

How does California deal with invasive species?



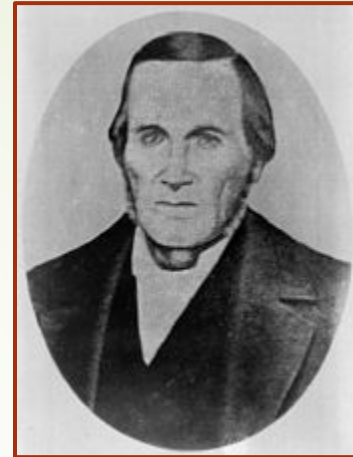
Plant Health and Pest Prevention Services
California Department of Food and Agriculture



Early Days



Junipero Serra (1713-1784)



William Wolfskill (1798-1866)



Mexican Fruit Fly in Mexico – 1897-1900

THE OUNCE OF PREVENTION NEEDED

One of the most serious features with regard to the importation of foreign fruit is that dangerous pests are likely to be introduced to the injury of our home product. A notable example of this kind is the risk which the California citrus fruit growers are running at the present time of an invasion of the Morelos orange worm.

In several provinces of Mexico this worm has taken possession, to the almost complete ruin of the crop. The insect lays its egg inside the fruit, where it hatches to a worm, without any evidence of disease showing externally on the fruit. A pest which conceals itself within the fruit is more disastrous to the whole industry than one which shows to the eye, as it destroys confidence in the entire output. To show how thoroughly this worm does business, we may state that in one importation a little over 50 per cent of all the oranges were found to contain well-developed specimens.

There are two ways in which these worms might make their way to this coast—one by direct importation of the fruit, which is not improbable, as Mexican oranges are occasionally brought here, and another by the eggs or cocoons being hidden in the empty cars which are sent to California after having done service on some Mexican line. It is, indeed, only a question of time, if these Mexican importations continue, when the Morelos worm will get a foothold in California, and whenever it comes some or all of the orange growers are bound to suffer.

The attention of the department of agriculture was recently called to the fact that these worm-bearing oranges were coming into the United States by the railroad, and Secretary Morton was urged to bring the evil to an end. The secretary answered the appeal by the statement that under existing laws governing fruit quarantine, the department had no power to stop such importations. He advised that the orange growers secure, if possible, the adoption of a law which should clothe the agricultural department with the necessary power to turn back the infected, or even the suspected, fruit when it appeared upon the border.

NO MEXICAN WORMS

RESOLUTIONS PASSED AT THE BOARD MEETING

Chamber of Commerce Appointed a Committee to Meet the Dovener Party

The board of directors of the chamber of commerce met yesterday afternoon at 3:15. The following directors were present: Forman, Klokke, McKinley, Newberry, Patterson, Slauson, Story, Vetter, Waters, Willard. President Forman occupied the chair. J. E. Aiken, wholesale paper, was elected to membership.

President Forman appointed C. B. Boothe as a delegate to represent the chamber of commerce at the irrigation congress to be held in Lincoln, Neb., the 28th of September.

The itinerary of the Dovener party was read, stating that the party would arrive here at 8:40 p. m. Thursday, September 9th. The president appointed the following committee to wait upon them on their arrival: Col. H. G. Otis, Hon. S. M. White, J. S. Slauson, T. E. Gibbon, C. D. Willard, W. E. Hughes, Chas. Weir.

A communication from J. C. Newton, J. M. Griffith, E. P. Johnson and others, in relation to the Agricultural park, was read and upon motion referred to the committee on law and legislation.

The matter of the importation of Mexican oranges into this country was brought up and the following resolution unanimously adopted:

Whereas, The season for importation of Mexican oranges into the United States is just opening, with indications of large stocks being sent into the middle and western states, and

Whereas, The existence of the Morelos orange worm in many of the Mexican oranges endangers our citrus industry to a great extent; therefore be it

Resolved, That this organization call upon the railway companies to use every possible precaution to prevent the introduction of this dreaded pest into California by having cars used in transporting Mexican oranges thoroughly fumigated after each shipment; and if any of the oranges are sent over their lines into California due notice of such shipment be given to the horticultural commission of the border counties, so that proper inspection may be made looking to the discovery of any pest or insect that might possibly be contained therein.

The board then, on motion, adjourned.

6

GOOD WORK HAS BEEN DONE.

HOW FRUIT PESTS HAVE BEEN KEPT OUT OF THE STATE.

Quarantine Officer Crow's Report to the State Board of Horticulture.

Quarantine Officer Alexander Crow yesterday presented to the State Board of Horticulture his report of what had been done in his department during the past year in preventing and eradicating insect pests. The report is as follows:

To the Honorable State Board of Horticulture—Gentlemen: During the summer months importations of trees and plants are usually light, but since my report to you, dated April 24th, a greater number of vessels have been found with plants on board, although the aggregate number of plants was less than during and corresponding period. Eighty-six steamships and sailing vessels came into port with plants from foreign countries. The imports were eighty-seven large cases and crates, and one hundred and seventy-seven small boxes, baskets and loose lots.

As formerly, all plants or fruit having insects new to the State, have been destroyed. The danger to the citrus interests of the State from the introduction of the "Mexican orange worm" (*Trypeta ludens*) increases with the improved transportation facilities of that country. So far as known this pest is confined to the States of Morelos and Puebla, 100 miles south of the City of Mexico, but within the past few years it has been found on oranges from those States in some of the mar-

ange containing sometimes over a dozen maggots and very frequently with no external indication of their presence.

I have taken every precaution to guard against its introduction into the State. The railroad company have expressed their willingness to co-operate with us in every way possible. I have also requested A. Hoffman, the general freight and passenger agent of the Mexican Central Railway, to notify their shippers not to send any oranges to California, for in the event of their being found infested they would certainly be destroyed. In reply he said, "According to the best information at hand there will be no shipments of oranges from the State of Morelos to any point in the United States during this season, as their oranges did not give satisfaction last year." This is encouraging, for the danger of infection will not be so great. I also wrote to Dr. L. O. Howard of Washington, asking if there was any way in which he could establish a quarantine station or inspector at El Paso. He replied that he could take no steps in the way of establishing a quarantine until we learn whether the quarantine bill is likely to pass Congress at the coming session. The only safeguard I can see against this pest is absolute prohibition of citrus fruits from sections where it is found, otherwise we will soon be confronted with a pest as difficult to fight as the codlin moth. A telegram received from Dr. Howard, dated Washington, D. C., October 23, 1897, informs me that peaches in Orizaba, in the State of Vera Cruz, Mexico, are infested with the maggots of *Trypeta fraterculus*. This works in the same manner as the other species in the orange, and would be a serious pest should it get a foothold in the peach orchards of the United States.

We have reliable information that a similar pest attacks peaches in Australia, also in South Africa. In the latter country they hardly get enough sound fruit some seasons for home use.

Mediterranean Fruit Fly in Hawaii – 1907-1910

LIVERPOOL—Sailed June 10—Stmr Laconia, for Boston; stmr Megantic, for Montreal. June 9—Stmr Crown of Castile, for San Francisco.
 QUEBEC—Arrived June 10—Stmr Royal Edward, from Bristol.
 HAVRE—Sailed June 7—Stmr Niagara, for New York.
 Arrived June 9—Stmr Rochambeau, from New York.
 MARSEILLE—Sailed June 7—Stmr Roma, for New York.
 Arrived June 6—Stmr Canada, from New York.
 SOUTHAMPTON—Sailed June 10—Stmr Bluecher, from Hamburg for Boston.
 GENOA—Arrived June 6—Stmrs Taormina and Lusitania, from New York.

SEAMAN ARRESTED FOR IMPORTING FRUIT PEST

Mangoes Infested With Mediterranean Fly Charged to Sailor on Steamship Recently Landed

Victor Perez, a seaman on the steamer Mexico, was arrested yesterday by the federal authorities for bringing into the port mangoes infested with the Mediterranean fly. The arrest was made after the federal grand jury had heard the case, but had not voted an indictment. Charges for similar offenses were investigated against Ah Chow, a messboy on the Siberia, and George W. Spencer, first assistant engineer on the steamer Alaskan.

The Mediterranean fly investigation will be continued before the federal grand jury this afternoon at 2 o'clock. It is expected that R. P. Schwerin and his secretary, A. J. Frey of the Pacific Mail Steamship company, will be called as witnesses.

SKATING IN COLISEUM RINK

Elaborate illuminations and all the latest ragtime melodies from Broadway together with a specially prepared dancing floor will be the attractions at the Coliseum on Friday night when a dancing and skating party will be held.

Skating will take place from 7:30 to

THE BIG 3 BEAR BEAVER ROSE CITY

PORTLAND
 BEAR sails 12 noon, Saturday, June 14. First class, \$10, \$12, \$15; second class, \$6. Berth & meals included.

LOS ANGELES
 ROSE CITY sails 11 a. m. Sunday, June 15. First class, \$7.35, \$8.35; second, \$5.35. Berth and meals included.

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California's Invasive Species Prevention Programs – A Multi-tiered Approach

- International pathways addressed by USDA regulations and port of entry inspections.
- Domestic pathways addressed by USDA and CDFA regulations, CDFA border station inspections on key highways, and county-level post-entry inspections.
- Preventive program to prevent establishment of Mediterranean fruit fly (*Ceratitis capitata*) in the Los Angeles basin via a continuous release of sterile flies (sterile insect technique [SIT]).
- Statewide detection program, coupled with an eradication infrastructure, to find and eliminate new introductions before they can become permanently established.

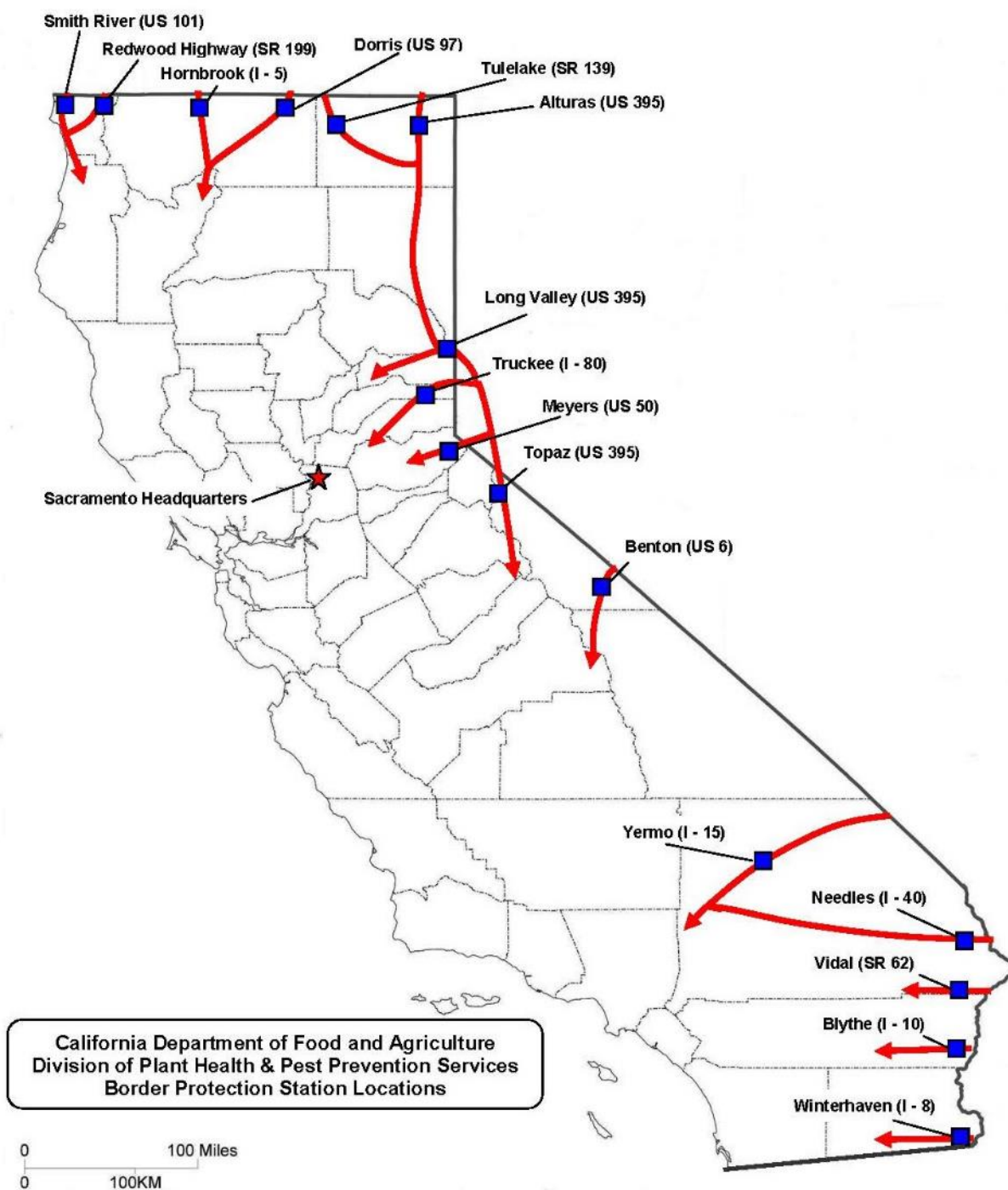
Pest Exclusion Exterior Program

- Operates 16 border inspection stations



- Ensures vehicles entering California are in compliance with quarantine laws and regulations

Border Stations



Pest Detection & Emergency Projects

Pest Detection:

Find insect pests before they infest one square mile and plant diseases before they exceed one-half of a square mile.

Emergency Projects:

Quickly and efficiently eradicate incipient infestations of serious agricultural pests, thereby preventing permanent establishment and subsequent spread in California.

PD/EP Mission and Functions

Mission

- To protect California from the damage caused by the introduction or spread of harmful plant pests by developing and operating programs designed to detect and eradicate invasive pests before they can become permanently established in California.
- PD/EP strives to use the most effective, expedient, environmentally responsible, and economical policies and technologies possible.

