C H A P T E R 2

Program Description

2.1 PROGRAM AREA AND VICINITY

The immediate Program Area is located in the following 13 counties of the state where LBAM infestations and quarantines presently occur (May 2009): Alameda, Contra Costa, San Francisco, Napa, Marin, Sonoma, Solano, San Mateo, Santa Clara, San Benito, Monterey, Santa Cruz, and Santa Barbara. The areas proposed for eradication activities in the short term cover approximately 1,280,000 acres (2,000 square miles). Within the 13 counties, eradication activities would be focused in the areas with the greatest infestation problems. Small and isolated infestations would be treated when practical.

However, the LBAM infestation has spread and may continue to spread until full-scale eradication and treatment activities are implemented. The CDFA decided to expand the Program Area description for the PEIR to include all portions of the state in which climatic conditions are suitable to the LBAM. Without a diapause (resting) stage, LBAM can only survive in areas where it can continuously breed and where sufficient hosts are available. Areas not expected to harbor LBAM are desert areas with sparse vegetation including most of Imperial County and the eastern portions of San Bernardino, Riverside, and Inyo counties. In addition, LBAM is not anticipated to utilize areas of extensive cold, including elevations above 5,000 feet, which consists of portions of Siskiyou, Modoc, Lassen, Plumas, Sierra, Nevada, Placer, El Dorado, Tuolumne, Alpine, Mariposa, Madera, Fresno, Tulare, and Mono counties and smaller portions of Kern, Ventura, and Los Angeles counties. In summary the Program Area would not include the majority of Alpine, Inyo, or Mono counties but all or portions of the remaining counties in California have areas that could harbor LBAM. The threat is greatest along the coast from the Oregon border to the Mexican border. LBAM is expected to survive in the Central Valley and foothills below 5,000 feet. This expanded Program Area is shown on Figure 2-1, LBAM Program Area Location, and includes portions of nearly all 58 counties within California. Figure 2-2, Areas Below 5,000-Foot Elevation is provided for its relevance to discussions of terrestrial and rural land resources.

The specific treatment area boundaries are determined based on trapping within any infested counties within California. The detection of two or more moths within a 3-mile radius within a time period equal to one LBAM life cycle places the area within the Program Area.

2.2 PROGRAM GOALS AND OBJECTIVES

LBAM eradication from California is the CDFA's goal because eradication is preferable to control and can reasonably be expected to be accomplished while the moth populations are concentrated within coastal counties. Eradication of LBAM populations will likely take 3 to 5 years to accomplish using several treatment tools. Some of the tools that may be used are currently under development and may require supplemental environmental analysis under CEQA. LBAM eradication will require an integrated systems approach using multiple tools: releases of sterile insects, applications of pheromone for mating disruption (ground and aerial treatments), male moth attractant treatment technology (ground treatment), use of insecticide treatments, and implementation of biological control agents. These tools are evaluated for their environmental impacts (physical, biological, and human/social) in this PEIR. Buffer areas (nontreatment areas adjacent to the treatment areas) will continue to be established and used to protect any threatened or endangered species or other environmentally sensitive areas from direct aerial and ground applications.

The "Core Strategy" for the eradication Program involves rapid detection of moth population density and spread, followed by containment, suppression, and then eradication using sterile LBAM. The following methods are proposed for use in 2008–2015 to achieve the goal of containment, suppression, and eradication (CDFA 2008a):

- Continuation of the statewide detection trapping program
- Release of sterile LBAM to effect eradication in the infested area
- Use of ground-based application of materials to treat outlying infestations
- Suppression of leading edges of LBAM infestation to reduce spread using ground-based treatments
- Ground-based treatment targeting heavily infested areas, especially around commercial production nurseries to reduce risk of artificial spread
- Stringent enforcement of state and federal quarantine regulations
- Aerial treatment of essentially uninhabited areas such as forests and chaparral

The CDFA will consult with the DPR concerning pesticide use in the LBAM eradication program and remain in close coordination with APHIS on effective eradication and control measures throughout the Program. Both the CDFA and USDA will work with the OEHHA and the California Department of Public Health (DPH) to conduct public outreach and education efforts. The OEHHA, DPR, and DPH will collaborate to conduct health reviews of the chemical-treatment tools to be used in the LBAM eradication program and to develop and monitor a system to collect and analyze health complaints that might be generated by the Program.

