
CITRUS PEST & DISEASE PREVENTION DIVISION
cdfa

HLB Detection Updates

- Valley Center, San Diego County.
  - A total of 15 positive trees were detected.
  - All the detections were at the same residential parcel with multiple tree blocks.
    - The homeowner treated all the host tree blocks.
  - The infected trees were removed and disposed off.
  - Delimitation survey and treatments were completed.
  - There are still four plant samples PDRs pending results.
- Three different HLB hot spots in San Diego: Oceanside, Rancho Bernardo, and Valley Center.
- Multiple detections in the neighborhoods of Santa Ana, Anaheim, Westminster, Garden Grove, Irvine, Duarte, Jurupa Valley, Corona, and Ontario.
  - First detection of HLB positive trees in Norco, Riverside County and Azusa, Los Angeles County.

HLB Delimitation Survey

Areas	Total Properties	Properties Surveyed	No Host Properties	Refusals/No Contact	Completion Percentage
Duarte (12-17, 21-25)	170	131	40	9/9	77%
San Gabriel (1-2, 9)	121	116	59	2/6	100%
Ontario (54-63)	583	419	239	10/11	72%
Valley Center(1-3)	13	10	2	0/3	77%
Jurupa Valley (3, 5-6)	111	60	20	5/5	54%
Corona (8,19,45-49)	420	363	270	1/7	86%
Irvine (4-8)	690	269	73	32	39%
Yorba Linda (1-4)	1,325	230	106	21	17%
Brea (1)	151	76	2	6	50%
Costa Mesa (2-8)	461	286	195	11	62%

HLB Delimitation Survey (FS and Adj. Orange County)

Areas	Properties Surveyed	No Host Properties	Refusals/No Contact-Pending
Anaheim	94	23	8
Buena Park	1	0	0
Santa Ana	28	6	1
Fountain Valley	1	0	0
Garden Grove	81	13	16
Huntington Beach	2	0	0
Tustin	4	0	0
Orange	98	51	21
Stanton	1	0	0
Westminster	8	1	1

HLB Delimitation Survey (FS and Adj. Los Angeles County)

Areas	Properties Surveyed	No Host Properties	Refusals/No Contact-Pending
Temple City	11	0	0/0
El Monte	1	0	0/0
San Gabriel	8	0	0/0
Paramount	1	0	0/0
Duarte	10	0	0/0
Azusa	2	0	0/0

Quadrant Survey 2023

(Find sites, Adjacent, Inconclusive samples)

County	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Los Angeles	684	241	92	118	1,876	506	115	282	74	77	215	147
Orange	656	923	753	1880	680	377	271	290	296	281	201	99
Riverside	62	140	188	32	84	283	26	64	196	20	67	0
San Bernardino	106	138	84	260	287	292	235	336	242	55	70	9
San Diego	28	60	382	107	127	107	40	13	1	65	33	19
Imperial	0	0	0	0	0	0	0	0	0	0	0	6
Total	**1,536**	**1,502**	**1,499**	**2,397**	**3,054**	**1,565**	**670**	**985**	**809**	**498**	**586**	**280**

HLB Positive Trees (October thru December)

County	Detected	Removed	Cumulative Pending
Los Angeles	62	77	17
Orange	514	821	335
San Bernardino	30	45	23
Riverside	37	19	25
San Diego	15	15	0
TOTAL	**658**	**977**	**400**

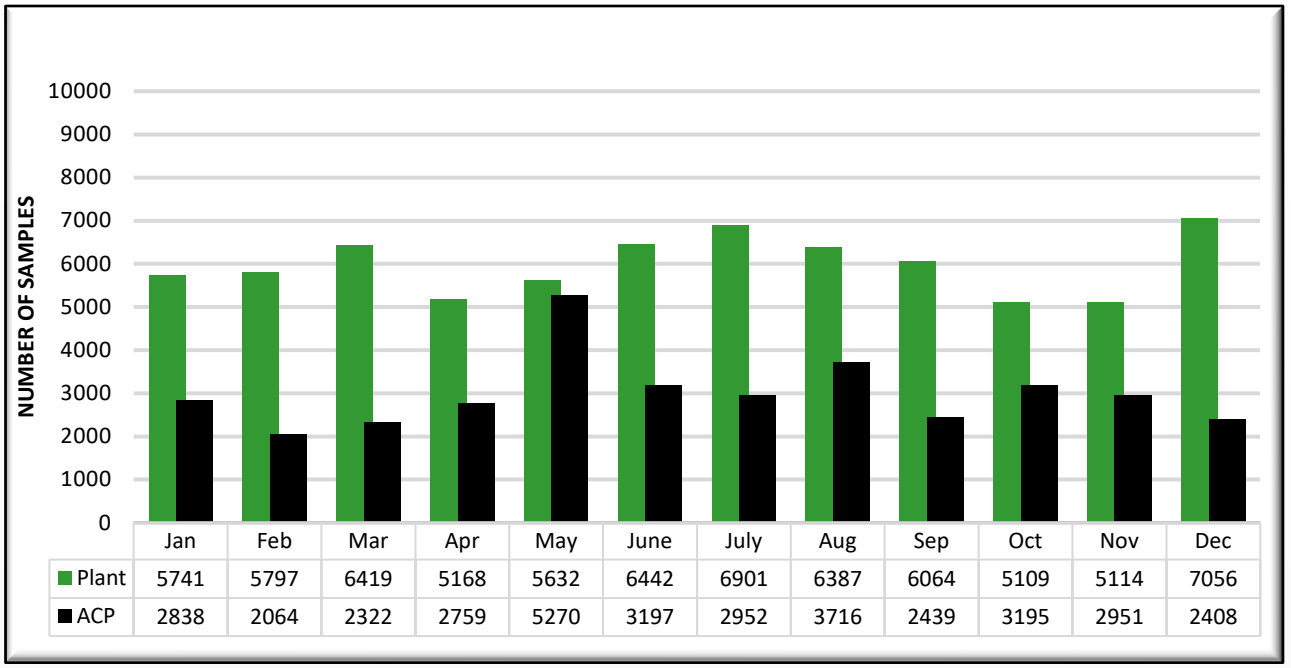
Citrus Yellow Vein Clearing Virus (CYVCV) Update

- CYVCV was detected in Hacienda Heights area of Los Angeles county on November 22.
- The disease was detected in a symptomatic lemon tree.
  - There are two more host trees on the property but without CYVCV symptoms.
  - Ironically, the find site is the same property where HLB was detected in 2012.
- The one-mile delimitation survey has been completed.
  - A total of 179 suspect plant samples were submitted to the lab and are pending results.
- The visual survey of two-mile arc is on going.
- The funding has been secured from USDA.

California Department of Food & Agriculture
Plant Pest Diagnostics Center
HLB Testing Program
2023

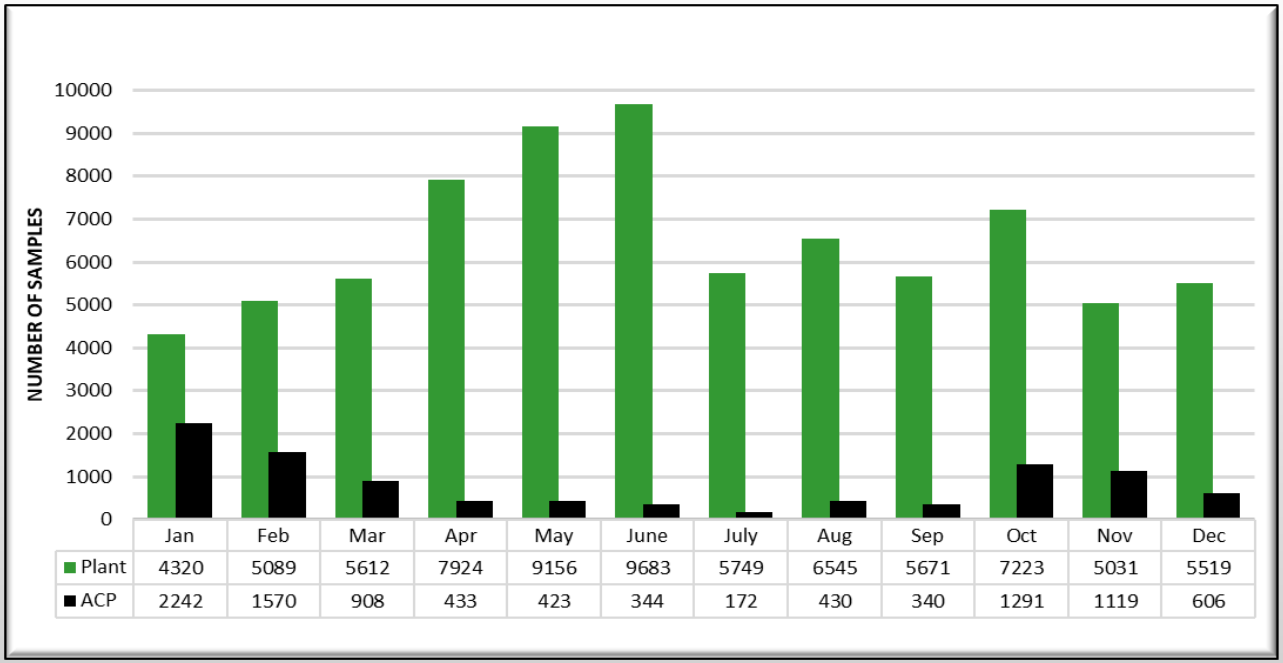
Total number of plant and ACP samples per month – Fig. 1a, Fig1b
Number of samples tested for HLB per year from 2008 –2023 – Fig. 2
Tally of positive detections by county and city – Tables 1-3
Percent infection per year from 2008 – Oct 2023 – Fig. 3
If you have any questions, please call or email me at 916-738-6710 lucita.kumagai@cdfa.ca.gov.

Fig 1a. 2022 - Total number of plant and ACP samples submitted per month.



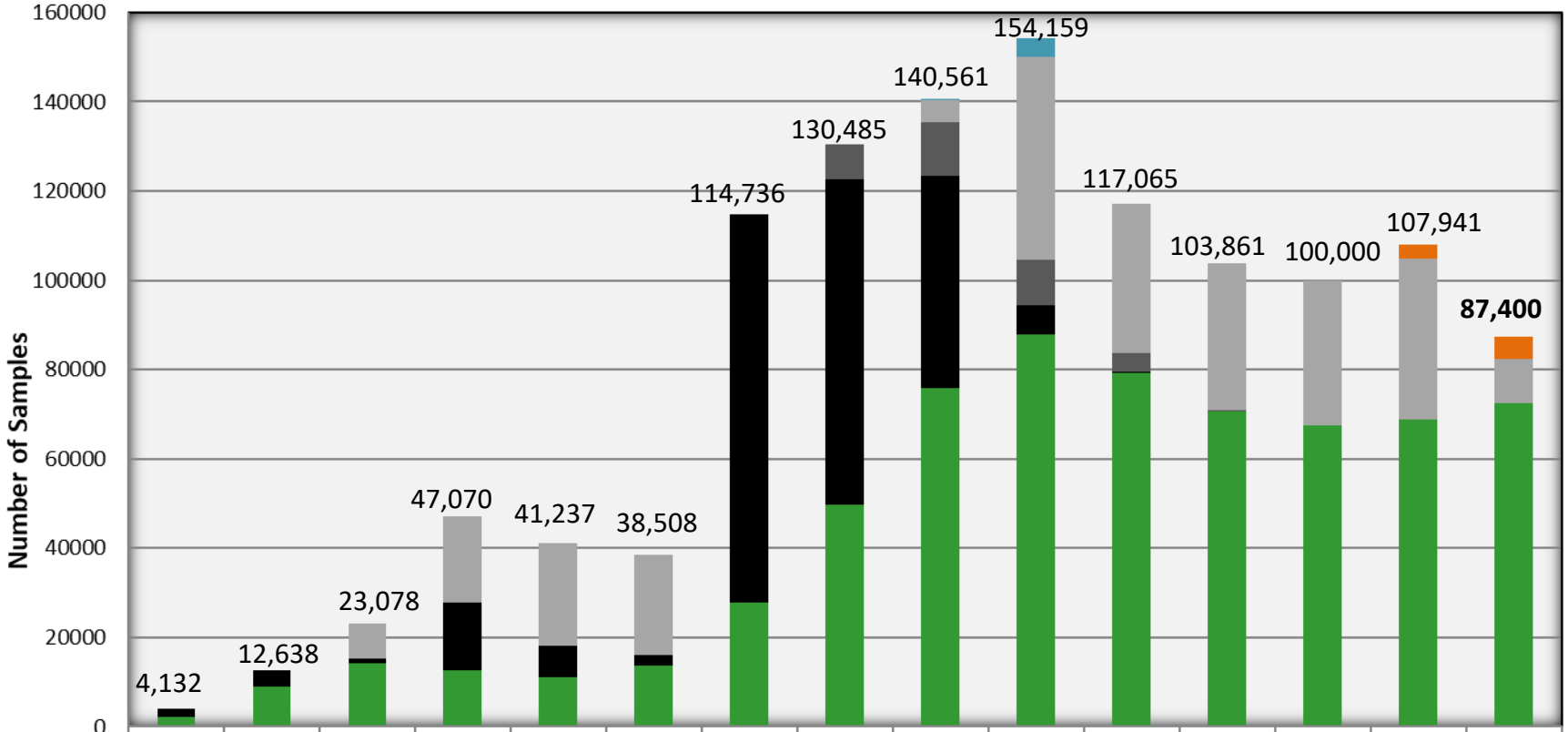
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Plant	5741	5797	6419	5168	5632	6442	6901	6387	6064	5109	5114	7056
ACP	2838	2064	2322	2759	5270	3197	2952	3716	2439	3195	2951	2408

Fig 1b. 2023 - Total number of plant and ACP samples submitted per month.



	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Plant	4320	5089	5612	7924	9156	9683	5749	6545	5671	7223	5031	5519
ACP	2242	1570	908	433	423	344	172	430	340	1291	1119	606

Fig 2. Number of samples tested for HLB per year from 2008 – 2023.



	2008-09	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
CRB Plant														3122	5086
CPDP ACP									94	4020	0	0	0	0	0
CRB ACP			7740	19380	23222	22568	0	0	5085	45550	33247	32920	32507	35948	9839
U AZ ACP								7881	11896	10079	4310	205	0	0	0
CDFA ACP	1923	3527	1105	15032	6872	2300	87052	72832	47619	6698	133	130	29	163	39
CDFA Plant	2209	9111	14233	12658	11143	13640	27684	49772	75867	87812	79375	70606	67464	68708	72436

Combined total of plant and ACP samples tested from 2008 – 2023 is 1,222,871

Table 1. Tally of positive sites, positive trees, and CLas+ ACP samples.

HLB Positive Detections			
City	# Sites	# Trees	# ACP samples
Orange County			
Garden Grove	697	1125	122
Santa Ana	669	1054	94
Anaheim	842	1419	160
Westminster	369	618	22
Orange	281	404	40
Tustin	52	64	10
Fountain Valley	15	22	3
Huntington Beach	27	30	2
Placentia	86	119	15
La Habra	5	6	1
Fullerton	15	22	6
Yorba Linda	21	21	6
Irvine	31	44	3
Costa Mesa	30	46	3
Brea	6	7	0
Buena Park	9	16	2
Cypress	5	1	5
Stanton	5	6	1
Midway City	7	11	0
Los Alamitos	1	0	1
Total	**3173**	**5035**	**496**
Los Angeles County			
Whittier	204	251	44
Pico Rivera	177	246	64
Montebello	80	111	2
San Gabriel	83	102	7
Rosemead	50	69	7
Paramount	29	35	5
La Mirada	53	72	6
La Puente	37	40	7
Norwalk	15	12	5
Cerritos	7	9	5
Hacienda Heights	5	5	1
Lakewood	5	6	0
Duarte	89	138	3
El Monte	74	106	8
South El Monte	23	43	4
Alhambra	3	4	0
Temple City	12	11	2
Compton	1	1	0
Glendora	1	0	1
South Gate	9	10	4
Long Beach	8	8	3
Los Angeles	7	6	1
Downey	28	35	5
Carson	4	3	1
Monrovia	20	28	0
Rowland Heights	2	0	2
Pomona	10	13	2
Artesia	7	8	0
Bellflower	5	5	0
Monterey Park	1	1	0
West Covina	1	0	1
City of Industry	1	2	0
Claremont	1	0	1
Santa Fe Springs	2	1	1
Azusa	1	3	0
Covina	1	0	1
Total	**1056**	**1384**	**193**
Riverside County			
Corona	113	157	27
Riverside	26	28	5
Eastvale	2	2	0
Jurupa Valley	28	44	4
Moreno Valley	1	1	0
Norco	1	2	0
Total	**171**	**234**	**36**
San Bernardino County			
Rancho Cucamonga	3	7	2
Montclair	8	7	1
Colton	6	11	3
San Bernardino	2	1	1
Ontario	185	300	21
Fontana	30	41	9
Chino	18	28	2
Total	**252**	**395**	**39**
San Diego			
Fallbrook	1	0	1
Oceanside	4	9	4
Pauma Valley	1	0	1
Vista	1	0	1
San Diego	26	42	0
Valley Center	1	15	2
Total	**34**	**66**	**9**
Ventura			
Santa Paula	42	68	5
Total	**42**	**68**	**5**
Grand Total	**4728**	**7182**	**778**

Table 2. Percent positives per county

County	Sites	Trees	ACP
Orange	67.1%	70.11%	63.8%
LA	22.3%	19.27%	24.8%
Riverside	3.6%	3.26%	4.6%
San Bernardino	5.3%	5.50%	5.0%
San Diego	0.7%	0.92%	1.2%
Ventura	0.9%	0.9%	0.6%
Total	100%	100%	100%

Table 3. Tally of positive samples from Risk-based and HLB Response surveys.