Functions

- Detection Surveys
- Delimitation Surveys
- Treatments
 - Preventive
 - Corrective
 - Environmental Monitoring



Melon Fly (USDA)

PD/EP Operations

Infrastructure

- 24 offices, including a Medfly rearing facility in Hawaii.
- Employs over 600 CDFA and CASS staff.
- Contracts with 47 CACs to perform detection trapping.
- Budget of \$75 million (1/3 General Fund).
- Responsible for over 200,000 traps at peak season.



PRP Trailer Complex (CDFA)



PRP Staff (CDFA)

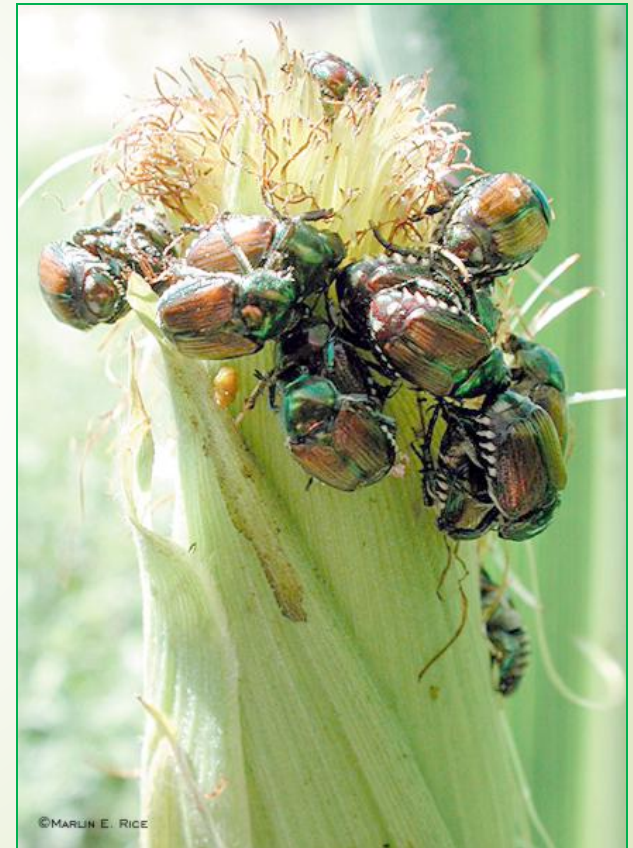
Japanese Beetle Program

Popillia japonica

- Major turf grass and ornamentals pest from Japan. Established in E U.S.
- 13,000 traps deployed.
- Aircraft originating in eastern U.S. are inspected.



Japanese Beetle Grubs in Soil
(Photo by David Faulkner, University of Illinois).



Japanese Beetles on Corn
(Iowa St. Univ.)

Japanese Beetle Responses

Delimitation Trapping

Traps increased 50+ traps/sq mile

Treatment

Within 200m radius of finds:

- Foliar treatment with cyfluthrin or carbaryl
- Imidacloprid applied to soil



2015 Japanese Beetle, *Popillia japonica* Sacramento County

- Treatment and delimitation around sites where 3 adult beetles were trapped in 2014 in Fair Oaks
- Treatment and delimitation around sites where 3 adults beetles were trapped in 2014 in Carmichael
 - Treatment conducted in 200-meter radius.
 - Foliar sprays of cyfluthrin and carbaryl to kill adults.
 - Soil drench of imidacloprid to kill young larvae.
- Seven adult beetles trapped near previous finds from 2014 in Carmichael.



Japanese Beetles on Corn (Iowa St. U.)

