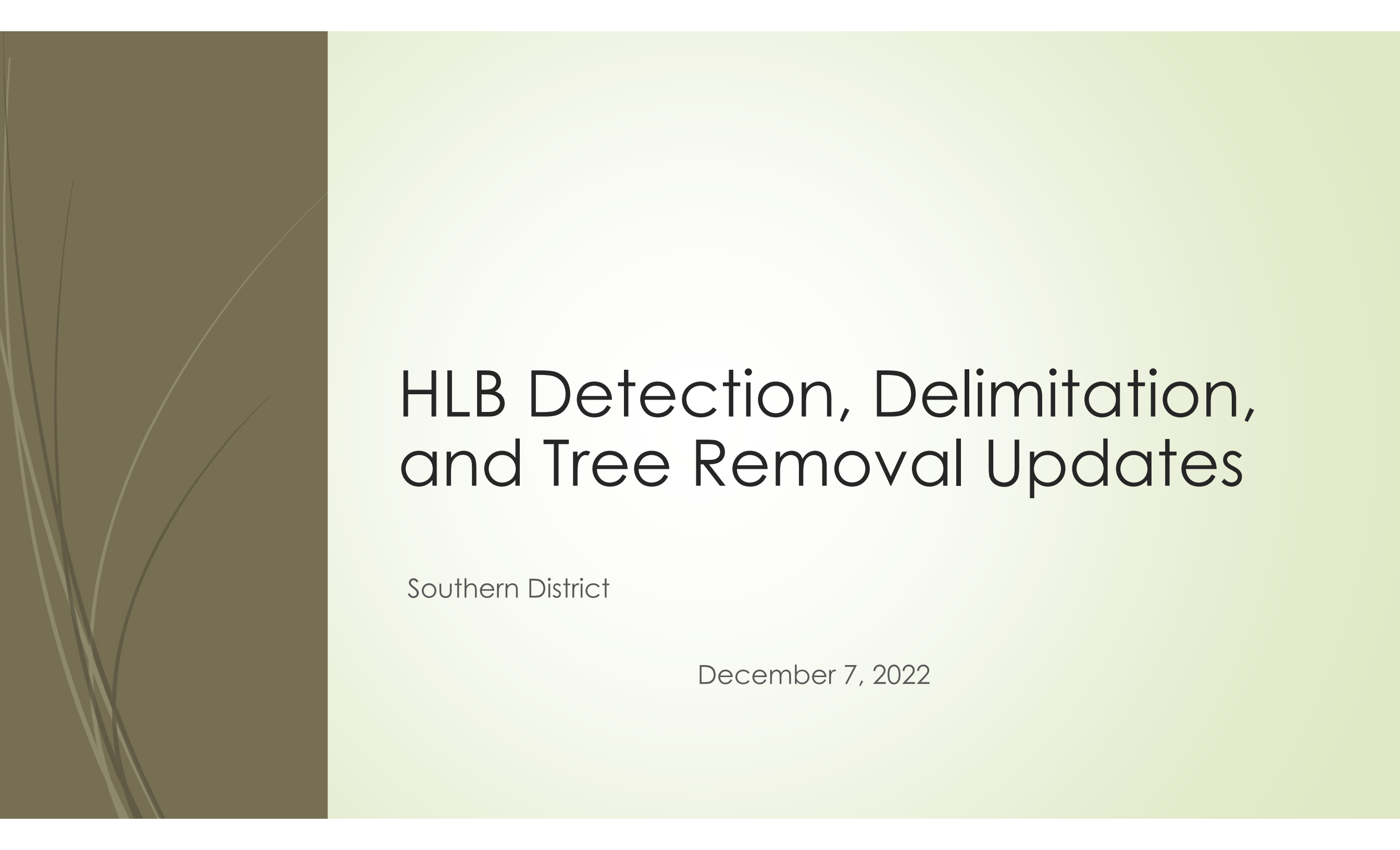




HLB Detection, Delimitation, and Tree Removal Updates

Southern District

December 7, 2022



Detection Updates

- October

- First HLB positive tree in Chino was detected.

- November

- First CLas+ ACP in Costa Mesa.
 - First HLB positive tree detection in the city of Bellflower.
 - First HLB positive tree detection in Monterey Park.

- No expansion of HLB quarantine boundary.

HLB Delimitation Survey I

Areas	Total Properties	Properties Surveyed	No Host Properties	Refusals/No Contact-Pending	Completion Percentage
Duarte(12-13,15,17-18)	268	242	46	3/19	99%
Whittier (46-47)	223	78	36	3/7	36%
Pico Rivera (31,36,38)	547	304	149	18/258	59%
Paramount (5)	59	27	14	0/22	46%
El Monte (4)	206	183	44	10/13	100%
La Habra Heights (2)	29	23	3	3/3	100%
La Mirada (9)	127	95	57	8/6	81%

HLB Delimitation Survey II

Areas	Total Properties	Properties Surveyed	No Host Properties	Refusals/No Contact-Pending	Completion Percentage
Jurupa Valley (5)	62	57	23	1/4	100%
Corona (15-20)	1,154	879	585	21/296	78%
Chino (1-2)	362	171	81	6/192	49%
Westminster (1-2)	186	120	28	3/13	65%
Orange (54,57,59)	59	17	9	0/1	29%
Garden Grove (3)	15	15	14	0/0	100%
Santa Ana (1,7,15,46,92)	48	26	3	2/1	58%
Anaheim(18,20,52,94,96)	475	60	32	1/3	Currently working

Quadrant Survey 2022

(Find sites, Adjacent, Inconclusive samples)

County	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Los Angeles	228	220	51	278	556	417	266	508	485	464	267	
Orange	1,057	773	702	644	454	608	598	891	251	234	670	
Riverside	69	50	4	9	101	111	473	225	99	211	85	
San Bernardino	224	109	219	103	24	0	24	222	198	383	63	
San Diego	29	0	18	0	0	0	65	88	0	4	232	
Imperial	0	0	0	0	0	0	0	0	0	0	0	
Total	1,607	1,152	994	1,034	1,135	1,136	1,426	1,934	1,033	1,296	1,317	

HLB Positive Trees (October and November 2022)

County	Detected	Removed	Cumulative Pending
Los Angeles	84	52	76
Orange	98	66	45
San Bernardino	7	14	4
Riverside	16	34	8
San Diego	0	0	0
TOTAL	205	166	133



California Department of Food & Agriculture Plant Pest Diagnostics Center HLB Testing Program 2022

Total number of plant and ACP samples per month – Fig. 1

HLB yearly totals – Fig. 2

Tally of positive detections by county and city – Tables 1-3

Tally of positive detections by city per year – Tables 4

If you have any questions, please call or email me at 916-738-6710 lucita.kumagai@cdfa.ca.gov.

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

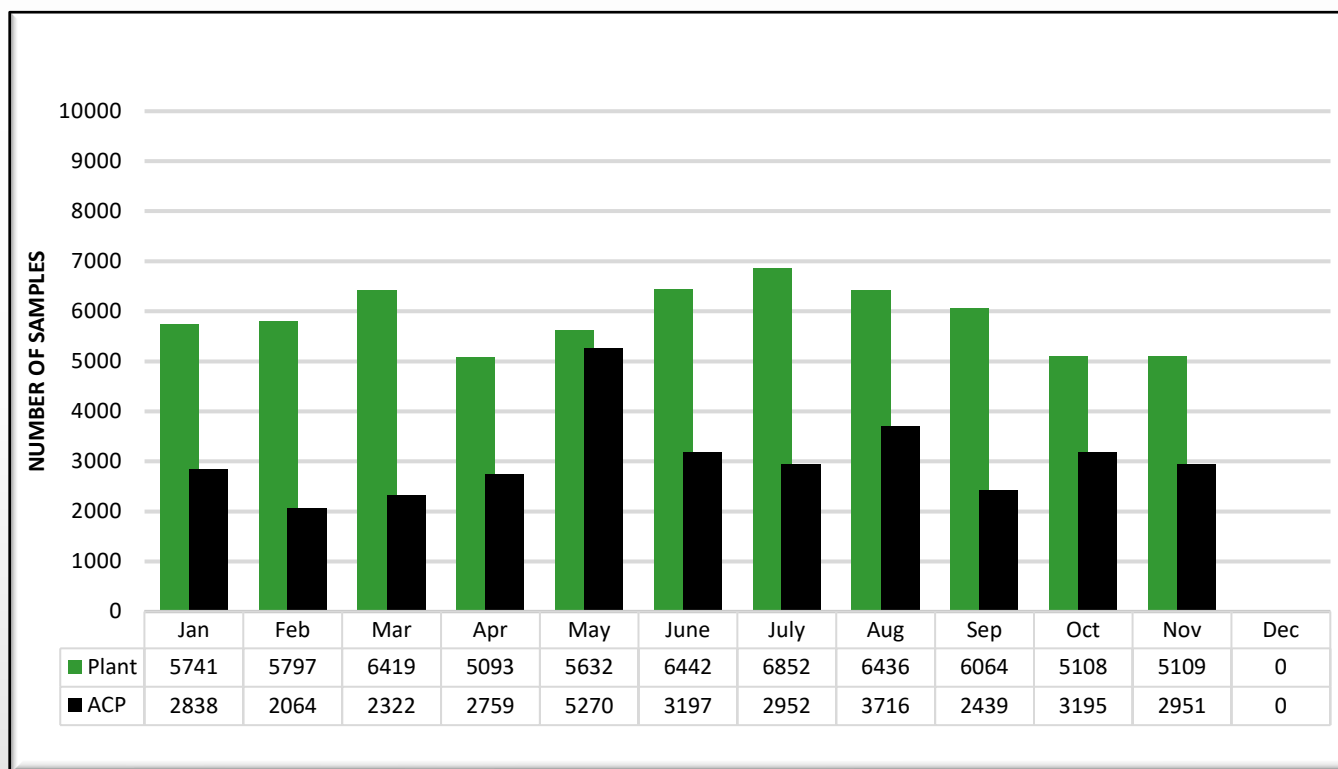
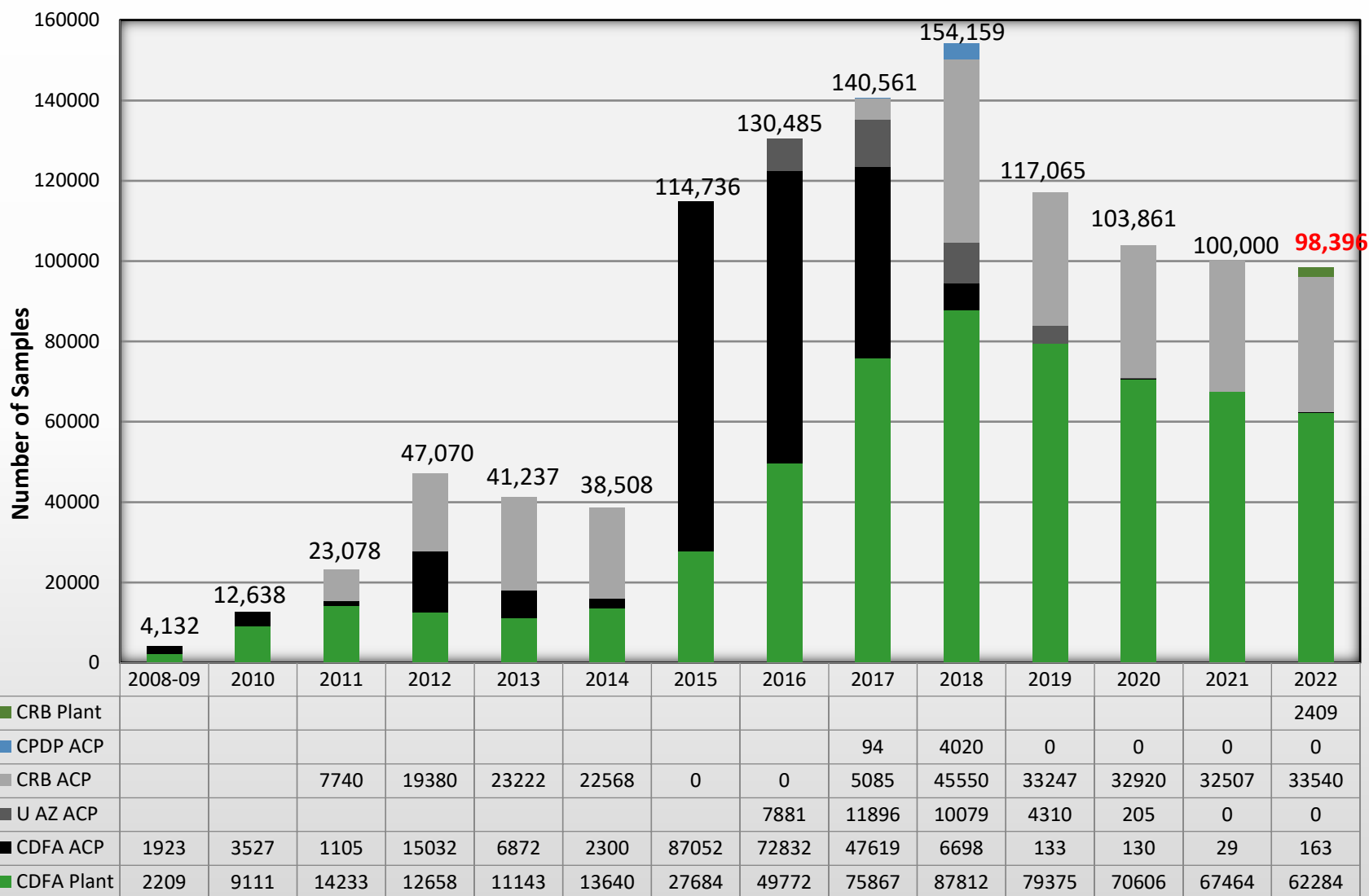


Fig 2. Number of samples tested for HLB per year from 2008 - November 2022.



Combined total of plant and ACP samples tested from 2008 – 2022 is 1,117,865.

Table 1. Tally of positive sites, positive trees, and CLas+ ACP samples by county and city as of 12/2/2022.