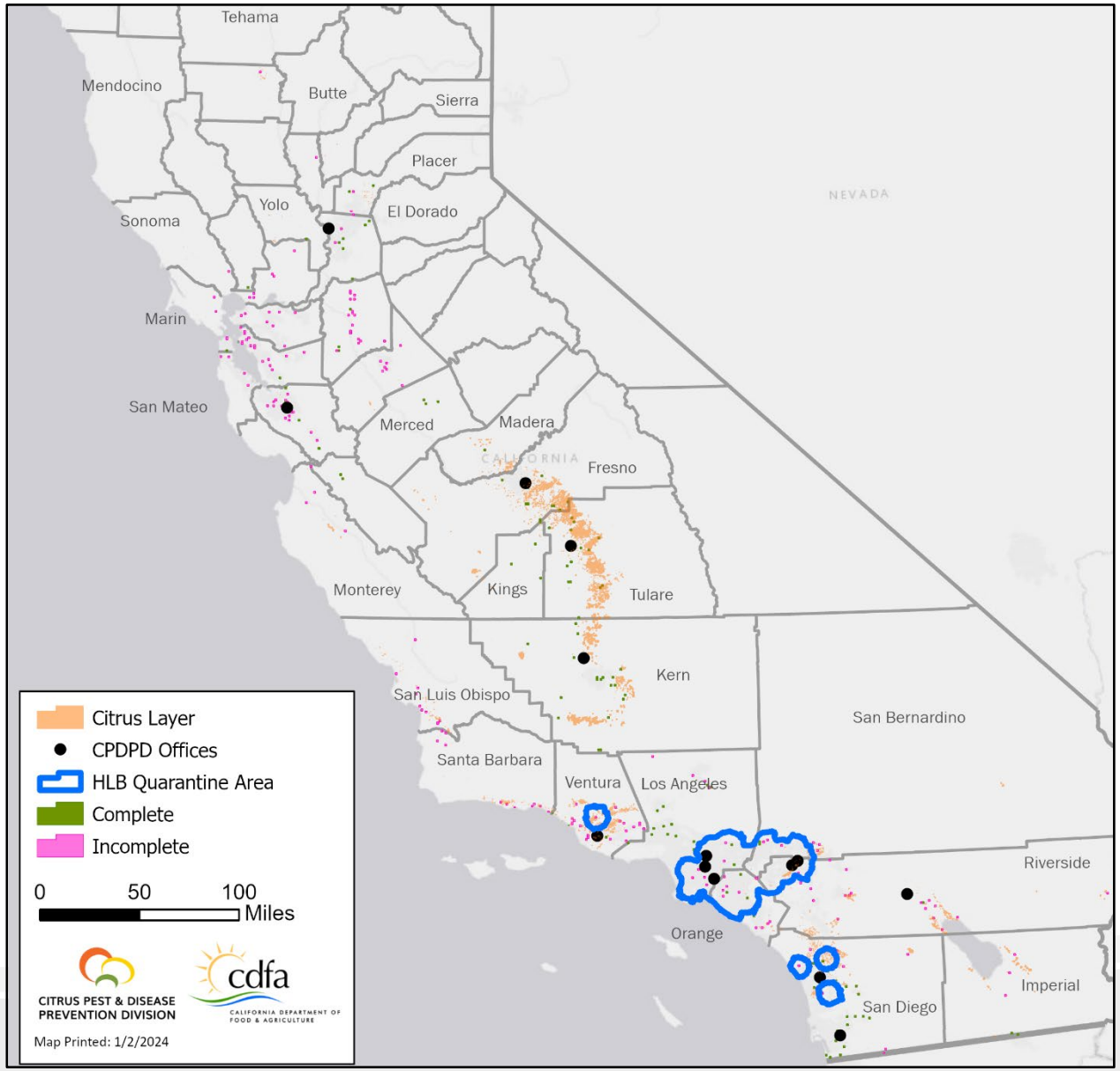
Sample type	Trees		ACP	
Risk-based Survey	473	7%	488	63%
HLB Response	6709	93%	290	37%
Total	**7182**	**100%**	**778**	**100%**

Fig 3. Number of positive detections from 2012 – 2023 per county

	2012		2015		2016		2017		2018		2019		2020		2021		2022		2023		Total	
County	Plant	ACP	Plant	ACP	Plant	ACP	Plant	ACP	Plant	ACP	Plant	ACP	Plant	ACP	Plant	ACP	Plant	ACP	Plant	ACP	**Plant**	**ACP**
Orange	-	-	-	-	-	-	147	66	553	69	585	55	407	24	434	38	849	47	2060	197	**5035**	**496**
Los Angeles	1	1	10	3	19	3	119	47	146	12	150	9	56	10	60	7	314	89	509	12	**1384**	**193**
San Bernardino	-	-	-	-	-	-	-	-	0	1	2	2	13	7	75	10	91	14	214	5	**395**	**39**
Riverside	-	-	-	-	-	-	3	3	0	0	19	9	12	2	20	0	88	14	92	8	**234**	**36**
San Diego	-	-	-	-	-	-	-	-	-	-	-	-	0	1	9	4	0	2	57	2	**66**	**9**
Ventura	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	68	5	**68**	**5**
TOTAL	**1**	**1**	**10**	**3**	**19**	**3**	**269**	**116**	**699**	**82**	**756**	**75**	**488**	**44**	**598**	**59**	**1342**	**166**	**3000**	**229**	**7182**	**778**

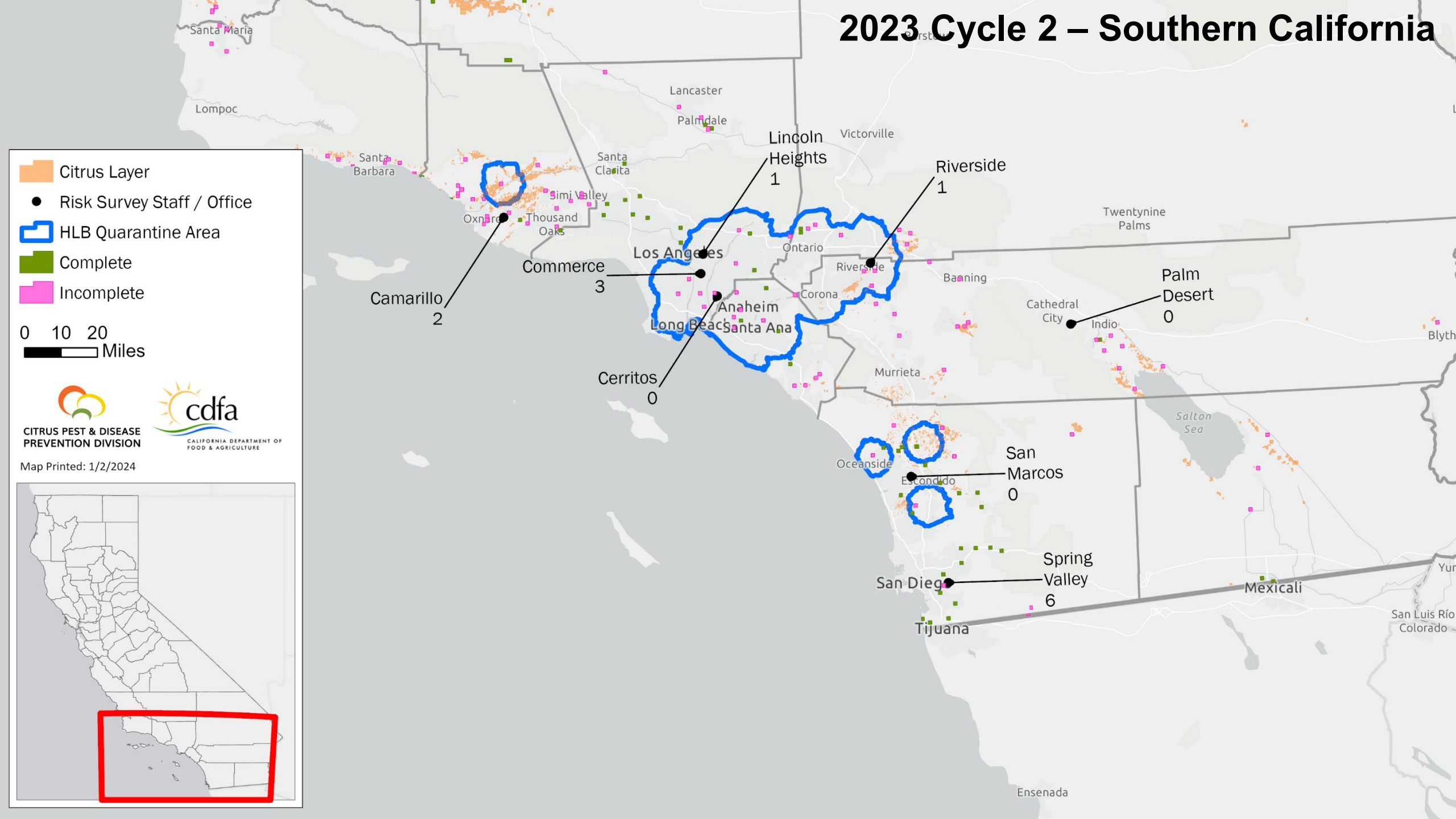
Multi-Pest Survey Update
Operations Subcommittee Meeting
January 10, 2024

2023 Cycle 2

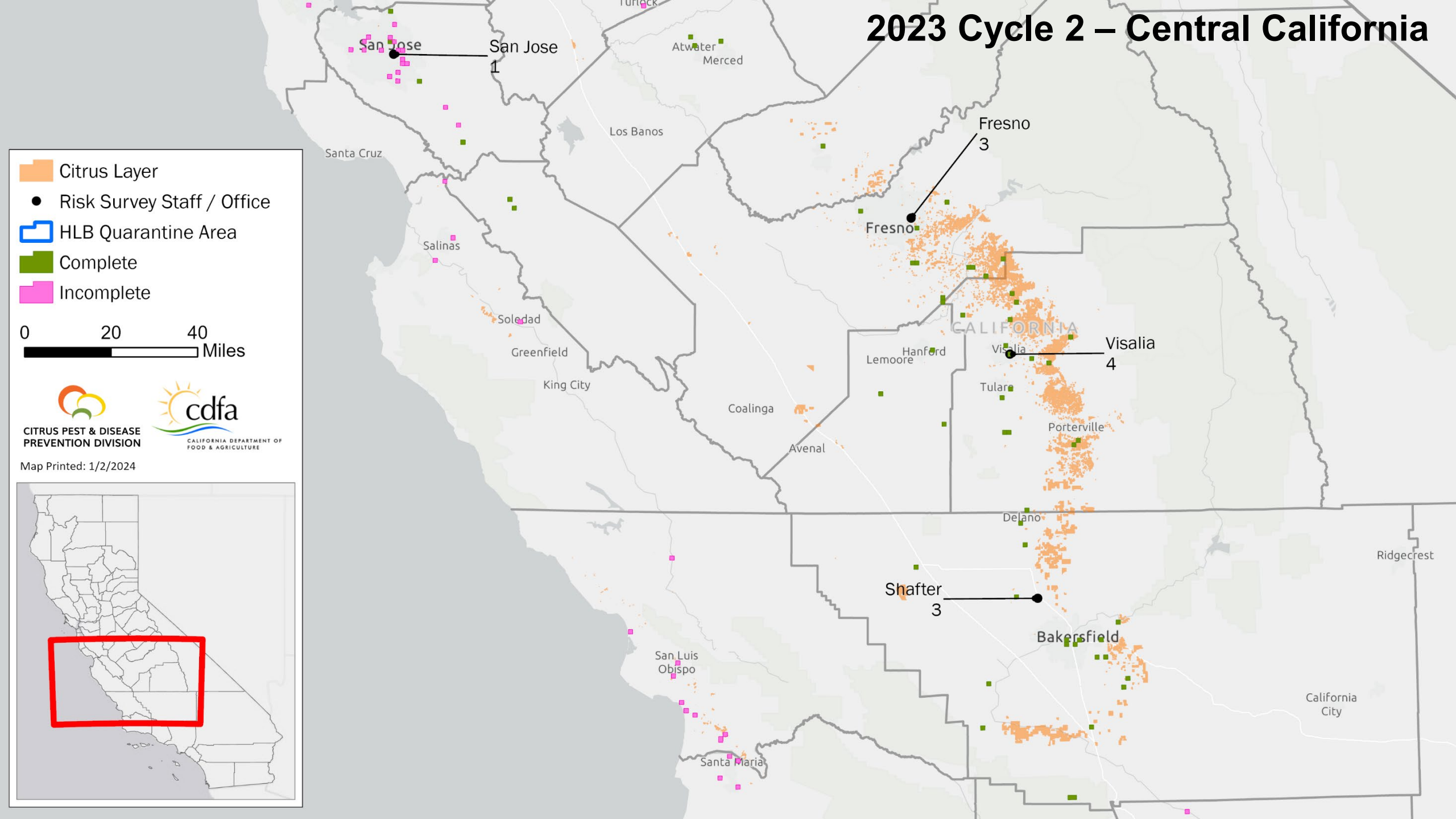


- Began August 2023
- 39% Complete
- Survey Complete in 9 of 34 Allocated Counties
- 4,467 Properties Surveyed
- 1,014 Properties Sampled
- 389 Entomology PDRs
- 728 Plant PDRs

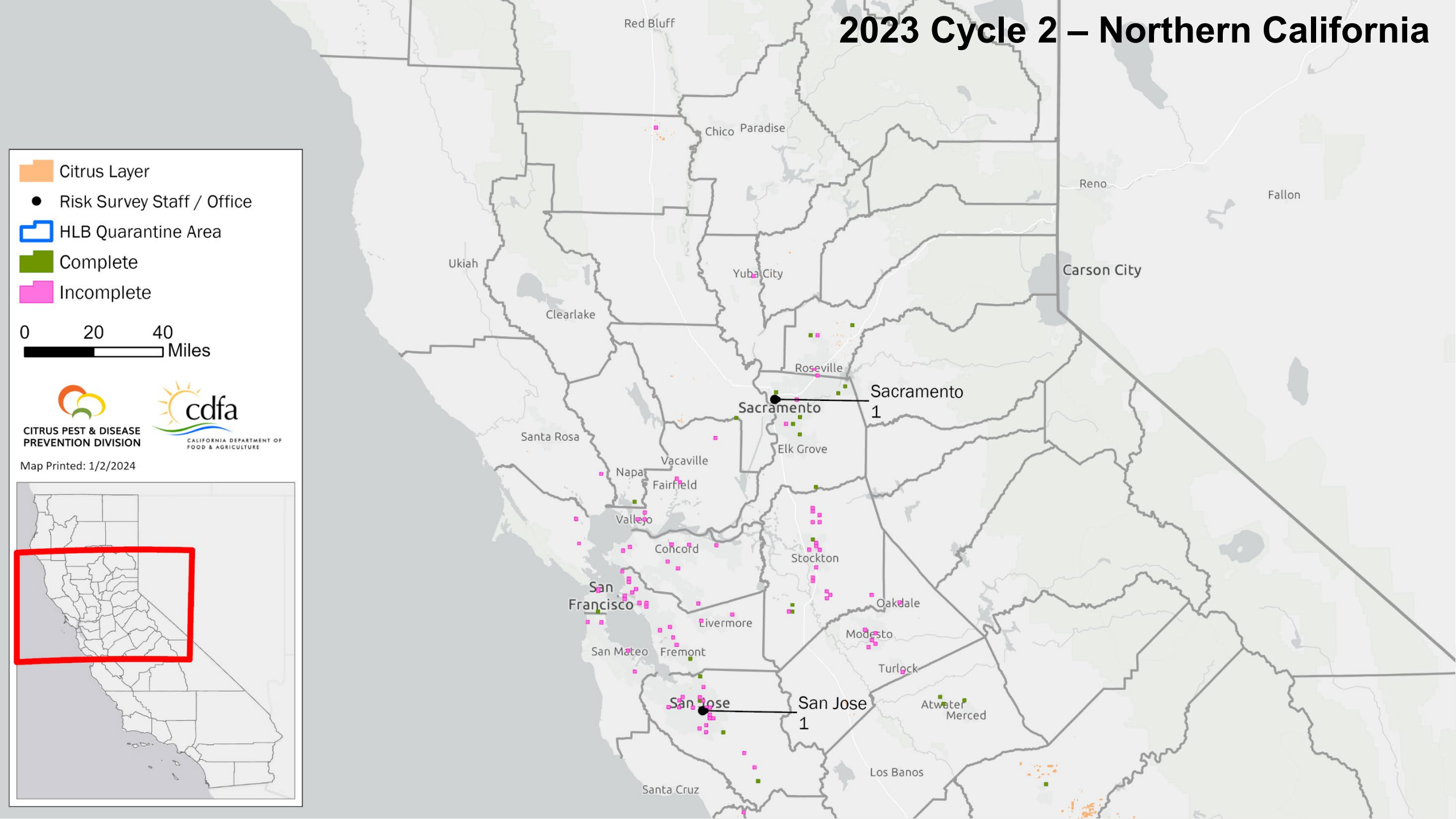
2023 Cycle 2 – Southern California



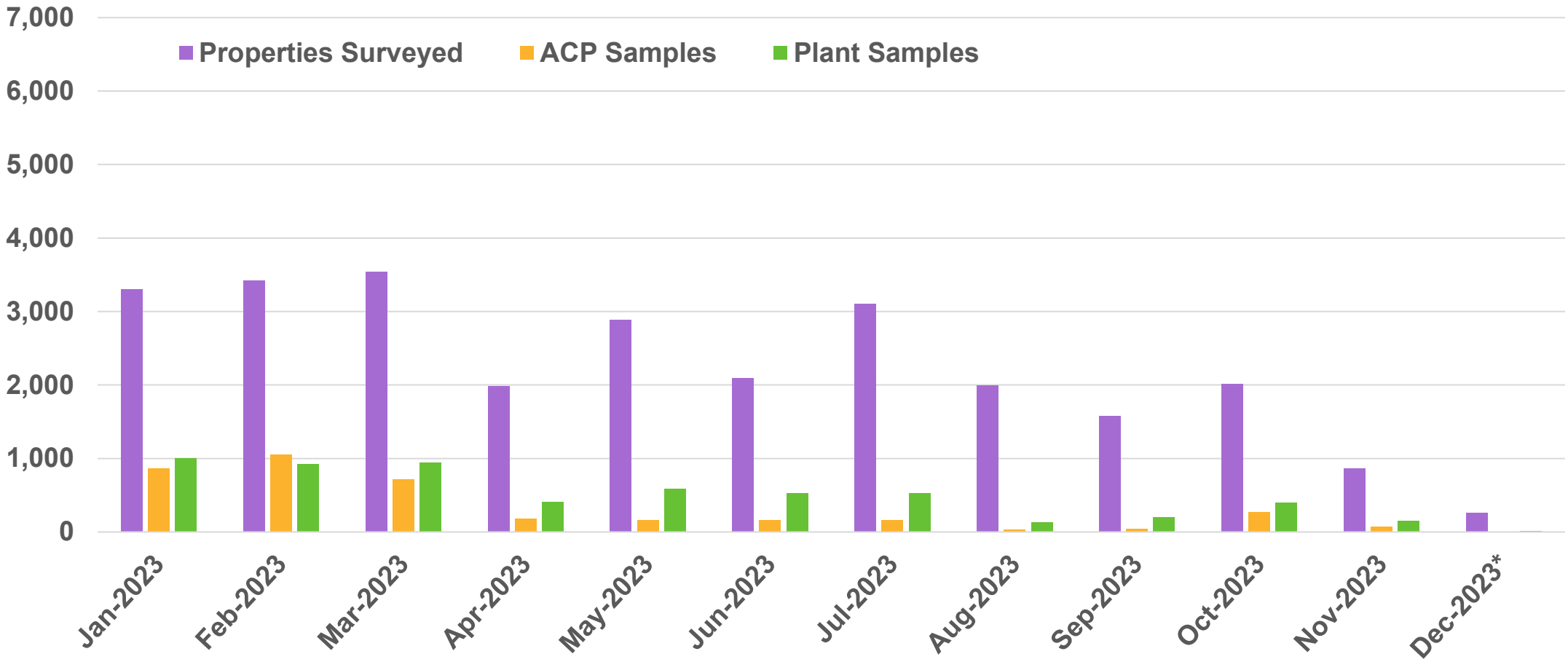
2023 Cycle 2 – Central California



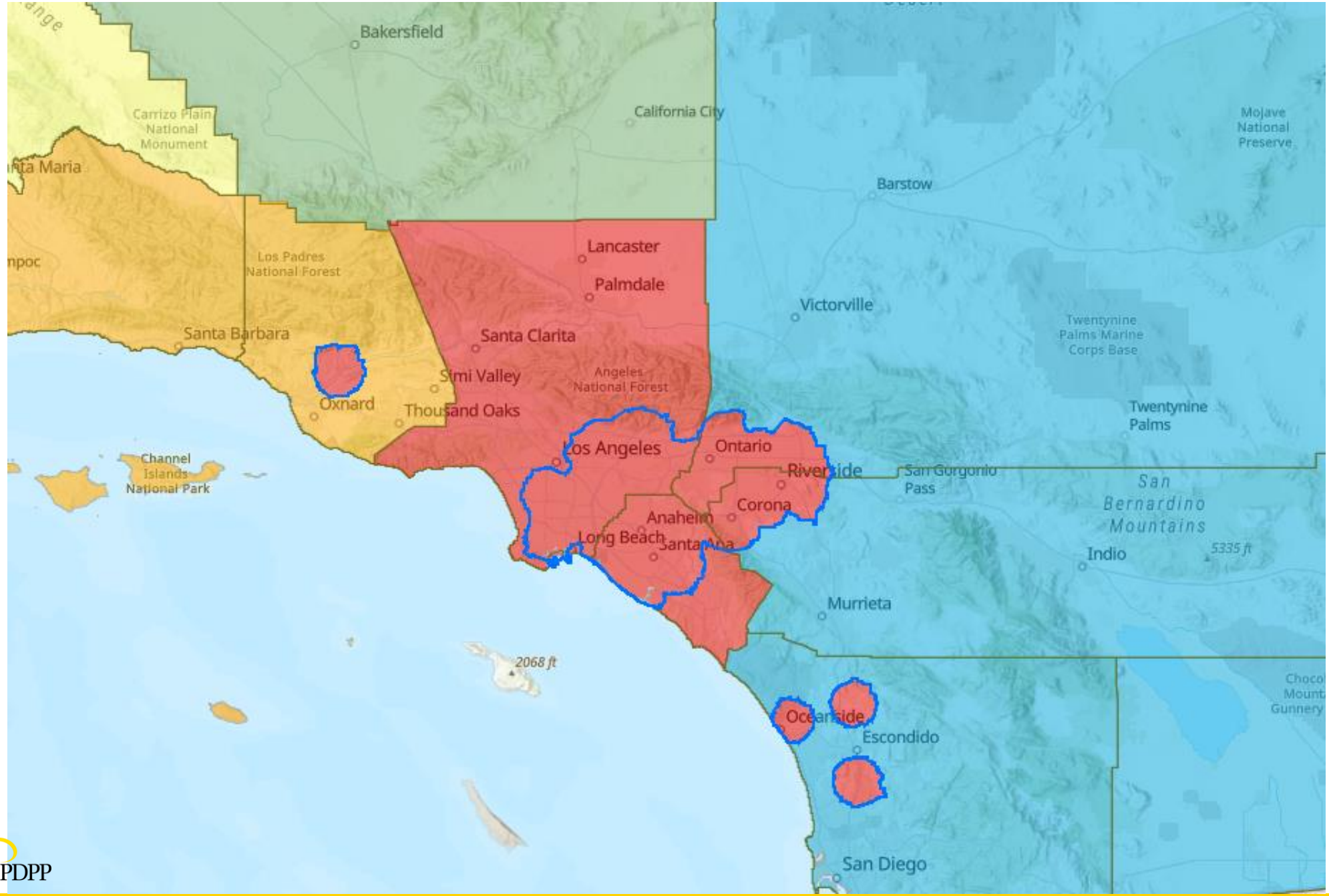
2023 Cycle 2 – Northern California



Statewide Trends (All Cycles)