Japanese Beetle

Fair Oaks, CA

2010: 1 female

2011: 1 female, 1 male

2012: 3 females, 1 male

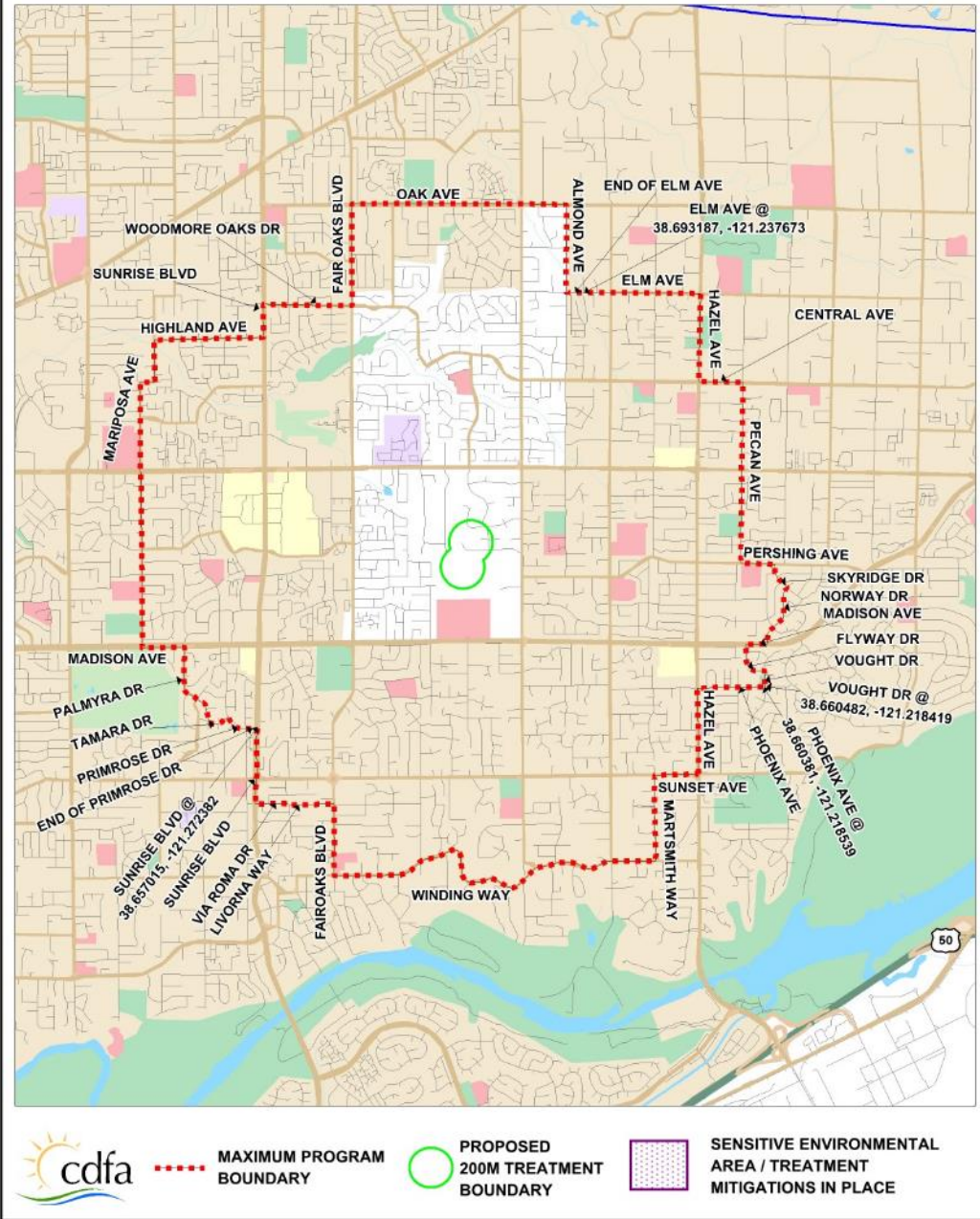
2013: 0 beetles

2014: 3 males

2015: 0 beetles

Monitor for two more years to monitor treatment success

JAPANESE BEETLE FAIR OAKS, SACRAMENTO COUNTY 2015



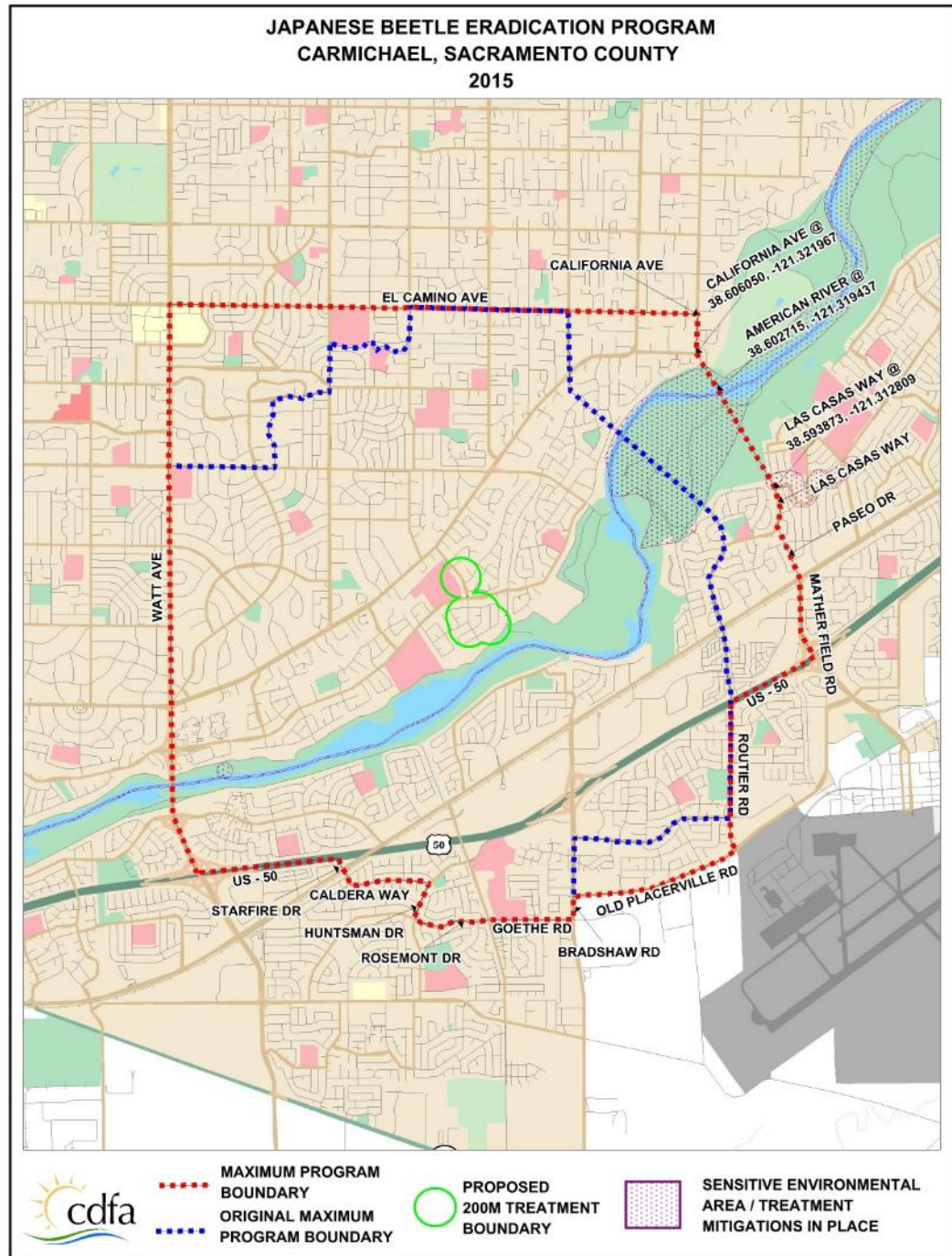
Japanese Beetle

Carmichael, CA

2014: 1 female, 2 males

2015: 2 females, 5 males

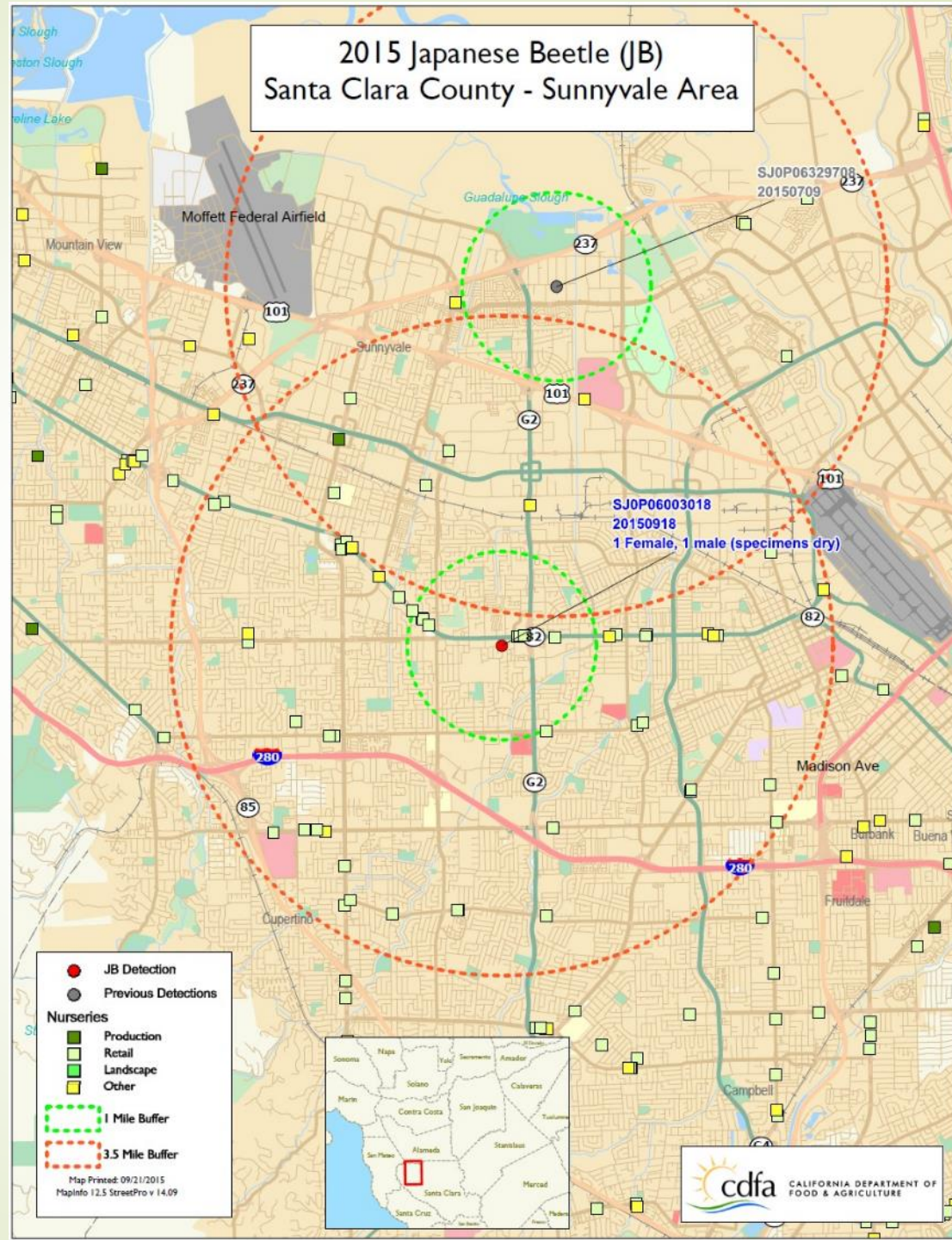
Treatment planned for 2016



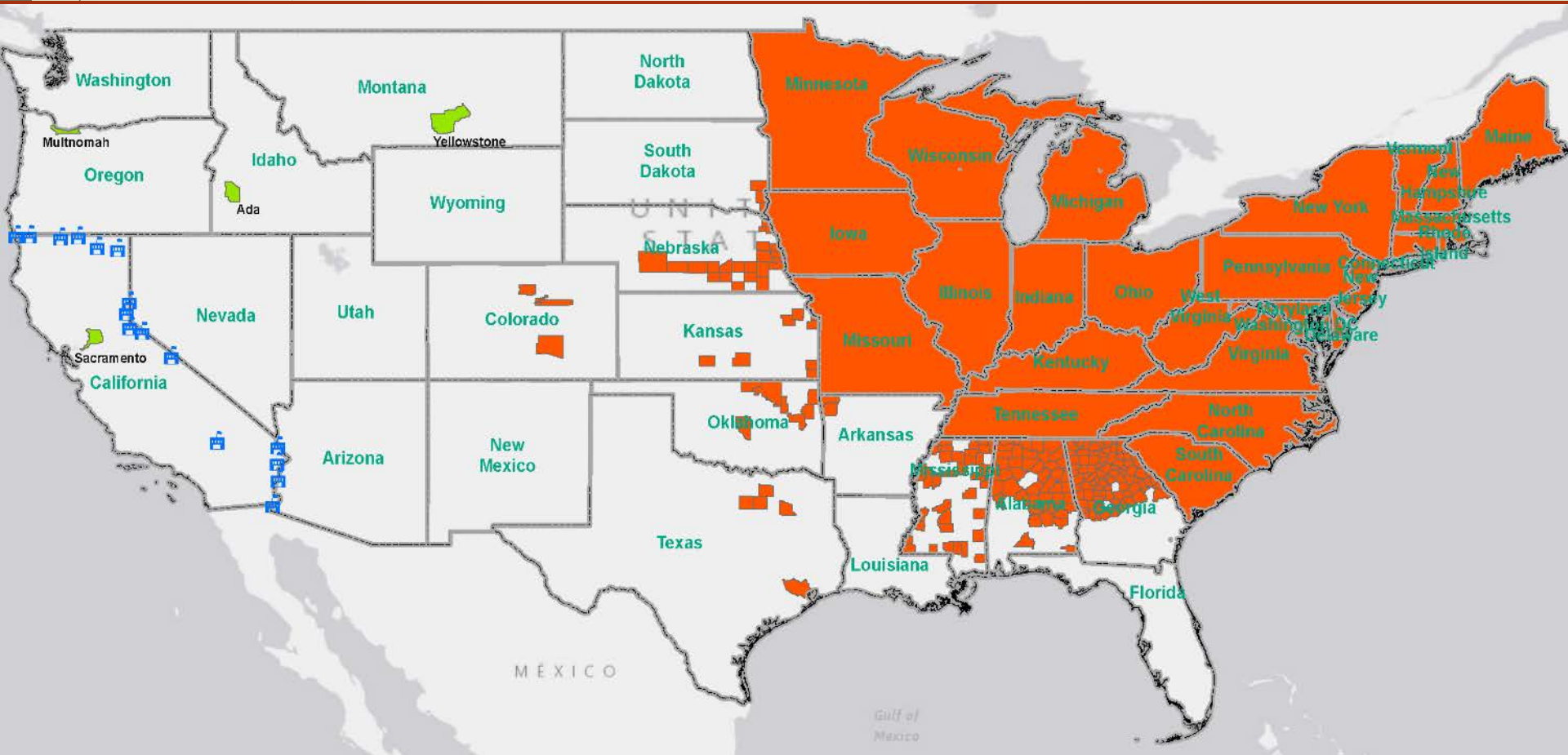
Japanese Beetle Sunnyvale, CA

2015: 1 female, 1
male

Treatment possible
for 2016







European Grapevine Moth (EGVM)

Lobesia botrana

- Larvae causing damage to a Napa County vineyard were tentatively identified using DNA as EGVM in September 2009. Subsequently, a female moth reared on September 15, 2009 was identified by CDFA as EGVM based on morphological characters.
- Found in 10 counties during 2010.
- EGVM is originally from Europe, parts of Africa, and Asia. It was found in Chile in 2008.
- EGVM is a significant pest of berries and berry-like fruits, especially grapes. Larvae feed on flowers and fruit.



Adult EGVM. (R. Gonzalez, Univ. of Chile)

European Grapevine Moth Development

- Typically has 2-3 generations per year
- First generation larvae web flower parts together and feed on individual flowers and pedicels.
- Second and third generation feed on berries and may burrow inside. A single bunch may be infested with several larvae. Webbing, frass, and fungal infection may result in extensive contamination of the bunch.
- Pupae of the last generation enter diapause over the winter, and adults emerge the following spring.



EGVM damage (A. Lucchi, Italy)



EGVM damage (R. Gonzalez, U. Chile)

European Grapevine Moth (EGVM)

Lobesia botrana

- 47,000 traps statewide.
- Voluntary treatment of commercial vineyards by growers in 500-meter radius of find sites with various insecticides, timed to generations throughout the growing season.
- Treatment of residences by CDFA in a 500-meter radius with grape removal or *Btk*.
- Goal: Inhibit spread of EGVM while eradicating all populations.
- 2010 – 100,959 moths (10 counties)
- 2011 – 144 moths (5 counties)
- 2012 – 77 moths (Napa)
- 2013 – 40 moths (Napa)
- 2014 – 1 moth (Sonoma)
- 2015 – 0 moths
- Quarantine reduced from 2334 mi² in 2011 to 446 mi² in 2015.



EGVM Damaged Grapes, Napa (CDFA)



EGVM Adult (R. Gonzalez, U. Chile)

EGVM Detections 2010-2015

County	Year: 2010	2011	2012	2013	2014	2015
Fresno	11	0	0	0	0	0
Mendocino	36	0	0	0	0	0
Merced	4	0	0	0	0	0
Monterey	1	0	0	0	0	0
Napa*	100,831	111	77	40	0	0
Nevada	0	4	0	0	0	0
San Joaquin	2	0	0	0	0	0
Santa Clara	3	19	0	0	0	0
Santa Cruz	1	1	0	0	0	0
Solano	11	0	0	0	0	0
Sonoma*	59	9	0	0	1	0
Total	100,959	144	77	40	1	0

* = quarantine in place

Gypsy Moth Program

Lymantria dispar

- Major forest and ornamental tree pest from Eurasia. Established in E U.S.
- 22,000 traps deployed.
- 2 traps/sq. mile in all urban and rural residential areas throughout state
- At least one trap per high-hazard site such as campgrounds, recreational areas, mobile home and RV parks, state parks, federal parks and monuments, moving companies, etc.
- 25 traps/square mile at 10 deep-water port locations identified as high-risk points of entry for Asian gypsy moth.
- 5 traps/sq. mile along waterways and railways in vicinity of major transportation hubs.

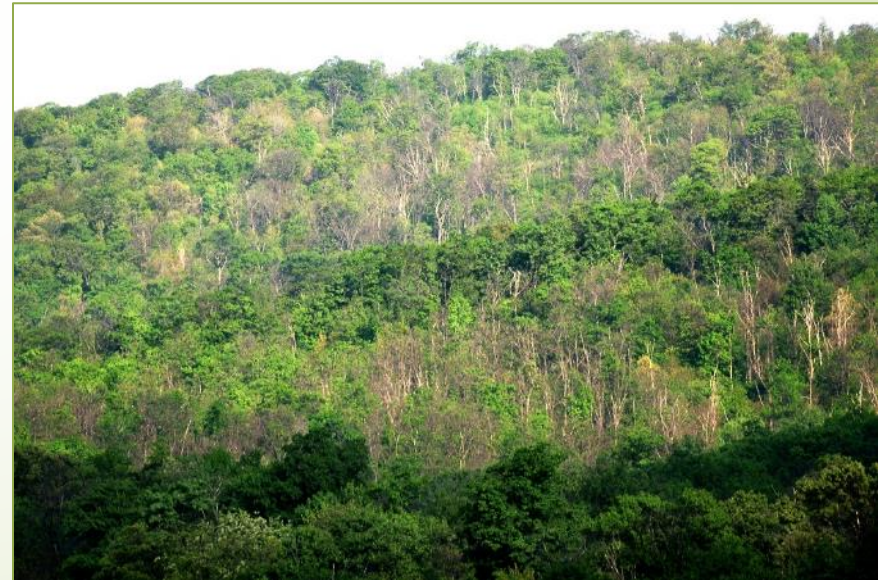


Gypsy Moth, *Lymantria dispar*

- 9 moths detected in 2015
- Southern California
 - San Diego County: 4
 - Los Angeles County: 2
- San Francisco Bay Area
 - Contra Costa County: 1
 - Alameda County: 1
- Northern California
 - Humboldt County: 1
- All moths trapped determined to be the European/North American strain



Male Gypsy Moth (USDA)