2.3 ALTERNATIVES FOR 2008–2015

The CDFA has published an Eradication Strategy for 2008–2015 (September 2008) that outlines treatment methodologies and application techniques (CDFA 2008a). All of these methodologies and techniques are considered alternatives for analysis under CEQA. The Strategy is described in greater detail in the sections below to facilitate comprehensive and thorough analysis of potential environmental effects. Each method proposed under the Program is discussed as a separate alternative, with different application options under some of the alternatives. The alternatives are categorized as either chemical treatment or nonchemical treatment methods. The chemical alternatives (mating disruption and pesticidal control, including No Project/No Program) are presented first for consistency with the ecological and human health risk assessments; then the sterile insect and biological control/parasitic wasp alternatives are presented. The subsequent impact analysis addresses the alternatives in this order as well. The order of presentation and discussion does not imply greater (or lesser) use of the alternative over the course of the eradication program. Methods considered but eliminated from the Program alternatives are discussed in Chapter 15, Other Required Disclosures, of this PEIR. The Program anticipates using all of the chemical and nonchemical alternatives (and options) in combination as part of an integrated pest management Program. However, should any one alternative become infeasible for effectiveness or economic or environmental reasons, the other alternatives would be used. Furthermore, the quarantine, inspection, detection, and private pesticide use components of No Program would continue until LBAM eradication is achieved.

All individual alternatives or alternative utilized in combination would have up to 12 work crews statewide available for the Program alternatives involving ground application. In addition, four spray planes would be available throughout the state on any given day to conduct aerial applications.