*December data is being finalized


Bakersfield
California City
Carrizo Plain National Monument
Mojave National Preserve
Barstow
Lancaster
Palmdale
Victorville
Los Padres National Forest
Santa Barbara
Santa Clarita
Simi Valley
Angeles National Forest
Oxnard
Thousand Oaks
Twentynine Palms Marine Corps Base
Twentynine Palms
Los Angeles
Ontario
Riverside
San Gorgonio Pass
San Bernardino Mountains
Channel Islands National Park
Corona
Anaheim
Long Beach
Santa Ana
Indio
5335 ft
Murrieta
2068 ft
Oceanside
Escondido
San Diego

cdfa CPDPP

Shipping Fruit into HLBQ

Current Rule

- Only from the adjacent, surrounding ACPQ to HLBQ – no mitigation other than safeguarding
- Implemented in 2020 to prevent long distance spread of ACP
- Examples
  - Ventura to Santa Paula HLB
  - Imperial to Riverside HLB

Proposed Change

- From any ACPQ to HLBQ for packing – no mitigation other than safeguarding
- Examples
  - Tulare to Ventura HLBQ
  - Ventura to Riverside HLBQ
- Achieved through permit. Revoked and amended based on risk

cdfa CPDPP

HLB Treatment Updates

Southern District

January 10, 2024

Treatment Updates

- Delimitation treatments were conducted in the following areas:
  - Corona, Jurupa Valley, Ontario, Irvine, Orange, Garden Grove, Santa Ana, Anaheim, Westminster, Tustin, San Gabriel, La Mirada, El Monte, Montebello, Duarte, Whittier, and Duarte.

- Public meetings:
  - To treat delimitation areas in Riverside and San Bernardino Counties: October 3, November 7, and December 12, 2023.
  - To treat delimitation area in Valley Center, San Diego County: November 21, 2023.
  - To treat delimitation areas in Los Angeles and Orange Counties: October 25 and November 29, 2023, and January 9, 2024.

HLB Delimitation Treatments

Areas	Total Properties	Properties Treated	No Host Properties	Refusals/ No Contact	Completion
Corona (8,11,41-49)	1,246	169	974	3/14	92%
Jurupa Valley (3,6)	97	31	48	6/12	81%
Ontario (1,10-15, 46-60)	1,176	420	549	22/185	82%
Temple City (11-12)	177	116	52	8/1	100%
Los Angeles (4-5)	204	25	177	0/2	100%
Duarte (21-23, 41-43)	246	91	144	8/3	96%
Valley Center	3	3	0	0/0	100%
Irvine (3-13)	1,094	608	383	68/33	90%

HLB Delimitation Treatments – Find Site and Adj. in LA County

Areas	Total Properties	Properties Treated	No Host Properties	Refusals/ No Contact
Pico Rivera	127	52	66	5/4
Rosemead	65	35	25	2/3
La Puente	124	40	69	5/4
Whittier	35	14	19	0/1
El Monte	406	178	210	9/7
Montebello	30	11	18	0/1
Paramount	33	19	11	3/0
La Mirada	21	10	10	1/0
San Gabriel	43	18	24	0/1
Downey	20	11	5	3/0
Artesia	96	26	68	1/0

HLB Delimitation Treatments – Find Site and Adj. in Orange County

Areas	Total Properties	Properties Treated	No Host Properties	Refusals/ No Contact
Tustin	155	92	51	10/1
Stanton	18	8	11	1/0
Fountain Valley	6	3	2	1/0
Westminster	23	19	1	1/1
Santa Ana	198	116	51	9/21
Orange	596	230	335	19/9
Huntington Beach	14	5	8	0/1
Garden Grove	33	24	8	1/1
Anaheim	875	275	561	18/21

Southern District Staffing Updates

County	Permanent	Seasonal	Pending Hiring	Hiring Status
Los Angeles	28	4	One PPA III	Interviews conducted.
Orange	13	0	Four PPA I	Two PPA I advertised and two PPA I interviews conducted.
Riverside and San Bernardino	15	8	One ES, One PPA I, and One PPA III	ES position advertised, conducted reference checks on a PPA I, and pending advertisement for one PPA III.
San Diego and Imperial	16	0	One PPA I	Job offered, starting on Jan10.

Staff Distribution By Activities

Counties	Delimitation and other Surveys	ACP/HLB Treatments and Tree Removals	ACP/HLB Regulatory
Los Angeles and Orange	25	16	3
Riverside and San Bernardino	3	6	3
San Diego and Imperial	10	4	2

Central District Update
Operations Subcommittee Meeting
January 10, 2024

Central District Update

- Since the last operations subcommittee meeting on October 11, there have been four ACP detections in the Central Valley.
  - 2 ACP residential detections in Fresno.
  - 1 ACP residential detection in Kern.
  - 1 ACP commercial detection in Tulare (regulatory incident).
- Treatment was completed for each of the residential detections.
- Detection, delimitation, and grove trapping remains status-quo.
- Multi-pest risk survey is on-going.
- Citrus staff continue to assist PD/EP staff on the Oriental fruit fly eradication project in San Bernardino.

As of January 4, 2024

Central District Update

Santa Paula, Ventura County (as of 1/4/2023)

- The 250m delimitation survey area has expanded several times since the first HLB+ tree detection.
  - Delimitation expansions caused the 5-mile quarantine boundary to expand twice.
- There have been no new HLB+ trees reported since December 15.
  - 1,117 properties surveyed
  - 429 properties have been treated
  - 35 properties are refusals
  - 66 HLB+ trees in total
  - 44 HLB+ trees have been removed
  - 13 HLB+ trees pending removal
- Tree removal contractor was awarded. Expect to use vendor beginning in early January.

Central District Update - Projects

Office	Survey	Trapping	Treatment
Fresno	2	8	3
Visalia	4	3	0
Shafter	3	2	0
Camarillo	4	0	4

Central District Update - Staffing

County	Total Perm Staff (current)	Pending Hiring (vacancies)	Hiring Status
Fresno County (Fresno)	13	--	Fully Staffed
Kern County (Shafter)	5	4 PPA I	2 PPA I new hires expected in February.
Tulare County (Visalia)	7	1 APCS 1 ES	APCS new hire expected in February. ES in process.
Tulare County (Visalia Regulatory)	1	--	--
Ventura County (Camarillo)	9	1 PPA II 2 PPA I	PPA II new hire to start in February. PPA I in process.

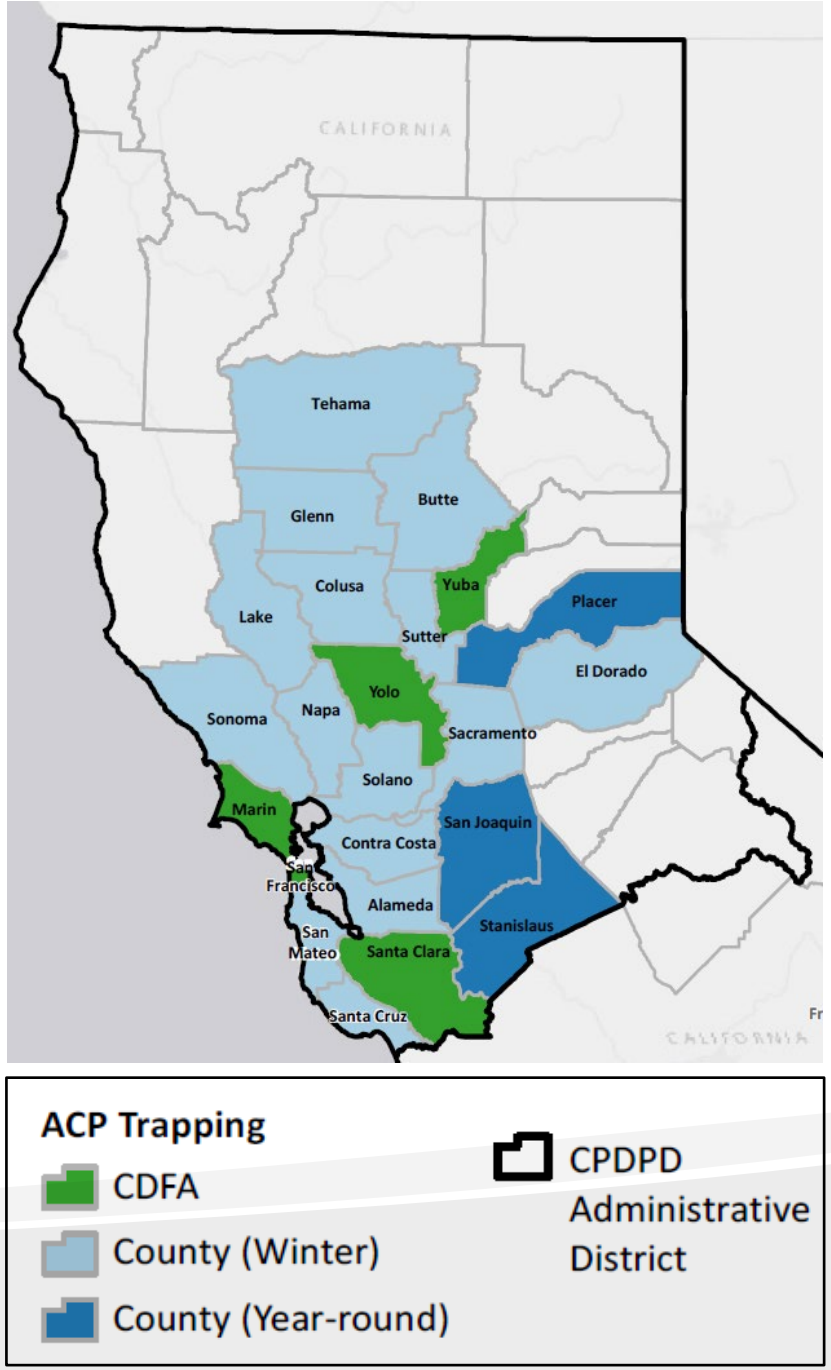
Northern District Update
Operations Subcommittee Meeting
January 10, 2024

Northern District Update | ACP Trapping

General Detection

Entity	Type	Number of Counties	Number of Traps
County	Commercial	3	139
County	Residential (YR)	3	1350
County	Residential (W)	14	5473
State (CDFA)	Residential (W)	5	*1358

* Recommendation to optimize winter trapping activities conducted by CDFA staff in Marin, San Francisco, Santa Clara, Yolo and Yuba Counties



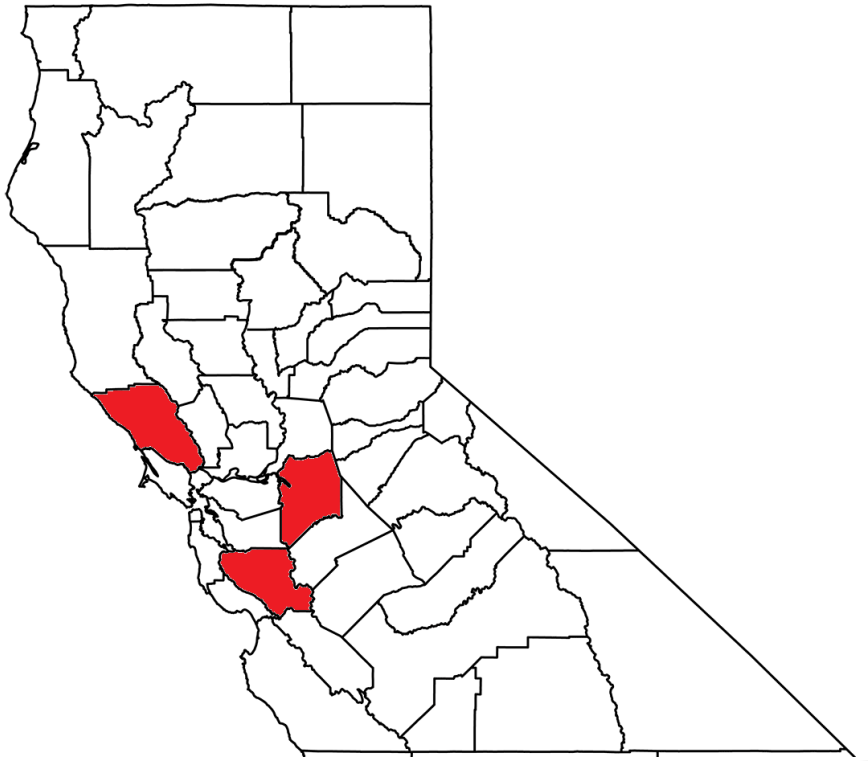
Northern District Update | ACP Trapping

Delimitation & Treatment

- San Joaquin County
  - No detections in delimitation area for 1 year
  - Conversion of 43 delimitation traps to winter traps starting January 2024

- Sonoma County
  - No detections in delimitation area for 1 year
  - Conversion of 55 delimitation traps to winter traps starting January 2024

- Santa Clara County – 720 delimitation traps
  - 24 new detections since October 11, 2023
  - 2 delimitation area expansions in Los Arboles
    - Addition of 7 new grids
  - Recommendation for Spot Treatment

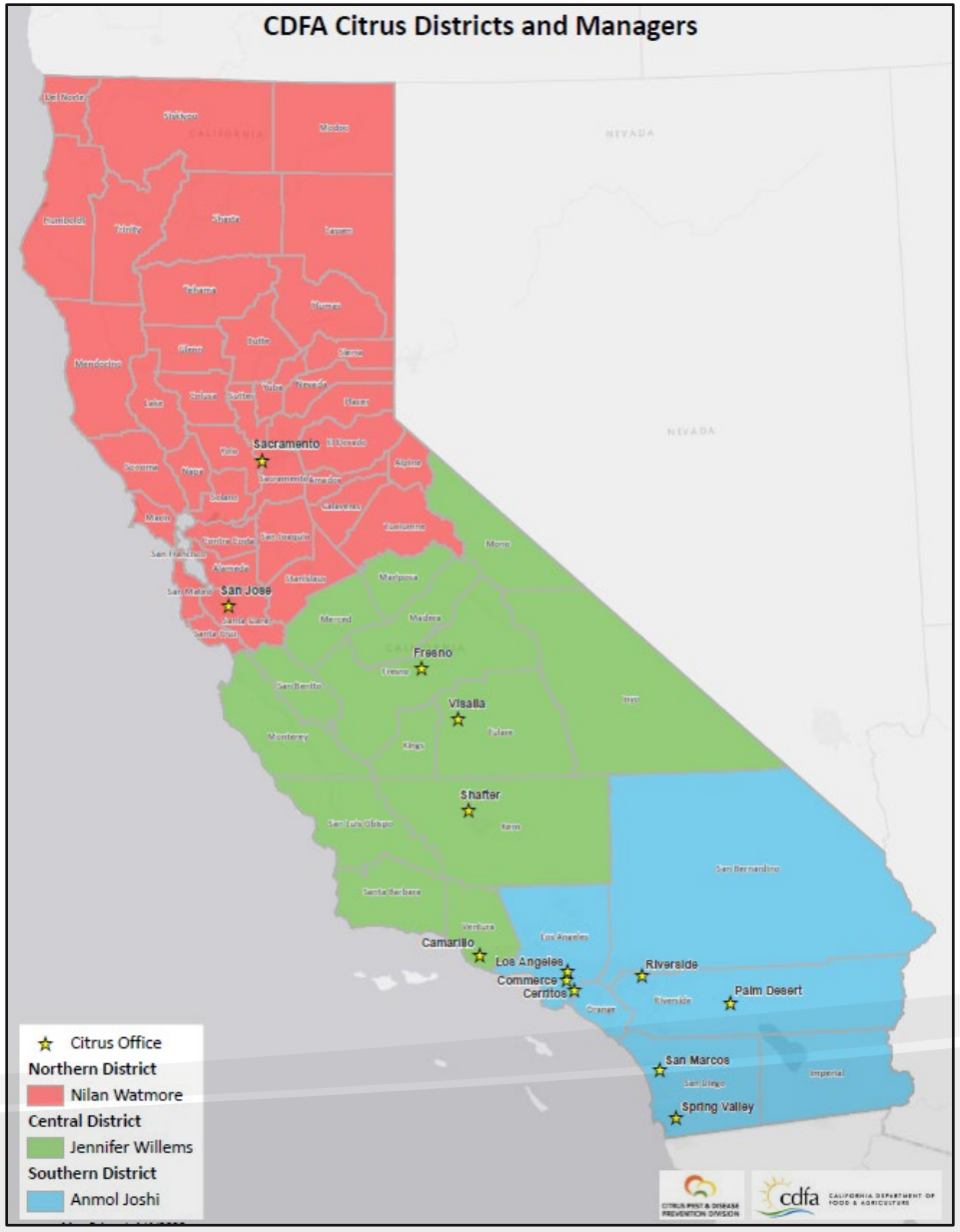


Northern District Update | HLB Risk-Based Survey

2023 Cycle 2 Counties	
Alameda	San Mateo
Contra Costa	Santa Clara
Glenn	Solano
Marin	Sonoma
**Napa	Stanislaus
Placer	Sutter
Sacramento	**Yolo
San Francisco	Yuba
San Joaquin	