HLB Positive Detections			
City	# Sites	# Trees	# ACP samples
Orange County			
Garden Grove	484	754	64
Santa Ana	421	592	57
Anaheim	487	781	112
Westminster	343	554	20
Orange	115	158	19
Tustin	12	15	3
Fountain Valley	6	10	2
Huntington Beach	22	25	2
Placentia	9	8	3
La Habra	3	4	1
Fullerton	4	5	3
Yorba Linda	3	2	2
Irvine	6	6	3
Costa Mesa	2	0	2
Total	1917	2914	293
Los Angeles County			
Whittier	174	215	35
Pico Rivera	128	147	49
Montebello	72	99	2
San Gabriel	67	83	7
Rosemead	32	37	7
Paramount	29	34	5
La Mirada	31	44	6
La Puente	11	11	7
Norwalk	10	6	5
Cerritos	3	2	2
Hacienda Heights	2	2	1
Lakewood	5	6	0
Duarte	37	43	3
El Monte	17	19	8
South El Monte	12	25	4
Alhambra	1	1	0
Temple City	3	2	2
Compton	1	1	0
Glendora	1	0	1
South Gate	7	6	4
Long Beach	5	4	2
Los Angeles	1	0	1
Downey	11	13	4
Carson	4	3	1
Monrovia	14	19	0
Rowland Heights	2	0	2
Pomona	10	12	2
Artesia	1	1	0
Bellflower	2	2	0
Monterey Park	1	1	0
Total	694	838	160
Riverside County			
Corona	51	84	19
Riverside	25	27	5
Eastvale	1	1	0
Jurupa Valley	15	14	4
Moreno Valley	1	1	0
Total	93	127	28
San Bernardino County			
Rancho Cucamonga	3	7	2
Montclair	6	6	0
Colton	6	11	3
San Bernardino	2	1	1
Ontario	54	113	18
Fontana	20	26	9
Chino	2	1	1
Total	93	165	34
San Diego			
Fallbrook	1	0	1
Oceanside	4	9	4
Pauma Valley	1	0	1
Vista	1	0	1
Total	7	9	7
Grand Total	2804	4053	522

Table 2. Percent positives per county

County	Sites	Trees	ACP
Orange	68.4%	71.90%	56.1%
LA	24.8%	20.68%	30.7%
Riverside	3.3%	3.13%	5.4%
San Bernardino	3.3%	4.07%	6.5%
San Diego	0.2%	0.22%	1.3%
Total	100%	100%	100%

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

Sample type	Trees		ACP	
Risk-based Survey	177	4%	258	49%
HLB Response	3876	96%	264	51%
Total	4053	100%	522	100%

Table 4. Annual tally of positive trees per city from 2012 – 2022 as of 12/2/2022

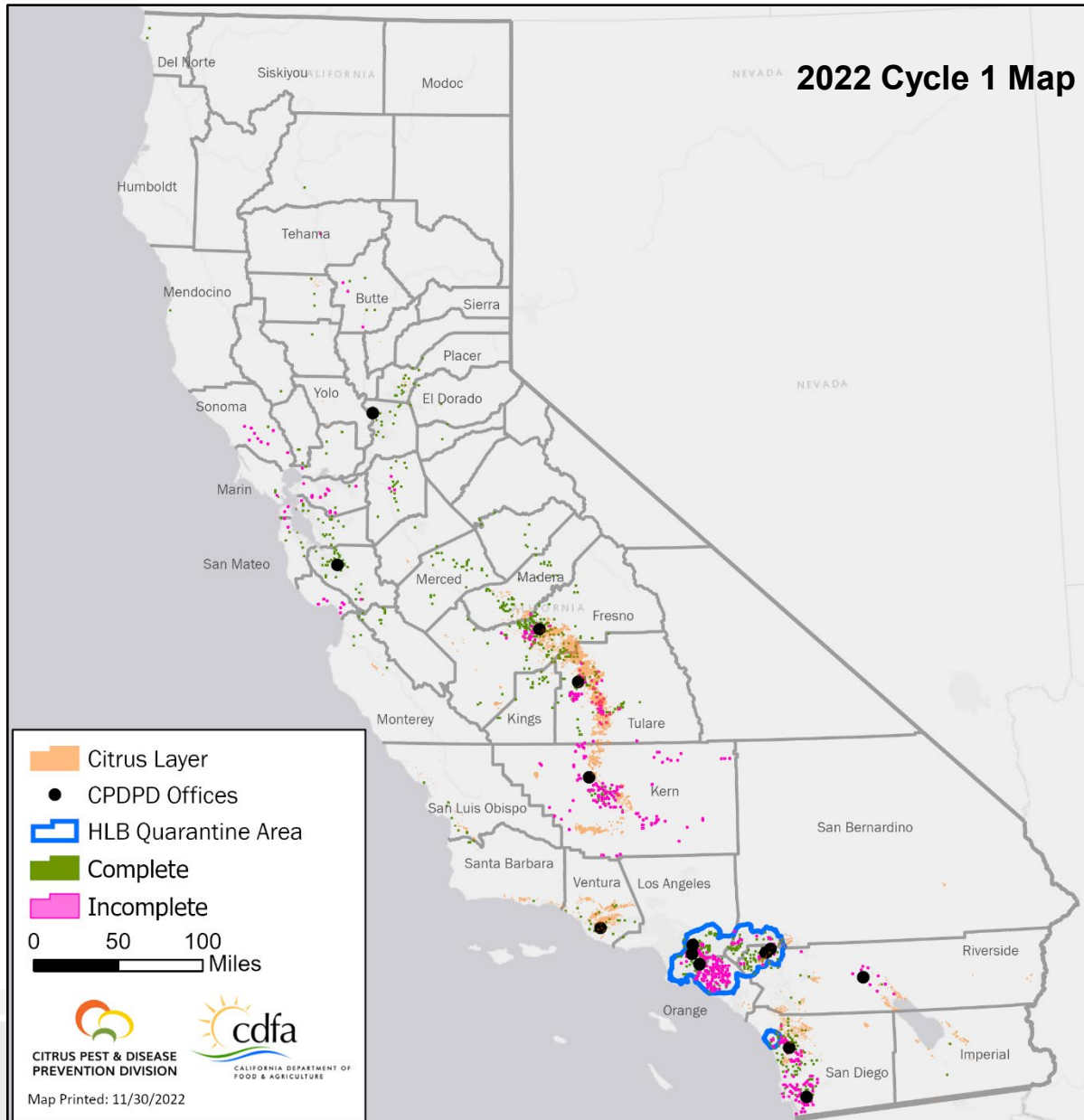
County	Total
Orange	2914
Los Angeles	838
Riverside	127
San Bernardino	165
San Diego	9
Grand Total	4053

HLB Positive Tree Detections										
City	2012	2015	2016	2017	2018	2019	2020	2021	2022	Total
Anaheim				132	109	90	21	200	229	781
Garden Grove				13	348	115	116	34	128	754
La Habra				1	0	2	0	0	1	4
Fullerton				1	0	0	0	0	4	5
Santa Ana					44	168	217	99	64	592
Westminster					15	175	3	39	322	554
Yorba Linda					1	0	0	1	0	2
Orange					31	14	36	43	34	158
Tustin					5	8	1	0	1	15
Huntington Beach						6	2	17	0	25
Placentia						7	0	0	1	8
Fountain Valley							10	0	0	10
Irvine							1	1	4	6
Costa Mesa										
Hacienda Heights	1	0	1	0	0	0	0	0	0	2
San Gabriel		10	17	33	10	6	0	1	6	83
Cerritos			1	1	0	0	0	0	0	2
Pico Rivera				67	35	18	10	1	16	147
Whittier				18	80	23	21	35	38	215
La Puente					0	3	0	0	8	11
Lakewood					1	1	0	4	0	6
Norwalk					1	0	2	1	2	6
Rosemead					17	11	0	0	9	37
Duarte					2	0	0	0	41	43
Temple City						1	0	0	1	2
Montebello						84	4	0	11	99
El Monte						1	1	0	17	19
Compton						1	0	0	0	1
Alhambra						1	0	0	0	1
La Mirada							7	6	31	44
Paramount							11	8	15	34
Long Beach								2	2	4
South Gate								2	4	6
Downey									13	13
Carson									3	3
Monrovia									19	19
Pomona									12	12
South El Monte									25	25
Artesia									1	1
Bellflower									2	2
Monterey Park									1	1
Glendora										
Rowland Heights										
Los Angeles										
Riverside				3	0	4	6	8	6	27
Corona						15	4	11	54	84
Eastvale							1	0	0	1
Moreno Valley							1	0	0	1
Jurupa Valley								1	13	14
Montclair						2	2	2	0	6
San Bernardino							1	0	0	1
Ontario							1	64	48	113
Colton							4	7	0	11
Rancho Cucamonga							5	2	0	7
Fontana									26	26
Chino									1	1
Oceanside								9	0	9
Fallbrook										
Pauma Valley										
Vista										
Total	1	10	19	269	699	756	488	598	1213	4053



Risk Research Survey Update
Operations Subcommittee Meeting
December 7, 2022

2022 Cycle 1



- Began June 2022
- 62% Complete
- Survey Complete in 21 of 42 Allocated Counties
- 24,363 Properties Visited
- 9,081 Properties Sampled
- 4,812 Entomology PDRs
- 5,594 Plant PDRs

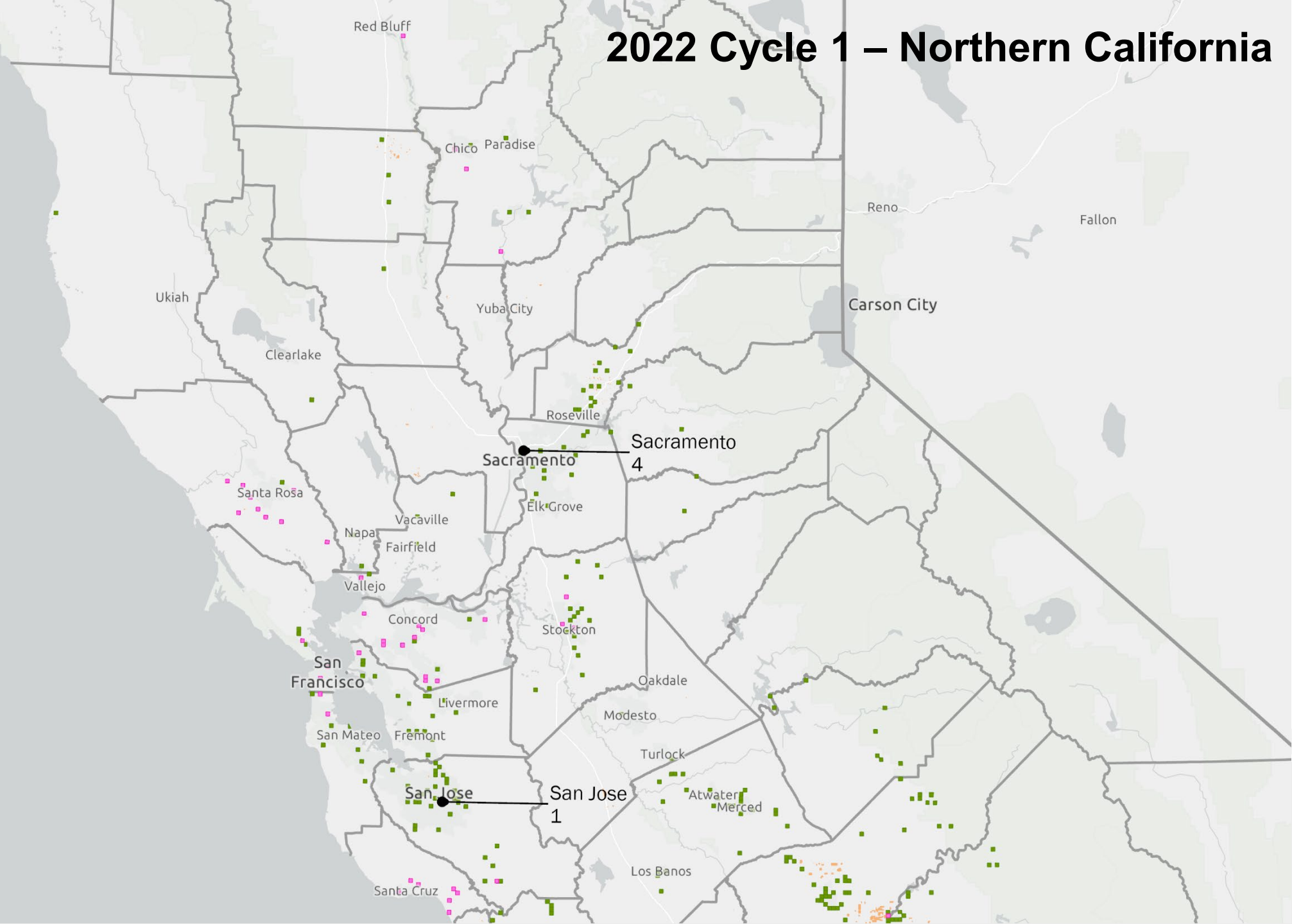
2022 Cycle 1 – Northern California

-  Citrus Layer
-  Risk Survey Staff / Office
-  HLB Quarantine Area
-  Complete
-  Incomplete