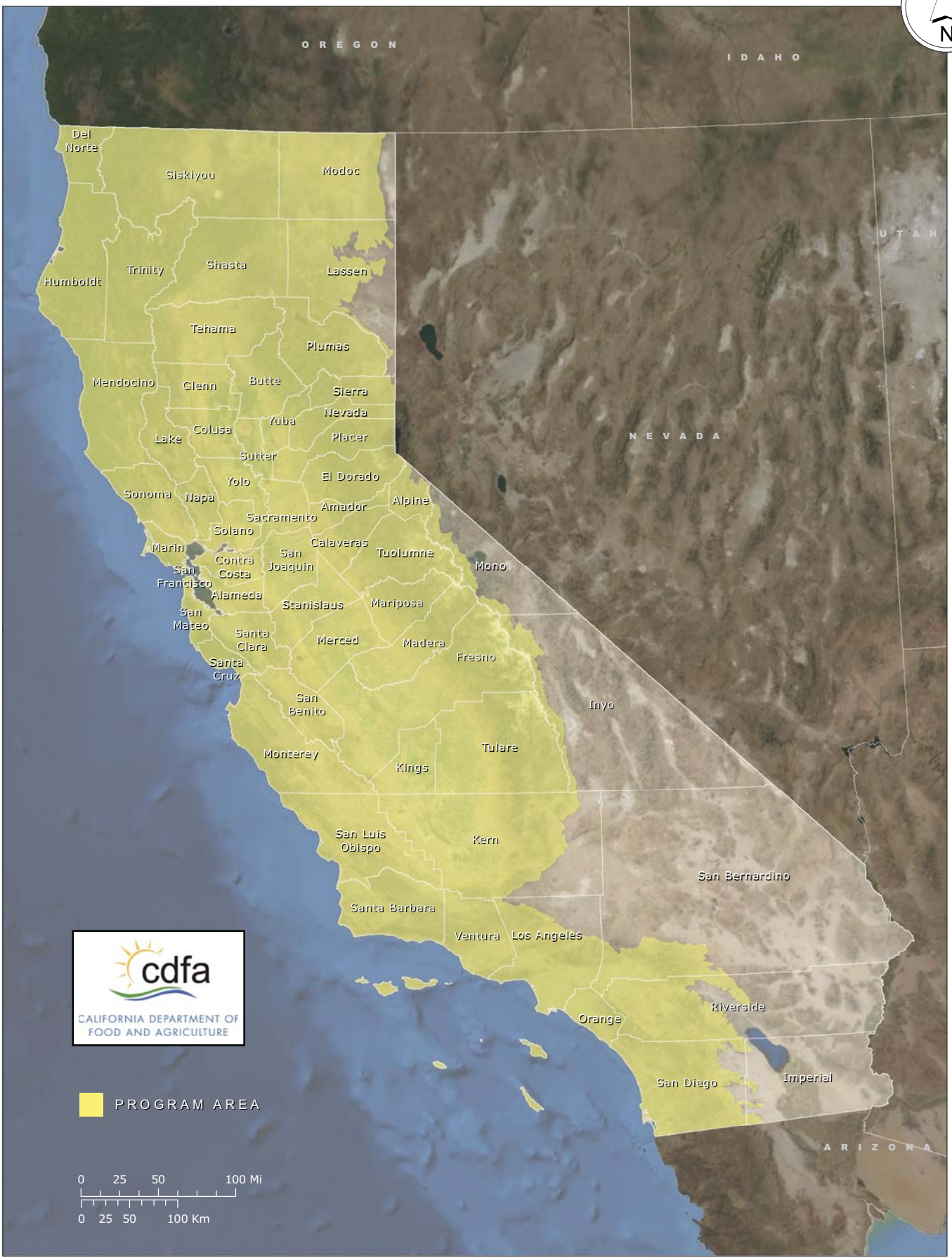

Figure 2-1: Program Area Location

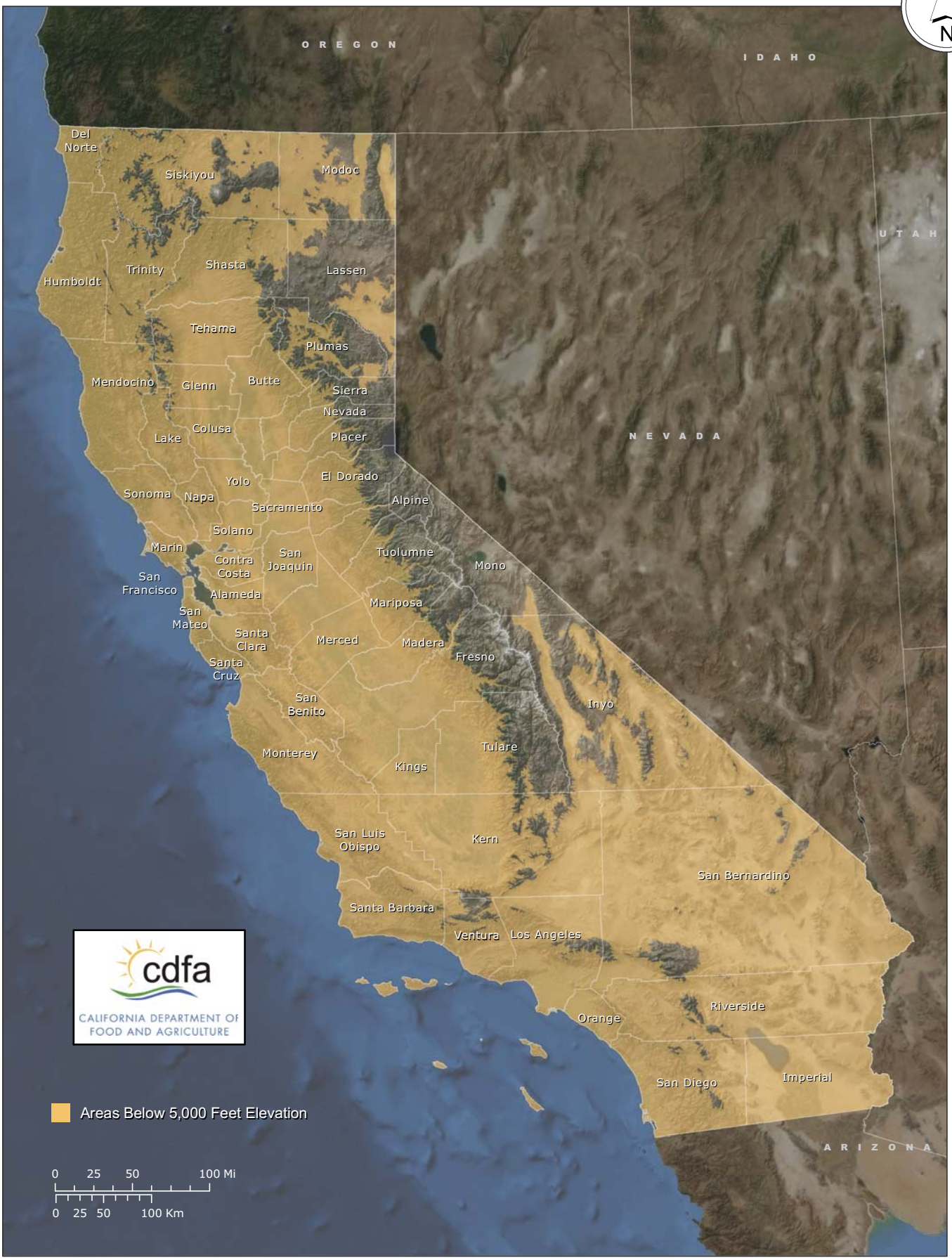

Figure 2-2: Areas of Elevation Below 5,000 Feet

In summary, the alternatives are presented in Chapter 2, Program Description, as follows:

No Program Alternatives

- Quarantine, inspection, and detection
- Chemical treatment with registered chemicals
  - Chlorpyrifos
  - Lambda-cyhalothrin
  - Permethrin
  - Spinosad
  - *Bacillus thuringiensis kurstaki* (Btk)

Program Alternatives

CHEMICAL TREATMENT ALTERNATIVES

- Mating disruption with pheromones (Alternative MD)
  - Twist ties (Alternative MD-1)
  - Ground application (Alternative MD-2)
  - Aerial application (Alternative MD-3)
- Male Moth Attractant (Alternative MMA)
- Organically Approved Insecticides (Alternatives Btk and S)
  - *Bacillus thuringiensis kurstaki* (Alternative Btk)
  - Spinosad (Alternative S)

NONCHEMICAL TREATMENT

- Inundative Parasite Wasp Releases (Alternative Bio-P)
- Sterile Insect Technique (Alternative SIT)

2.3.1 No Program Alternative

The No Project or No Program Alternative, hereafter referred to as the No Program Alternative, would be to continue and expand quarantine and detection and inspection activities but without the application of the pheromone or any other insecticides or sterile moths or parasitic wasps on an areawide basis by the USDA or CDFA. Restrictions on domestic and foreign trade would increase. It is included here early in the PEIR (rather than in Chapter 15, Other Required Disclosures, Alternatives), along with the Program alternatives, due to public interest expressed in the alternative during public scoping.

Private individuals (households and growers at nurseries and/or crop production areas) may utilize the following registered insecticides to control LBAM:

- Chlorpyrifos
- Lambda-cyhalothrin

- Permethrin
- Spinosad
- *Bacillus thuringiensis kurstaki* (Btk)

Homeowner insecticide use for LBAM control has been estimated by the CDFA's Robert V. Dowell, PhD. using permethrin as a representative material (Dowell 2008b). Permethrin is a broad spectrum insecticide that will kill LBAM larvae and is readily available. The projected increase in permethrin use due to LBAM ranges from 0.7 to 5.6 percent of the 41,940 pounds of permethrin used annually for a 9-county area to 9.5 to 34.5 percent of the 215,348 pounds used in a 16-county area.