*Currently 19% of Cycle 2 is complete

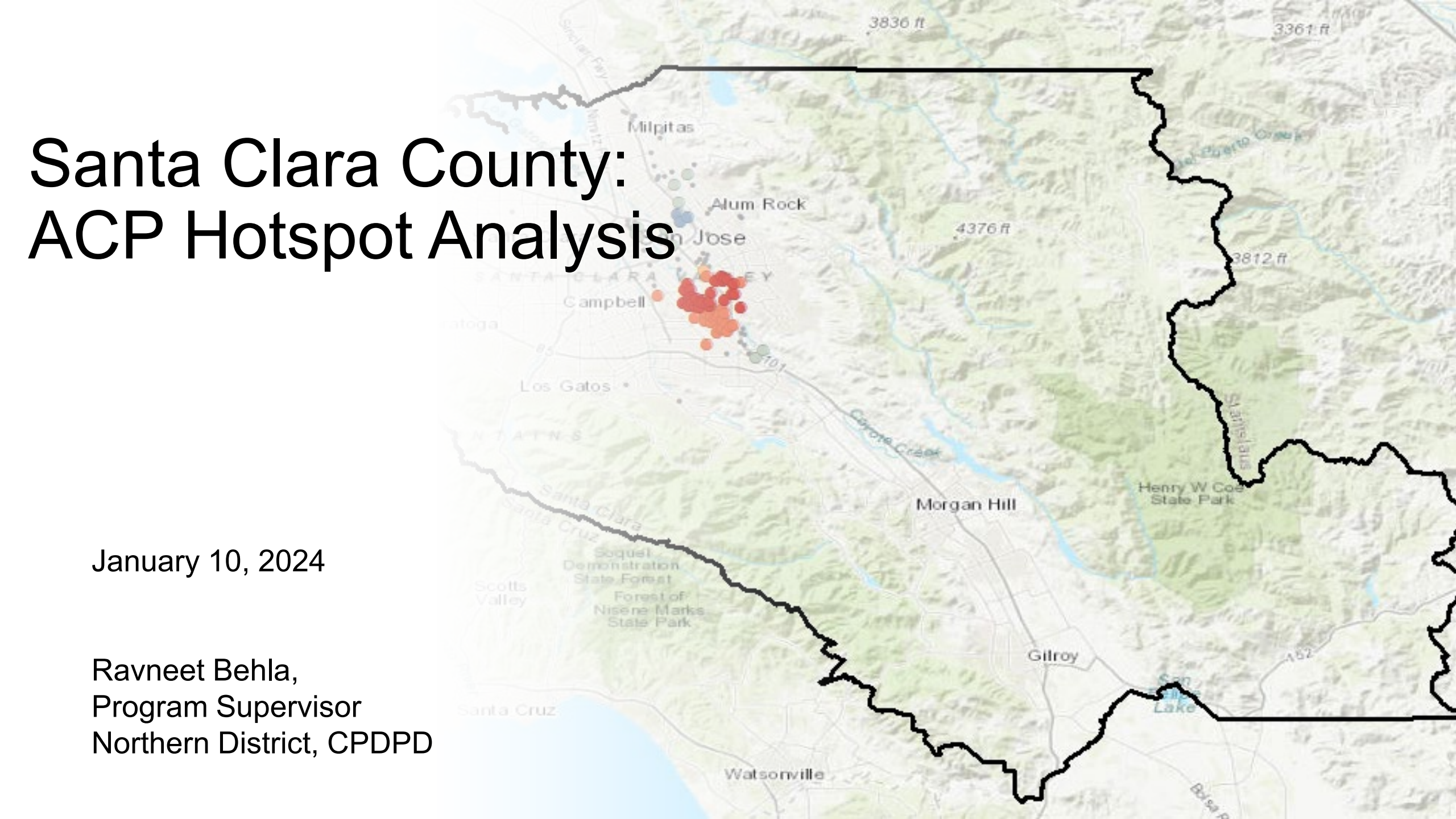
**Risk-Survey for Cycle 2 is complete



Northern District Update | Staffing

Classification	Total Perm Staff (current)	Pending Hiring (vacancies)	Hiring Status
Senior Environmental Scientist (Supervisory)	4	1	Retirement in December 2023
Senior Environmental Scientist (Specialist)	1	0	
Environmental Scientist	8	0	
Research Data Specialist I	1	0	
APC Supervisor	1	0	
APC Specialist	1	1	
Pest Prevention Assistant II	5	0	Hired one staff December 2023
Pest Prevention Assistant I	3	0	Hired one staff January 2024

Santa Clara County: ACP Hotspot Analysis

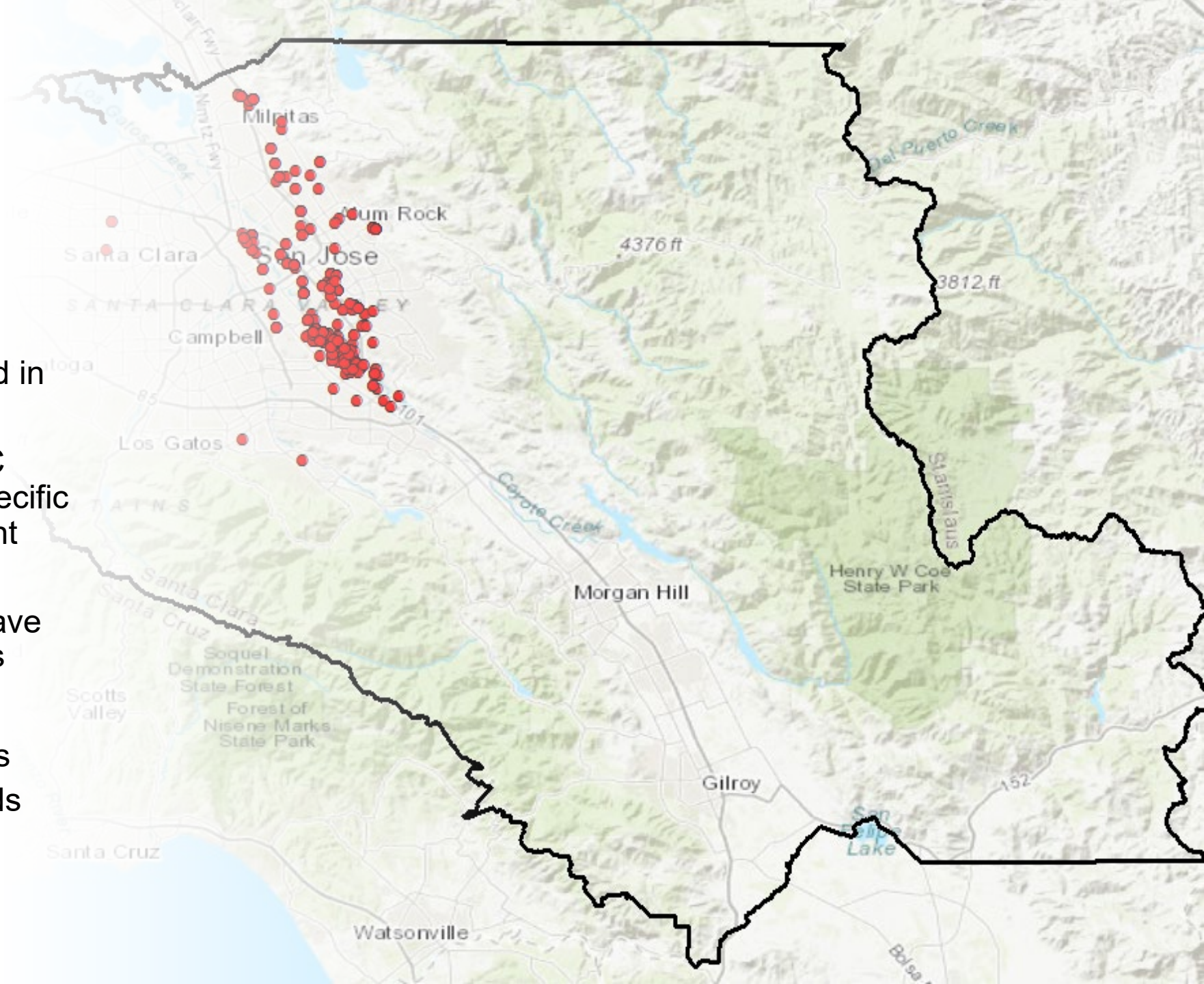


January 10, 2024

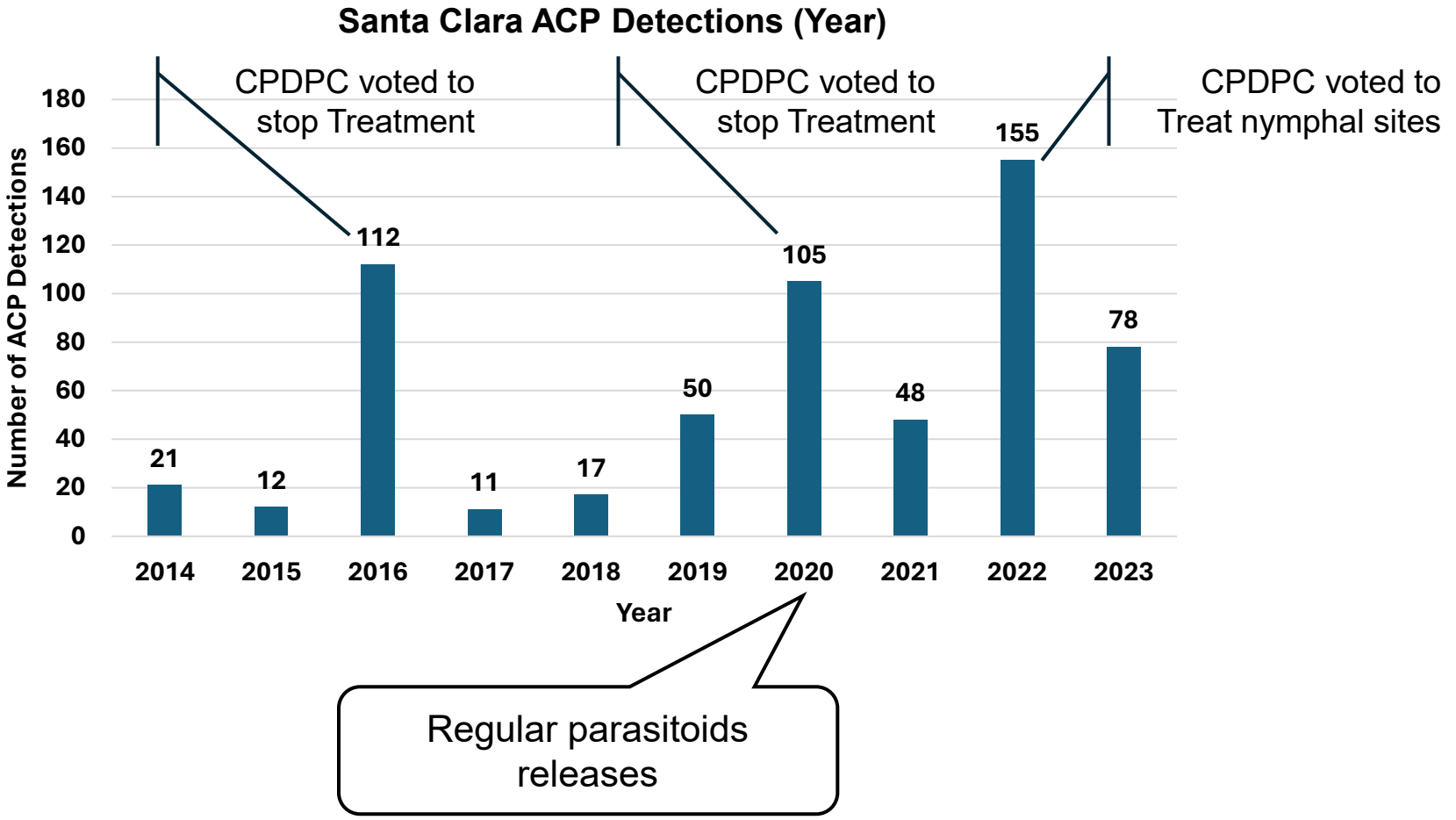
Ravneet Behla,
Program Supervisor
Northern District, CPDPD

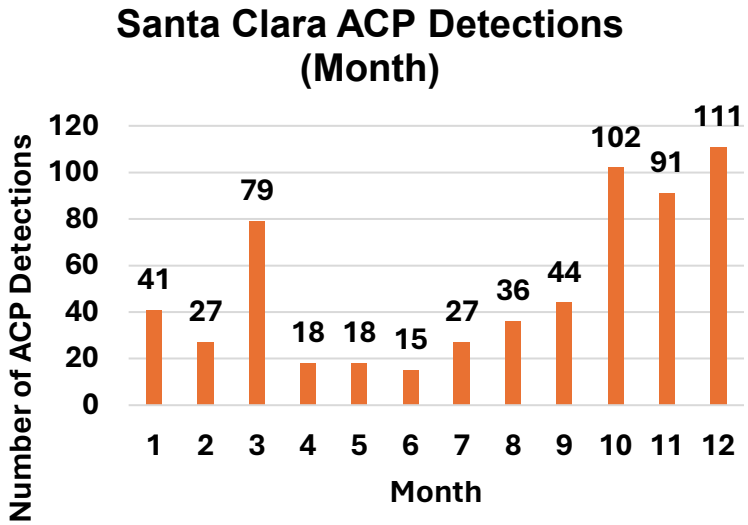
Background

- 2014 – first ACP confirmed in Santa Clara County
- December 2022 – CPDPC approved treatment on specific nymphal sites and adjacent properties
- As of 12/18/2023, there have been 609 confirmed PDRs
- Two Active Delimitations:
  - Los Arboles – 36 grids
  - Clayton North – 4 grids



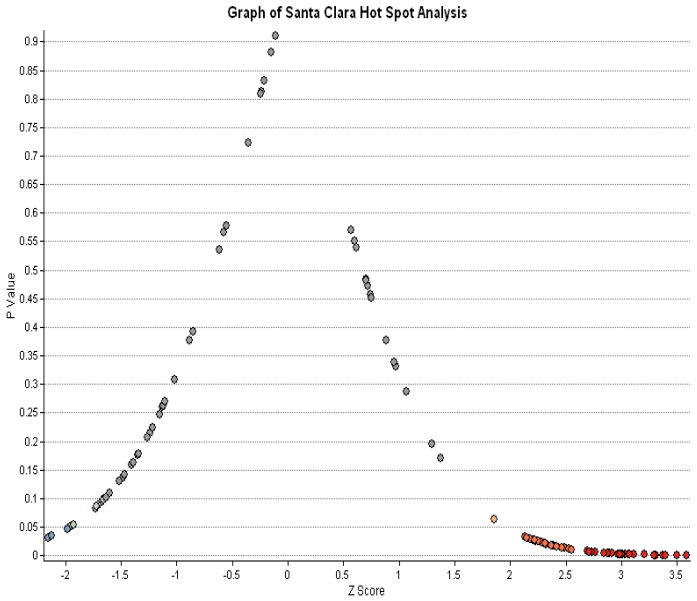
ACP Temporal Distribution



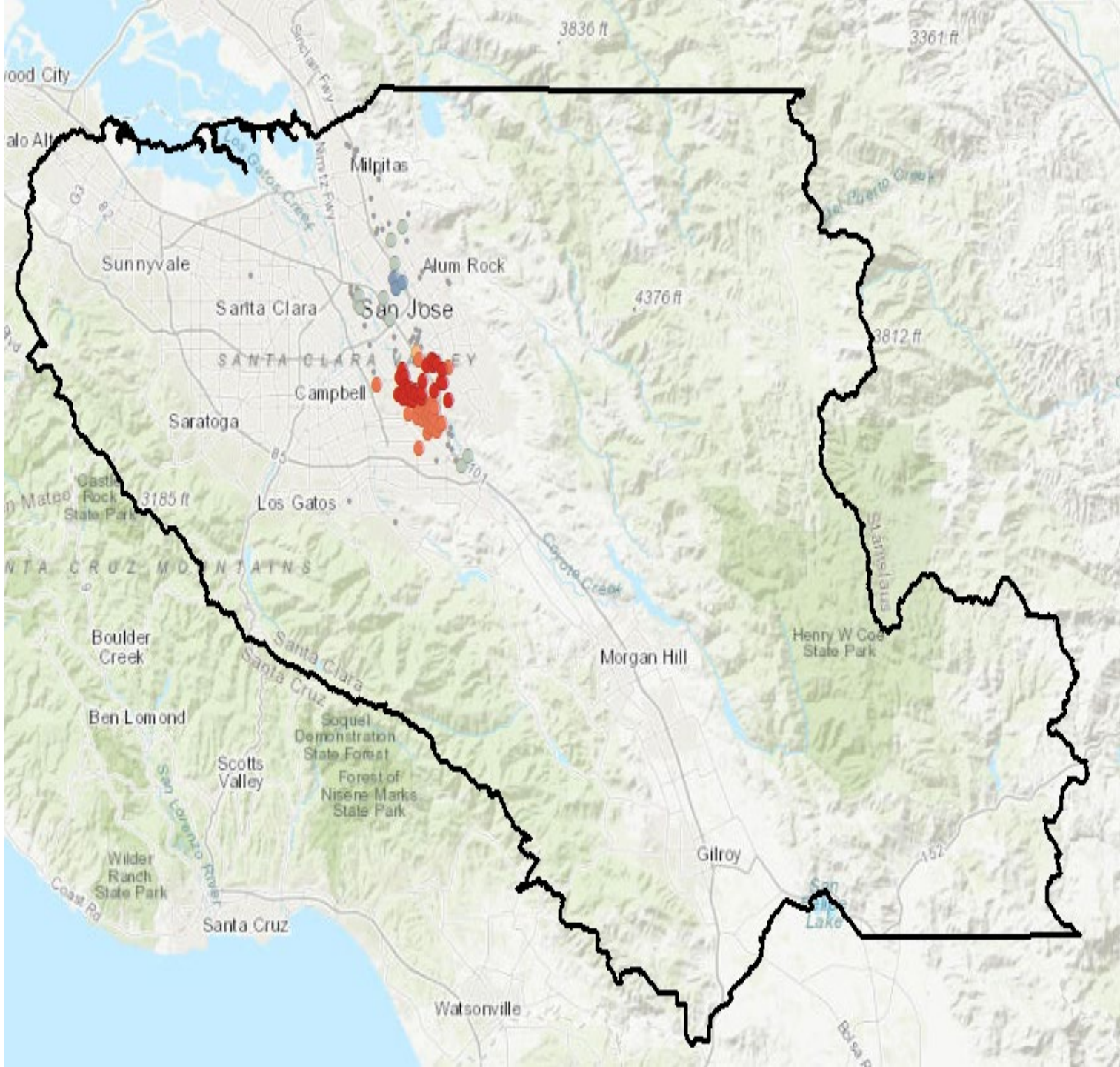


Credit: CPDPD Data Analytics and Visualization Unit (DAVU)