0 20 40
Miles



Map Printed: 11/30/2022



2022 Cycle 1 – Central California

 Citrus Layer

● Risk Survey Staff / Office

 HLB Quarantine Area

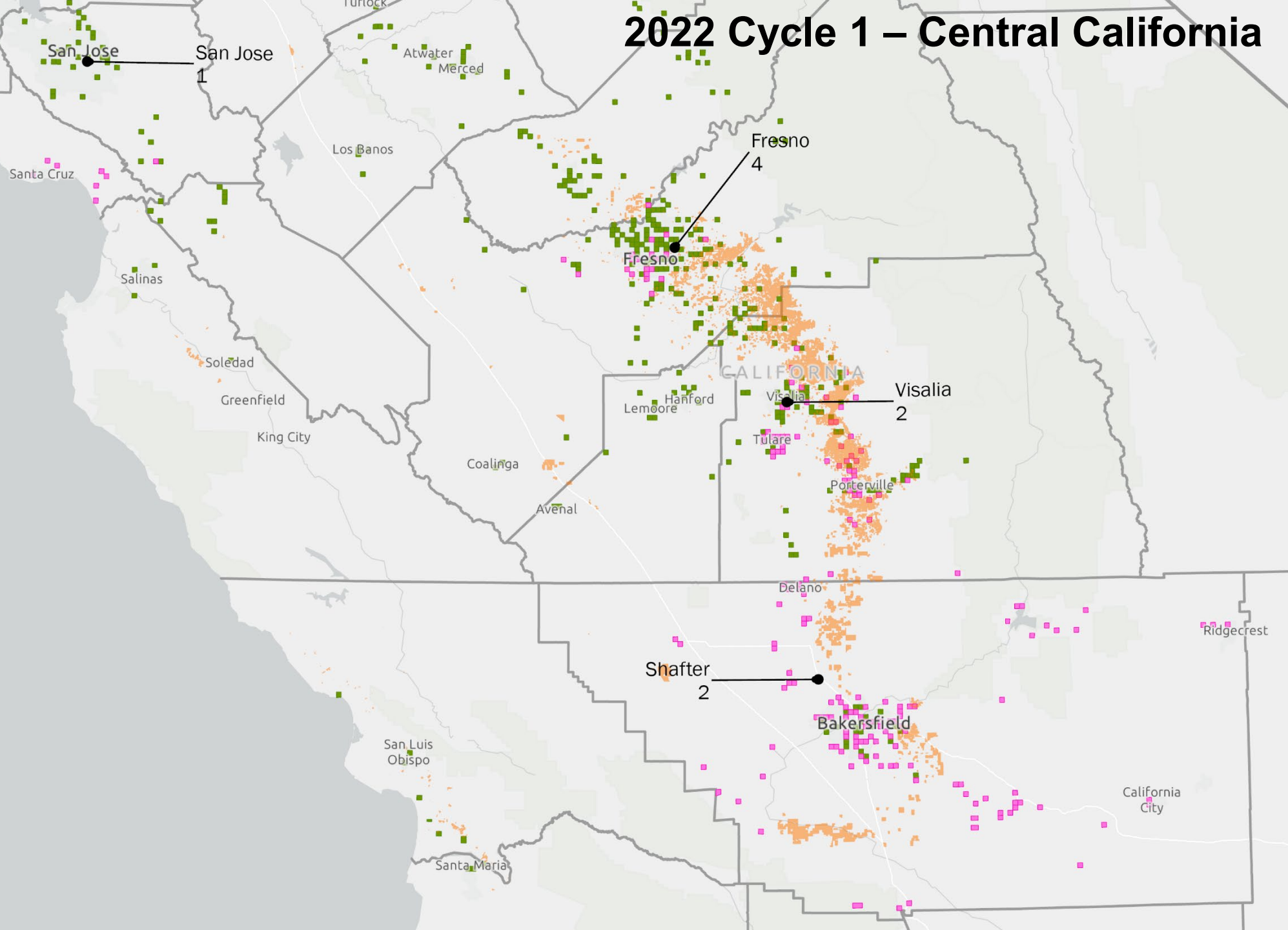
 Complete

 Incomplete

0 20 40
Miles



Map Printed: 11/30/2022



2022 Cycle 1 – Southern California

Citrus Layer

●

Risk Survey Staff / Office

HLB Quarantine Area

Complete

Incomplete

0

20

40

Miles

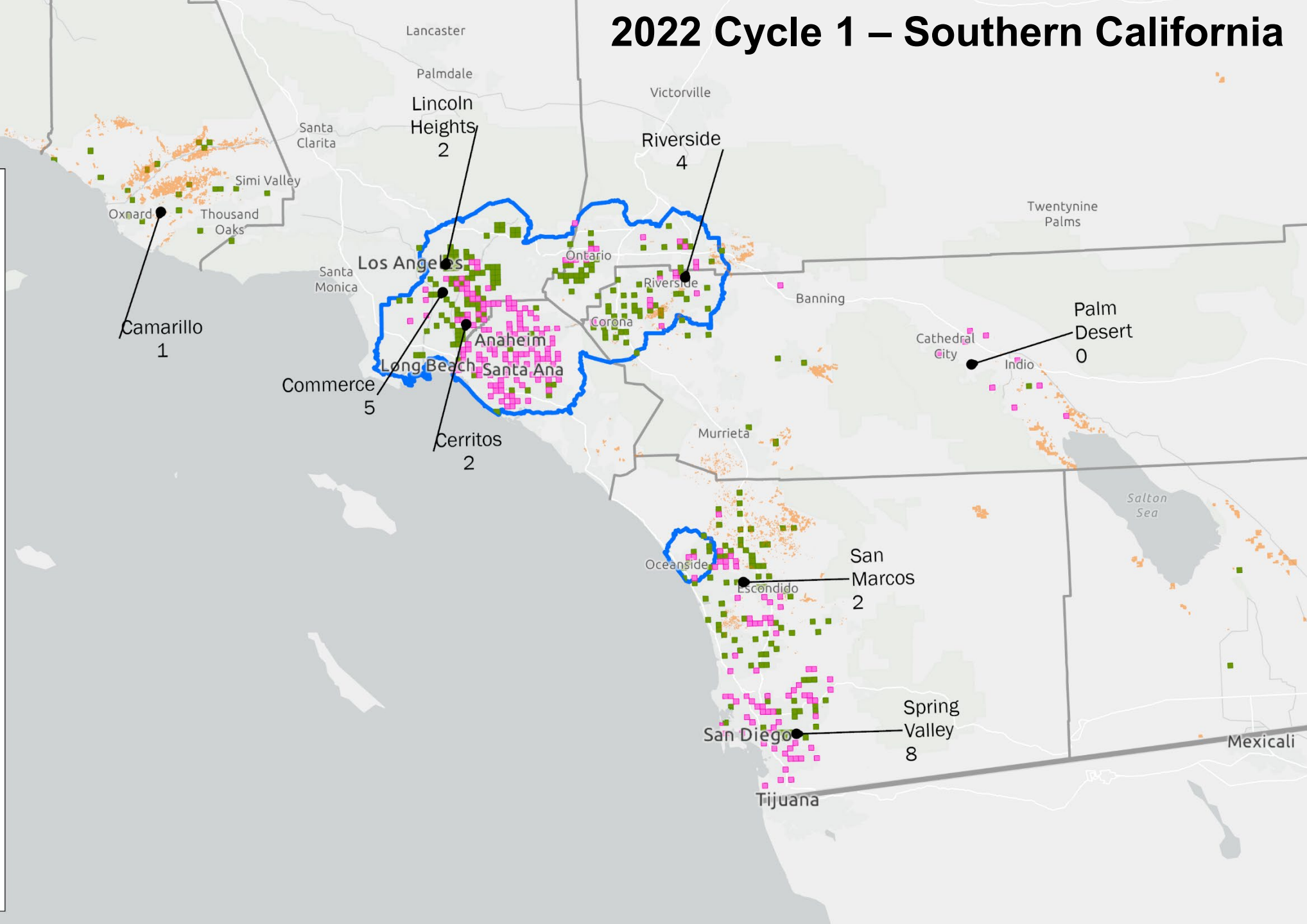


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PREVENTION DIVISION

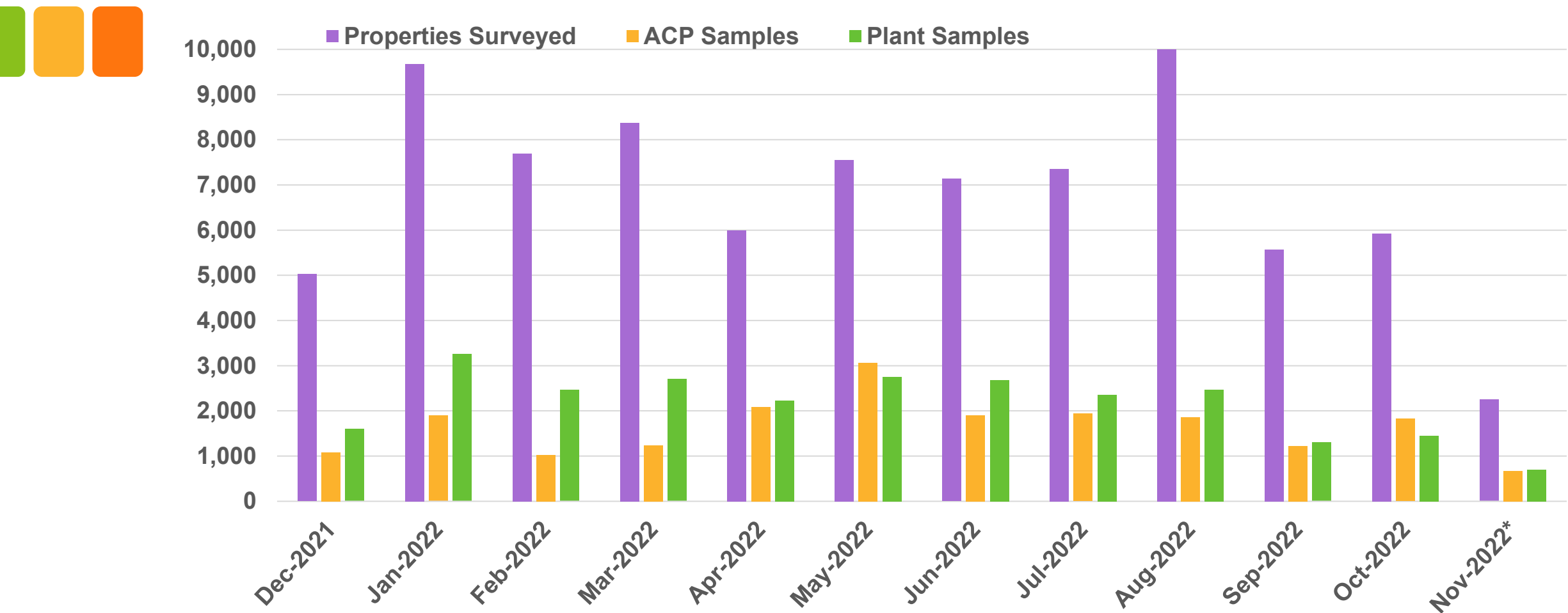


cdfa
CALIFORNIA DEPARTMENT OF
FOOD & AGRICULTURE

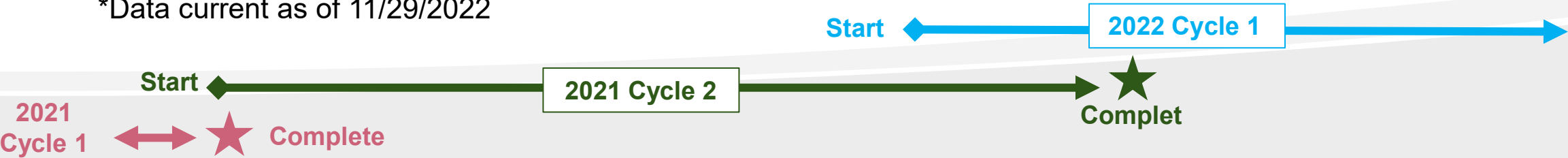
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Statewide Trends (2021 Cycle 1 and 2, and 2022 Cycle 1)



*Data current as of 11/29/2022



County Monthly Activity Report
October 2022

County	FY 2022 23 Budget Amount	Percent Expended	CAs Issued	Grower Inspections	Transporter Inspections	Packer/Processor Inspections	Fruit Seller Inspections	Regulatory Incidents	NOVs	NOPAs
Fresno	\$84,424.26	18%	17	0	16	1	0	0	0	0
Imperial	\$55,892.01	8%	0	3	6	3	0	0	0	0
Kern (*1)	\$70,000.00	0%	0	0	0	0	0	0	0	0
Kings (*1)	\$20,035.30	0%	0	0	0	0	0	0	0	0
Los Angeles	\$263,358.11	5%	0	1	0	0	38	0	0	0
Monterey (*1)	\$14,227.50	0%	0	0	0	0	0	0	0	0
Orange (*1)	\$87,987.88	0%	0	0	0	0	0	0	0	0
Riverside (*1)	\$680,306.63	0%	0	0	0	0	0	0	0	0
San Bernardino (*1)	\$29,334.95	0%	0	0	0	0	0	0	0	0
San Diego (*1)	\$561,592.75	0%	0	0	0	0	0	0	0	0
San Luis Obispo	\$8,035.44	13%	0	0	0	0	0	0	0	0
Santa Barbara	\$15,147.08	5%	0	0	0	0	1	0	0	0
Tulare	\$340,031.38	10%	31	0	98	2	0	3	3	0
Ventura (*1)	\$200,951.41	0%	0	0	0	0	0	0	0	0
Total	\$2,431,324.70	3%	48	4	120	6	39	3	3	0

(*#) = number of invoices missing from reporting period



HLB Treatment Updates

Southern District

December 7, 2022



Treatment Updates

- Delimitation treatments were conducted in the areas of Irvine, Corona, Jurupa Valley, Montebello, Whittier, Pico Rivera, Norwalk, Duarte, Garden Grove, Santa Ana, Orange, Fountain Valley, and Anaheim.
- The winter cycle of Treatments Around Commercial Citrus Groves (TACCG) will take place between January and March 2023.
- Public meetings held in October and November:
 - To treat delimitation areas in Riverside and San Bernardino Counties: Oct 4, Nov 1, and Nov 30, 2022.
 - To treat delimitation areas in Los Angeles and Orange Counties: Oct 18 and Nov 22, 2022.

HLB Delimitation Treatments I

Areas	Total Properties	Properties Treated	No Host Properties	Refusals/ No Contact	Completion
Corona (16-18)	723	149	501	11/61	100%
Chino (1)	129	64	57	7/1	100%
Jurupa Valley (4-5)	92	40	47	0/5	100%
Duarte (19-23)	221	127	75	15/3	100%
Whittier (47-52)	195	78	108	3/7	100%
Montebello (1-2, 5-6)	135	65	65	3/1	100%
Norwalk (4,8-9)	227	129	89	4/5	100%

HLB Delimitation Treatments II

Areas	Total Properties	Properties Treated	No Host Properties	Refusals/ No Contact	Completion
Pico Rivera (36,37,49)	139	74	53	7/5	100%
Irvine (3)	198	95	89	12/2	100%
Orange (58-59,62-64)	933	227	674	17/15	100%
Fountain Valley (2)	317	194	105	11/16	100%
Anaheim (89,96,97)	603	165	418	8/12	100%
Santa Ana (23,26,28,35,45)	268	183	61	5/18	100%
Santa Ana (91-93)	409	180	199	12/19	100%

Southern District Staffing - Updates

County	Permanent	Seasonal	Pending Hiring	Hiring Status
Los Angeles	31	6	One Ag Tech II and four PPA I (LT)	Three PPA I (LT) needs readvertise, one Ag Tech II needs to be posted. One new hire PPA I(LT) starting Dec 1, 2022.
Orange	13	5	One PPA III, Two PPA I, and Five PPA I (LT)	Reviewing applications for PPA III. Need to readvertise PPA I and four PPA I(LT). One PPA I and one PPA I (LT) will start on Dec 1, 2022.
Riverside and San Bernardino	15	15	Eight PPA I (LT), One PPA II and One PPA III	Reviewing applications for all.
San Diego and Imperial	19	1	Three PPA I (LT)	PPA I (LT) needs to be readvertised to get new applications.