Gypsy Moth Defoliation

Photo by Jeffrey A. Mai

Gypsy Moth 2015

San Diego County

National City

- 2 moths near port

San Diego

- 1 moth in residential area near La Jolla

Chula Vista

- 1 moth in residential area



Gypsy Moth 2015

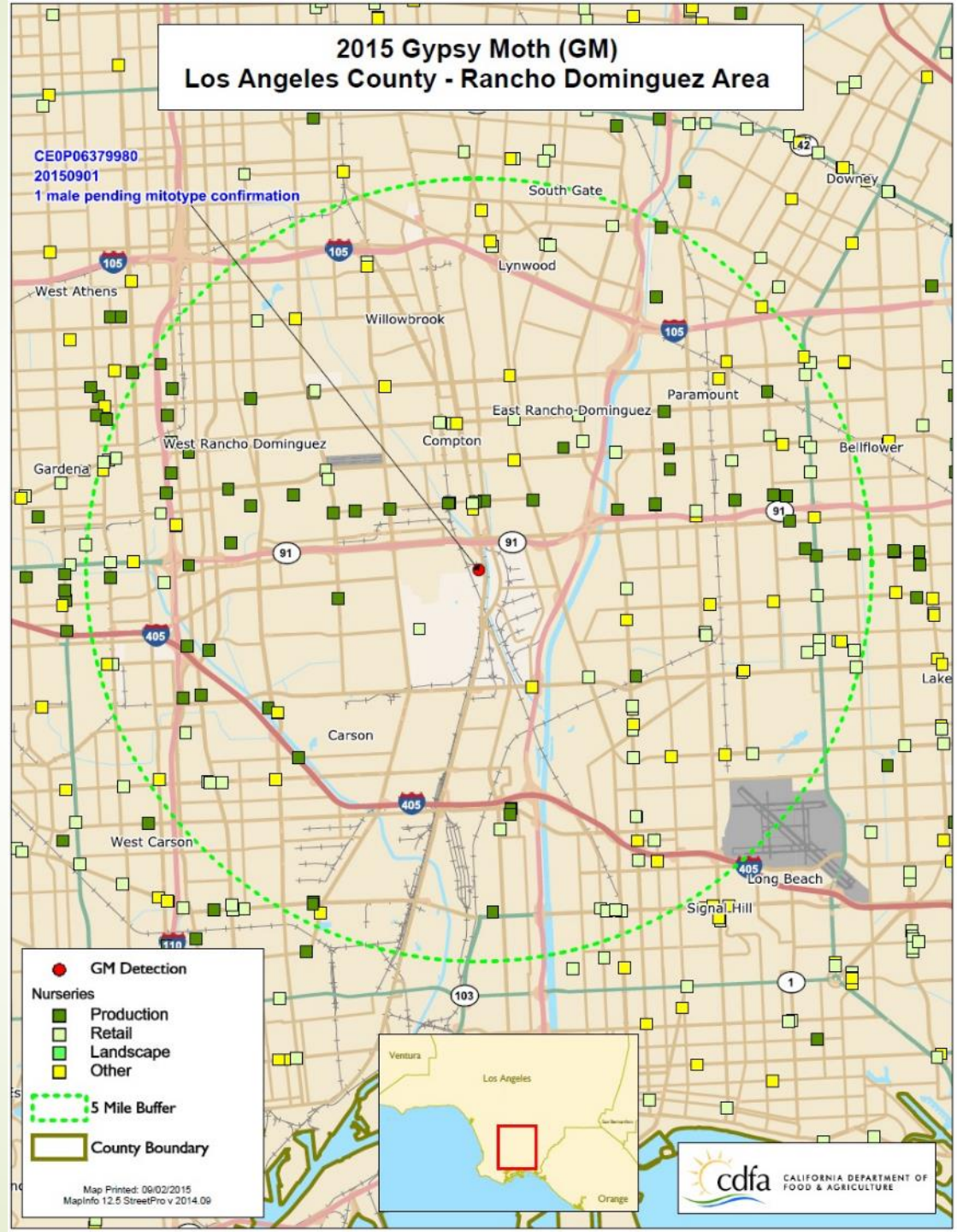
Los Angeles County

Rancho Dominguez

- 1 moth in residential area near Rancho Dominguez adobe

Los Angeles

- 1 moth in residential / industrial area near LAX



Gypsy Moth 2015

Alameda County

Hayward

- 1 moth in industrial area
- Several moving companies in area

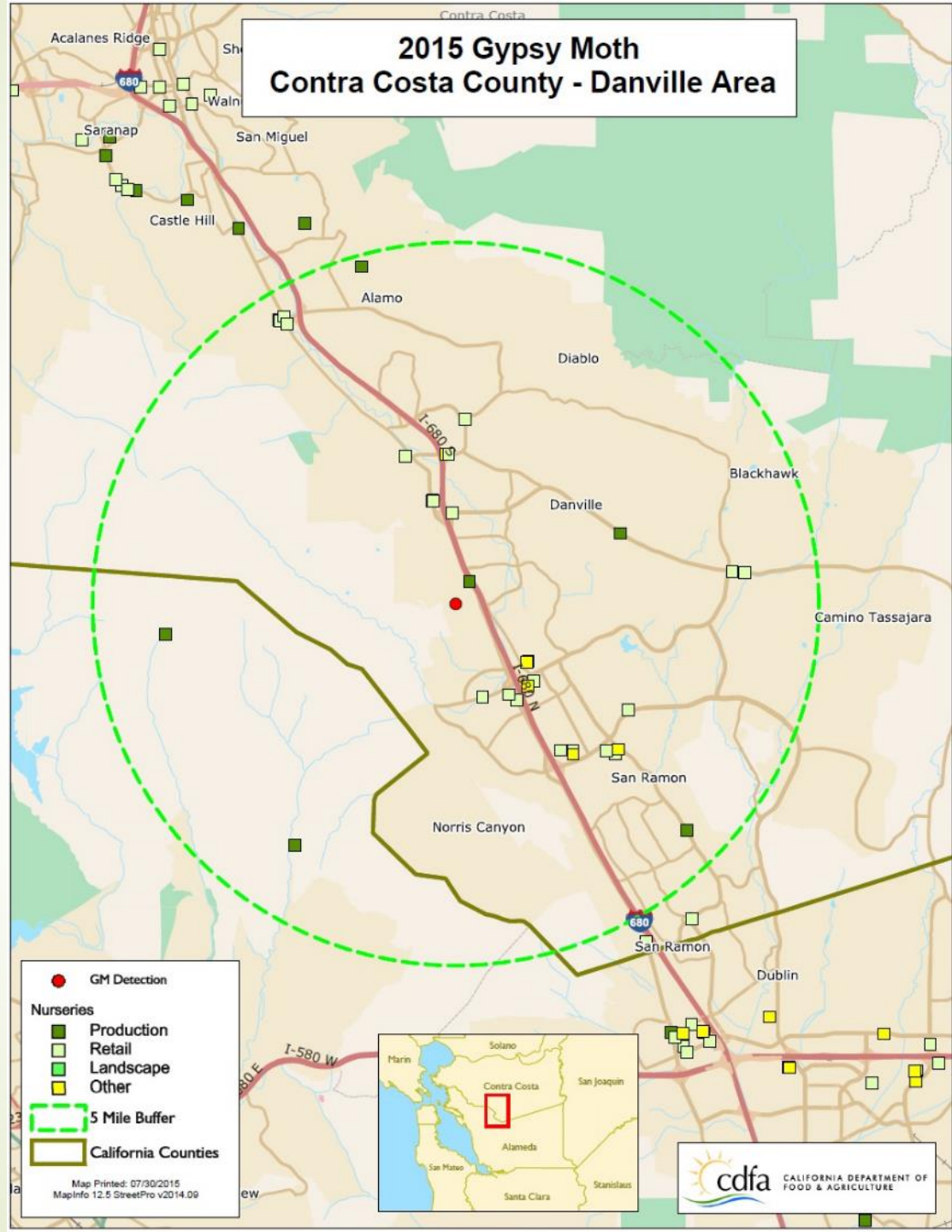


Gypsy Moth 2015

Contra Costa County

Danville

- 1 moth in residential area

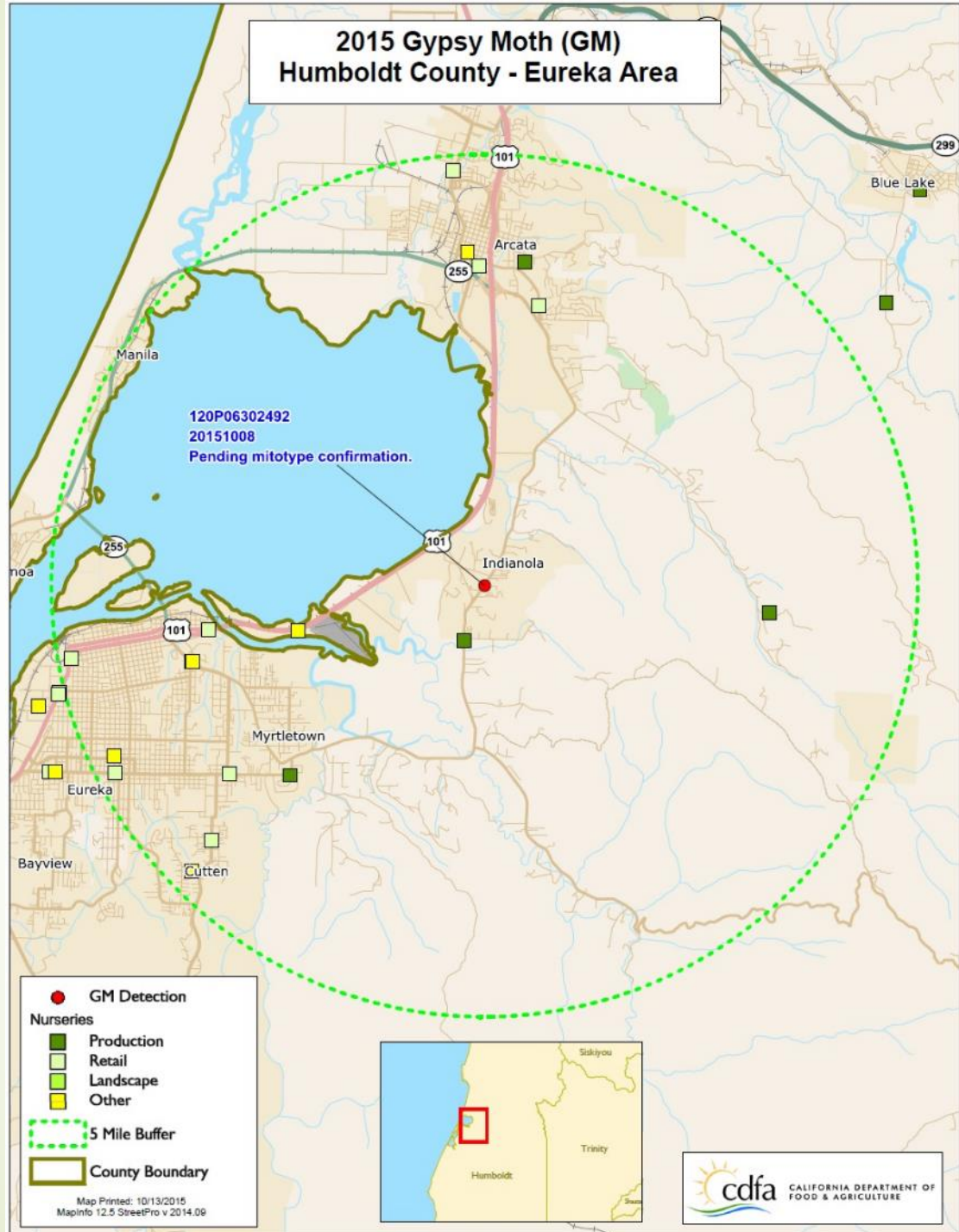


Gypsy Moth 2015

Humboldt County

Bayside

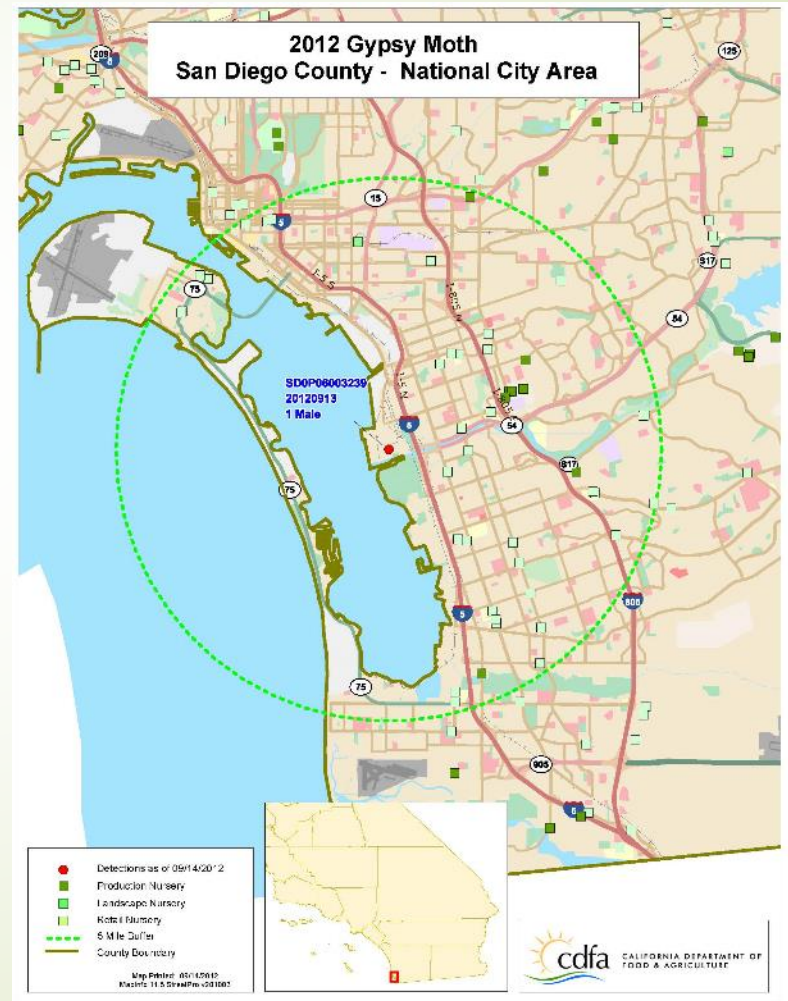
- 1 moth in residential area near campground



Asian Gypsy Moth, *Lymantria dispar asiatica*

- One male trapped in 2012 at Port of San Diego.
- Delimitation trapping in 2013 and 2014, with no detections.

NATIONAL CITY MARINE TERMINAL
1401 Torrey Pines Road, National City, CA 91954
Wireless: 619 683 8863 - Fax: 619 683 8864
NICTD@portofsandiego.org



Medfly Preventive Release Program (PRP)

- Began in July 1996 to prevent the establishment of Medfly in the Los Angeles basin by the continuous aerial release of sterile Medflies into the environment.
- Cooperative program between CDFA and USDA.
- Proactive vs. reactive approach.
- Environmentally friendly - No pesticides are used in the PRP.
- Helps prevent quarantines against agriculture industry and the public.
- Serves as a platform for launching exotic fruit fly SIT programs both in the PRP area and in other parts of California.



Pupae Arriving (CDFA)



Loading Flies onto Aircraft (CDFA)

PRP Operations

- Sterile flies
 - CDFA Rearing Facility in Hawaii – 150 million pupae/week.
 - USDA Rearing Facility in Guatemala – purchase as needed.
- Release area is 1750 mi² (4533 km²) over parts of four counties – Los Angeles, Orange, Riverside, and San Bernardino
- Standard release rate of 62,500/mi²/week (241/ha).
- Increased release rate in historical high risk area of central Los Angeles County over 250 mi² of 125,000/mi²/week.
- Two releases per week at 3-4 day intervals, year round.
- 125 million flies released each week.