Table 2-1 lists examples of approved products for LBAM control or prevention at nurseries and/or crop production areas. Establishments where a LBAM infestation has been detected must follow procedures outlined in the LBAM Regulatory Procedures Manual (CDFA et al. 2008). It is incumbent upon the user to follow all label restrictions. Many active ingredients are in multiple products, each with specific site recommendations. If the user's crop or site does not appear, alternative products may be available for the specific situation.[1]

Table 2-1 Registered Products for Control or Prevention of Light Brown Apple Moth

Target Life Stage: Eggs/Larvae				
Active Ingredient	Product	USEPA Reg. #	Sites	Remarks/ Restrictions
Chlorpyrifos with superior-type spray oil*	DuraGuard ME	499-367-ZA	Ornamentals	Apply at not less than 250 ppm ai with superior-type spray oil rate of 1% by volume. See label.
	Dursban 4E	62719-11-AA	Ornamentals and crops	
Lambda-cyhalothrin with superior-type spray oil*	Warrior with Zeon	100-1112-AA	Crops, Conifer/ Deciduous trees	Apply at maximum label rate of 148 milliliters/100 gallons water (38 ppm ai) with superior-type spray oil rate of 1% by volume. See label.
Permethrin with superior-type spray oil*	Permethrin E-Pro	79676-2	Crops, Conifer/Deciduous trees	4 to 8 fluid ounces per 100 gallons or 4 to 8 fluid ounces per acre 0.5% broadcast treatment of E-Pro
Spinosad (including spinosyn A and D) with superior-type spray oil*	Entrust	62719-282-AA	Crops, Conifer trees	Apply at maximum label rate of 22 fluid ounces/100 gallons water with superior-type spray oil rate of 1% by volume. See label.
Bacillus thuringiensis kurstaki (Btk)	DiPel DF PRO	73049-39	Trees and forests	Apply at maximum label rate of 1 lb. per 100 gallons for ground application, 1 lb. per 10 gallons for aerial application.
*Superior-type spray oil is not approved as quarantine treatment targeting eggs when used alone.				
*Superior-type spray oil	Bonide All Seasons Commercial Horticultural and Dormant Spray Oil	4-80-ZB	Ornamentals and crops	Apply at label rate. Application rate less than the label rate is acceptable if not less than 1%. See label.
ppm = parts per million ai = active ingredient				

Without a regional coordinated governmental treatment program, which effectively means having no program, LBAM would flourish in existing areas and spread to surrounding areas, with associated environmental effects. The No Program Alternative relies on the use of registered chemicals by private

[1] Search products based on multiple categories (site and chemical code) at http://www.cdpr.ca.gov/docs/label/m4.htm.

individuals and continuation of government operated regulatory programs involving quarantines and other procedures to lessen the potential for LBAM to spread as the result of domestic and foreign trade. Table 2-2 shows the application assumptions for treatment with the registered chemical treatments.

Table 2-2 No Program Technical Treatment Data

Alternative	Product Name	Methodology	Application Equipment	Application Rate (Active Ingredient)	Maximum Coverage Rate	Fraction of Active Ingredient	Droplet Size Delivered (Range)	Intervening Period Between Treatments
Chlorpyrifos	DuraGuard ME	Ground Application	Hydraulic Spray from Truck or Backpack	437 g/ac	3 acres per day (8 hours)	20%	ASAE Medium (Truck) to Course (Backpack)	14 days
Chlorpyrifos	Dursban 4E	Ground Application	Hydraulic Spray from Truck or Backpack	205 g/ac	3 acres per day (8 hours)	44.90%	ASAE Medium (Truck) to Course (Backpack)	14 days
Lambda-cyhalothrin	Warrior with Zeon	Ground Application	Hydraulic Spray from Truck or Backpack	18 g/ac	3 acres per day (8 hours)	11.40%	ASAE Medium (Truck) to Course (Backpack)	14 days
Permethrin	Permethrin E-Pro	Ground Application	Hydraulic Spray from Truck or Backpack	90 g/ac	3 acres per day (8 hours)	37%	ASAE Medium (Truck) to Course (Backpack	14 days
Spinosad	Entrust	Ground Application	Hydraulic Spray from Truck or Backpack	19 g/ac	3 acres per day (8 hours)	80%	ASAE Medium (Truck) to Course (Backpack)	14 days
Btk	DiPel DF, DiPel DF PRO	Ground Application	Hydraulic Spray from Truck or Backpack	490 g/ac	3 acres per day (8 hours)	54%	ASAE Medium (Truck) to Course (Backpack)	14 days