Staff Distribution By Projects

Counties	Multi-Pest Surveys	ACP/HLB Treatments and Tree Removals	ACP/HLB Regulatory
Los Angeles and Orange	32	17	4
Riverside and San Bernardino	17	9	4
San Diego and Imperial	16	2	2



Central District Update

Operations Subcommittee Meeting

December 7, 2022

Central District

- **County ACP Detections**
- ACP detections from September 7, 2022 – November 30, 2022

County	# Detections*	Treatment	Public Meeting
Fresno	1	No – Reg. Incident	No
Kern	80	Yes	Yes
Madera	1	Yes	Yes
San Luis Obispo	9	Yes	Yes
Tulare	10	Yes	Yes



*Detections = PDR's, not individual ACP counts



Central District Update

- **Biocontrol releases**

County	September	October	November	Total
Fresno	4,000	4,100	-	8,100
Kern	6,900	6,700	32,000	45,600
Madera	-	-	3,200	3,200
Santa Barbara	8,400	12,300	9,600	30,300
San Luis Obispo	9,600	-	4,800	14,400
Tulare	-	3,200	6,400	9,600
Total	28,900	26,300	56,000	111,200



Central District Update - Projects

Office	Survey	Trapping	Treatment
Fresno	5	5	2
Visalia	2	4	2
Shafter	2	3	4
Camarillo	1	2	5



Central District Update - Staffing

County	Total Perm Staff (current)	Pending Hiring (vacancies)	Hiring Status
Fresno County (Fresno)	10	1 ES 2 PPA I	Interviews scheduled
Kern County (Shafter)	5	3 PPA I	In process
Tulare County (Visalia)	8	1 APCS	In process
Tulare County (Visalia Regulatory)	1	--	--
Ventura County (Camarillo)	7	1 PPA II 2 PPA I 1 ES 1 APCS	All interviews conducted, candidate selection in process



Northern District Update
Operations Subcommittee Meeting
Dec 7, 2022

Northern District Update | Trapping and Biocontrol

Detection Traps

Winter trapping resumed in November in 20 counties.
Year-round trapping continues in 3 counties.

Delimitation Traps

Alameda County (Ends Dec)	127
Santa Clara County	625

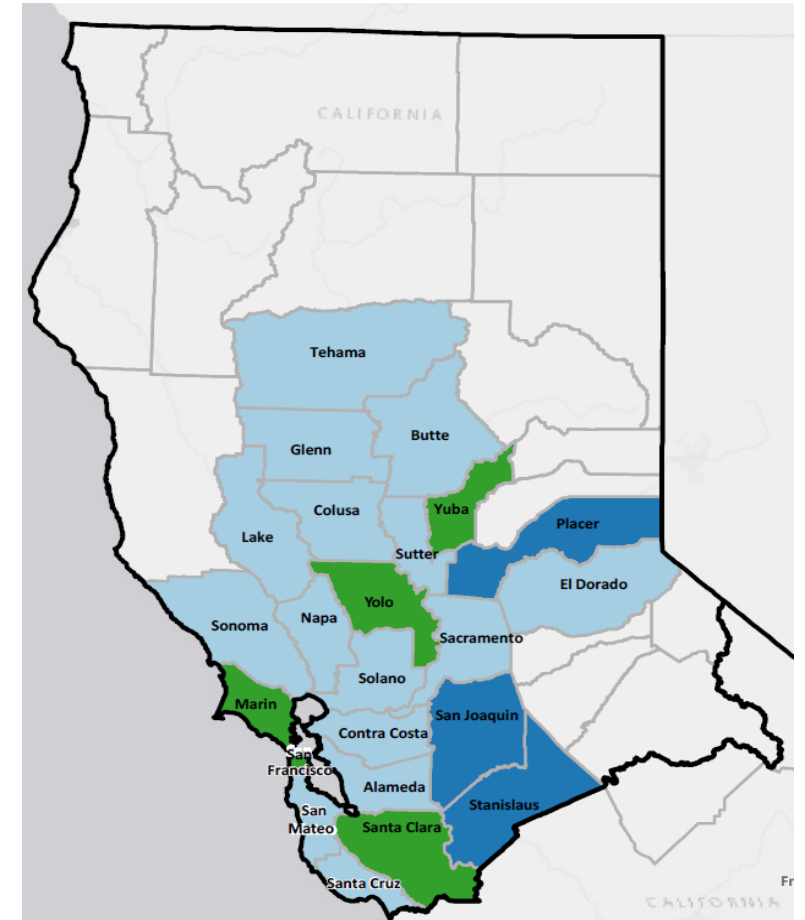
Biocontrol

Number of <i>Tamarixia radiata</i> (since 7-2020)	170,000
--	---------

Number of Properties	369
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Average 5,500 released per month

Data updated 11/22.



ACP Trapping

- CDFA
- County (Winter)
- County (Year-round)

CPDPD
Administrative
District

Northern District Update | Treatment

San Jose Treatment

- 5 nymph find sites and adjacent properties within 50m. 68 properties total.
- Using CDFA staff and equipment.
- Public meeting Dec 8th.
- Treatment tentatively scheduled for Dec 13th.



Northern District Update | Risk Survey 2022 Cycle 1

Completed	In Progress
Amador	Alameda
Lake	Contra Costa
Mendocino	Marin
Shasta	Sonoma
Stanislaus	San Francisco
Napa	San Joaquin
Placer	San Mateo
Sacramento	Santa Clara
Del Norte	Santa Cruz
Glenn	Tehama
Colusa	Butte
El Dorado	Solano



Northern District Update | Staffing



Activity	Number of Staff
Risk Survey	8
ACP Detection and Delimitation	4
Biocontrol	1
Regulatory	3



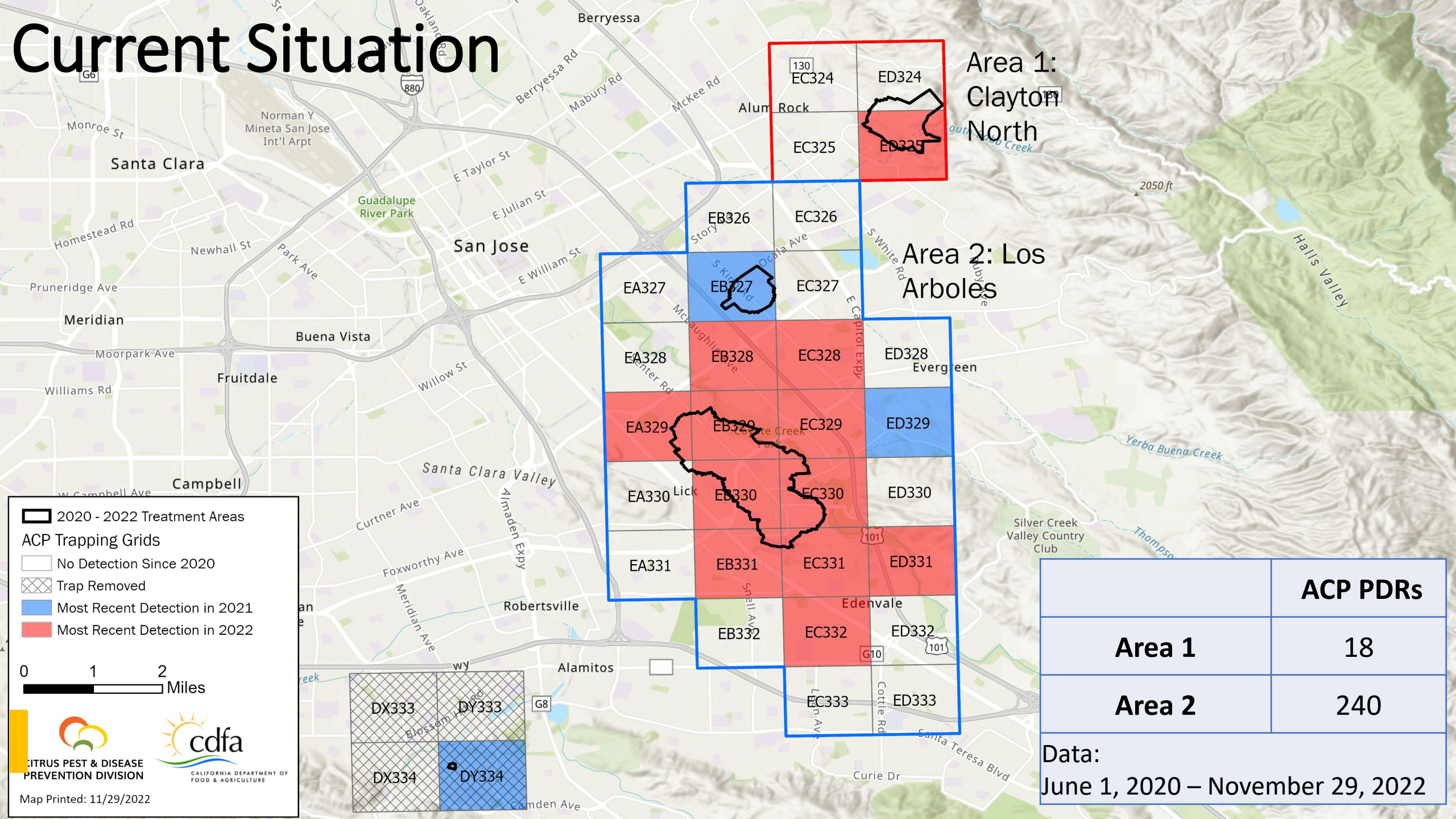
Update: Santa Clara County

Clayton North and Los Arboles Delimitations



Northern District
December 7, 2022





Current Situation

Area 1:
Clayton
North

Area 2: Los
Arboles



ACP Treatment Area Map 1

Printed 11/29/2022

Total 2020 Treatment Properties (3,508)

- | | |
|---|---|
| ■ Treated (49.5%) | ■ Refused (4.5%) |
| ■ No Host (40.9%) | ■ No Contact (4.0%) |

0 100 Meters

This map does not provide actual physical locations. However, this map provides a model of full treatment based on historical data.

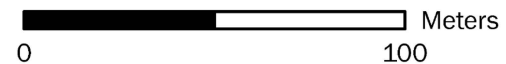




ACP Treatment Area Map 2

Printed 11/29/2022

Total 2020 Treatment Properties (3,508)



This map does not provide actual physical locations. However, this map provides a model of full treatment based on historical data.



Data Department Update

Rick Dunn

CRB Director of Data and Information Management

12/7/2022

Data Management Department Activity,

December 7, 2022

Richard Dunn - Data, Information & Management Director

UCKAC GIS Facility

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

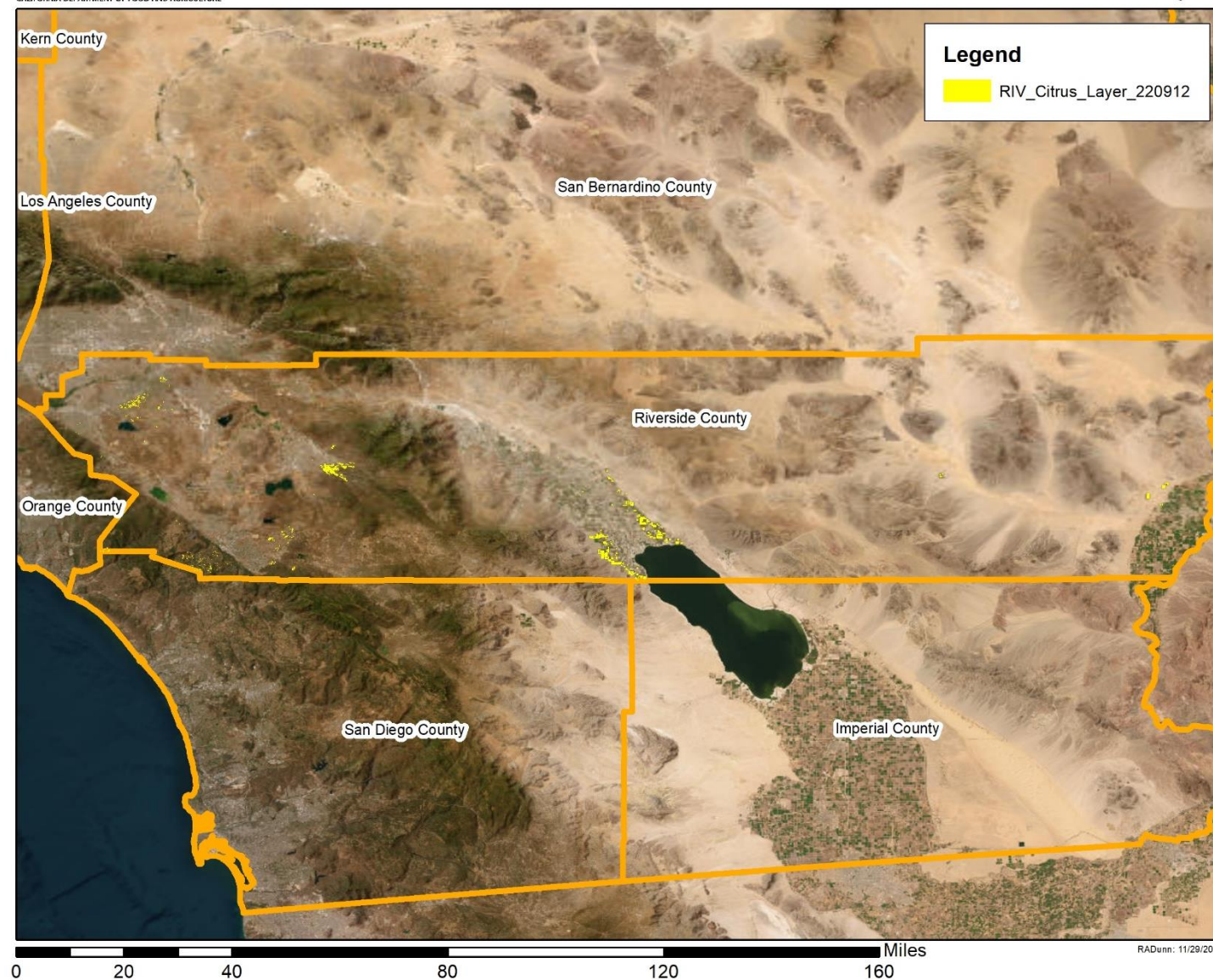
CRB Data Department

- 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. Riverside and San Bernardino counties have been completed. San Diego and Imperial Counties are in progress. Director is collaborating with CDFA PDAS and CPDPD GIS staff on development of a NOMAD replacement system. Initial beta testing of the new iPhone app will begin shortly.
- GIS Analyst Nancy Ying is conducting routine data scrubbing, quality control, and map production tasks.
- Search for new DATOC Program Manager continues. Former DATOC Analyst Dr. Sandra Olkowski is helping out in the interim.
- Staff continue to support the CPDPP commercial grove trapping / sampling program. Supplying trappers with individualized GIS Trapsite and Samplesite 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, CPDPP Sampling progress maps, Trapping catch per day maps, Sampling close-up maps, and ArcGIS Online detection / collection heat maps, as well as monthly summary data, ACP situation data, and statistical reports.