Egging Cages (CDFA)

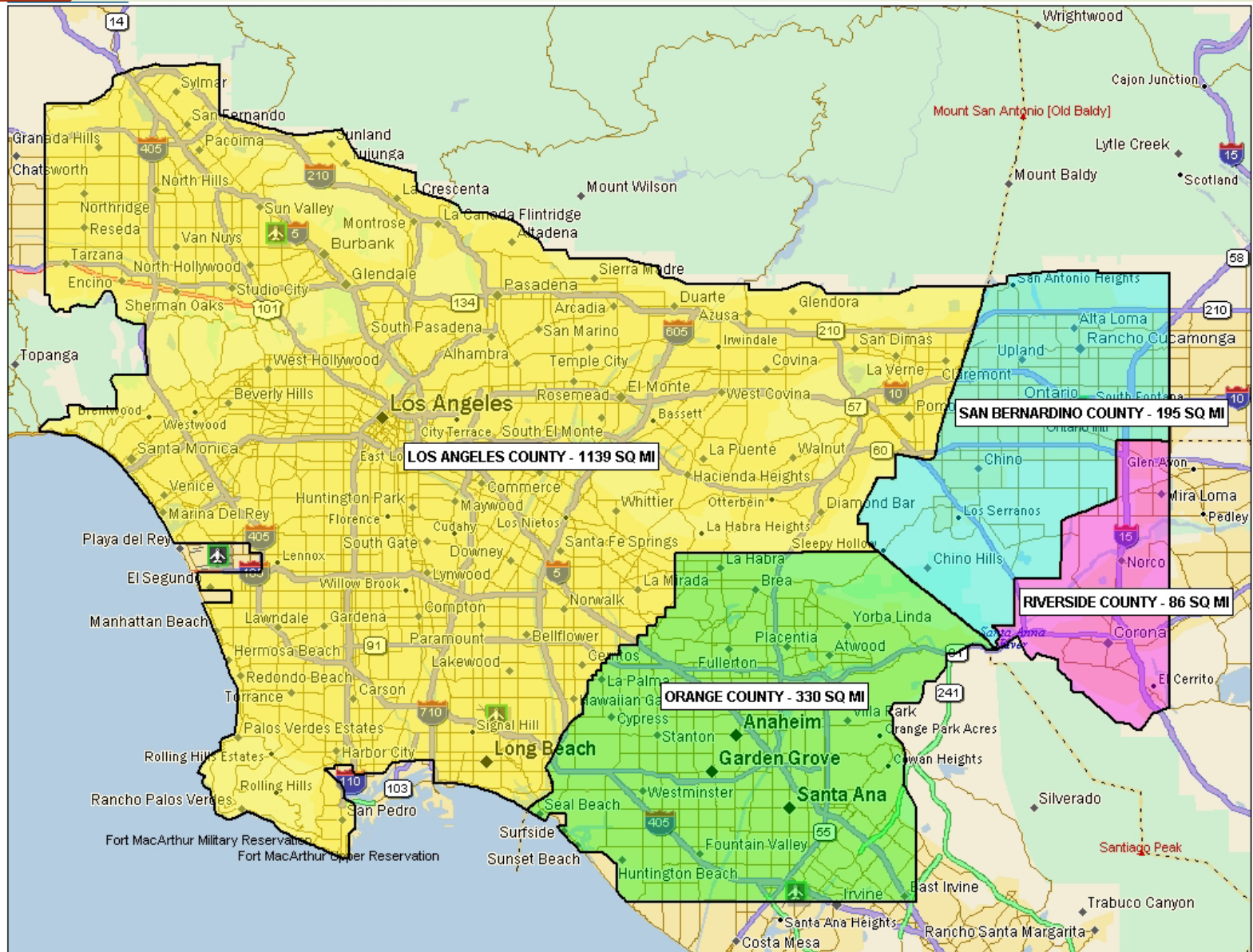


Larval Rearing (CDFA)



Irradiated, Dyed Pupae (CDFA)

PRP Release Area



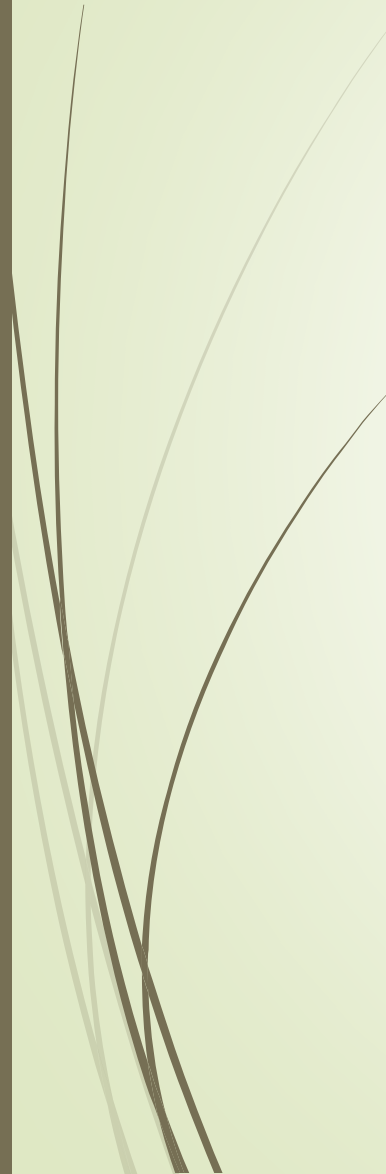


Photo Courtesy of OC Register

Detection

- 90,000 detection traps during peak season.
- Uses 5 lures and 3 trap types.
- Targets *Anastrepha*, *Bactrocera*, *Ceratitis*, *Dacus*, and *Rhagoletis*.
- Trap density based on population density and environment.
- Annual quality control program to assess adherence to trapping protocols and recognition of target species.

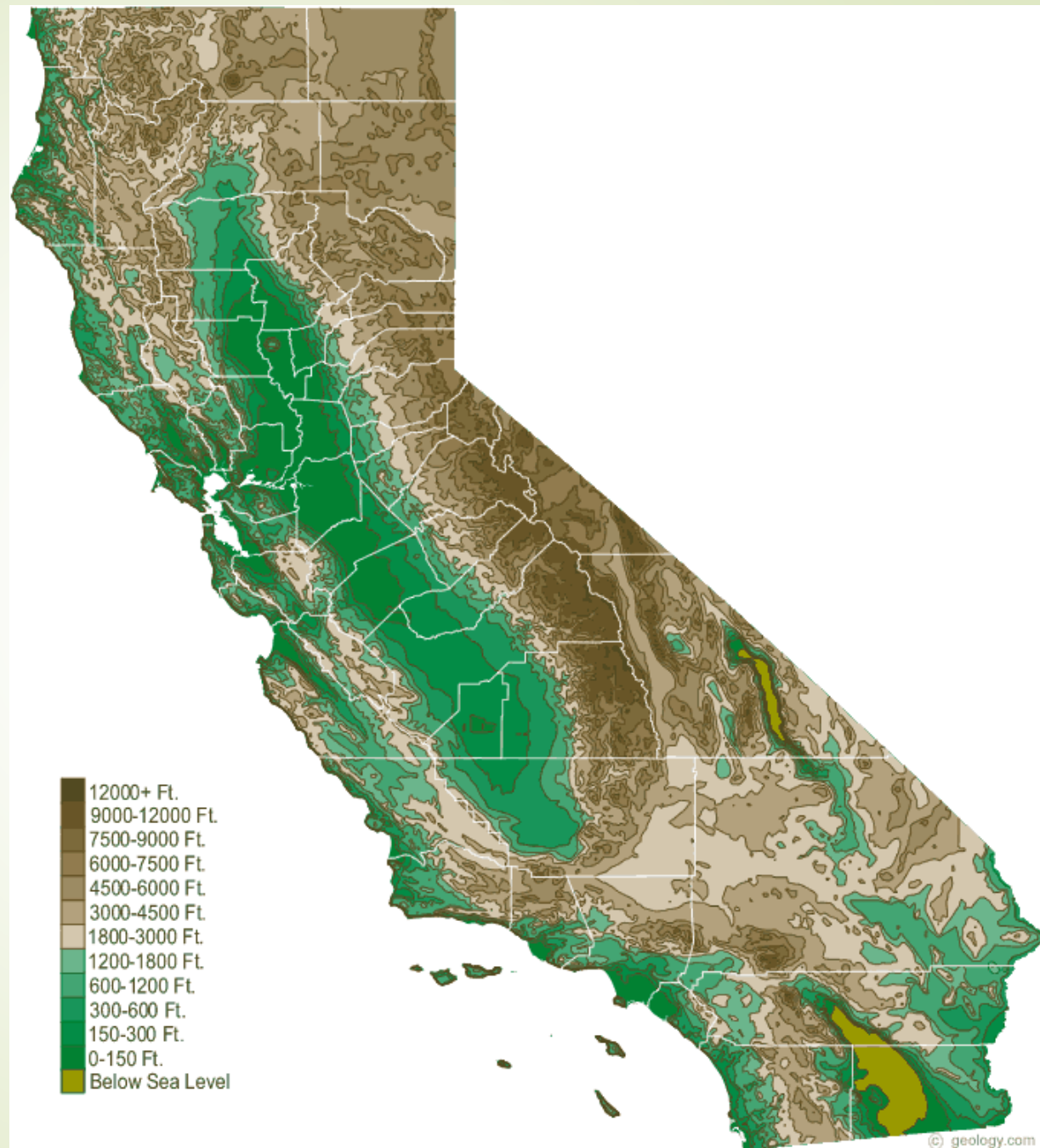


Jackson Trap (CDFA)



McPhail Trap (CDFA)