2.3.2 Mating Disruption (Alternative MD)

The LBAM pheromone may be used to disrupt the moth's mating activities. The three mating disruption methodologies under consideration include twist ties, ground application of pheromones, and aerial application of pheromones. Features of these alternative tools, including equipment use and general rates of application, are shown in Table 2-3. Additional detailed information for each mating disruption treatment alternative is presented in Section 2.3.2.1, Twist Ties (Alternative MD-1), Section 2.3.2.2, Ground Application (Alternative MD-2), and Section 2.3.2.3, Aerial Application (Alternative MD-3).

Table 2-3 Alternative MD Methodologies

Feature	Alternative MD-1	Alternative MD-2	Alternative MD-3
Description	Use of twist ties for small isolated regions that exist more than 5 miles from a general infestation.	Use of ground- based pheromone mating disruptors in thick matrix form for trees, shrubs, and backyards in infested regions.	Use of aerial-released pheromone mating disruptors in undeveloped regions with LBAM populations. A 1.5-mile radius from LBAM detection in region would be sprayed.
Eradication Methodology	Twist Tie	Ground Application	Aerial Application[a]
Application Equipment	Manual	Meter gun / Truck- Mounted Spray / Dollop	Beechcraft A90 Airplane
Application rate per acre (active ingredient)	250 ties	15-30 grams	15-30 grams
Radius of treatment from single application[a]	200 meters	200 meters	16.72 meters[b]
Pheromone Droplet size delivered (range)	Not applicable	Not applicable	52–2,460 micrometers (SPLAT); 2,000–5,500 micrometers (Hercon)
Number of treatments for eradication goal[c]	3	3	3
Intervening period between treatments	3–6 months	SPLAT: 60 days	SPLAT: 30-60 days
		Hercon: 30 days	Hercon: 30 days

a. Aerial application information detailed in Table 2-4.
b. For aerial application the radius of treatment is considered to be the swath width of a King Air A90 flight line. The swath width is calculated as 1.2 times the wing span. Total treatment for one LBAM detection is a 1.5-mile radius.
c. Goal is two LBAM life cycles with no detection.

2.3.2.1 Twist Ties (Alternative MD-1)

Plastic ties infused with LBAM pheromone (IsoMate) are to be used in small isolated infestations (at least 5 miles from a regulated area or separated from a regulated area by a physical barrier, such as a largely uninhabited area or mountain range). Twist ties would be used as a stand-alone treatment or in conjunction with larval treatments of Btk or spinosad. Pheromone twist-tie placement for mating disruption includes the following activities:

- Twist-tie deployment is ongoing.
- Areas designated for twist-tie placement:
  - Isolated sites
  - Areas that are further than 5 miles from a generally infested area
  - Areas with low-level populations
- Twist ties are placed at the rate of approximately 250 twist ties per acre in a 200-meter radius around each infested site.
- Trap density for small isolated outlier sites will be 100 traps in the core and 25 traps per square mile in the surrounding 8 square miles.

Timing of Applications

Twist ties remain in place for two life cycles and are replaced every 3 to 6 months as needed to maintain pheromone at disruption levels.

Completion of Applications

After two life cycles without any LBAM detections, the twist ties are removed. Delimitation traps would remain in place for one additional life cycle. Duration of LBAM life cycles is calculated using a local daily temperature-driven computer model maintained by the CDFA. If no additional LBAMs are detected, this area will be declared LBAM free and trapping levels would return to detection levels.

2.3.2.2 Ground Application (Alternative MD-2)

The pheromone treatments may be applied to the ground for two scenarios: (1) to the trees and shrubs in residential yards and (2) to telephone poles and trees on public property alongside the roadways. Each has different application mechanisms.

