2023 Asian Defoliating Moth Survey
Annual Accomplishment Report
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Year:	
State:	
Cooperative Agreement Name:	
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Project Document Date:	
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Quarterly Report	☐
Semi-Annual Accomplishment Report	☐
Annual Accomplishment Report	☒

A. Objective and Need for Assistance

The California Department of Food and Agriculture (CDFA) trapped for flighted spongy moths (FSM), *Lymantria dispar asiatica* (Lepidoptera: Lymantriidae), the rosy moth (RM), *Lymantria mathura* (Lepidoptera: Lymantriidae), nun moth (NM), *Lymantria monacha* (Lepidoptera: Lymantriidae), and Siberian silk moth (SSM), *Dendrolimus superans sibiricus* (Lepidoptera: Lasiocampidae) in and near port areas and transportation corridors and hubs receiving cargo shipments from East Asian and Russian ports located between 24 and 60 degrees north latitude. The CDFA also trapped for Spongy moth (SM) *Lymantria dispar dispar* (Lepidoptera: Lymantriidae) in urban, forest, and other high-hazard locations throughout California; and conducted delimitation trapping for any current and new detections.

The objective of California's survey activities for 2023-2024 was to: 1) continue early detection of Asian Defoliating Moth (ADM) at high-risk California deep-water port sites, in adjacent urban and ornamental plantings and around transportation corridors and hubs associated with foreign containers; 2) trap for SM throughout California in urban forests and other high-hazard locations; and 3) delimit current and new detections of these pests. Early detection of these pests is critical to the ability to eradicate incipient infestations. This survey increases the likelihood that these pests, if detected, will be found at incipient levels that allow for successful eradication.

California is at continual risk of introduction of ADM and SM, as evidenced by detections of adult moths in 2018 (one FSM and one SM both in Santa Cruz County), 2019 (one SM in Yuba County), 2020 (one FSM in Santa Clara County and one SM in Placer County) and 2022 (one SM in Contra Costa County). In addition, recent detections of ADM and SM in the state of Washington indicate a pathway into the Pacific coast in general. Spongy moths have been detected every year in Washington since 1977. Absent of a quarantine or self-inspection program, due to geographic proximity to Washington, there is a high probability that egg masses will hitchhike on outdoor items into California.

Assistance is needed because current state funding levels are not sufficient to support the challenge of detecting invasive defoliator introductions at high-risk entry points. The state benefits by having a complementary program that specifically targets those areas of highest risk for the introduction of the FSM and its relatives via seaports. Detections of FSM have occurred at and around ports in the northwestern United States (U.S.), and in all cases, introductions were associated with commercial shipments primarily from the Far East (Asia and Russia). The amount of cargo arriving at ports in California continues to increase, thus increasing the risk of introduction of these pests. Since 2016, three FSM adults and 12 SM adults have been trapped in California. An SM moth has been trapped every year from 2016 to 2022, except for 2021. In 2023, seven male SM were found, additional details are provided below. These detections highlight the need to continue early-detection efforts for ADM to prevent establishment of these pests in California.

Pest	Common Name	Scientific Name	Hosts
FSM	Flighted Spongy Moth	*Lymantria dispar asiatica*	Deciduous trees & conifers: oak, poplar, willow, birch & pines. Older larvae feed on spruce, apple, fir & cedar
RM	Pink spongy moth, rosy moth	*Lymantria mathura*	Deciduous trees only: oak, apple, pear, cherry, willow, birch, hickory, walnut & beech
NM	Nun moth	*Lymantria monacha*	Deciduous trees & conifers: oak, maple, ash, birch, apple, cherry, other fruit trees, pine, spruce, fir & larch
SSM	Siberian silk moth	*Dendrolimus superans sibiricus*	Conifers only: larch, pine, fir & spruce
SM	Spongy moth	*Lymantria dispar dispar*	Deciduous trees & conifers: oak, poplar, willow, birch & pines. Older larvae feed on spruce, apple, fir & cedar

B. Approach and Work accomplishment

Monthly activities:

July – September - Inspected traps.
September – October - Removed some traps. Worked on processing and curating specimens, completed identifications, prepared annual report, cleaned, and repaired equipment as able.
November – May – Administrative work for billing and reporting. Completed trap removal. Finished annual report, cleaned and repaired equipment, and completed laying off seasonal personnel.
March – April –Folded and prepared traps for deployment.
May – Folded and prepared traps for deployment, conducted survey site selection; made initial contacts to arrange for survey activities. Trained permanent personnel; obtained supplies needed for field activities. Solicited and evaluated perspective seasonal employees, hired and provided training to seasonal personnel.
June – Deployed traps statewide and begin servicing traps. Traps were serviced every two weeks to monthly.