ACP Spatial Distribution and Hotspot

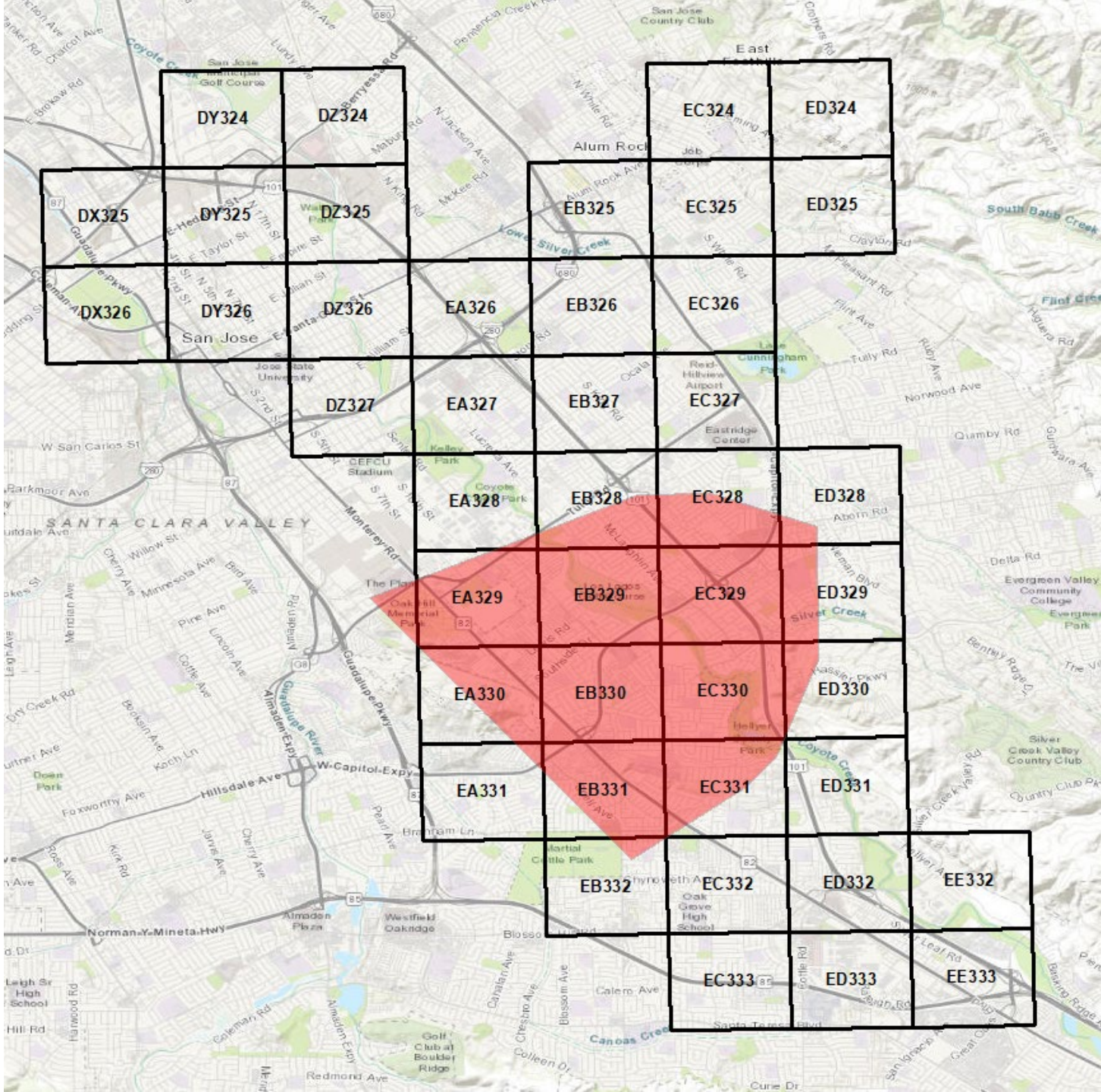


Credit: DAVU



Trapping Grids & Hotspot

Credit: DAVU



Locations and Frequency

Street Name	Frequency	Latest Year (#)	Street Name	Frequency	Latest Year (#)
EB329-Street 1	56	2023 (3)	EC331-Street 2	9	2023 (1)
EB327-Street 1	19	2021 (2)	EA328-Street 2	9	2014 (9)
EB329-Street 2	17	2023 (1)	EC330-Street 1	9	2023 (2)
ED325 -Street 1	15	2023 (2)	EB330-Street 2	8	2022 (4)
EB331-Street 1	14	2023 (1)	EC330-Street 2	8	2023 (1)
EC328-Street 1	14	2023 (2)	EC330-Street 3	7	2023 (3)
EB329 -Street 3	14	2020 (4)	EC330-Street 4	7	2022 (6)
EC331-Street 1	12	2023 (2)	EC330-Street 5	7	2022 (6)
DZ322-Street 1	11	2015 (4)	EC330-Street 6	6	2023 (3)
EB330-Street 1	11	2023 (1)	EB329 -Street 5	5	2023 (2)
EA329 -Street 4	10	2022 (1)	EB330-Street 2	5	2023 (1)
EB331-Street 2	9	2023 (2)	EA326-Street 1	4	2023 (2)

CPDPD Activities

- Hotspot analysis
- Performing visual surveys
  - Hotspot grids, and Frequent find sites and adjacent
  - Requesting access to backyards, where possible
  - Interviewing homeowners
  - Using TAP method as part of visual survey
- Conducting regular web searches for unregulated points of sale
- Coordinating with the county

Recommendation

- Program recommends approval of spot treatments at find sites with breeding populations in Santa Clara County
  - Northern District has a treatment truck and can perform treatments with almost no additional cost to the program
  - The county is supportive of spot treatments
- Spot treatment sites
  - Find sites and adjacent with hosts
- Upon confirmation, CDFA staff will conduct survey of find sites and adjacent to evaluate if spot treatment is warranted
  - Repeat find sites
  - Properties with breeding populations

Importance

- Bay Area is a busy transportation corridor connecting Sacramento and San Joaquin Valley
- Busy international ports
- Milder winter as compared to the valley
- Diverse residential plant species
- Spot treatments provide an additional tool to reduce ACP population build up
- Efficient use of CPDPD resources

Cost Analysis

- Assumptions
  - 12 properties treated per day
    - Maximum of 180 treatments based on 60 properties with 3+ interceptions
  - 2 staff (Pest Prevention Assistant I)
    - Salaries for 3 weeks = **$5,717.90**
  - 1 treatment truck
    - Pesticide cost = **$573.47**
    - Fuel cost = **$750.00**
- Total Cost (Upper Limit)
  - **$7,041.37**

- Questions?
- Thank You!

Data Department Update

Rick Dunn

CRB Director of Data and Information Management

1/10/2024

Data Management Department Activity,

January 10, 2024
Richard Dunn - Data, Information & Management Director

UCKAC GIS Facility

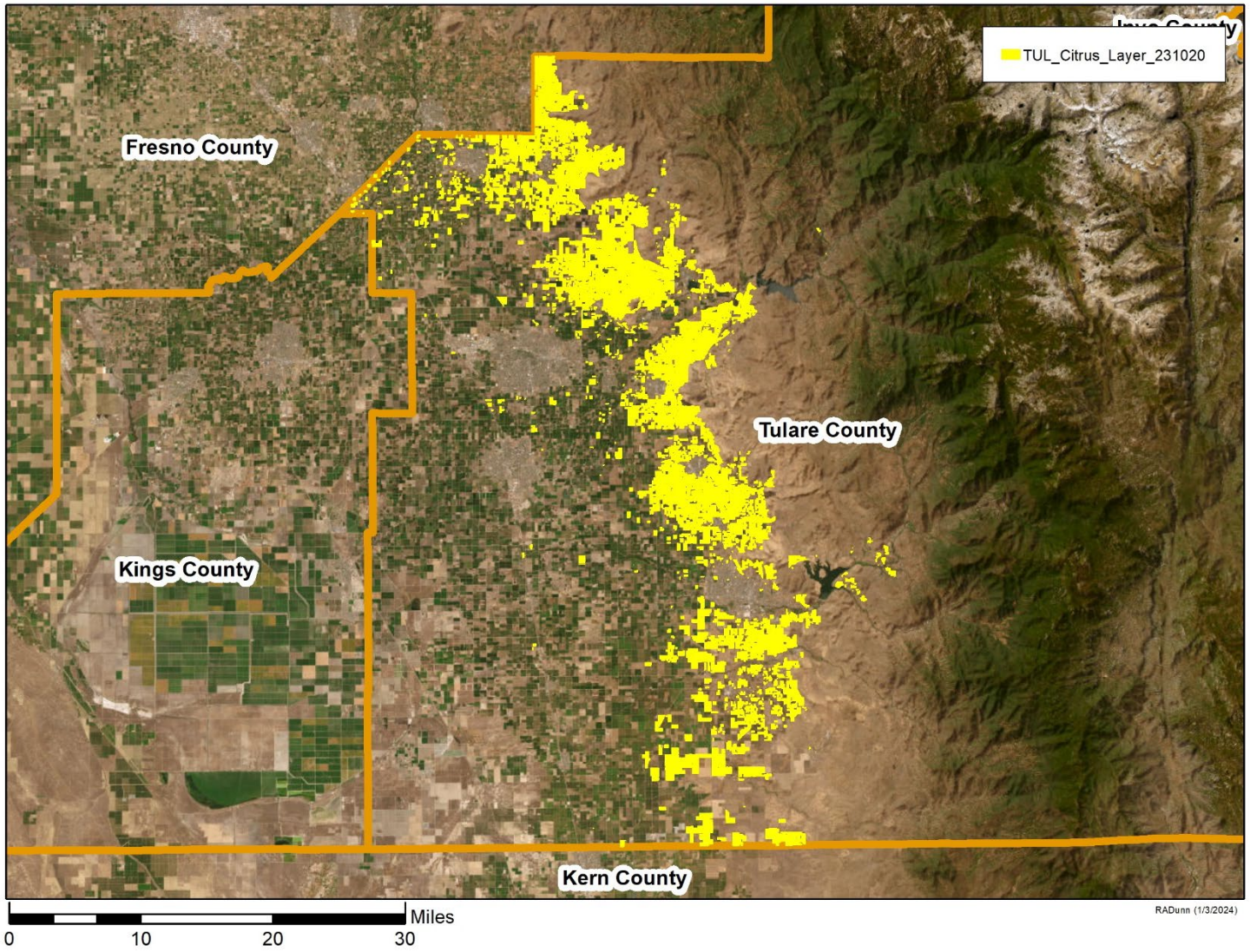
- Robert Johnson continues to assist with Statewide Citrus Layer maintenance and keeping the public UCANR interactive web map updated with ACP, Biocontrol, CLas+ACP, and HLB detection data. http://ucanr.edu/acpmap

CRB Data Department

- Director is supporting Psyllid Management Area group activities and regional ACP / HLB Task Force groups in various counties with mapping support services. Revising the Statewide Commercial Citrus Layer as information is received. Tulare county has been completed. Fresno and Kings Counties are in progress. Director monitored termination of the CASS grove sentinel tree ACP sampling program. Grove traps in Placer and Monterey counties continue to be serviced by CAC staff using the NOMAD system.
- GIS Analyst Nancy Ying is conducting routine data scrubbing, quality control, and map production tasks. Nancy is also assisting with Citrus Layer production.
- Staff continue to support the CPDPP commercial grove trapping program. Supplying trappers with individualized GIS Trapsite layers updated weekly for use on their NOMADs. We produce and distribute ACP / HLB detection overview maps, PDR 800M maps, Biocontrol Workgroup activity maps, CPDPP Trapping progress maps, Trapping catch per day maps, as well as monthly summary data, ACP situation data, and statistical reports.

CITRUS PEST & DISEASE PREVENTION DIVISION
CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE

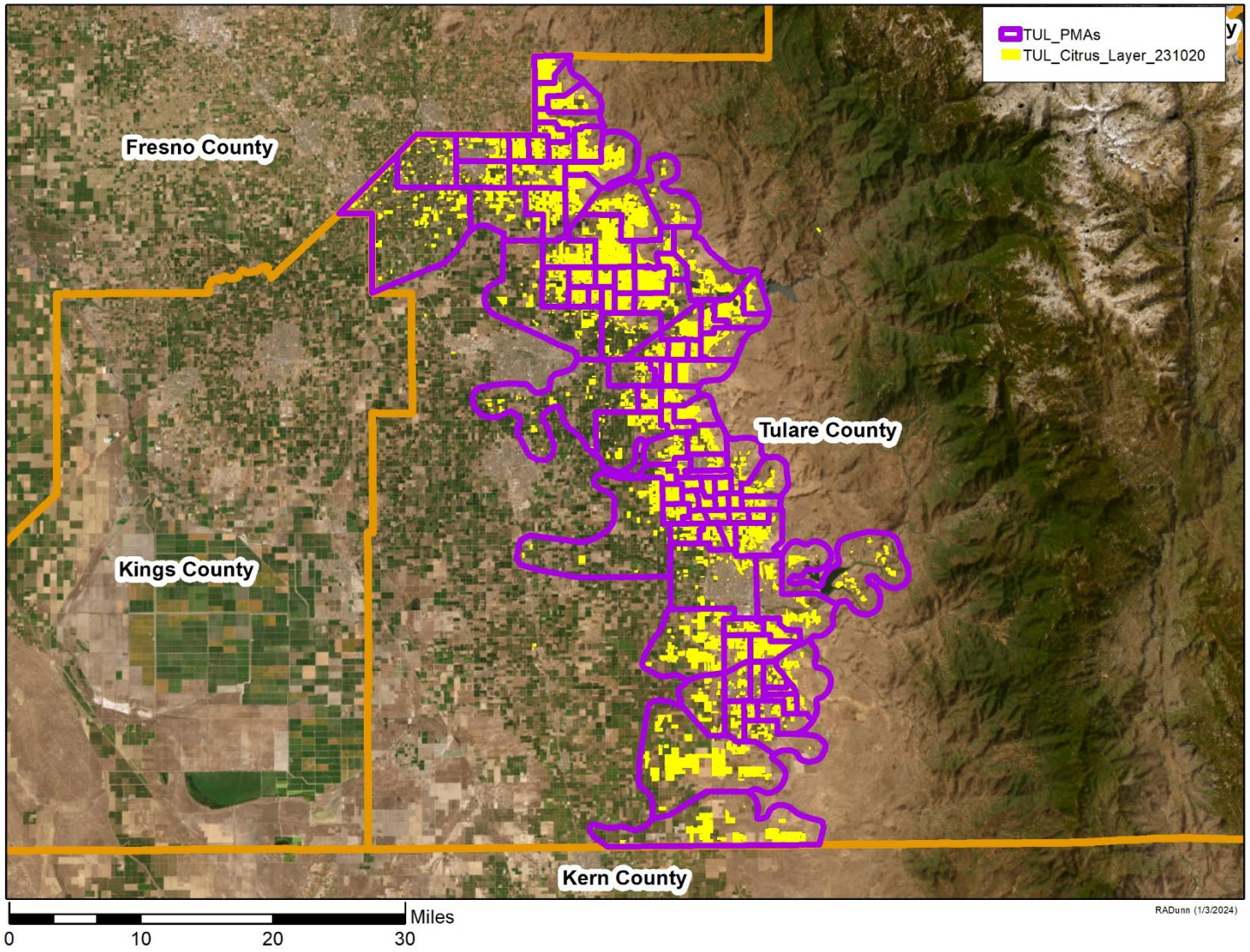
Tulare County Citrus Layer



- 12,202 blocks mapped
- 133,196 acres total (based on GIS)
- 1,381 Pesticide Use Permits

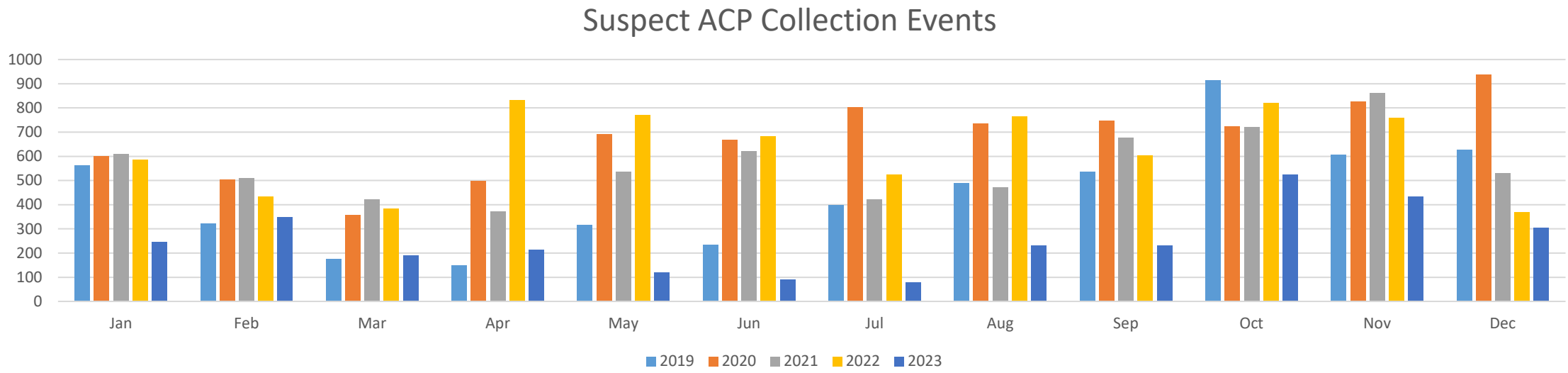
CITRUS PEST & DISEASE PREVENTION DIVISION
CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE

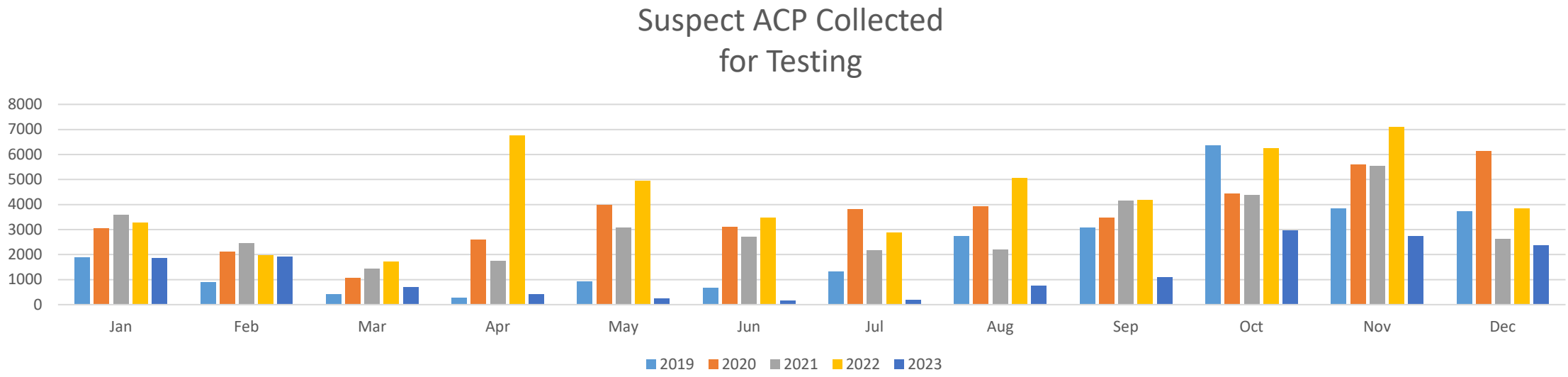
Tulare County Citrus Layer



- 103 Psyllid Management Areas (PMAs)

CPDPD Commercial Grove Sampling Program
January 2024 update





CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE

Action Plan for Sweet Orange Scab in California

December 2023

This document sets forth the California Department of Food and Agriculture (CDFA), Citrus Pest and Disease Prevention Division (CPDPD) statewide Action Plan for sweet orange scab (SOS). This document details the program implemented by CPDPD to sustain and protect California's commercial citrus production, residential citrus plantings, and natural resources.

Contents

I. Action Statement

CDFA established the Citrus Pest and Disease Prevention Program (CPDPP) in 2009 to sustain and protect citrus in the state of California through the implementation of this Action Plan for SOS. CDFA's Citrus Pest and Disease Prevention Division (CPDPD) in collaboration with the United States Department of Agriculture (USDA), California County Agricultural Commissioners (CACs), and Citrus Pest and Disease Prevention Committee (CPDPC) administers the CPDPP.

Sweet orange scab (SOS) is a federally actionable fungal plant pathogen that threatens all *Citrus* and *Fortunella* species and hybrids. Fruit afflicted with SOS can be severely blemished, rendering them unfit for sale in the fresh produce market. Additionally, the disease can cause premature fruit drop, and stunt young nursery trees and new field plantings. SOS presents an imminent and ongoing threat to California's $7.1 billion citrus industry.

In response to an increasing number of SOS detections, the CPDPC recommended that CDFA establish a state interior quarantine to regulate the movement of regulated host material from areas around SOS detections.

CPDPD reviews this plan on at least a quarterly basis to ensure all actions are consistent with identified program goals and objectives and will consider adjustments in response to new and relevant information, technologies, pest pressures, or other developments. Current scientific findings and recommendations, as well as updated federal and state regulations, policies, and/or industry practices, are reviewed to ensure CPDPD's actions are coordinated, scientifically based, transparent, and consistent with the goal of protecting California's commercial citrus production, residential citrus plantings, and natural resources.