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

Riverside County Citrus Layer

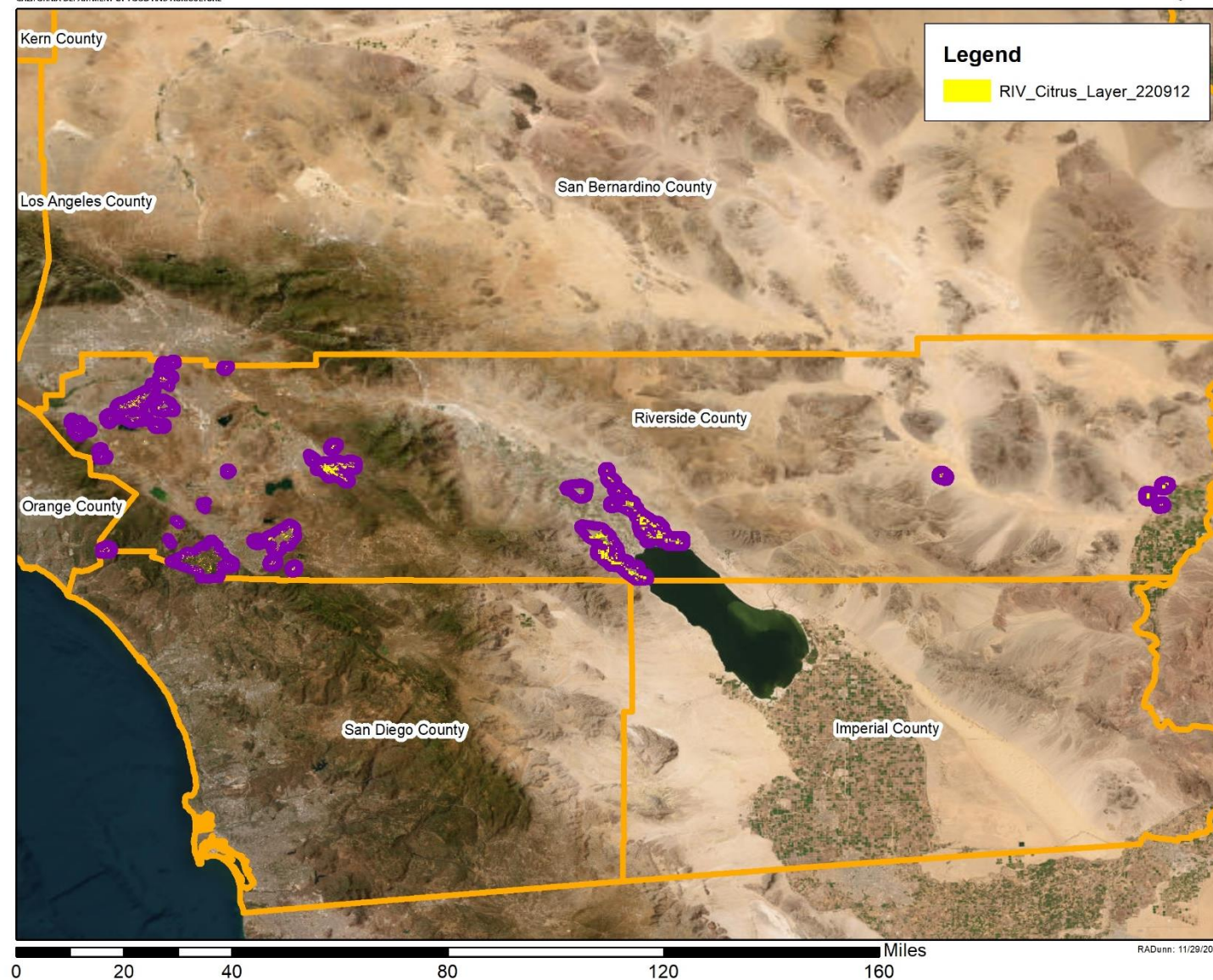


- 2,067 blocks mapped
- 16,469 acres total (based on GIS)
- 127 Pesticide Use Permits



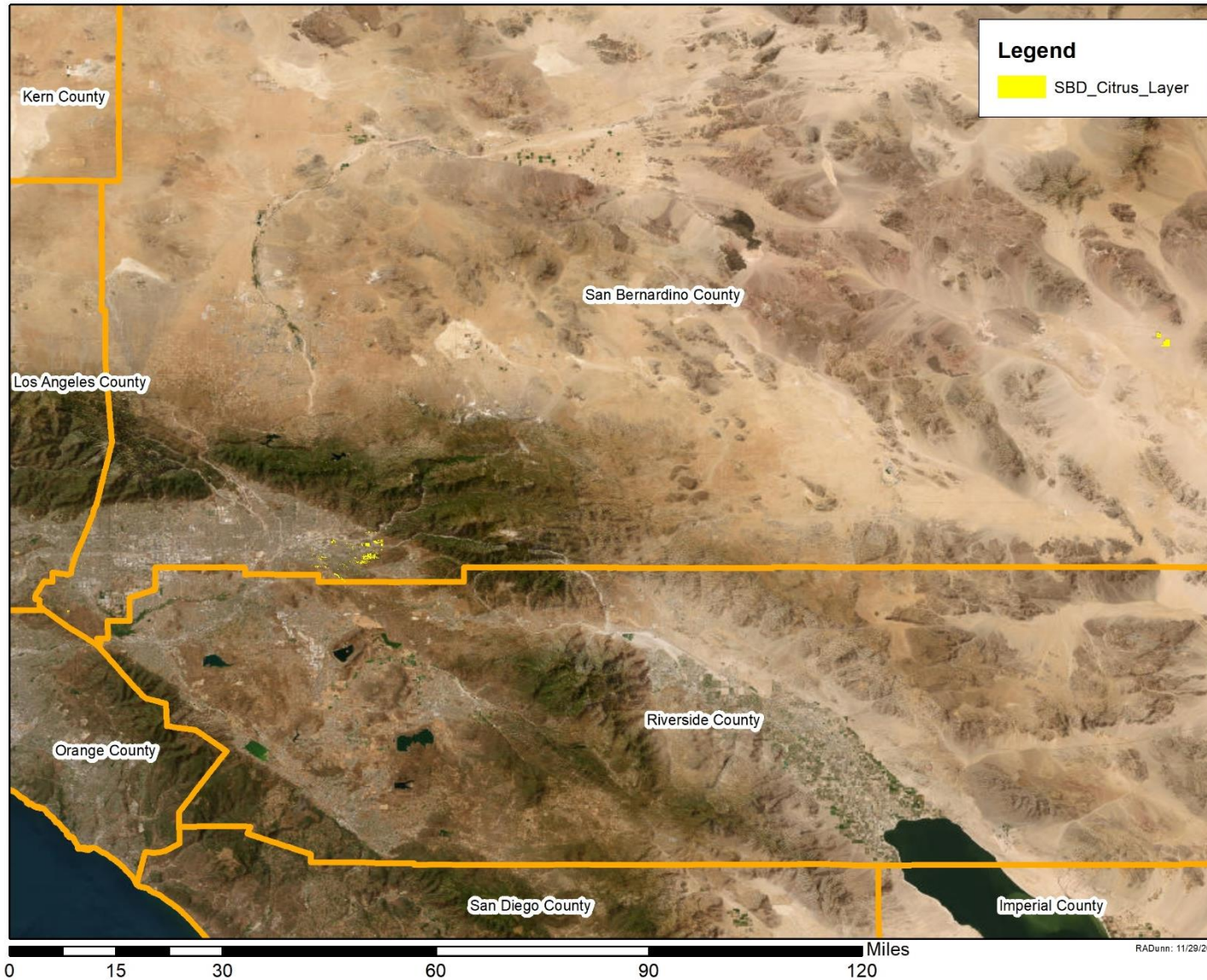
CITRUS PEST & DISEASE
PREVENTION DIVISION
CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE

Riverside County Citrus Layer



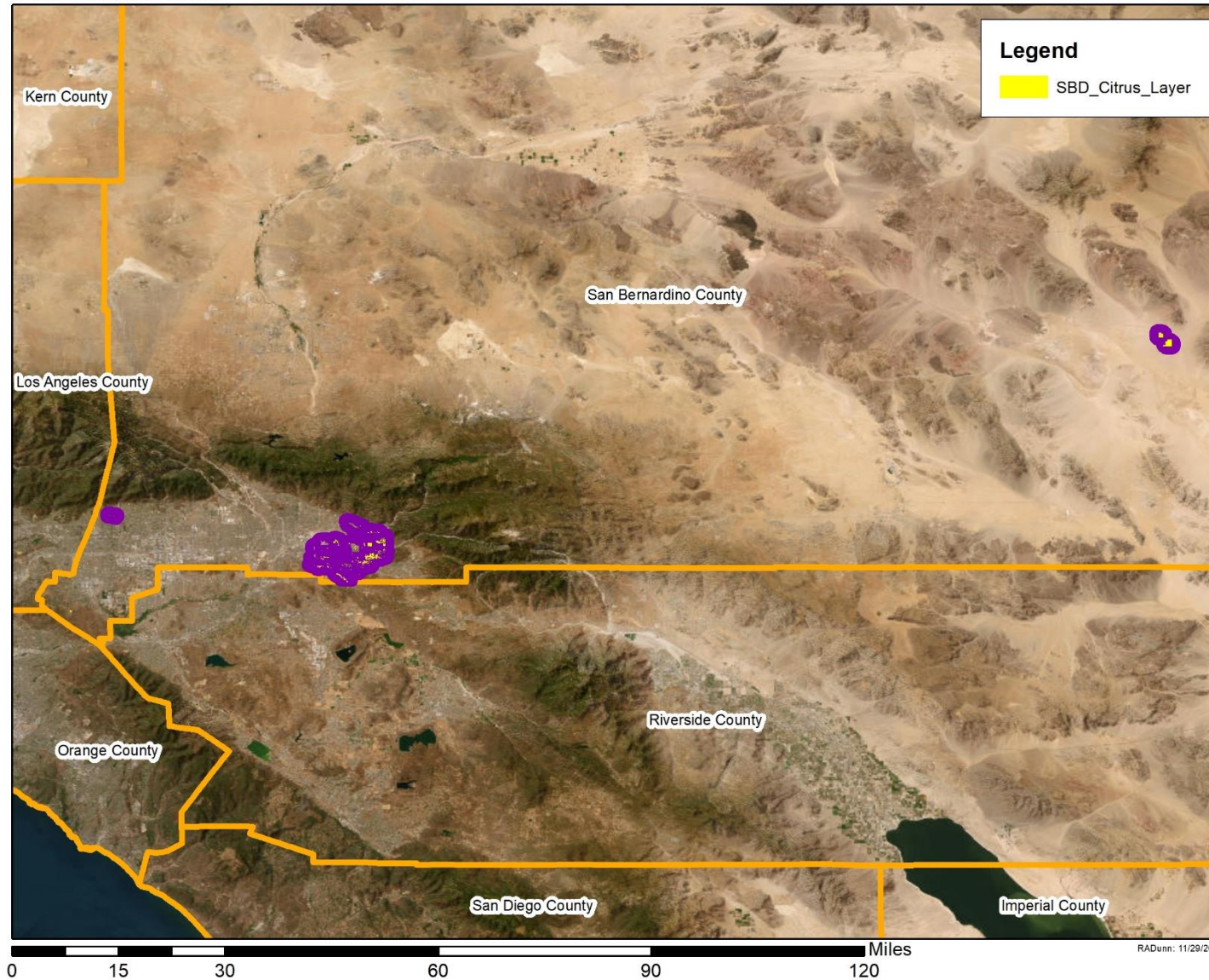
- 41 Psyllid Management Areas (PMAs)

San Bernardino County Citrus Layer



- 623 blocks mapped
- 2,705 acres total (based on GIS)
- 155 Pesticide Use Permits

San Bernardino County Citrus Layer

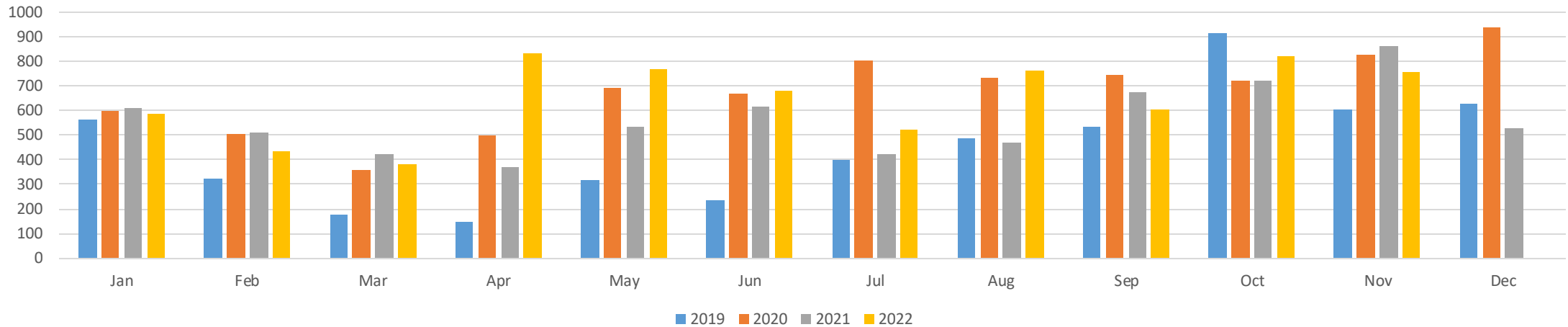


- 19 Psyllid Management Areas (PMAs)