Beginning in the spring of 2023, traps targeting ADM were placed at ports in the following 10 counties: Alameda, Contra Costa, Humboldt, Los Angeles, San Diego, San Francisco, San Joaquin, Solano, Ventura and Yolo. San Joaquin, Solano and Yolo County ports are inland along the Sacramento and San Joaquin River Delta but

are regularly visited by deep water vessels via shipping channels. Traps for SM were placed in urban areas and other high-hazard locations throughout the state. Traps were already in place at the start of this agreement of July 2023. Traps were expected to be serviced every two weeks. Overall, 19,100 ADM and SM traps were deployed throughout the state.

In 2023, the CDFA detected an unprecedented 948 adult invasive fruit flies (IFF) which triggered a total of seven eradication projects. Due to this very high level of pest pressure and the need to divert and prioritize resources towards eradication of these IFF some ADM traps were not serviced on time, and some traps were removed after the survey season officially ended. These impacted counties included Los Angeles, Orange, Riverside, San Francisco, Santa Barbara, Santa Clara, Yolo, Ventura and Yuba.

Riverside County could only deploy 30% of SM traps and the traps were not regularly serviced because of staff limitations due to county personnel assisting with the large Riverside-San Bernardino Oriental fruit fly quarantine project. Some SM traps in Riverside County were partially removed in November 2023 and the remainder were removed in May 2024. Ventura County removed some FSM traps late and all traps were removed by February 2024. Los Angeles County had lower than usual SM trap servicing and was unable to service SM traps in August 2023. The SSM, RM and NM traps deployed in Los Angeles County were removed in October and November which was later than originally planned.

In Orange County, SM traps were not regularly serviced from June to September 2023 and traps were removed starting in September and ending in November. San Francisco County experienced lower SM trap servicing in July, followed by irregular servicing of both SM and FSM traps in August and traps were removed in October. Santa Barbara County's SM trap servicing was below normal due to staffing shortages, while Santa Clara County removed traps late in October 2023. Similarly, Yolo County removed SM, FSM, RM, SSM, and NM traps in October, and Yuba County also removed SM traps in the same month. The Smith River Complex Fire which occurred in August through September 2023, also significantly impacted the ability of trappers to service traps in Del Norte County during this period.

Protocols for trap placement by targeted insects:

	FSM	RM	NM	SSM	SM
Traps / square mile	25	5	5	5	2
Trap type	Delta	Pherocon IIC	Delta	Milk carton	Delta
Placement	Trunk	Canopy	Trunk	Canopy	Trunk
Note: ALL TRAPS MUST BE AT LEAST 30 METERS AWAY FROM EACH OTHER					
Servicing schedule	2-week	2-week	2-week	2-week	2-week

Baiting schedule	once/season	once/season	once/season	4-week	once/season
Trap replacement schedule	as needed				
Vaportape II (DDVP insecticide strip)	N/A	N/A	N/A	Lasts 12 weeks	N/A

The following table provides a breakdown of the number of traps placed by county in 2023. The key below explains the categories used in the table:

* **Total ADM** represents the combined total of traps for FSM, RM, NM, and SSM. Spongy Moth traps and delimitation traps are listed separately for clarity.
** **Total** includes the combined sum of all ADM and SM traps.
*** Shows total SM detection and SM delimitation traps.

Trap placement by County:

County:	Number of Traps Placed - Actual						
	FSM	RM	NM	SSM	**Total ADM***	SM	**Total****
Alameda	180	43	53	31	307	546	853
Amador	NA	NA	NA	NA	0	150	150
Butte	NA	NA	NA	NA	0	182	182
Calaveras	NA	NA	NA	NA	0	226	226
Colusa	NA	NA	NA	NA	0	60	60
Contra Costa	64	22	14	12	112	650 ***	762
Del Norte	NA	NA	NA	NA	0	105	105
El Dorado/ Alpine	NA	NA	NA	NA	0	306	306
Fresno	NA	NA	NA	NA	0	449	449
Glenn	NA	NA	NA	NA	0	19	19
Humboldt	129	20	20	20	189	196	385
Imperial	NA	NA	NA	NA	0	60	60
Inyo/Mono	NA	NA	NA	NA	0	90	90
Kern	NA	NA	NA	NA	0	455 ***	455
Kings	NA	NA	NA	NA	0	82	82
Lake	NA	NA	NA	NA	0	92	92
Lassen	NA	NA	NA	NA	0	103	103
Los Angeles	364	67	67	67	565	2,752 ***	3,317