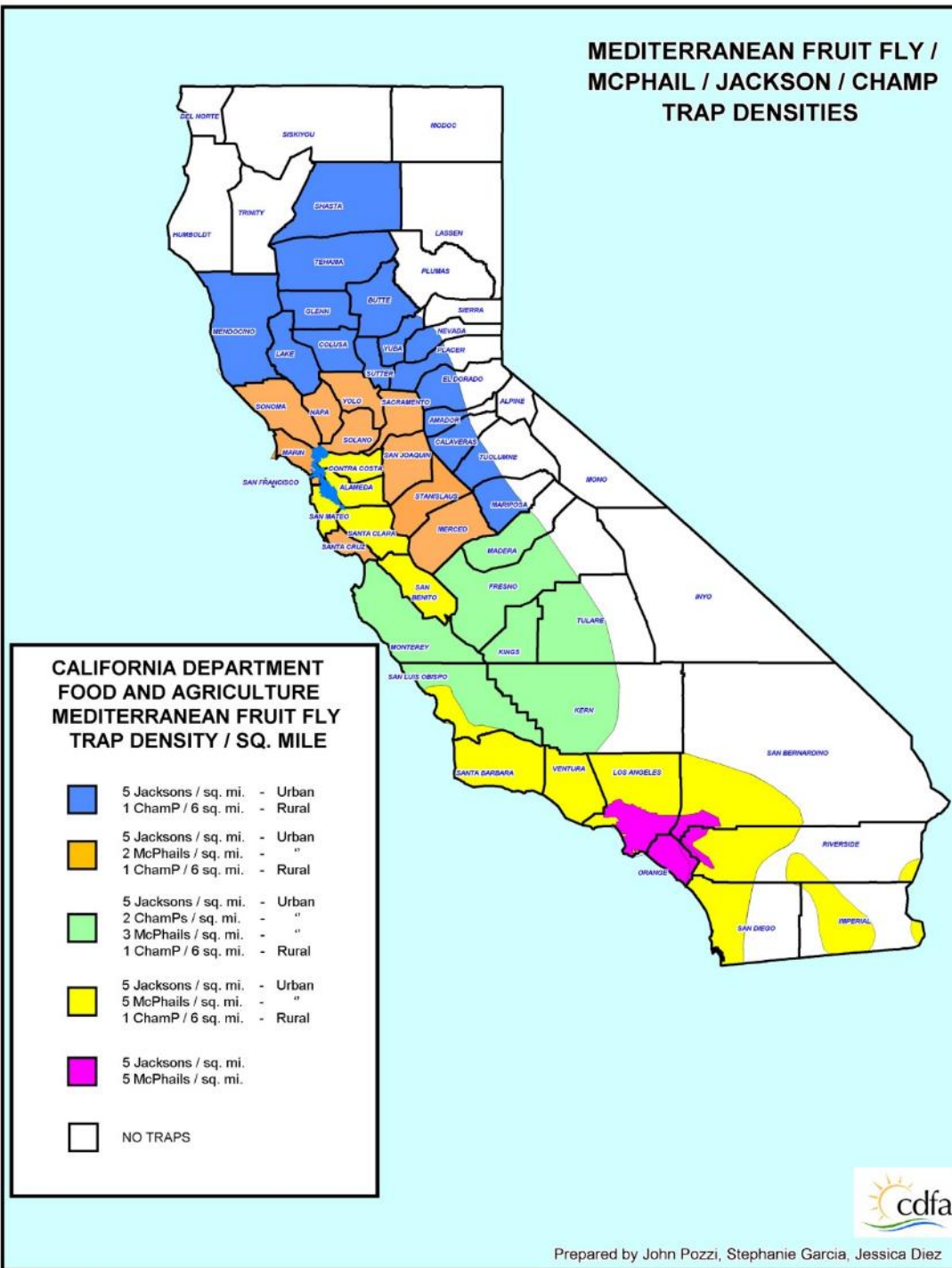
California Topography



Trap Densities I

- Trimedlure Jacksons
- McPhails w/ Yeast
- Champs w/ Ammonium Bicarbonate

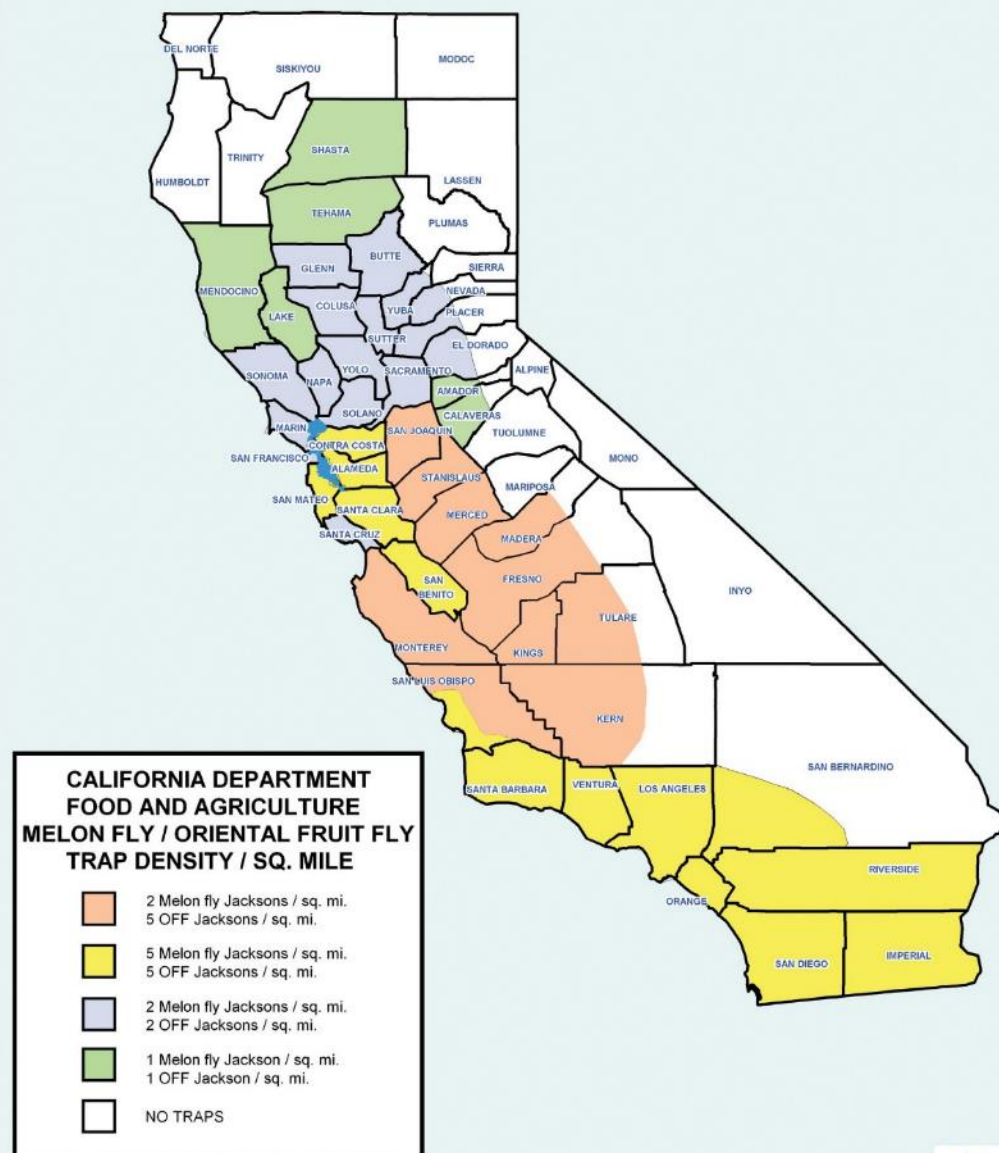
MEDITERRANEAN FRUIT FLY / MCPHAIL / JACKSON / CHAMP TRAP DENSITIES



Trap Densities II

- Cuelure Jacksons
- Methyl Eugenol Jacksons

MELON FLY / ORIENTAL FRUIT FLY TRAP DENSITIES



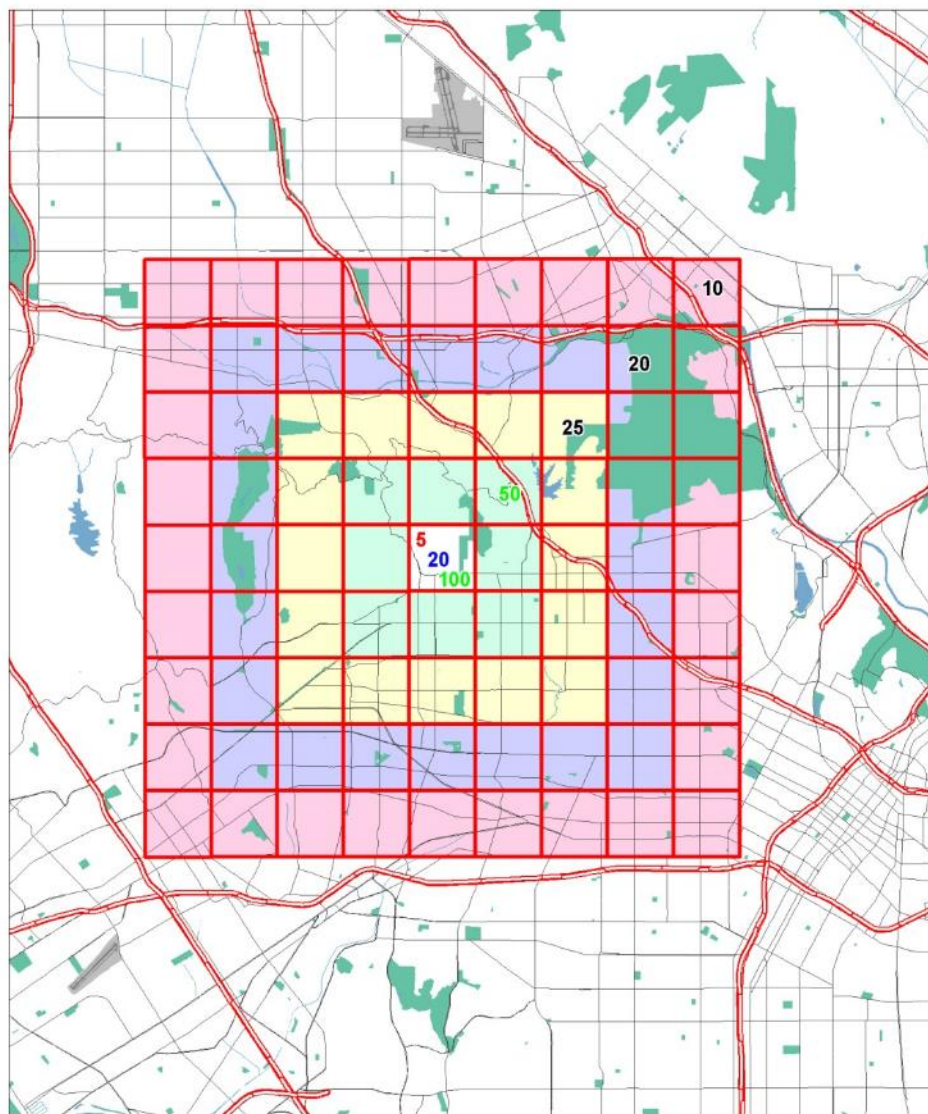
Response Triggers

- **Delimitation – incursion occurred.**
 - Single adult.
- **Treatment – possible that infestation has or may occur.**
 - 2 or more males or unmated females within 3 miles (4.8 km) and within one life cycle.
- **Quarantine – infestation has occurred.**
 - Same as or higher than treatment trigger. Number of males and unmated females dependent on species, trapping system, and proximity to agriculture.
 - Single mated female.
 - Egg, larva or pupa.

Delimitation Survey

- Trap placement begins within 24 hours of confirmed detection.
- Area is 4.5 mile (7.2 km) radius from each fly find, resulting in a 81 mi² (210.6 km²) zone.
- Area is broken into a core mi² (2.6 km²) and 4 concentric buffers, each 1 mile (1.6 km) thick.
- Densities range from 5 to 125 traps per mi² (2 to 48 per km²).
- Check traps daily in core areas for first week.
- All other traps checked twice a week for first week.
- After the first week and with no further detections, servicings go to once per week.
- Conducted for 2 or 3 life cycles, depending on species.
- Fruit sampling may occur in a 200 meter radius.

MEDITERRANEAN FRUIT FLY TRAP DELIMITATION ARRAY



MCPHAIL

IPMT

CHAMP

JACKSON/TRIMEDLURE

Treatments

- **Foliar Bait – all species**
 - Spinosad GF-120.
 - 200 meter radius from each find site.
 - Repeated for 1 to 2 life cycles.
 - Aerial application possible (not used since 2003).
- **Fruit Removal – all species**
 - All ripening host fruit removed.
 - 100 meter radius from each find site.
 - Conducted once.
- **Male Attractant Technique (MAT) – *Bactrocera* spp.**
 - Dibrom with methyl eugenol or cuelure
 - 1.5 mile radius from each find site.
 - 600 to 1000 bait stations per square mile.
 - Repeated for 1 to 2 life cycles.
- **Sterile Insect Technique (SIT) – *A. ludens* & *C. capitata***
 - 250,000 males/week released by air.
 - 1.5 mile radius from each find site.
 - Repeated for 2 life cycles.

California Action Plans

Lure	Delimitation Array*	Bait Spray	Aerial Spray**	Fruit Removal	MAT	SIT	Quarantine Trigger***
Cuelure	50-25-15-10-5	Yes	No	Yes	Yes	No	2
Methyl Eugenol	25-5-5-5-5	Yes	No	Yes	Yes	No	Urban = 8 Rural = 6
Trimedlure	100-50-25-20-10	Yes	Yes	Yes	No	Yes	2
Protein	80-40-20-10-5 Mexfly = 80-40-5-5-5 SIT = 20-20-5-5-5	Yes	Yes	Yes	No	Yes	2 Mexfly = 5

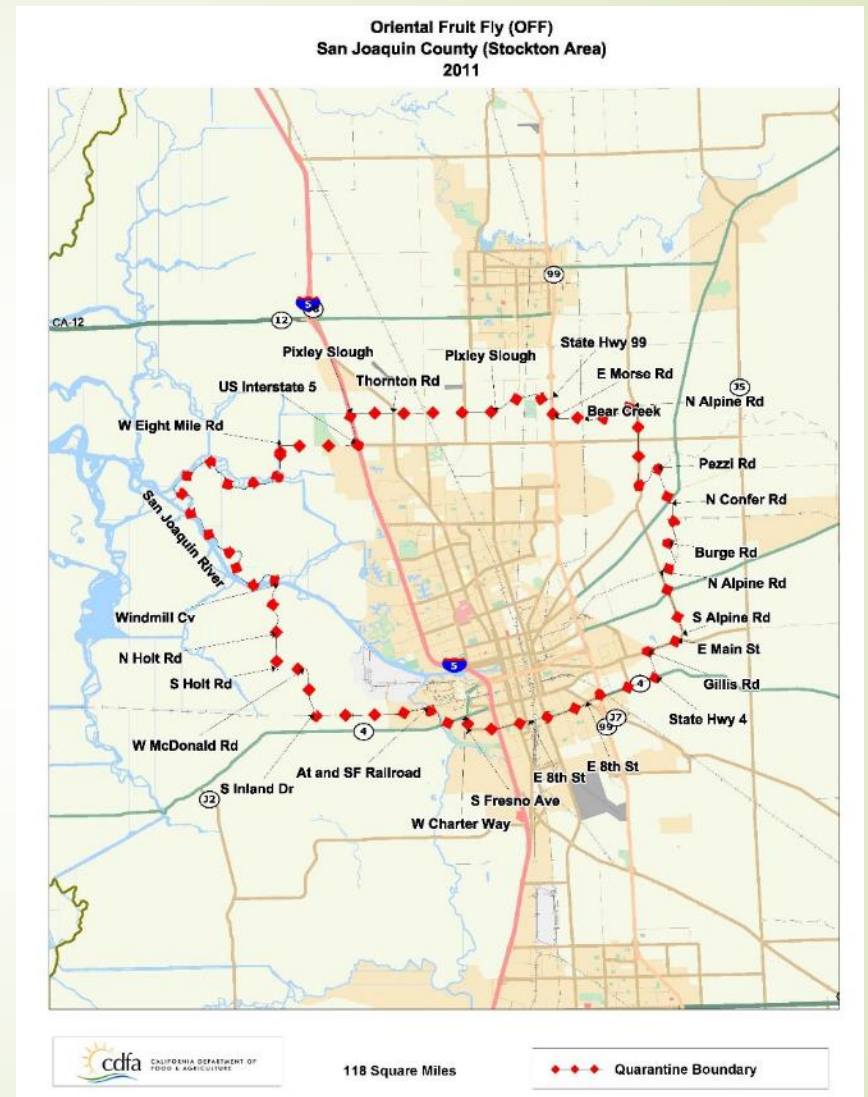
* = Number of traps with the specified lure

** = Not used since 2003

*** = Number of males and unmated females

Quarantine

- Boundaries out to 4.5 mile radius from infestation.
- Regulate vendors and growers of host fruit.
- Regulate vendors of host trees (i.e., nurseries).
- Regulate landscapers and others associated with green waste.
- In place for 3 life cycles past last detection.



OFF group, San Joaquin Co., Stockton, 2011

Detections 1954 – 2015

Native Origin: Americas

Species	Common Name	First Year	# of Years
<i>Anastrepha fraterculus</i> complex	South American fruit fly complex	2010	1
<i>Anastrepha ludens</i>	Mexican fruit fly	1954	45
<i>Anastrepha obliqua</i>	West Indian fruit fly	1967	7
<i>Anastrepha serpentina</i>	Sapote fruit fly	1989	1
<i>Anastrepha striata</i>	NW Guava fruit fly	1963	7
<i>Anastrepha suspensa</i>	Caribbean fruit fly	1983	6
<i>Rhagoletis pomonella</i>	Apple maggot	1983	1*

* = considered established

Detections 1954 – 2015

Native Origin: Asia/Pacific

Species	Common Name	First Year	# of Years
<i>Bactrocera albistrigata</i>	White striped fruit fly	2009	1
<i>Bactrocera correcta</i>	Guava fruit fly	1986	26
<i>Bactrocera cucurbitae</i>	Melon fly	1956	15
<i>Bactrocera dorsalis</i> group	Oriental fruit fly group	1960	49
<i>Bactrocera facialis</i>	Tonga fruit fly	1998	1
<i>Bactrocera latifrons</i>	Solanaceous fruit fly	1998	1
<i>Bactrocera scutellata</i>	Striped fruit fly	1987	9
<i>Bactrocera tryoni</i>	Queensland fruit fly	1985	2
<i>Bactrocera zonata</i>	Peach fruit fly	1984	15



Detections 1954 – 2015

Native Origin: Africa/Europe

Species	Common Name	First Year	# of Years
<i>Bactrocera oleae</i>	Olive fruit fly	1998	1*
<i>Ceratitis capitata</i>	Mediterranean fruit fly	1975	30
<i>Dacus bivittatus</i>	Greater pumpkin fruit fly	1987	1

* = considered established after first year

2015 Exotic Fruit Fly Detections (as of Nov 10)

- 102 adults
- 2 larval sites
 - (18 larvae)
- 6 species
- 10 counties



Melon Fly (CDFA)



Mexican Fruit Fly (CDFA)



Peach Fruit Fly (CDFA)



Mediterranean Fruit Fly (UC Davis)



Oriental Fruit Fly Group (PACIFLY)



Guava Fruit Fly (FL DPI)

2015 Detections (as of Nov 10)

SPECIES	COUNTY	FLIES	TOTAL
Anastrepha ludens Mexican Fruit Fly	Los Angeles San Bernardino	4 1	5
Bactrocera correcta Guava Fruit Fly	Los Angeles Orange San Mateo Santa Clara	12 1 1 1	15
Bactrocera cucurbitae Melon Fly	Los Angeles	1	1
Bactrocera dorsalis Group Oriental Fruit Fly Group	Los Angeles* Orange Santa Clara San Diego Alameda Contra Costa Sacramento	45 2 17 8 1 1 1	75
Bactrocera zonata Peach Fruit Fly	Orange Fresno	1 1	2
Ceratitidis capitata Mediterranean Fruit Fly	San Diego	4	4

* 2 larval sites with 18 larvae.