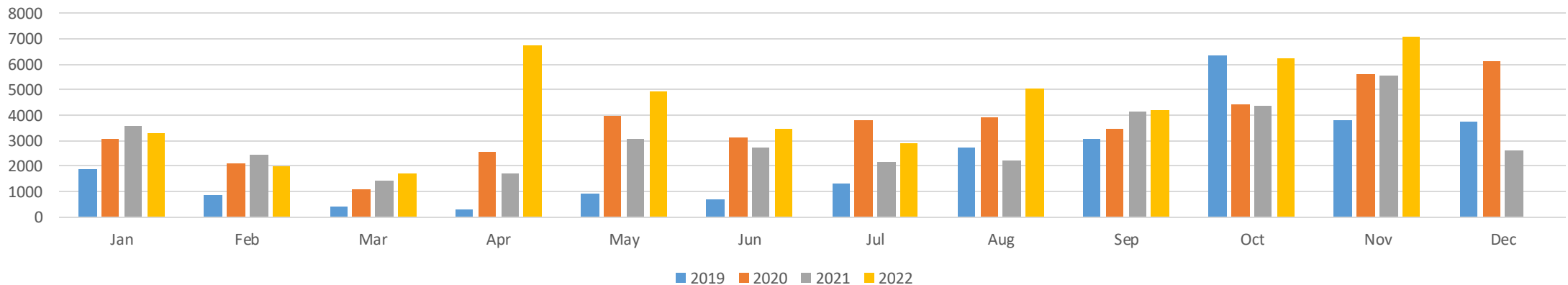
CPDPD Commercial Grove Sampling Program

November 2022 update

Suspect ACP Collection Events



Suspect ACP Collected for Testing



Risk based Survey and Model Refinement: Residential Citrus Host Estimation (refined)



NC STATE
UNIVERSITY

Weiqi Luo



Neil McRoberts

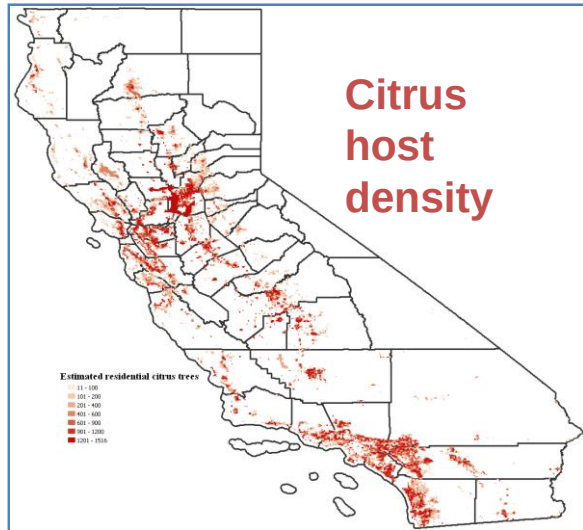


Support: CRB #5300-199, 5300-212

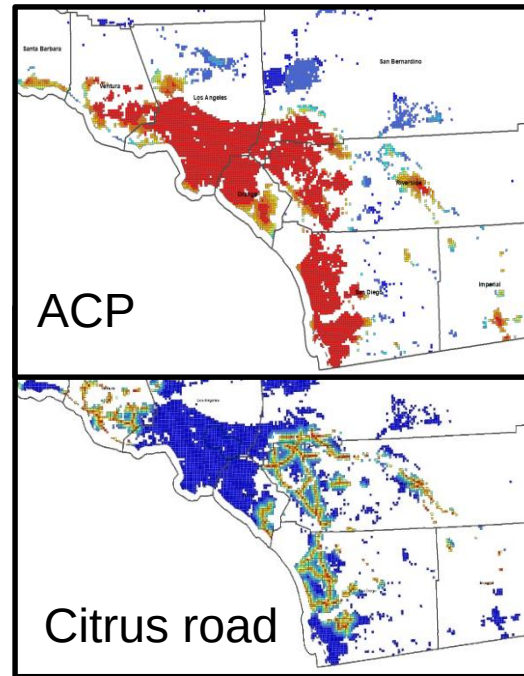
Revisit Risk-based survey (RBS) model framework (Residential & Commercial)

Maps are developed on 1-square mile grids (STRs)

Citrus Host
Population
Maps $F(Host)$

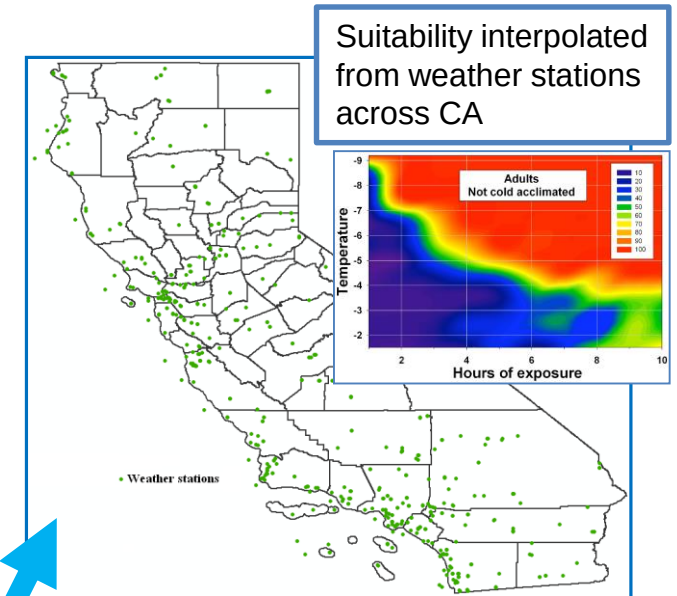


Dynamic Spatial
Risk Models for
each factor ($Risk_i$)



Etc.....

Climate Suitability
 $G(Suitability)$



$$Risk = F(Host) * \sum_i w_i Risk_i * G(Suitability)$$

Aim & Objectives

Problem: the previous residential citrus distribution is estimated solely from human population density, which can lead to citrus over-estimation for certain urban areas (apartments, condos)

- **How to refine residential citrus population and distribution**

- ❖ Residential survey



- ❖ Aerial/spectrum image analysis



Citrus

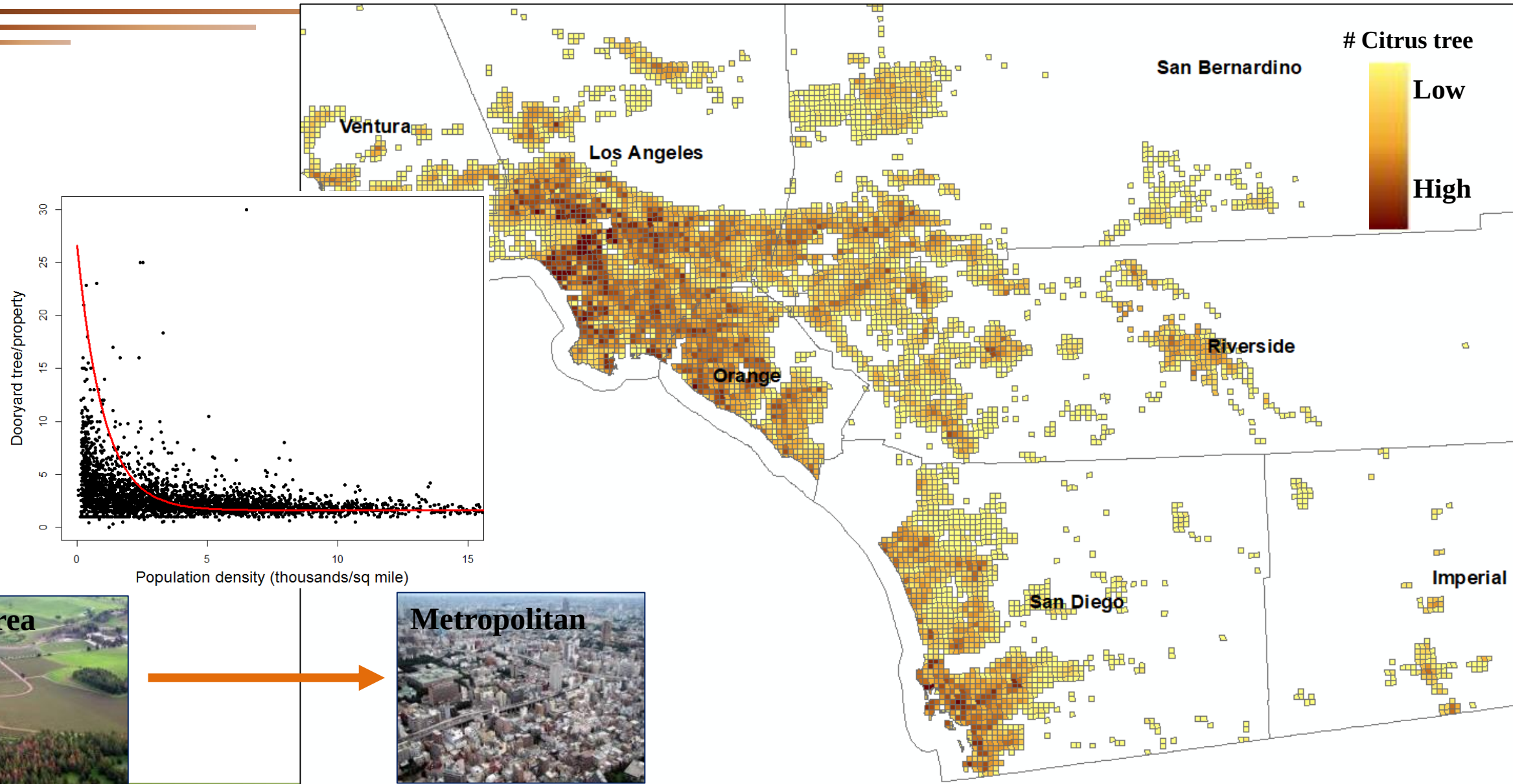
Non-citrus

- ❖ Model/refine with land parcel data with US Census info



through '**supervised machine learning**' process

Previous residential citrus host map

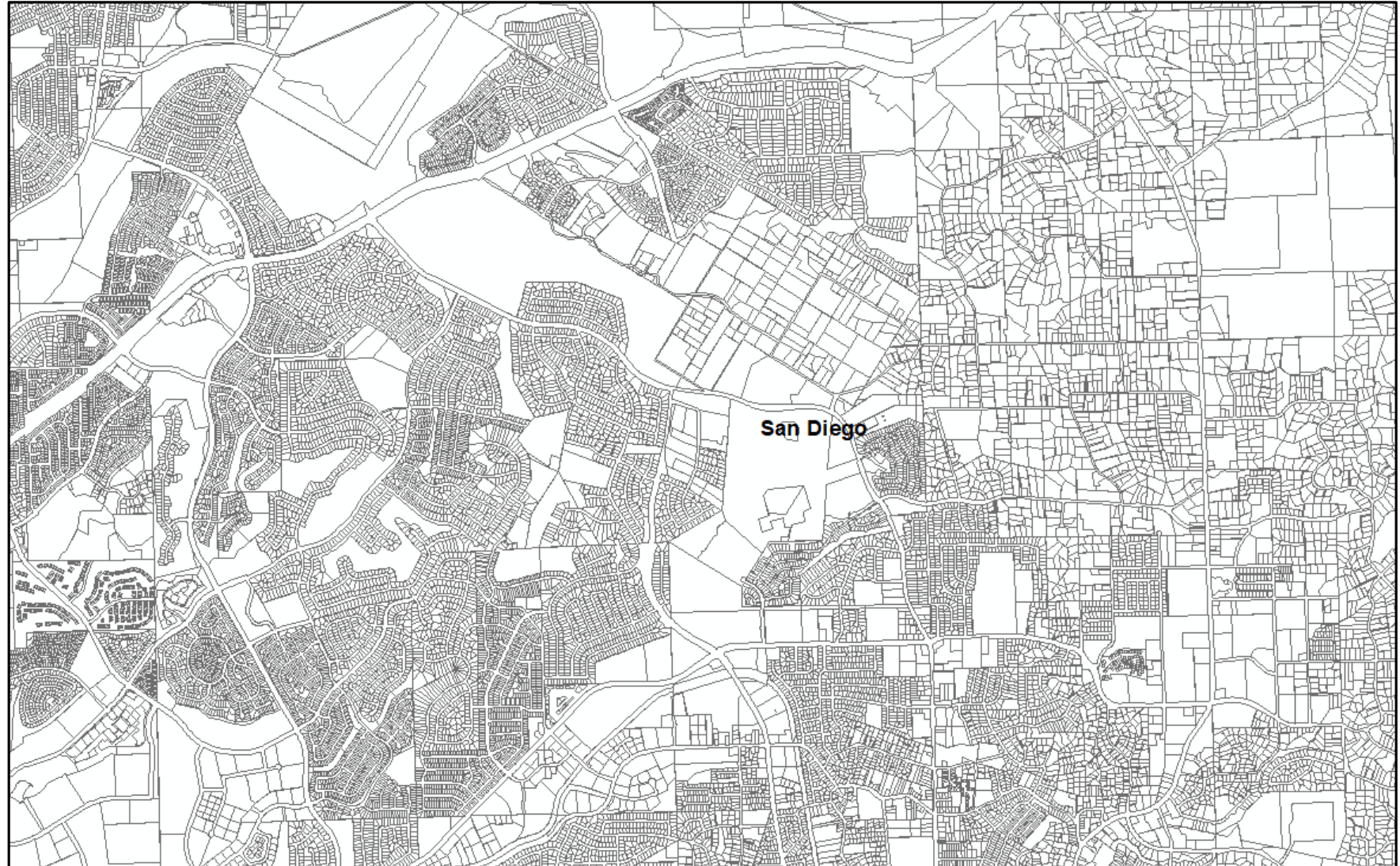


‘Supervised machine learning’ procedure

Example landscape: to determine residential properties suitable for dooryard citrus

Criteria:

- Remove land parcel with irregular shape
- Remove land parcel outside normal dwelling size range (based on population density).
- Filter out certain land cover types, including parks, government buildings, commercial facilities, etc.
- Link with US census data for latest human population at block level
- Link with land assessor info when available