Madera	NA	NA	NA	NA	0	176	
Marin	NA	NA	NA	NA	0	156	
Mariposa	NA	NA	NA	NA	0	217	
Mendocino	NA	NA	NA	NA	0	270	
Merced	NA	NA	NA	NA		97	
Modoc	NA	NA	NA	NA		75	
Monterey	NA	NA	NA	NA	0	205	
Napa	NA	NA	NA	NA	0	85	
Nevada	NA	NA	NA	NA	0	197	
Orange	NA	NA	NA	NA	0	1,172	
Placer	NA	NA	NA	108	108	275	
Plumas/ Sierra	NA	NA	NA	NA	0	130	
Riverside	NA	NA	NA	NA	0	209	
Sacramento	NA	NA	NA	NA	0	659	
San Benito	NA	NA	NA	NA	0	48	
San Bernardino	NA	NA	NA	NA	0	293	
San Diego	93	20	26	24		1,308	
San Francisco	34	6	4	4		93	
San Joaquin	118	24	26	23	191	250	441
San Luis Obispo	NA	NA	NA	NA	0	135	135
San Mateo	NA	NA	NA	NA	0	407	407
Santa Barbara	NA	NA	NA	NA	0	231 ***	231
Santa Clara	NA	NA	NA	NA	0	726 ***	726
Santa Cruz	NA	NA	NA	NA	0	261	261
Shasta	NA	NA	NA	NA	0	415	415
Siskiyou	NA	NA	NA	NA	0	330	330
Solano	72	18	18	18	126	240	366
Sonoma	NA	NA	NA	NA		214	
Stanislaus	NA	NA	NA	NA	0	204	204
Sutter	NA	NA	NA	NA	0	61	61
Tehama	NA	NA	NA	NA	0	220	220
Trinity	NA	NA	NA	NA	0	101	101
Tulare	NA	NA	NA	NA	0	185	185
Tuolumne	NA	NA	NA	NA	0	175	175
Ventura	65	10	10	10	95	378 ***	473

Yolo	154	20	20	20	214	151	365
Yuba	NA	NA	NA	NA	0	110	110
Grand Total	1,273	250	258	337	2,118	16,982	19,100

C. Results of survey

Detections:

Seven male SM were detected in California in 2023. One in San Diego County, one in Ventura County, one in Santa Clara County, one in Monterey County and three in Los Angeles County. The SM found in Carmel Valley Monterey was caught in a Champ fruit fly trap. Delimitation trapping for the San Diego County find began in August 2023 and traps were removed in October 2023 and then re-deployed in May 2024. Delimitation trapping for the other 2023 finds began in May 2024.

2023 Spongy Moth Detections

Pest	County	City	# Collected	Date found	Trap/Lure
SM	San Diego	Chula Vista	1	7/6/2023	Delta/Disparlure
SM	Ventura	Ventura	1	7/25/2023	Delta/Disparlure
SM	Santa Clara	Mountain View	1	8/9/2023	Delta/Disparlure
SM	Monterey	Carmel Valley	1	8/16/2023	Champ/Ammonium bicarbonate
SM	Los Angeles	Venice	1	8/16/2023	Delta/Disparlure
SM	Los Angeles	Calabasas	1	10/4/2023	Delta/Disparlure
SM	Los Angeles	Calabasas	1	10/4/2023	Delta/Disparlure

Delimitations:

A single male SM was detected in Contra Costa County on July 29, 2022. The delimitation was completed in 2023 with no additional finds.

Moth	County	City	# Collected	Trap/Lure
SM	Contra Costa	Clayton	1	Delta / Disparlure

Taxonomic Support: The CDFA's Plant Pest Diagnostic Center (PPDC) identifies all suspected samples as either SM or non-target species.

D. Outreach and Education

Residences and businesses within the core square miles of the past Contra Costa County SM delimitation project received informational flyers about the threat posed by FSM and SM. The flyers included descriptions of the pest life stages and information on how to report any suspect pests to the CDFA's exotic pest hotline. The State Survey Coordinator presented information about the CDFA's ADM and

statewide SM surveys on October 24, 2023 at the Annual *Lymantria Dispar* Review meeting in Morgantown, West Virginia.

E. Training

Survey staff were trained by district entomologists and trapping supervisors trained trappers on proper trap assembly and deployment, preliminary insect identification, and proper sample submission. Quality Control was not conducted for the ADM port trapping programs or urban SM routes but was conducted for all residential SM detection routes due to lack of staff availability caused by the IFF emergency projects.

F. Database submissions

A total of 21 SM suspects and one suspect ADM cocoon sample were submitted to the CDFA's PPDC for identification. The cocoon suspect was confirmed as non-target insect eggs, and 14 of the 22 suspects were identified as non-target moths. Seven SM suspects were confirmed to be adult SM males (See 2023 moth detections table above). All positive and negative data will be entered into the National Agricultural Pest Information System prior to the submission of the final report by October 28, 2024.

Approved and signed by

Victoria Hornbaker — Digitally signed by Victoria Hornbaker Date: 2024.10.15 12:35:05 -07'00'

Victoria Hornbaker, ROAR — Date
California Department of Food & Agriculture
Plant Health & Pest Prevention Services

BETH STONE SMITH — Digitally signed by BETH STONE SMITH Date: 2024.10.16 08:23:29 -07'00'

Beth Stone-Smith, ADODR — Date
United States Department of Agriculture
AHPIS, Plant Protection & Quarantine