II. Pest Profile

SOS is a plant disease caused by the fungal pathogen *Elsinoë australis*, which results in the formation of pustules (small, raised spots or rounded swelling) and lesions on the skin or rind of citrus fruit.

Two scab diseases on citrus are now common in many humid citrus growing areas worldwide: sour citrus scab, caused by *Elsinoë fawcettii*, and SOS, caused by *Elsinoë australis*. Multiple pathotypes have been identified for both species. Sour citrus scab has already been widely distributed around the world, whereas sweet orange scab was limited mostly to southern South America, until it was detected in the United States for the first time in Texas in 2010 in residential lemon and tangerine trees.

SOS is a common disease in South America, mainly Argentina, Brazil, and Paraguay. SOS has now been confirmed in Alabama, Arizona, California, Florida, Louisiana, Mississippi, Puerto Rico, and Texas. Beginning in 2013 to present day in California, SOS

has been found in the Calipatria and Winterhaven areas of Imperial County, in the Pomona, San Gabriel, and Whittier areas of Los Angeles County, in the Orange and Santa Ana areas of Orange County, and in the Blythe and Riverside areas of Riverside County.

The initial scab or lesion forms on very young fruit, is slightly raised, and pink to light brown in color. As the lesion expands, it appears cracked or warty and may change color to yellowish brown and eventually dark gray. The scabs typically form a pattern on the fruit that resembles water splashes. The central area of the fungal growth is depressed and becomes drab, greyish, and velvety when the pathogen is producing spores. Old scab lesions have a rough surface, are dusk colored, cracked, and fissured. Fruits are infected in the early stages of their development, grow misshapen, and are subject to premature drop. On the rind of developed fruits, raised lesions are formed with different shapes, sizes, and colors depending on citrus species and cultivar affected. These lesions can appear as scattered protuberances, conical projections, craters, extensive areas of fine eruptions, or they can coalesce to give scabby patches.

Similar warty lesions and corky eruptions are formed on young twigs, shoots, and stems of nursery plants, which can grow bushy and stunted. On young stems, the lesions resemble an area of scabbed over dieback. Lesions begin on the underside of leaves as water-soaked spots and typically form along the edge of the leaf or the mid-vein.

Hosts for *Elsinoë australis* include fruit and propagative parts of all Citrus and *Fortunella* species and hybrids and *Simmondsia chinensis* (jojoba). The most susceptible hosts are sweet orange and tangerine.

Although there is minimal effect on internal fruit quality and taste, fruit afflicted with SOS can be severely blemished, rendering them unfit for sale in the fresh produce market and subject to export quarantines. Additionally, the disease can cause premature fruit drop, and stunt young nursery trees and new field plantings. SOS is a serious and ongoing threat to California's commercial and residential citrus. Physical movement of infected host fruit is a recognized channel for the spread of SOS from an established area to a new location. Spores may also be spread by wind and rain dispersal. Fruit from regulated areas must be washed, brushed, disinfested, treated, and waxed prior to shipment to help prevent the spread of this fungal pathogen.

III. Current Status of SOS

SOS is an actionable, quarantine plant disease in California and is regulated under Federal Quarantine Order DA-2022-18. On February 1, 2022, SOS, an "A-rated" and federally actionable fungal plant pathogen, was detected in a residential citrus tree in the City of Santa Ana, Orange County. The USDA Detection and Delimitation Survey Methods for *Elsinoë australis* (the fungal causal agent of sweet orange scab) requires a delimitation survey of all citrus hosts within an 800-meter radius from the site of confirmed positive fruit, leaves, and/or twigs.

SOS has been detected in California citrus groves on multiple occasions since the initial detection in California in 2013. These detections occurred only in southern California (Imperial, Los Angeles, Orange, and Riverside). Effective October 1, 2023, Section 3443 of Title 3 of the California Code of Regulations (CCR), Sweet Orange Scab Interior Quarantine, was adopted and established a five-mile radius quarantine area around SOS detections.

Table 1. SOS Positive Samples

SOS Positive Samples		
Imperial County		# of PDRs
	Calipatria	2
	Winterhaven	11
Imperial County Total		13
Los Angeles County		
	Pomona	1
	San Gabriel	2
	Whittier	1
Los Angeles County Total		4
Orange County		
	Orange	4
	Santa Ana	36
Orange County Total		40
Riverside County		
	Blythe	2
	Riverside	4
Riverside County Total		6
Grand Total		**63**

As of 10/20/2023

IV. Organization, Responsibilities, and Staffing

The Incident Command System (ICS)

Managing SOS in California is a coordinated, interagency effort between USDA – Animal and Plant Health Inspection Services (APHIS), CDFA's CPDPD, and CACs, and requires the participation of multiple non-governmental entities (industry members, university researchers, technical specialists, etc.).

The presence of SOS in California constitutes an "incident" per the Federal Emergency Management Agency and represents a threat to the environment and property. Responding to these pests is required to ensure protection of valuable resources. Because federal funding is expended to implement the response, ICS management is used.

The ICS is an action planning process which ensures that all SOS-related activities are coordinated and communicated to all partners involved and that all activities support identified objectives. The ICS process ensures integration of all program elements including planning, operations, communication, outreach, equipment needs, and financial management. Using the ICS process facilitates a standardized system of communication, collaborative decision-making, and cost-effective resource utilization.

Representatives from CDFA, CPDPD, USDA, and affected CACs convene regularly (daily, weekly, or other frequency as determined necessary) to plan, communicate, and act on the SOS response in California.

United States Department of Agriculture (USDA)

USDA-APHIS, Plant Protection and Quarantine (PPQ) program is responsible for administering the Citrus Health Response Program (CHRP). The goal of CHRP is to sustain the United States' citrus industry, maintain growers' continued access to export markets, and safeguard the other citrus growing states against a variety of citrus diseases and pests, including Asian citrus psyllid (ACP), huanglongbing (HLB), and SOS. CHRP provides guidelines for nursery stock production, fruit inspection, treatment, and certification.

PPQ, Science and Technology (S&T) provides scientific support for PPQ regulatory decisions and operations. S&T is responsible for ensuring that PPQ has the information, tools, and technology to make science-based regulatory and policy decisions. In addition, S&T ensures PPQ's operations have the most scientifically viable and practical tools for pest exclusion, detection, and management.

The National Plant Protection Laboratory Accreditation Program (NPPLAP) evaluates laboratories that conduct molecular diagnostics for USDA-APHIS. NPPLAP accreditation process ensures accuracy and credibility in the diagnostic determinations that inform

regulatory actions.

USDA Agricultural Research Service (ARS) is the chief scientific in-house research agency for the USDA. ARS conducts research to develop and transfer solutions to agricultural problems of high national priority. ARS disseminates information to ensure production of high-quality, safe food, and other agricultural products. ARS also works to assess the nutritional needs of Americans, sustain a competitive agricultural economy, enhance the natural resource base and the environment, and provide economic opportunities for rural citizens, communities, and society.

The Department of Homeland Security, Customs and Border Protection (CBP) employs agriculture specialists at United States ports of entry and international mail facilities to target, detect, intercept, and thereby prevent the entry of invasive pest and disease threats before they have a chance to do any harm. The CBP agriculture specialists work with specialized x-ray machines that detect organic materials. They utilize agricultural canines specifically trained to sniff out meat and plant material at international ports of entry.

California Department of Food and Agriculture (CDFA)
CDFA's CPDPD develops, administers, manages, and implements the SOS response program. Program elements include:

- Administration of Federal CHRP Agreements
- Visual Survey
- Delimitation
- Regulatory Quarantines
- Public Outreach and Messaging

CPDPD and the Plant Pest Diagnostics Center (PPDC) provide different services in support of SOS detection and response activities. CPDPD conducts all aspects of SOS survey and rulemaking while PPDC conducts diagnostics of symptomatic SOS plant samples.

Citrus Pest and Disease Prevention Committee (CPDPC)
Food and Agricultural Code (FAC) section 5914 created the CPDPC. CPDPC is comprised of Secretary-appointed members of the California citrus industry and the public. FAC section 5915 authorizes CPDPC to develop, subject to Secretary approval, a statewide citrus specific pest and disease work plan that includes, but is not limited to the following:

- Informational programs to educate and train residential owners of citrus fruit, local communities, groups, and individuals on the prevention of pests and diseases and their vectors, specific to citrus.
- Programs for surveying, detecting, analyzing, and treating pests and diseases

specific to citrus involving producers of citrus and residential owners of citrus fruit and host materials, except as provided in FAC section 5930.

In addition, CPDPC submits recommendations to the Secretary on, but not limited to, the following:

- Annual assessment rate.
- Annual budget.
- Expenditures necessary to implement the statewide work plan.
- The amount of fees to be levied, as provided in FAC section 5919.
- The receipt of money from other sources to pay any obligation of the committee and to accomplish the purposes and objectives of the committee.
- The adoption of regulations consistent with the powers and duties of the committee.

California County Agricultural Commissioner (CAC)
CACs implement federal, state, and local regulatory programs designed to promote agriculture and protect people, the environment, and marketplace equity. CACs conduct regulatory activities in coordination with the USDA-APHIS, CDFA, CPDPD, and the California Department of Pesticide Regulation (CDPR). Each CAC is licensed by CDFA and appointed by the respective county's Board of Supervisors.

Pesticide Use Enforcement
Enforcement of pesticide safety regulations; issuance of restricted material permits; on-site inspection of pesticide applicators; administration of pesticide use reporting; surveillance of dealers, pest control advisors, and pest control operators (PCO); and investigate pesticide incidents. CACs enforce regulations to protect ground and surface water from pesticide contamination.

Pest Exclusion/Quarantine/Phytosanitary Certification
In conjunction with CDFA, CPDPD, and USDA-APHIS, the CACs enforce the State Interior Quarantine for SOS which is set forth in California Code of Regulations (CCR), title 3, section 3443. Enforcement actions include, where applicable, the inspection of bulk citrus shipments from areas affected by the quarantine to ensure compliance and enforce the terms of Master Permits. Master Permits issued by CDFA enable movement of agricultural commodities where otherwise prohibited by quarantines. CACs also oversee licensed PCOs to ensure that pesticide use is properly reported.

CACs provide training and technical resources to citrus production nurseries statewide regarding the implementation of the federally approved insect-resistant screen house program, issue compliance agreements, conduct on-site inspections, procure plant samples, and monitor approved, insect-resistant growing structures.

CACs provide phytosanitary certification services, including inspection, sampling, and issuance of compliance agreements and/or certificates to facilitate movement of

regulated commodities from the affected SOS quarantine area. Phytosanitary certification is provided to meet state, federal, and international plant quarantine regulations pertaining to SOS.

V. Technical Advisors and Support

Science and Technology (S&T)
Scientists with the USDA-S&T are consulted on all program elements, including detection techniques, diagnostic tools, and exclusion policies. Scientists with S&T are typically included in the Technical Working Group (TWG). S&T also develops and validates new molecular diagnostic tools and provides diagnostician training.

Agricultural Research Services (ARS)
Scientists with the USDA-ARS conduct research to develop and transfer solutions to agricultural problems of high national priority and provide information access and dissemination to CDFA. Scientists with ARS are typically included in the TWG. ARS scientists are actively engaged in the development of survey programs implemented in California.

University of California, Division of Agriculture and Natural Resources (UC ANR), Cooperative Extension

Citrus Clonal Protection Program (CCPP)
CCPP is a cooperative program among the UC Riverside Department of Plant Pathology and Microbiology, CDFA, CPDPD, USDA-APHIS, the citrus industry of the state of California, and the Citrus Research Board (CRB). Since 2009, the CCPP has been a part of the National Clean Plant Network for specialty crops. CCPP provides a safe mechanism for the introduction into California of citrus varieties from any citrus-growing area of the world for research, variety improvement, or for use by the commercial industry of the state. This mechanism includes disease diagnosis and pathogen elimination followed by maintenance and distribution of true-to-type, primary citrus propagative material of the important fruit and rootstock varieties. CCPP provides support to the citrus industry and CPDPD by ensuring, through quarantine and disease testing, that citrus material entering California regardless of its point of origin, foreign or domestic, is free from bud-transmissible diseases.

CDFA Primary Plant Pathologist
CDFA Primary Plant Pathologist provides scientific input to CDFA Executive staff and program managers to ensure science-based policy development and decision-making.

Industry Representatives
Industry representatives are knowledgeable about existing production practices including chemical and cultural insect control practices and harvesting and handling practices. Industry representatives provide information used in the development of regulatory policies and procedures and are queried for input on the practicality and feasibility of

proposed policies and procedures.

Citrus Research Board (CRB)
CRB administers the California Citrus Research Program, the grower-funded and grower-directed program established under the California Marketing Act as the mechanism enabling the state's citrus producers to sponsor and support needed research. The priorities for the Citrus Research Program have been realigned to meet the challenges facing citrus growers in California. The objective of the program is to be reactive to immediate threats and plan for future threats to the economic production of citrus. CRB partners with CPDPD on several projects, including biocontrol activities of ACP and research projects on early detection technologies.

California Citrus Quality Council (CCQC)
CCQC's primary objective is to ensure that California citrus production meets domestic and international regulatory standards. CCQC works with government agencies, international standards setting organizations, the UC, the California citrus industry, and trading partners to help the California industry meet domestic and international phytosanitary, food safety, food additive, and pesticide residue regulations. The CCQC provides CDFA with input and updates on trade impacts associated with SOS.

Trade Associations
California Citrus Mutual (CCM) and Sunkist are both trade associations that work with citrus growers to market fruit nationally and internationally. CCM represents its members on matters that affect economic livelihood and provides necessary information to enhance the ability to profit from their work. CCM closely monitors and becomes involved, as needed, in regulatory and legislative processes which may result in an economic impact to growers. Sunkist is a grower cooperative that works to develop a worldwide market, promote a brand name, access a global transportation system, develop comprehensive research capabilities, and gain governmental access to overseas markets. Like other citrus trade associations, CCM and Sunkist partner with CPDPD to ensure grower's needs are being met by the program.

Nursery Industry Groups
The nursery industry has several groups that engage in activities to support citrus nurseries in California, including Plant California Alliance, California Citrus Nursery Society (CCNS), the California Citrus Nursery Board (CCNB), and the California Nursery Advisory Board (NAB). Plant California Alliance is a trade organization, focusing on retail nurseries and garden centers, which works to promote and protect the California nursery industry.

CCNS is a non-profit industry association helping the citrus nursery industry of California become more successful. CCNS provides an exchange for information useful to the citrus nursery industry. It holds an annual conference and several single-purpose meetings each year to disseminate information and/or to serve as forums for industry representatives to develop positions on matters of interest to the industry.

CCNB, also known as the California Citrus Nursery Research and Education Program, is an industry-funded and directed program established under the California Marketing Act to enable the State's citrus nurseries to sponsor and support needed research. NAB is a group appointed by the Secretary to advise CDFA on matters affecting and pertaining to nurseries in California.

NAB is comprised of representatives from a wide spectrum of the nursery industry. The mission of the NAB is to grow and maintain a strong relationship between CDFA and the nursery industry to secure the industry's future. All these entities work collaboratively with CPDPD to ensure that the citrus nursery industry needs are represented and are being met by the program.

VI. Administrative Activities

Public and Stakeholder Notification

Information concerning SOS detections and regulation is conveyed directly to concerned local and state political representatives and authorities via letters, emails, and/or faxes. Press releases, if issued, will be prepared by CDFA's public information officer and the CAC, in close coordination with the project leader responsible for treatment. Either the CAC or CDFA's public information officer serves as the primary contact to the media.

Data Analysis and Visualization Unit

CPDPD's Data Analysis and Visualization Unit (DAVU) conducts extensive data analysis and generates a variety of static and web-based maps to advance the goals and objectives of the program. On a routine basis, DAVU receives data from field staff conducting detection, survey, and regulatory activities. The data is used to inform internal and external stakeholders of the status of the program activities and to illustrate the distribution of citrus pests and diseases throughout California. DAVU's principal tasks include generating maps to guide field staff in their prevention and eradication efforts and developing and managing a streamlined process for effective data management. DAVU also conducts the environmental analysis required prior to commencing field activities to ensure the protection of rare and sensitive species, habitats, and protected waterways.

VII. Detection and Survey Activities for SOS

Multi-Pest Survey

On October 1, 2021, the CDFA, at the direction of the USDA implemented a multiple pest survey as part of the CHRP agreement. Previously the CHRP agreement had been focused solely on ACP and HLB activities. The expanded survey includes diseases such as SOS, citrus canker (CC), citrus black spot (CBS), citrus variegated chlorosis (CVC), citrus leprosis (CL), citrus yellow vein clearing virus (CYVCV), and citrus yellow mosaic virus (CYMV). Field staff survey for these pests and diseases during routine residential HLB risk-based surveys. However, the primary focus of this section is to document CPDPD's methodology for surveying of SOS.

USDA ARS HLB Risk Model is used as a guide to identify survey sites and sampling densities for the multi-pest survey. The following factors are considered when determining risk associated with HLB:

- Census Travel
- ACP Density
- CLas+ ACP
- Potential ACP Source
- Major Citrus Transportation Corridor
- Packinghouses
- Farmer's Markets
- Military Installations and Sovereign Lands
- Organic Citrus
- Weather Suitability

Using these risk factors, total risk is determined for each square mile grid, resulting in a recommended sampling density as shown in Table 2. Each square mile is mapped, and identified by the section, township, range (STR) identification (ID) (the unique index). Each STR ID is assigned a Sample Density from Table 2, which is used to determine the number of sites to survey per square mile.

Table 2. Example of Recommended Sampling Density and Number of Survey Sites for Citrus Pests and Diseases in California

Recommended Sampling Density	Actual Number of Sites to Survey	Square Miles with the Recommended Density	Total Number of Sites to Survey
0 – 5	5	260	1,300
6 – 20	10	239	2,390
21 – 40	25	209	5,225
41 – 80	50	497	24,850
81 – 160	100	648	64,800
161 +	200	291	58,200

The CPDPD uses this method to determine the number of sites to sample for each survey cycle. Data obtained from the survey is submitted to USDA to verify that the Global Position System points are within the assigned STR and then forwarded to USDA ARS. In subsequent survey cycles, USDA ARS may recommend additional or fewer sites or STR's to survey so that the recommended sampling density is achieved. Although the survey sites and sampling densities are primarily selected based on modeled HLB risks, staff will inspect all host trees for symptoms of other citrus diseases.

Inspection of Hosts at Survey Site

- All members of the plant family Rutaceae at the site, primarily *Citrus* species, and other hosts of SOS are identified.

- All hosts at the site are inspected for symptoms of SOS and other pests and diseases. The most common SOS symptoms are pink to light brown scab or lesions forming on young fruit.
- Plant material is collected from all hosts displaying disease symptoms.

Submission of Plant Parts for SOS Analysis

- Collect symptomatic leaves and small fruit. Leaf samples are not collected from all trees on the property, only from trees exhibiting SOS symptoms.
- Clippers, if used, are disinfected with 70 percent non-denatured ethanol or cleaned with disinfecting wipes (containing 10% bleach, or alkyl dimethyl benzyl ammonium chloride, or alkyl dimethyl ethyl benzyl ammonium chloride) after every sample collection.
- Thorns are cut off leaves. Leaves are subsequently cleaned with a paint brush to remove any debris, including any ACP life stages present and any other insects.
- Leaves are placed on a paper towel and thoroughly checked to ensure all insects (including ACP) and their life stages are removed. Staff ensure that all plant samples submitted to the PPDC are free of all insects.
- Plant samples are wrapped in a paper towel. Towel(s) with samples are placed in a sealable, plastic bag. When multiple hosts are sampled at a single property, the individual bags are placed inside a larger sealable, plastic bag.
- Using a permanent marker, the bag is labeled with the host tag number, host type, sampling date, address of the property, and GPS coordinates of the tree. A copy of the PDR is placed inside the bag.
- A PDR sticker is placed on the bag, or the PDR number is written directly on the bag. A PDR number is assigned to each bag containing a sample.
- The sealable plastic bag is stored in a cooler with ice packs and a paper towel is placed between the ice packs and the samples to ensure that the samples stay dry but cool.
- One PDR (Plant Pathology) is completed for each site. Samples from each site are numbered. If the detection site has multiple trees, one PDR with multiple samples is created.
- In the “Remarks” section, information on the host from which the sample was taken is recorded and describe the type of plant part(s) taken as a sample. Examples:
    - T #1 = lemon (leaves); SOS Delimitation Example.pdf
    - T #2 = grapefruit (fruit); and
    - T #3 = Mexican lime (leaves & fruit).
- Host information is entered in the host section of the PDR.
- Samples collected from CPDPD’s Northern District are hand-delivered to the PPDC, whereas samples collected from CPDPD’s Southern and Central districts are shipped to the PPDC. PPDC confirms that the contents of the cooler are accurately reflected on the chain of custody and the samples are analyzed per the appropriate protocol.