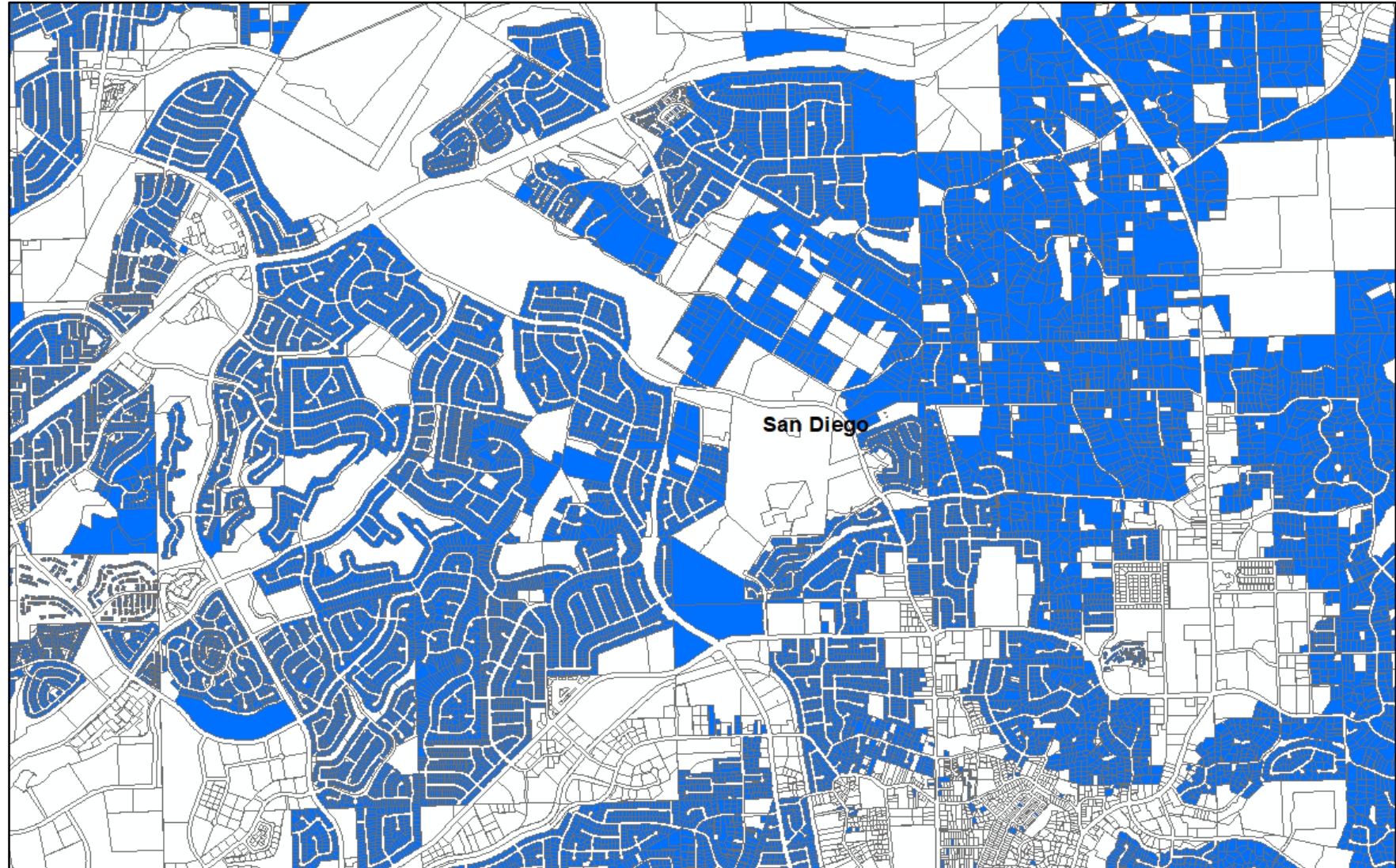


‘Supervised machine learning’ procedure

Example landscape: to determine residential properties suitable for dooryard citrus

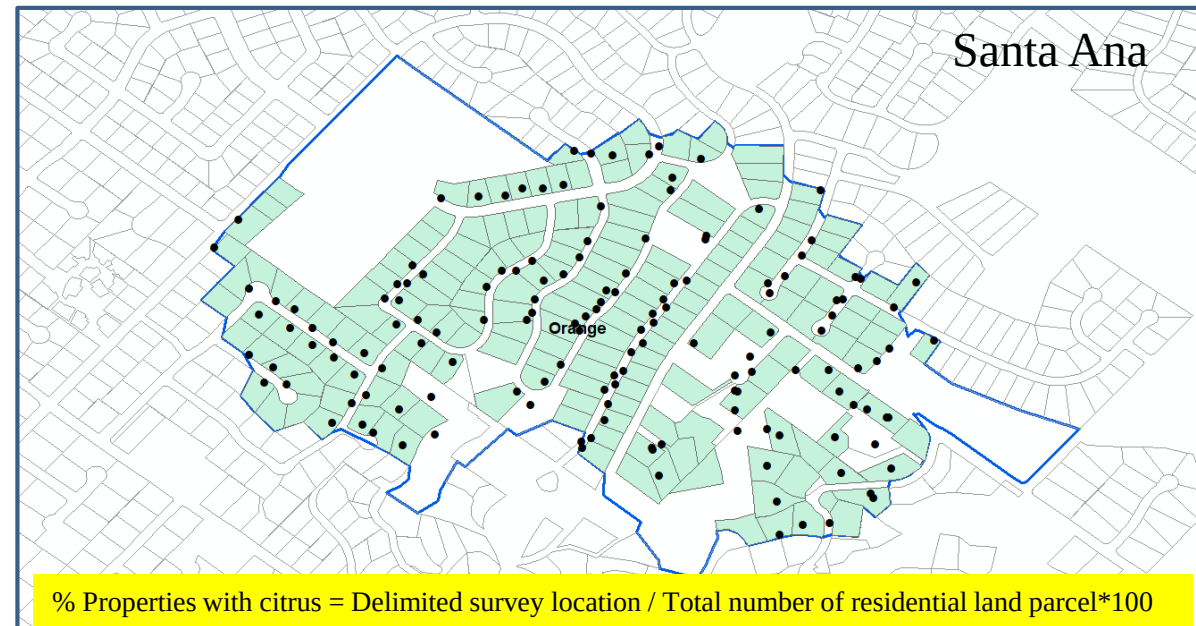
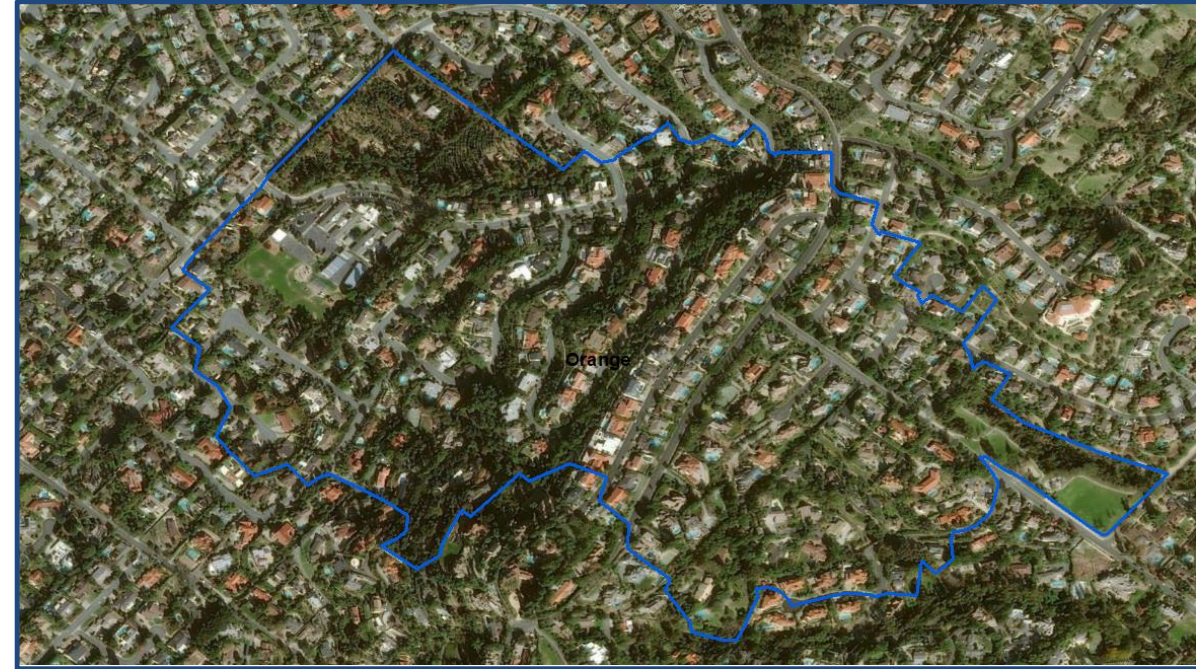
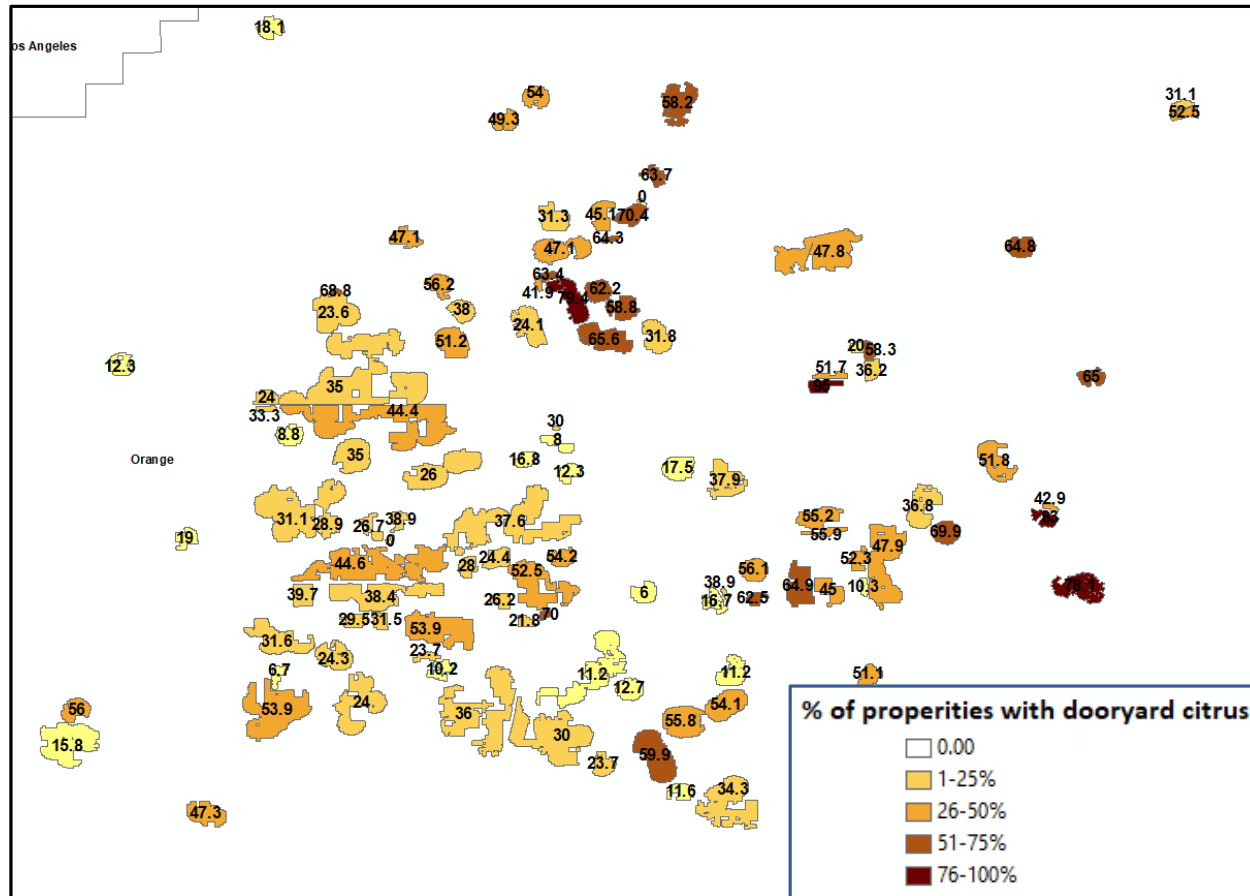
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Estimate % Properties with dooryard citrus

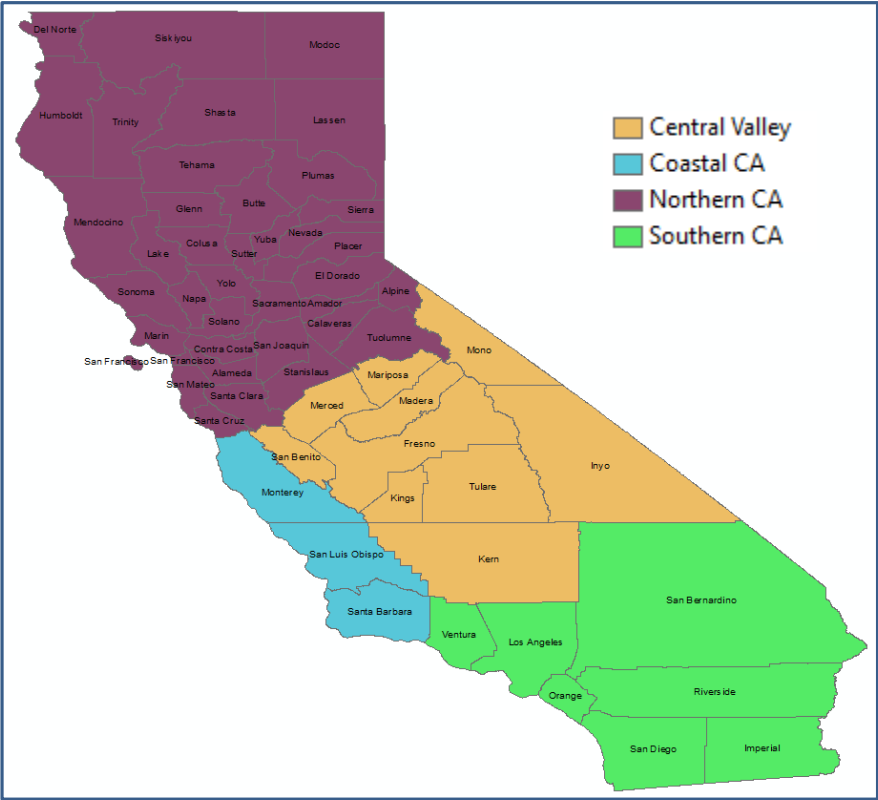
Overlay residential land parcel with delimited survey location to estimate % properties with dooryard citrus