2015 Delimitation/Eradication Projects

- 26 delimitation-only projects.
- 16 eradication projects, 12 for OFF, 2 for GFF, 1 for Medfly, 1 for Mexfly.
- 12 OFF eradications triggered 3 quarantine projects.
- 1 Medfly eradications triggered 1 quarantine project.
- 2 GFF eradication triggered 1 quarantine project.
- Treatment methods used for Medfly & Mexfly:
 - Sterile Insect Technique (1.5 mile radius).
 - Spinosad GF-120 sprays (200 meter radius).
 - Fruit removal (100 meter radius).
- Treatment methods used for OFF & GFF:
 - MAT (1.5 mile radius).



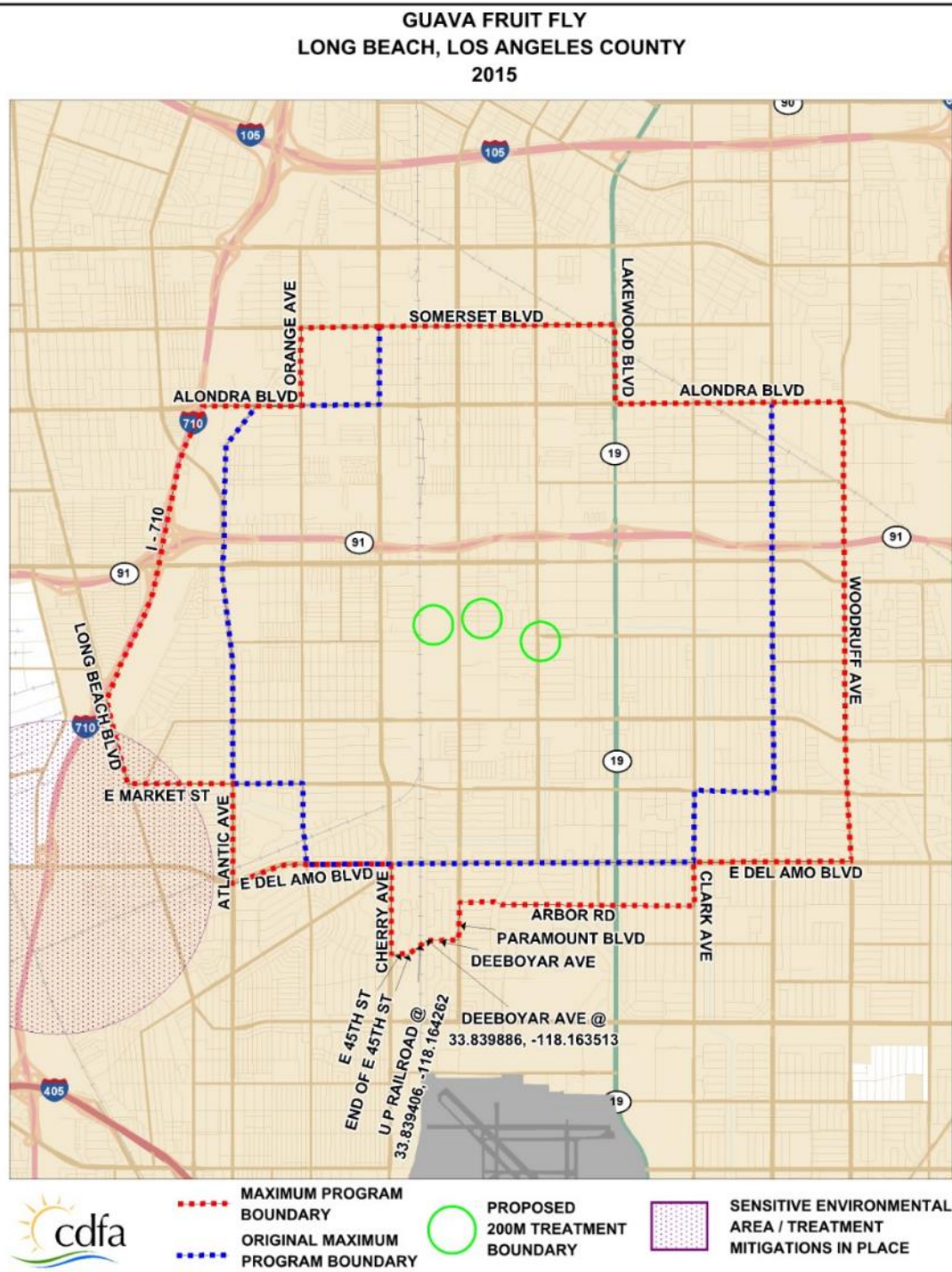
MAT (CDFA)



Backyard Fruit Removal (CDFA)

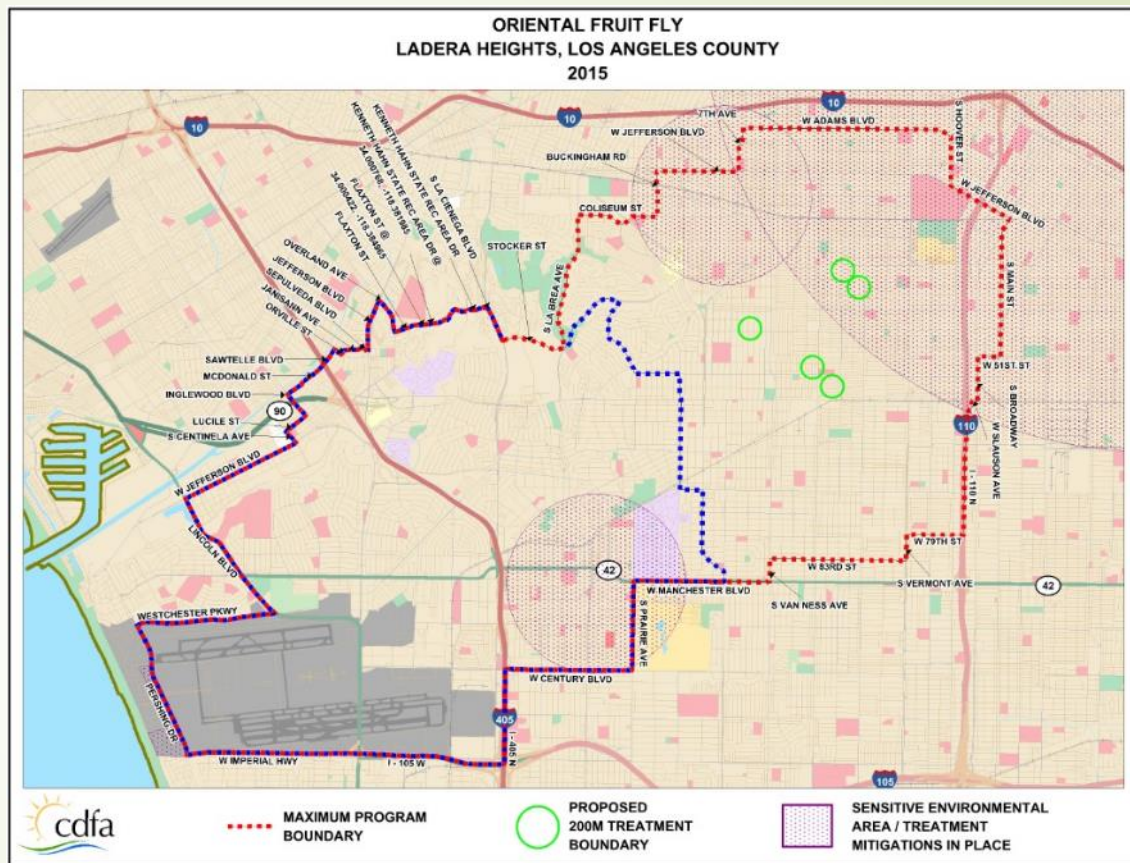
Long Beach Guava Fruit Fly 2015

- May 1-13, 2015 8 flies trapped in lemon and loquat trees at 3 sites
- Triggers the first quarantine for GFF in the U.S.A.
- MAT treatment began May 13
- Spinosad treatment began May 16
- Fruit removal May 20-23
- 3,200.25 pounds of fruit removed from 37 properties
- 338 compliance agreements
- F3 completed 10/8/15



Ladera Heights Oriental Fruit Fly 2015

- June 19-29: 10 flies trapped at 7 sites
- July 9: 17 larvae found in infested grapefruit
- MAT treatment began July 6
- Spinosad treatment began June 27
- 2,725 pounds of fruit removed from 56 properties
- 880+ compliance agreements
- August 12-18: 6 flies trapped at 6 sites
- Three flies trapped Sept & Oct
- F3 projected for 5/12/16

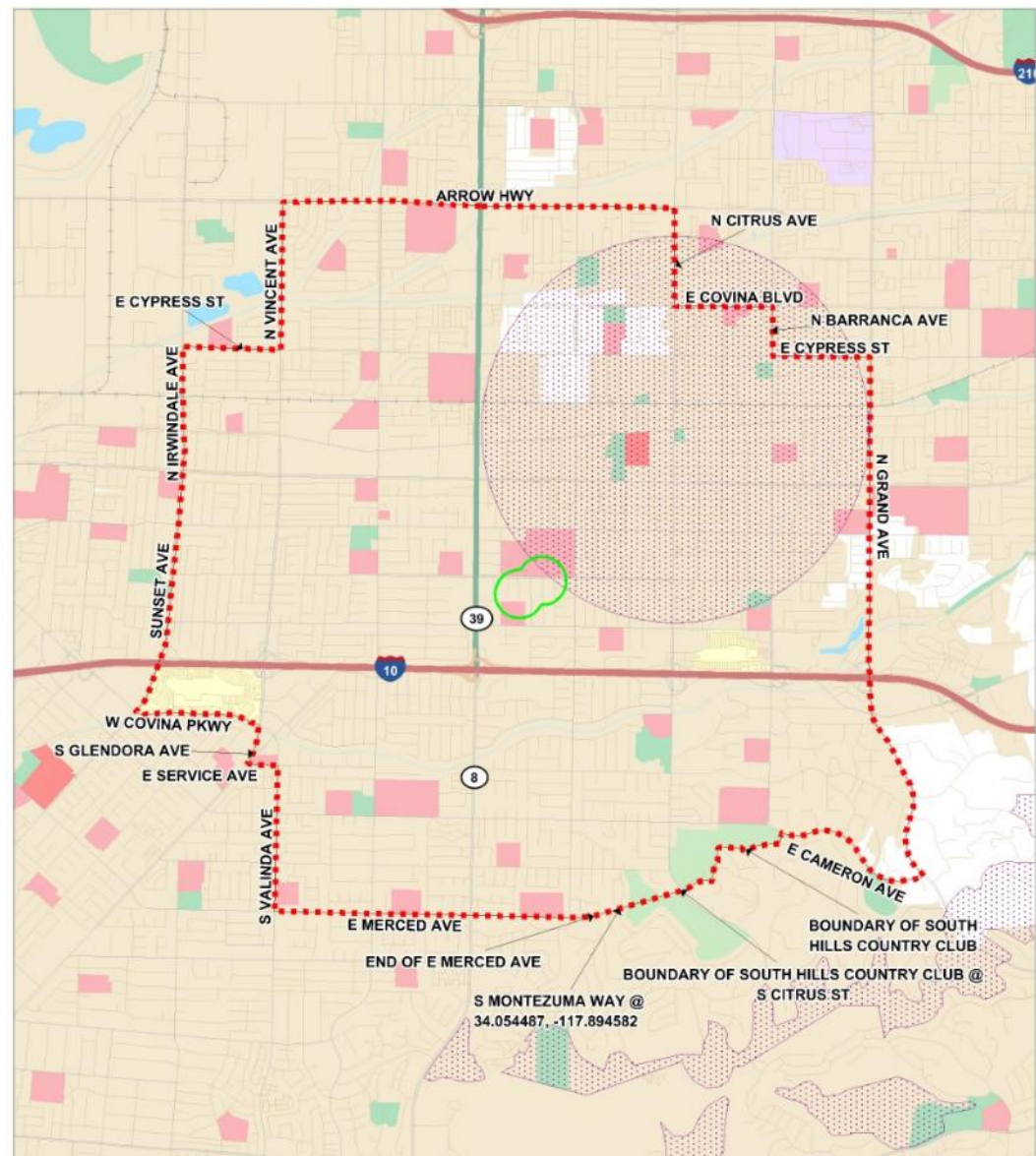


Covina Oriental Fruit Fly

2015

- July 8-August 1: 4 flies trapped at 2 sites
- 1 larva found in grapefruit
- MAT treatment began August 7
- Spinosad treatment began August 10
- August 11: 796.5 pounds of fruit removed from 9 properties
- 44 compliance agreements
- F3 projected for 12/16/15