Delimitation Survey Following an SOS Detection

An SOS detection triggers an 800-meter radius delimitation area. The delimitation area is created from the location of the positive tree. A new 800-meter radius delimitation area is created with each subsequent find.

- All host plants are surveyed. Plant samples are collected from symptomatic trees only.
- If the detection is in an area not quarantined for SOS, a five-mile radius quarantine is established with CAC concurrence. If an SOS quarantine already exists but does not include all areas within the five-mile radius, the existing quarantine is expanded.
- All trace back information is collected on the source of the diseased plant if available.

VIII. Diagnostics

Plant Pest Diagnostics Center (PPDC)

CDFA's PPDC Plant Pathology Laboratory tests citrus fruit and leaves for *Elsinoë australis*, the fungus that causes SOS, using a polymerase chain reaction (PCR) test. There are five pathotypes of SOS which are detected by this test. The sweet orange pathotype primarily affects the fruit of sweet orange and mandarins, but also infects lemon, sour orange, tangerine, kumquat, lime, grapefruit, calamondin, and *Fortunella* sp. Other pathotypes infect natsudaidai, jojoba (Ash et al. 2012), and *Populus* sp. (Zhao et al., 2020, EPPO 2021). Leaves of citrus are rarely affected. Samples scraped from lesions are pooled from fruit sampled from the same trees. A USDA-validated conventional multiplex PCR protocol is used to test plant samples for the presence of *Elsinoë australis*: This test uses the detection primers designed by Hyun et al. (2007 and 2009) from the intergenic spacer region of the ribosomal DNA and will not amplify *Elsinoë fawcettii*, the causal agent of SOS, which is common in Florida. The primers used for the internal controls are NS1 and NS2 (Dams et al. 1988) which amplify a product from all plant samples tested to date. For a sample to be called positive by the lab it must be tested twice and both samples must test positive. Confirmation by sequence analysis that the amplicon is from *Elsinoë australis* is also performed. If a sample tests positive from a county with no previous detections, or a new host is detected, samples will be sent to the USDA-S&T lab in Laurel, Maryland for confirmation. Their tests include PCR and sequence analysis.

IX. Regulatory Activities

General

CDFA regulates the intrastate movement of SOS host material pursuant to 3 CCR § 3443, Sweet Orange Scab State Interior Quarantine. The USDA regulates the interstate movement of SOS host material pursuant to Federal Order DA-2022-18 for SOS. This federal order establishes quarantine areas, hosts and possible carriers of the pest and

disease, and the prohibitions or conditions which enable movement of hosts within or from a quarantine area.

In conjunction with USDA and the CACs, CPDPD enforces all provisions of the regulation and provides guidance to affected industry representatives of the conditions and actions which would make regulated products eligible to move within and from the quarantine areas.

CDFA conducts regulatory activities and enforces the regulations to prevent the artificial spread of SOS by restricting the movement of host material from the quarantine area. Regulatory activities include creating and issuing compliance agreements, publishing Citrus Division and Phytosanitary Advisories to provide detailed information on regulations and enforcement policies, developing and sharing educational material, and consistently communicating with and inspecting regulated establishments to ensure compliance with the regulations.

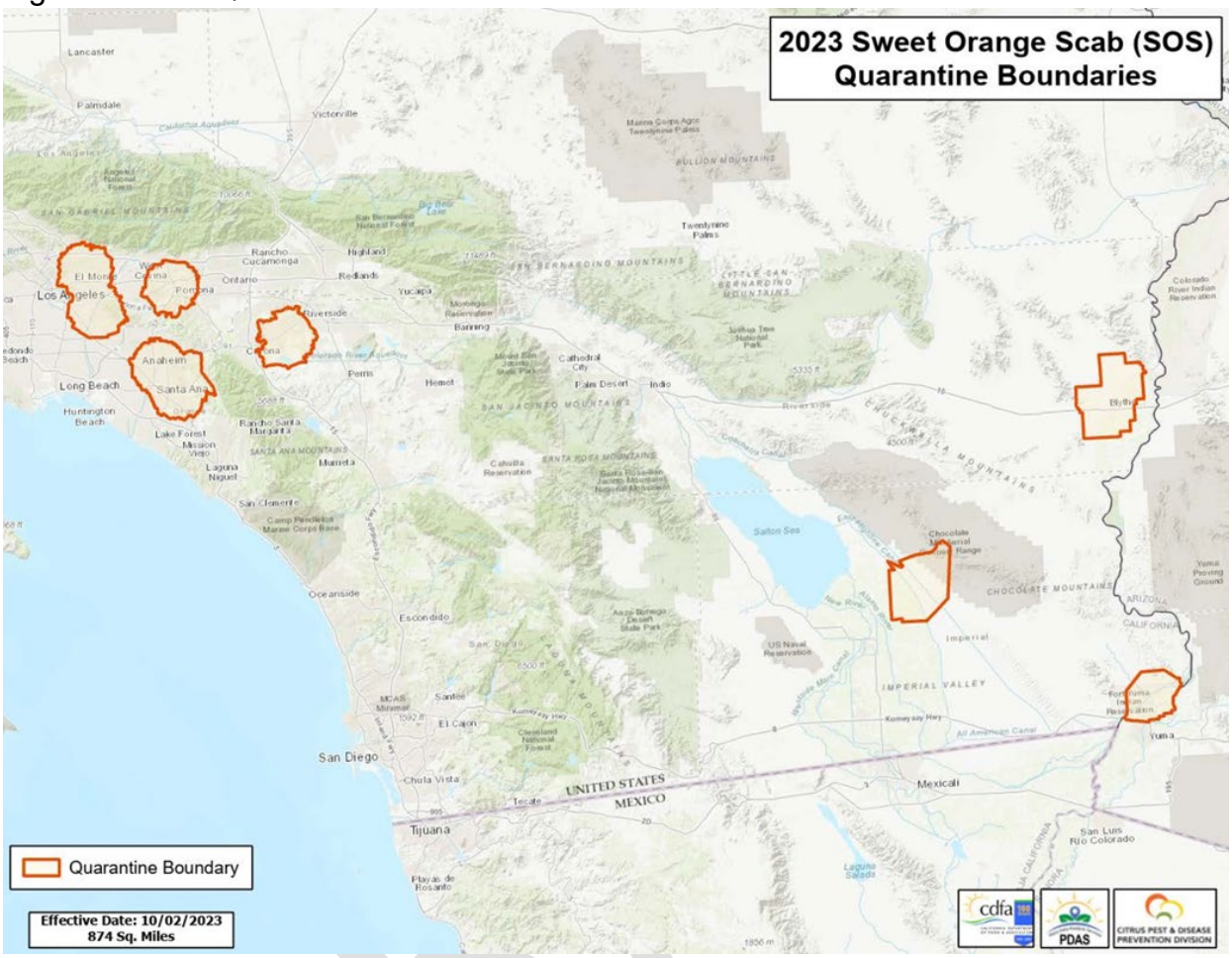
In addition to the requirements regarding SOS, all citrus nursery stock produced and/or sold in California must meet the requirements found in 3 CCR § 3701, Citrus Nursery Stock Pest Cleanliness Program (NSPCP). All source trees for citrus nursery stock propagative materials are registered with the Citrus NSPCP and must meet testing and maintenance requirements.

SOS Quarantine

Pursuant to 3 CCR § 3443, CDFA will establish a quarantine area with a five-mile radius from each SOS-positive detection. Quarantine borders follow physical boundaries such as roads, rivers, or railways. All establishments growing, transporting, selling, or packing SOS host material within the established SOS quarantine area are regulated under a signed compliance agreement.

SOS host nursery stock, propagative plant parts (except seed extracted from fruit), and fruit are prohibited from moving out of the SOS quarantine area unless they meet the requirements outlined in Federal Order DA-2022-18 for SOS.

Figure 1. SOS Quarantine Areas



Compliance Agreements

Compliance agreements convey the quarantine restrictions and requirements to affected businesses located within a regulated area. Under the authority provided in FAC § 5705, CDFA issues compliance agreements to all citrus growers, transporters, packers, and wholesale nurseries. Under a signed compliance agreement, regulated establishments are permitted to move host material while adhering to the terms of the agreement and with general CPDPD oversight. While the signed agreements are self-executing, CPDPD conducts periodic inspections to ensure quarantine compliance.

Safeguarding Requirement

All citrus transporters/haulers are required to completely safeguard citrus fruit while in transit from the SOS quarantine area. Safeguarding of fruit can be accomplished in any manner that prevents the fruit from being exposed to SOS and stops the loss of fruit, leaves, stems, branches, or plant debris while in transit. The safeguards are secured prior to the vehicle departing with fruit and must remain in place until the vehicle reaches its destination for offloading.

Nurseries within the SOS Quarantine

SOS host nursery stock is restricted to shipments within the contiguous SOS quarantine area to non-commercial citrus-producing states, or to states regulated for SOS and contiguous to California's interior quarantine area. Movement of SOS host nursery stock from an area under quarantine is prohibited unless produced and continuously maintained in a USDA-approved structure pursuant to the requirements outlined in Federal Order DA-2022-18 for SOS.

Interstate Movement

USDA regulates interstate movement of SOS host material and nursery stock. Under a permit issued by USDA, entities in California may ship these commodities interstate and must also sign a compliance agreement with CDFA. Shipments from a USDA-approved structure may be shipped to a citrus producing or non-citrus producing state, subject to local restrictions. Shipments of commodities maintained outdoors may only be shipped to non-citrus producing states under a Limited Permit issued by USDA, in addition to the compliance agreement.

SOS Quarantine Enforcement

In cooperation with USDA and the CACs, CDFA enforces the quarantine requirements to help ensure SOS is not artificially spread throughout the state. Enforcement activities include conducting inspections at nurseries, monitoring regulatory fungicide treatments, checking treatment and sales records, and inspecting citrus fruit growers, packers, and transporters.

Quarantine enforcement activities also include responding to SOS detections in new quarantine areas. Compliance agreements are signed with all regulated establishments to ensure quarantine requirements are met.

Special Permits

Under authority provided in 3 CCR § 3154, the Secretary may issue special permits pertaining to the movement of regulated articles and commodities which would otherwise be prohibited by a regulation. This may occur when there is a specific demonstrated need and the terms and conditions of the permit adequately mitigate the biological risk of spreading a pest. These special permits are called Quarantine Commodity (QC) permits and may be issued to individuals, businesses, researchers, or to CDFA program staff. The permit may be self-executing with all the terms and conditions listed in the permit or may require the permit participants to enter into compliance agreements.

Additionally, special permits are issued by the state and federal government to support research activities related to SOS. State permits are required for the intrastate movement and use of such organisms and their hosts. Federal permits are issued to researchers for the interstate movement of regulated organisms.

X. Outreach and Education Program

The CPDPD engages the services of a professional outreach contractor to oversee a statewide outreach and education program. The program is designed to conduct concise and focused outreach to various audiences, including homeowners, citrus industry members, and elected officials, about the threat that SOS poses to residential and commercial citrus trees. Additionally, the contractor keeps growers informed of the status of SOS, as well as other citrus pests and diseases. The outreach and education program includes, but is not limited to, the following items:

- A work plan including all deliverables and completion dates for all components.
- Messaging that creates an environment of cooperation and support for controlling SOS among residents, industry members, legislators, and stakeholders.
- Cohesive, distinctive artwork and graphics to be used on all printed and electronic materials associated with the CPDPD and CPDPC outreach and education program.
- Quarterly newsletters and articles distributed in existing publications, i.e., *Citrograph*, regional associations, trade press, on the CDFA's and CPDPC's websites, and via postal mail.
- A media update guide, including press releases for distribution to local papers, trade press, print media, television, and radio in citrus growing regions.
- Handouts and complementary materials that can be easily updated and produced in short runs for use in trade shows and repurposed for electronic distribution via email, on websites, etc., to provide relevant updates on the CPDPP.
- A program that provides regular updates to regional citrus growers, CACs and Farm Bureau chapters, and that provides materials and information for use in local grower meetings, field day activities and trade shows.
- A program to identify candidates among California's citrus growers for education and deployment as local experts available or media interviews and public meetings in areas, such as their local communities, where citrus trees are newly infested with SOS.
- Speaker kits, including talking points, handouts, and visuals, for use in providing presentations on SOS.
- A media outreach strategy that can reach reporters with breaking news in a timely fashion.
- Social medial outreach (Twitter, Facebook, etc.), upon approval of the CPDPD and CDFA.
- Provide program's outreach materials in multiple languages for distribution via multiple media channels to reach the largest audience.
- Paid media advertising strategies in key regions, including paid placements of a public service announcement and/or other advertisements.
- A program that participates in select public events in areas where support of treatment is critical.
- Ongoing management and programming of the existing homeowner (CaliforniaCitrusThreat.org) and industry (CitrusInsider.org) websites.
- Working collaboratively with the regional Grower Liaisons to support outreach and develop a campaign to encourage grower participation in the area-wide treatment program.

- Supporting industry outreach if/when SOS arises or regulatory changes take place, or in other situations requiring immediate, focused attention on growers, packinghouses, field workers, haulers, pesticide applicators, etc.
- A program that provides ongoing educational information and resources to elected officials and local governmental groups, so they are informed on the issue and can share program messaging with their constituents.
- Building and reinforcing relationships with CACs, city officials and their staff for long-term partnership in combating SOS in their districts and counties, through engagement at conferences, city council meetings, and relevant trade associations elected officials are members of.
- An outreach plan to connect with elected officials in areas where there is a need to remove abandoned groves and/or a need for homeowner associations, and city- and county-owned properties to adequately treat citrus trees, including potentially participating in area-wide management.

Residential Messaging

When conducting outreach to residential homeowners throughout the state, messaging is tailored to reflect the specific behaviors the CPDPD is seeking of residents with a citrus tree on their private property. In all areas, public messaging encourages residents to inspect their trees for signs of SOS and emphasizes residents' cooperation with CPDPD survey crews.

Grower Messaging

In some citrus growing areas, commercial groves are separated by substantial distances, making open communication and coordination between growers difficult. Individual growers may have implemented pest management strategies for SOS, but experience has shown that a successful control program must be coordinated among all growers in an area to maximize the effect of treatments. It is imperative in managing this disease that outreach messaging directed toward growers emphasizes grower participation in an area-wide pest management strategy to protect commercial citrus as well as individual growers.

To accomplish the timely application of treatments over large geographical areas in a coordinated manner, the program's outreach materials are distributed in various ways, including by the contractor, CDFA, CPDPD, and Grower Liaisons. Recognizing that the cost of treatments is borne by the citrus growers, it is imperative to have a robust grower outreach program that reaches as many growers as possible to ensure effective treatments are conducted in a timely manner.

XI. Facilitating Research

The CPDPD periodically receives requests to facilitate research and is willing to participate if feasible. If a research opportunity arises, the CPDPD requests a one- page concept proposal from the requestor. The proposal shall include a brief background of the research, the name of the principal investigator and the number of additional research staff that will be involved in the project. For the description of the project, certain criteria

must be met. This includes: the project timeline, the anticipated deliverable, and sample collection needs. If samples are to be collected, the proposal must describe what and where the samples will be collected, where the samples will be moved to, what safeguarding methods are being used, and the final disposition of the samples. The anticipated area for the project, the number of field research staff and the frequency of the visits also must be described. Additionally, the proposal shall include the funding source, and if the research project is a new or existing project. Proposals are reviewed for scientific validity and to assess impacts to the CPDPD's SOS response program.

CDFA Winter Trapping Optimization

Sandra Olkowski, PhD

Victor Alves

David Phong

Marina Kaiser

CITRUS PEST & DISEASE PREVENTION DIVISION
CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE

Goal:

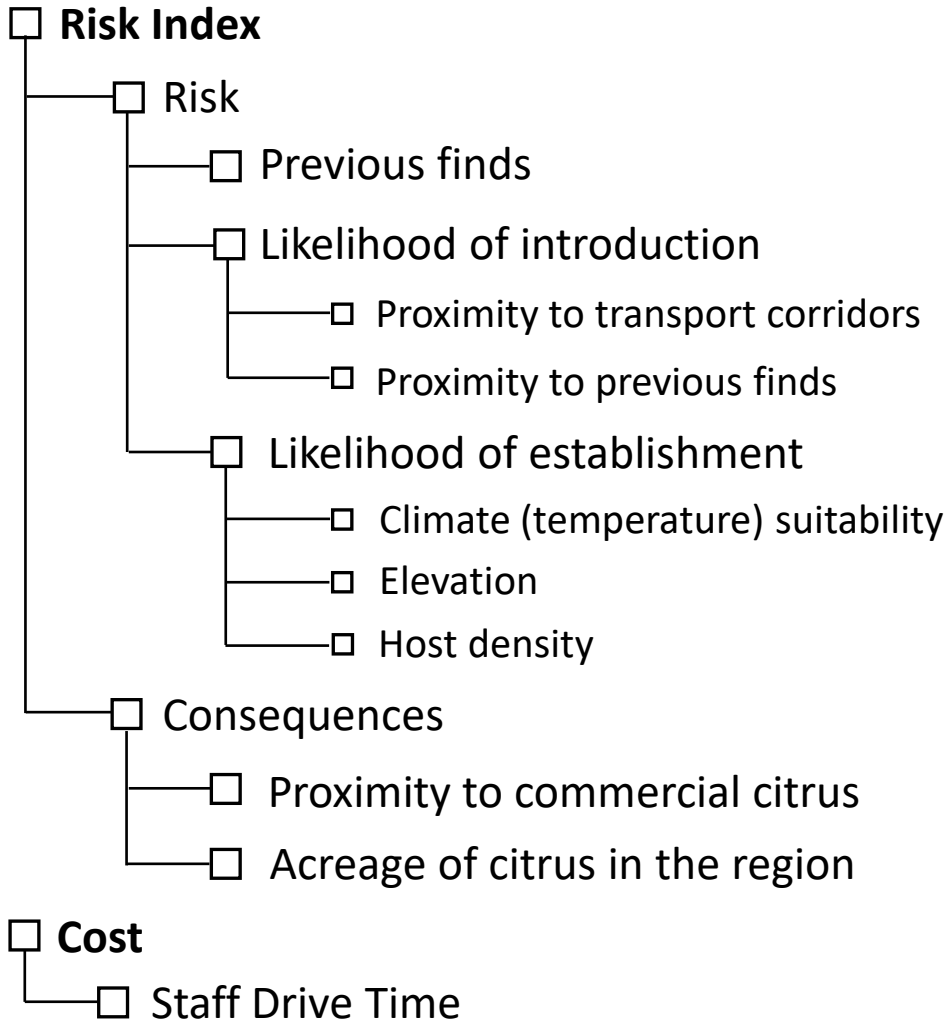
Optimizing CDFA's winter ACP trapping in: Marin, San Francisco, Santa Clara, Yolo, and Yuba

- ✓ Data-driven / evidence-based
- ✓ Objective
- ✓ Transparent
- ✓ Generalizable to other locations

CITRUS PEST & DISEASE PREVENTION DIVISION
CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE

Method:

Balancing ACP Risk versus Trapping Cost



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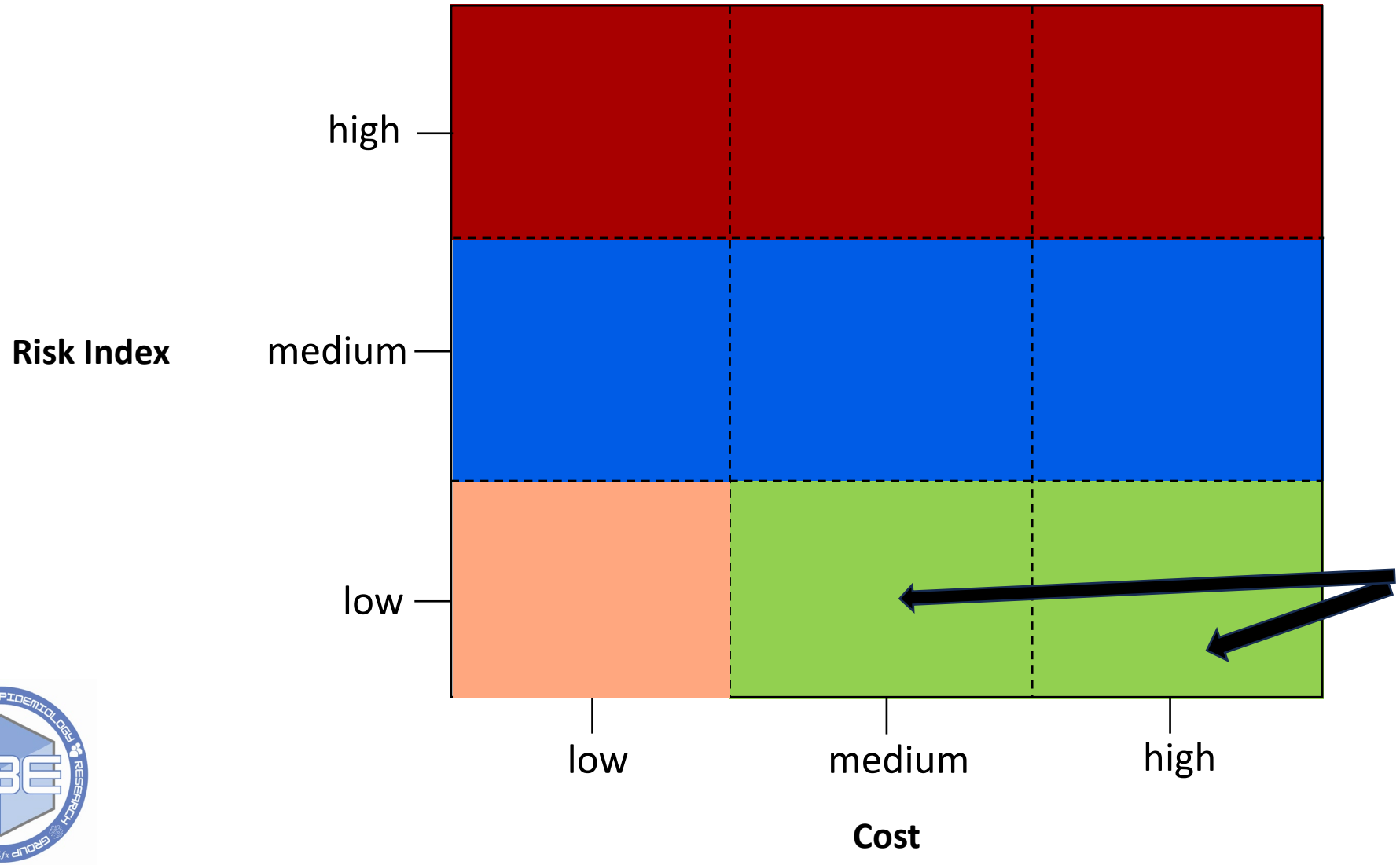
Method (Continued):



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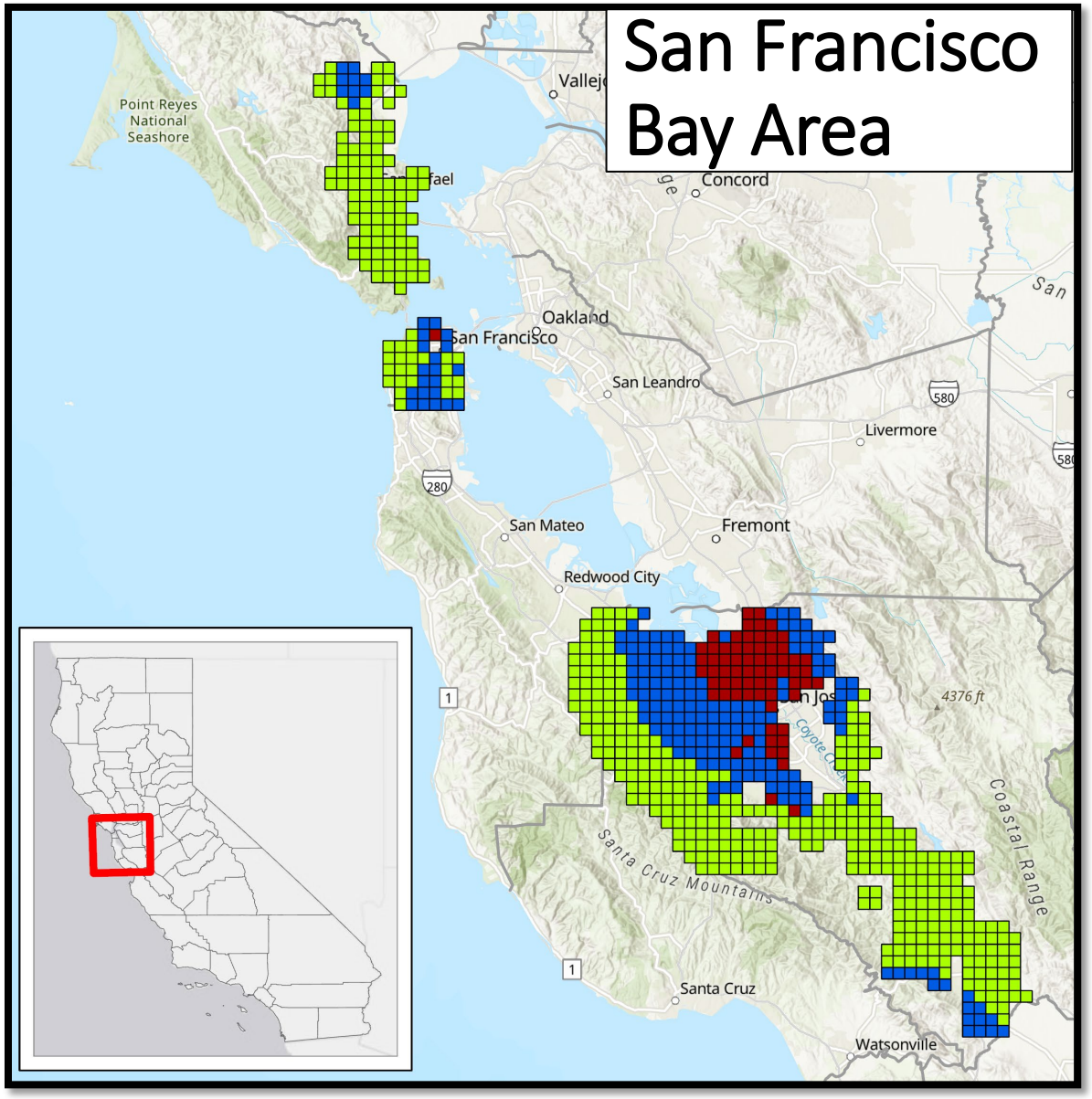
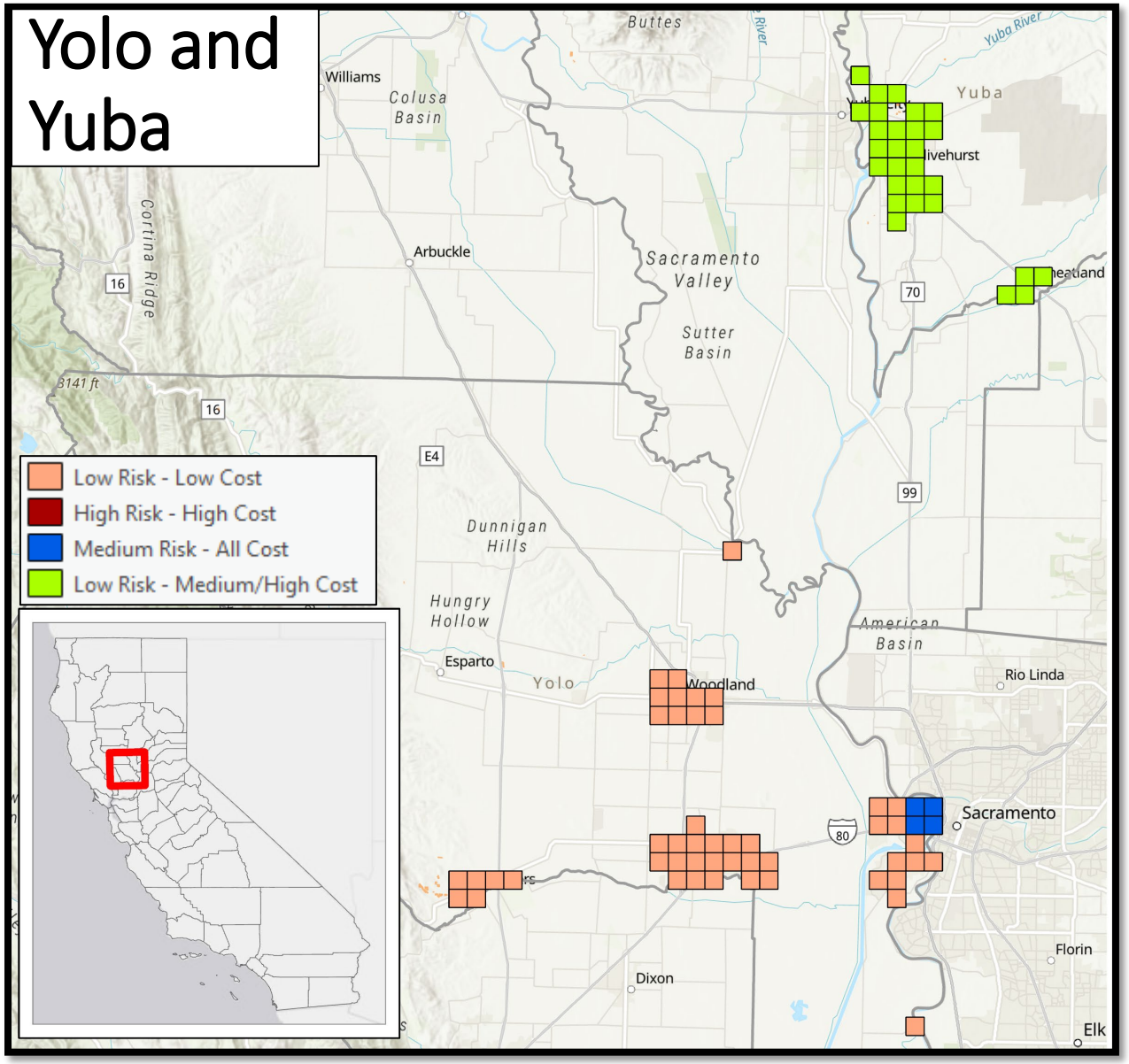
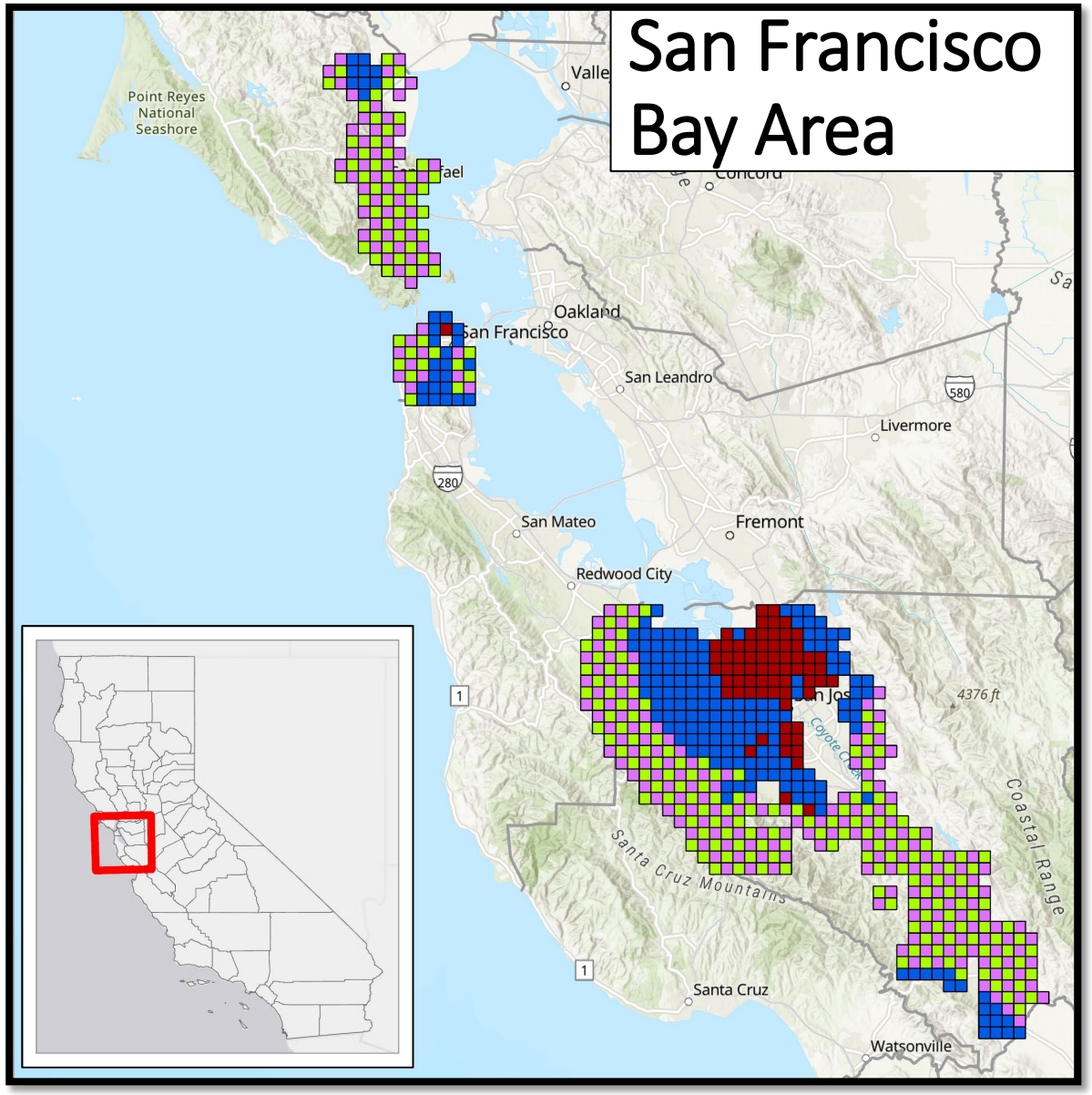
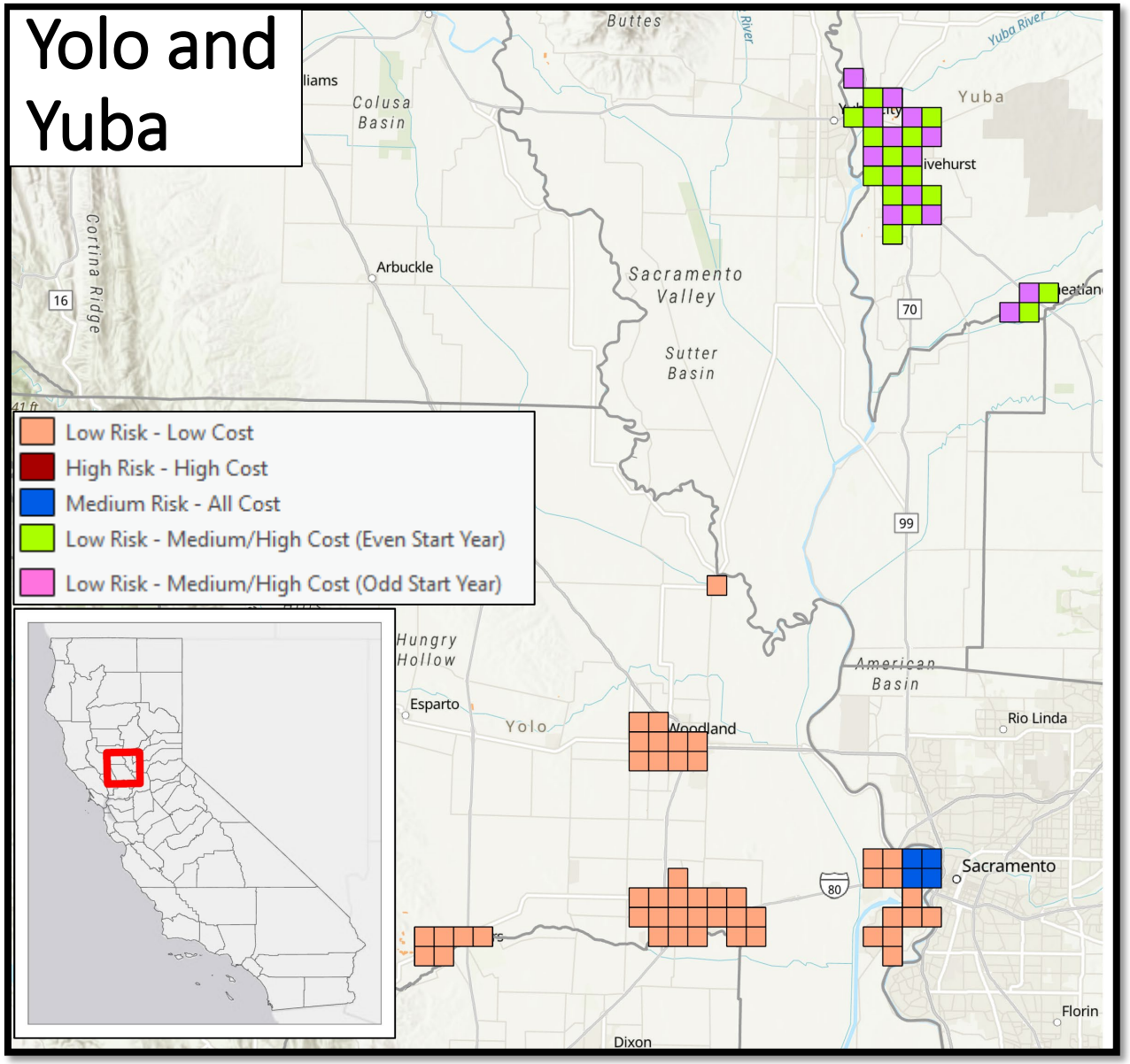
Results:


San Francisco Bay Area
Point Reyes National Seashore
Concord
Oakland
San Francisco
San Leandro
Livermore
San Mateo
Fremont
Redwood City
Santa Cruz Mountains
Coastal Range
Santa Cruz
Watsonville
4376 ft


Yolo and Yuba
Low Risk - Low Cost
High Risk - High Cost
Medium Risk - All Cost
Low Risk - Medium/High Cost
Williams
Colusa Basin
Buttes
Yuba River
Yuba
Arbuckle
Cortina Ridge
Sacramento Valley
Sutter Basin
8141 ft
Dunnigan Hills
Hungry Hollow
American Basin
Esparto
Yolo
Woodland
Rio Linda
Sacramento
Dixon
Florin
Elk

Application:





Recommendation:

- Adopt a rotating year trapping strategy in low-risk grids with more than two hours per day of driving time.
- This strategy reduces CDFA winter trapping effort by up to 30%.

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