Residential and Commercial citrus trees in Southern CA

Southern CA

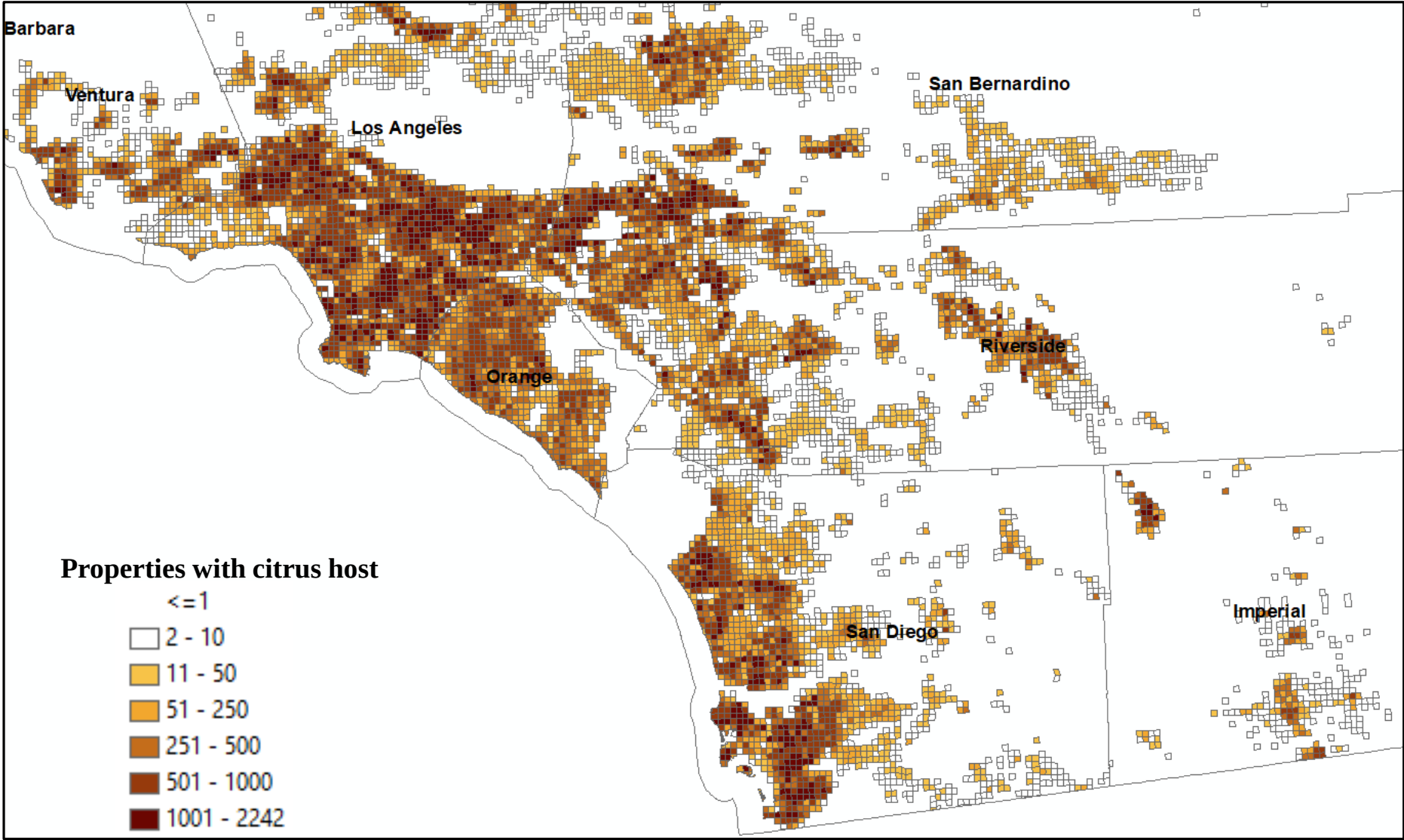
County	Total STR	# STR with residential citrus tree	Total residential properties with citrus tree (estimated)	# STR with commercial citrus	Total actual commercial citrus acreage
LA	4,129	2,341	929,826	0	0
Orange	873	646	232,773	36	572
Riverside	7,311	1,764	338,888	285	18,616
San Diego	4,373	1,621	431,049	366	11,501
Imperial	4,497	420	37,100	64	8,020
San Bernardino	20,457	1,922	345,495	84	3,387
Ventura	1,952	505	110,876	338	26,255



STR – Section, Township & Range (1-sq mile grid)
*Coastal & Central Valley: completed by 01/2023
**Northern CA: completed by Mid 2023

Refined residential citrus host distribution at STR level (1-sq mile grid)

County	# STR properties with citrus >1000 (estimated)
LA	282
Orange	12
Riverside	39
San Diego	112
Imperial	4
San Bernardino	74
Ventura	12



Residential host estimation performance (Southern CA)

- Compare actual residential citrus locations with our estimated citrus residential area

County	Total surveyed citrus tree (non-commercial)	Intercept within (0 meter)	Intercept within (10 meters)	Intercept within (25 meters)	Intercept within (50 meters)
LA*	178,773	50,883 (28.5%)	156,466 (87.5%)	169,736 (94.9%)	173,804 (97.2%)
Orange	120,133	49,553 (41.2%)	106,882 (89.0%)	113,728 (94.7%)	115,314 (96.0%)
Riverside*	38,400	11,071 (28.8%)	29,642 (77.2%)	32,719 (85.2%)	33,665 (87.7%)
San Diego*	47,677	31,317 (63.6%)	36,009 (75.5%)	37,655 (79.0%)	39,472 (82.8%)
Imperial	11,448	5,503 (48.1%)	7,249 (63.3%)	7,487 (65.4%)	7,908 (69.1%)
San Bernardino	25,704	5,750 (22.4%)	18,730 (72.9%)	21,711 (84.5%)	22,603 (87.9%)
Ventura*	3,809	2,137 (56.1%)	2,908 (76.3%)	3,032 (79.6%)	3,258 (85.5%)

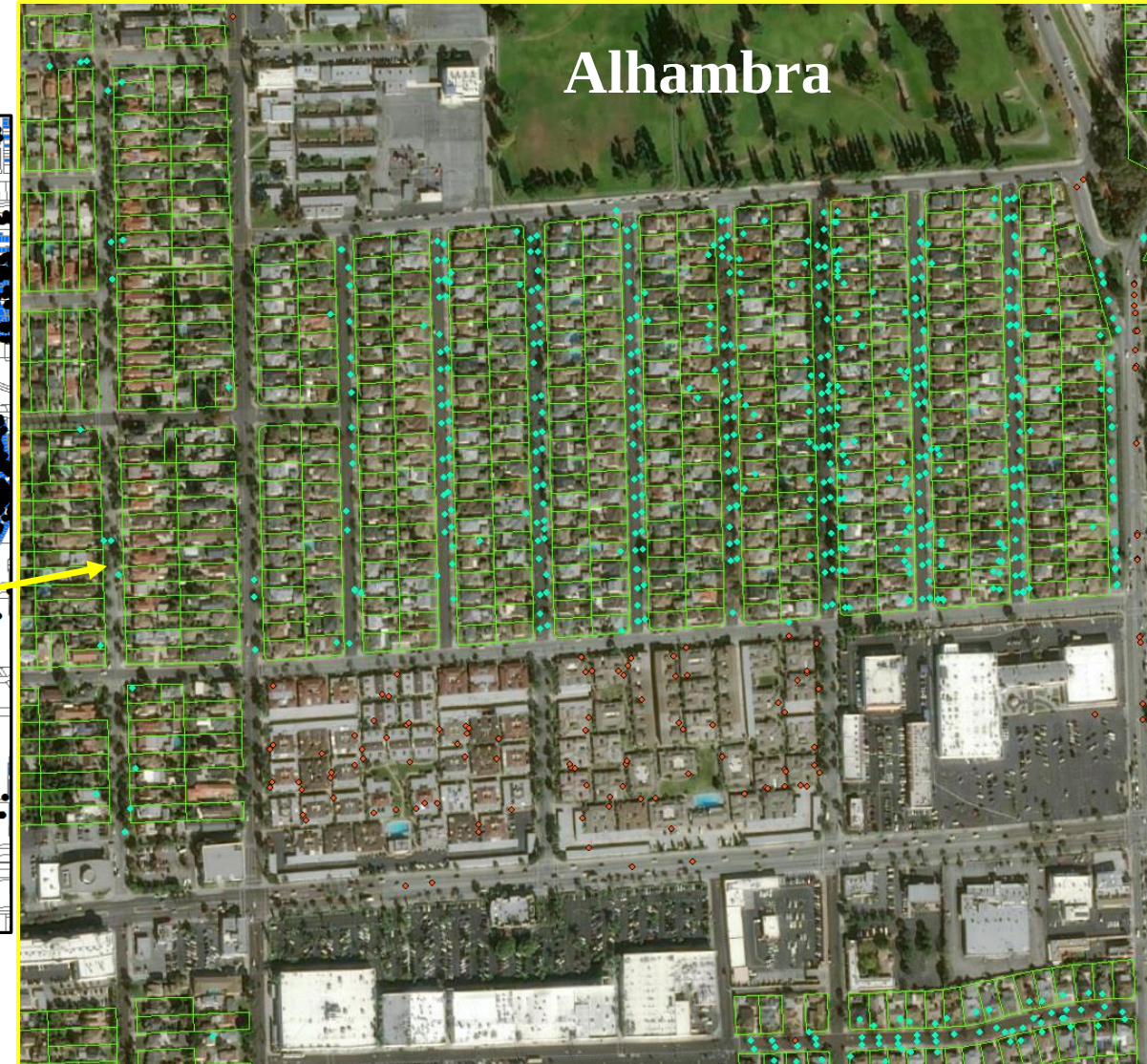
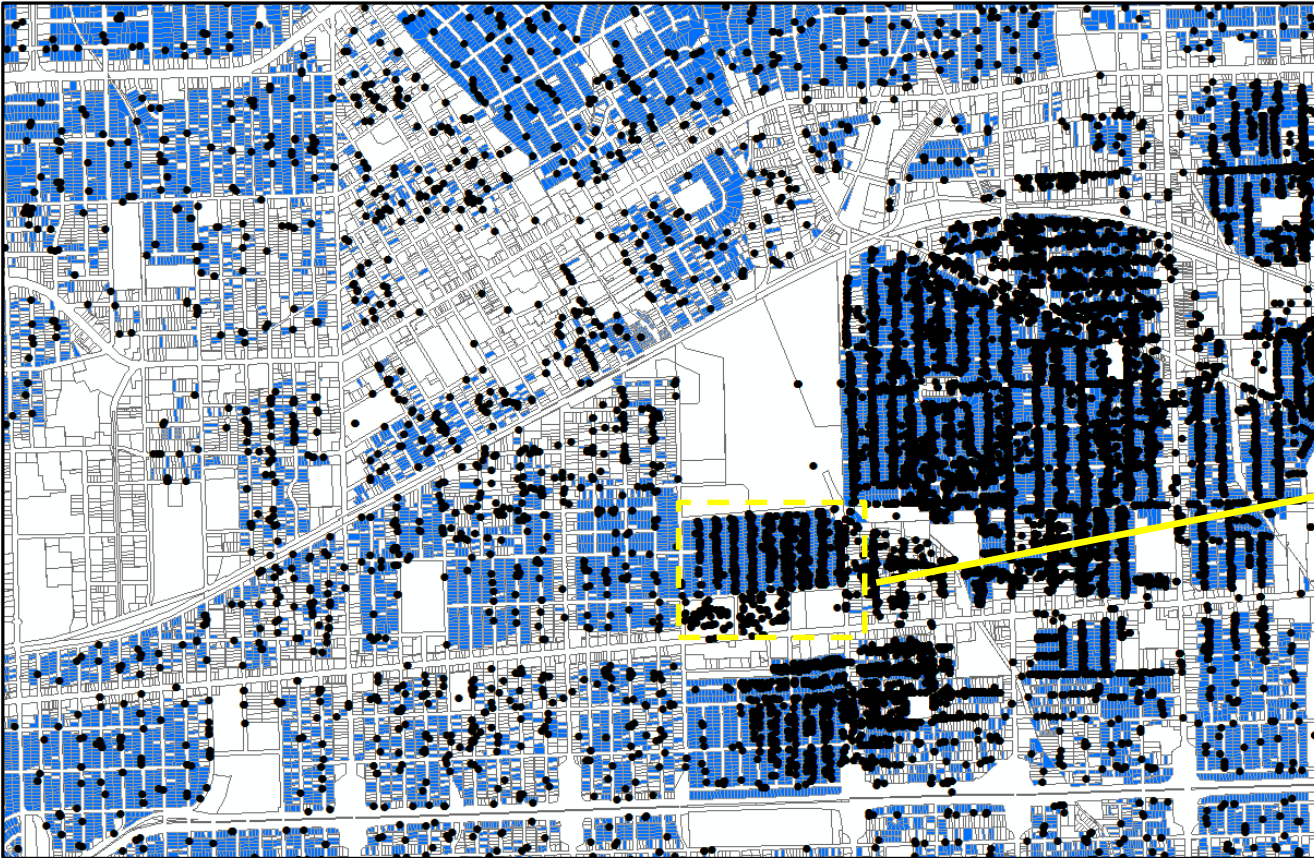
* Counties with land Assessor data

If most of the actual sampled residential citrus trees are found within our estimated residential areas, this will provide us confidence about our algorithm in estimating the residential citrus population.

Residential host estimation performance (LA county)

Accuracy (94.9%) - intercept within 25 meter

Alhambra



Citrus type preference in Southern CA

Dooryard citrus type distribution (%) by county (survey data 2012-2021)



County	ORANGE	LEMON	LIME	GRAPEFRUIT	MANDARIN	TANGERINE	TANGELO	POMELO	KUMQUAT	CALAMONDIN	Other
LA	25	28.7	14.5	6.8	7.1	4.7	1.1	3.3	6.3	1.6	0.9
Orange	26.7	27.7	15	6.2	6.2	5.9	1.1	2.4	5.8	1.8	1.2
Riverside	31.4	30.3	12.7	9.7	4.7	3.8	1.9	1	3.2	0.9	0.3
San Diego	34.1	31.2	11.3	6.5	4.3	5.1	2.4	0.5	2.5	1.9	0.2
Imperial	21	38.3	15.1	13.7	4	3.1	3.6	0.2	0.5	0.3	0
S. Bernardino	29.6	30.3	14.9	7.5	5.4	4.1	1.7	1.1	3.8	1.3	0.3
Ventura	35.8	37.6	8.1	6.8	4.1	5.1	0.8	0.3	1	0.5	0

Lowest Highest

Other: Curry, Murraya, Buddha's hand, etc.

Thanks for your time and attention!



Special thanks to CDFA, DATOC & CRB for background data and support!