ORIENTAL FRUIT FLY COVINA, LOS ANGELES COUNTY 2015



..... MAXIMUM PROGRAM BOUNDARY

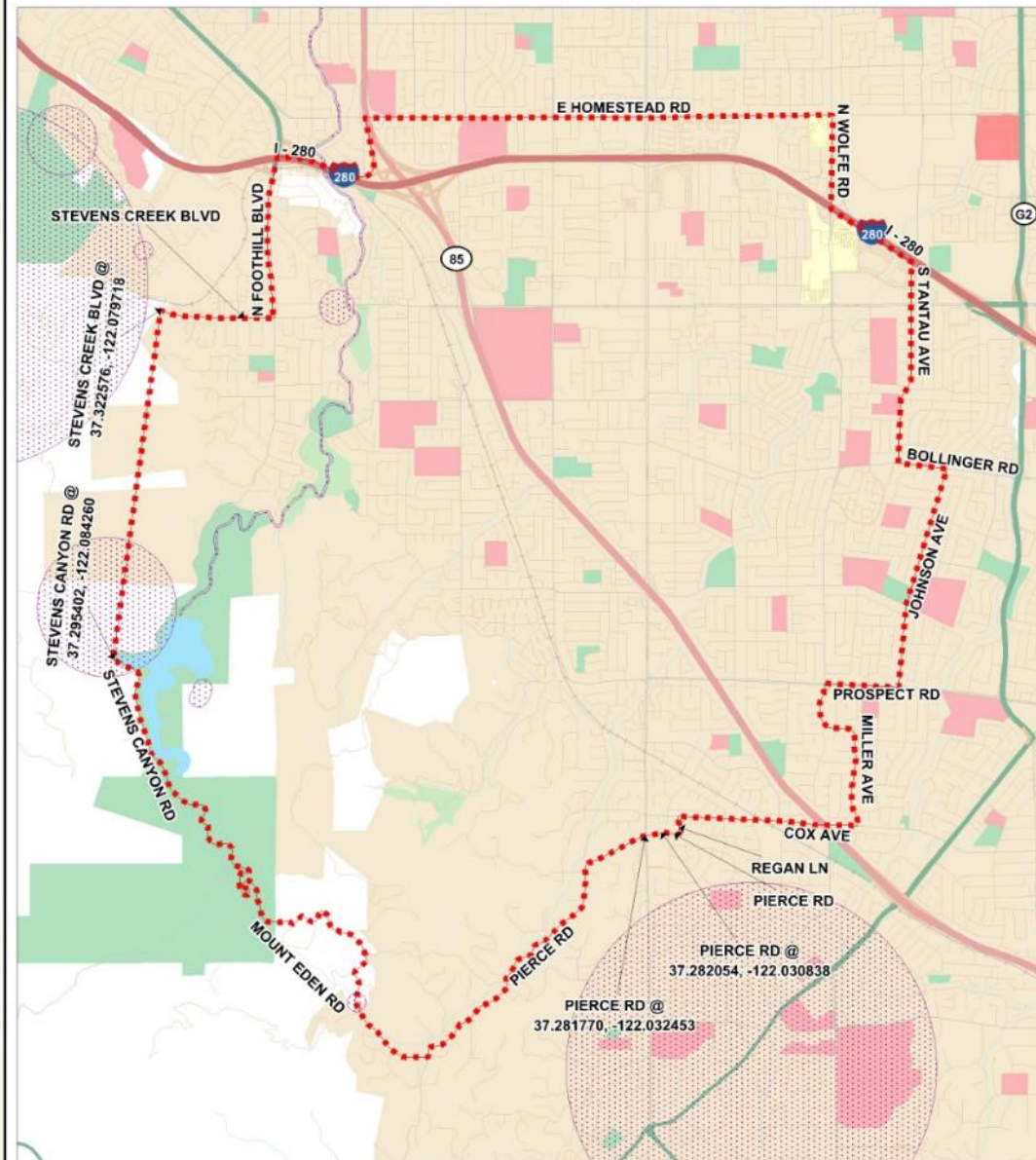
○ PROPOSED 200M TREATMENT BOUNDARY

▨ SENSITIVE ENVIRONMENTAL AREA / TREATMENT MITIGATIONS IN PLACE

Cupertino Oriental Fruit Fly 2015

- June 22-23: 6 flies trapped at 3 sites
- Commercial agriculture in area lowers quarantine trigger to 6 flies
- MAT treatment began June 26
- Spinosad treatment began June 30
- 160 compliance agreements
- F3 projected for 11/12/15

ORIENTAL FRUIT FLY CUPERTINO, SANTA CLARA COUNTY 2015



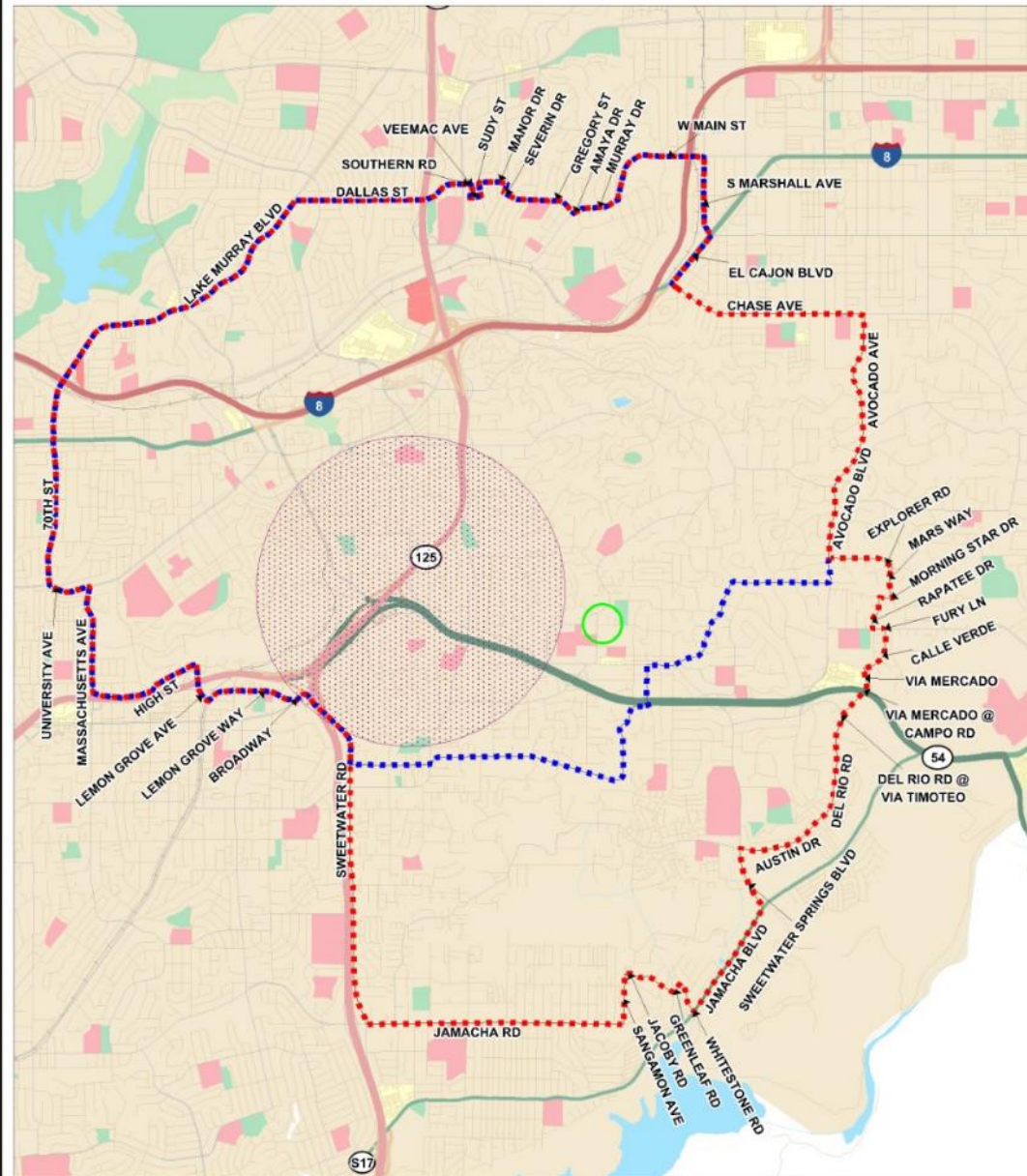
..... MAXIMUM PROGRAM
BOUNDARY

SENSITIVE ENVIRONMENTAL
AREA / TREATMENT
MITIGATIONS IN PLACE

La Mesa Mediterranean Fruit Fly 2015

- July 22: 2 males trapped at 1 property
- Inconclusive if these were sterile or wild flies
- July 30: Molecular analysis shows flies are wild: BBBB
- July 31 & August 4: 2 more flies trapped
- August 10: SIT began
- Spinosad treatments
- F3 completed 10/15/15

MEDITERRANEAN FRUIT FLY LA MESA, SAN DIEGO COUNTY 2015



MAXIMUM PROGRAM
BOUNDARY
ORIGINAL MAXIMUM
PROGRAM BOUNDARY

PROPOSED
200M TREATMENT
BOUNDARY

SENSITIVE ENVIRONMENTAL
AREA / TREATMENT
MITIGATIONS IN PLACE

Fruit Fly Projects 2006 – 2015 (*as of Nov 10)

Year	Flies	Species	Eradications	Quarantines	Flies in Central Valley	Quarantines in Central Valley
2006	81	5	15	3	9	1
2007	80	5	11	4	16	1
2008	78	4	10	3	1	0
2009	83	7	11	8	3	0
2010	40	7	5	3	10	2
2011	55	5	8	2	11	1
2012	37	4	6	1	0	0
2013	161	4	12	1	6	0
2014	94	6	10	3	0	0
2015*	102	6	16	5	2	0

Asian Citrus Psyllid (ACP), *Diaphorina citri* & Huanglongbing (HLB), *Candidatus Liberibacter* spp.

- 30,000 yellow panel traps placed in citrus producing counties.
- Treatment in a 400- to 800-meter radius of find sites with a foliar insecticide (cyfluthrin) and a systemic (imidacloprid).
- Development of biocontrol for suppression.
- Goal: Inhibit spread of ACP by restricting human-mediated movement, suppressing established populations, and eliminating outlying incipient populations, and survey for HLB.
- HLB first detected in Hacienda Heights (Los Angeles Co.) March 2012.



ACP Adult & Nymphs (M. Rogers, U. FL)

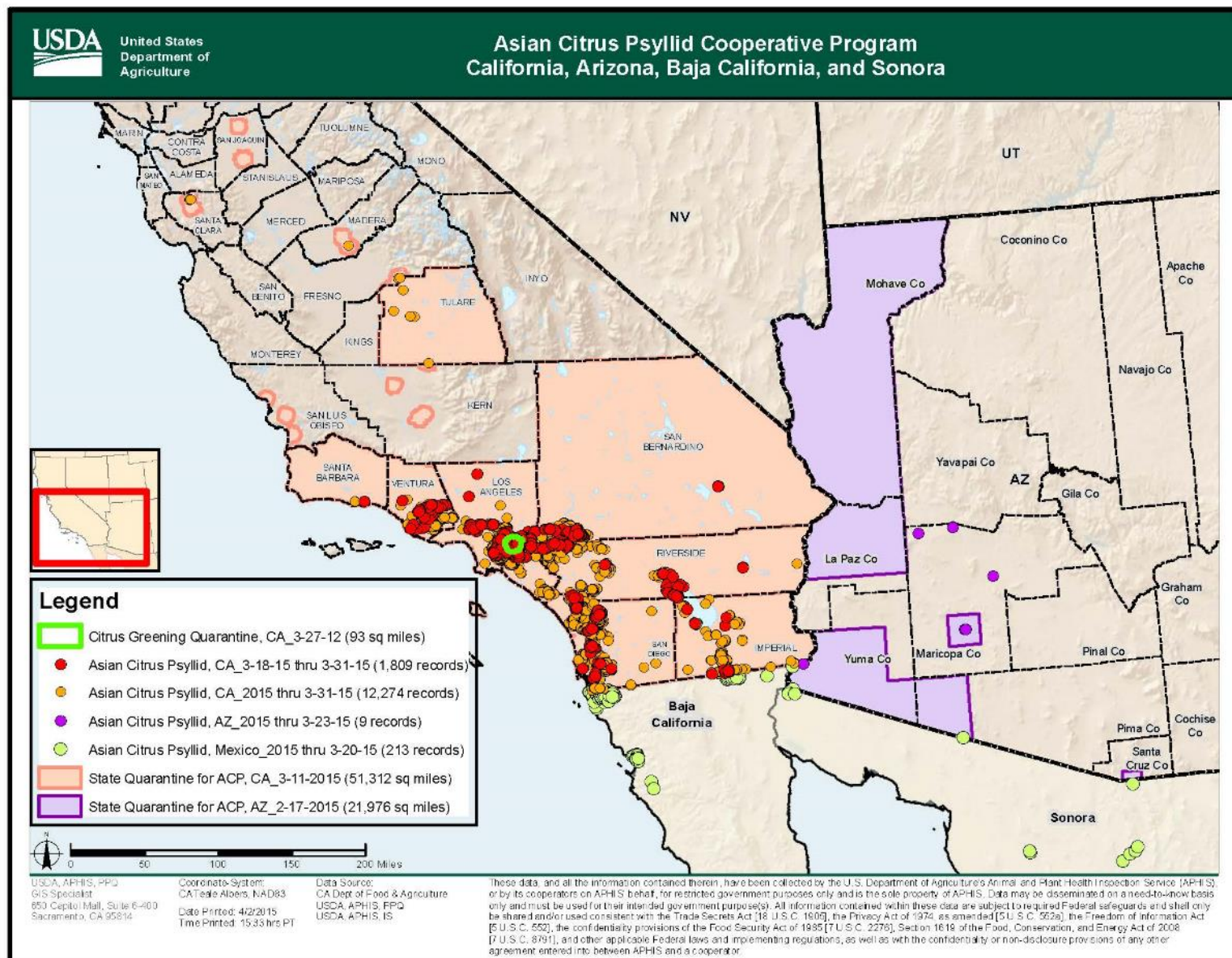


HLB Infected Leaves (CDFA)





ACP / HLB Finds & Quarantine Boundaries



Operation Mangosteen Madness



The End

HOW YOU CAN HELP – REPORT!



REPORT A PEST
REPORT A PEST

How You Can Help

1-800-491-1899

<http://www.cdfa.ca.gov/phpps/ReportaPest/>