- For application to trees and shrubs in front- and backyards using ground-based equipment, both SPLAT and Hercon treatments would be used. The Hercon pheromone treatment would be mixed with a sticky matrix material (Micro Tac II™) and applied using a pod gun, which places the pheromone at an elevated position in trees, telephone posts, and large bushes. For SPLAT, two delivery mechanisms may be used: the first is the use of a "caulk gun" to deliver a one teaspoon-sized dollop; the second is the use of a backpack-based "nozzle" to deliver a measured amount of pheromone to the target. Average coverage rate is 2 acres per day; maximum rate is 3 acres per day.
- For application to telephone poles and trees on public property alongside roadways, the SPLAT formulation would be used. SPLAT is to be applied using a truck-based spray system, similar to a "meter jet gun." This method applies a measured amount of SPLAT on each target. On average 640 acres per day could be covered; a maximum coverage rate is 960 acres per day. A maximum of 1,200 "squirts" per square mile would be accomplished. Trucks would be at a location for 5 to 30 minutes.

Timing of Applications

The pheromone treatments should be applied prior to or at the first sign of male LBAM flight. Hercon bioflake and the SPLAT treatment options should be applied every 1 to 2 months for SPLAT and every month for Hercon to maintain disruption concentrations.

Completion of Applications

Eradication applications are applied for a time interval equal to at least two LBAM life cycles beyond the last LBAM detected within that treatment area. Duration of LBAM life cycles is calculated using a local daily temperature-driven computer model maintained by the CDFA. The model is based on research done on the effects of temperature on LBAM growth and development (Mo 2006; New South Wales Department of Primary Industries Agriculture 2008).

2.3.2.3 Aerial Application (Alternative MD-3)

The use of aerial release of pheromones is on hold while the CDFA completes this PEIR, and while the OEHHA and DPR, in consultation with the DPH, finish a review of possible formulations in late 2009 or early 2010. After that time, aerial application of the pheromone in agricultural or undeveloped areas may be considered where ground applications of the pheromone are not feasible.

Aerial applications of pheromone for mating disruption would be used to treat denser LBAM populations. The area for aerial applications is a 1.5-mile radius around each location where a LBAM is detected in an undeveloped area. The type of plane to be used is a Beechcraft A90, and applications would be made at a height of 300 to 500 feet from ground level. Two pheromone formulations are under primary consideration, Hercon and SPLAT. A summary of the key parameters for the aerial application is presented in Table 2-4.

Timing of Applications

Anticipated start date for aerial application of pheromone for mating disruption has not been determined. If needed, a 30- to 90-day spray interval, depending on the formulation used, would continue throughout the LBAM's reproductive flight periods (approximately 9 months) as pheromone is available. Three to four aerial applications for each treatment area are expected over a 9- to 12- month period.

Completion of Applications

After two life cycles of mating disruption applications without any LBAM detections, these applications would cease. Once the pheromone has dropped to levels that will not interfere with trap efficacy, post-treatment monitoring traps would remain in place for one additional life cycle. If no additional LBAMs are detected, this area would be declared LBAM free and trapping levels would return to detection levels.

2.3.3 Male Moth Attractant (Alternative MMA)

This alternative involves ground treatment with the LBAM-specific pheromone plus permethrin to kill male moths. Alternative MMA is conducted in advance of the release of sterile moths or parasitic wasps (if needed) to enhance the efficacy of the aerial mating disruption pheromone applications. The treatment area consists of a 1.5-mile radius around any detection site. Treatments may occur on street trees and utility poles, 8 feet aboveground. Male attractant treatment sites would be out of reach of the general public. The method of application would be the same as that discussed for the ground application of SPLAT in Section 2.3.2.2, Ground Application (Alternative MD-2). Up to 1,200 squirts (dollops) per square mile could be accomplished. Each squirt would contain 5 milliliters (mL), which consists of the pheromone, the permethrin, and inert ingredients (SPLAT).

Table 2-4 Aerial Application Characteristics for Pheromone Technologies

Treatment	Aerial Application Rate per acre (spray material)	Active Ingredients	Active Ingredients CAS	(E)-11-Tetradecen-1-yl Acetate	(E,E)-9,11-Tetradecen-1-yl Acetate	Melting Point	Boiling Point	pH	Water Solubility	Aerial Application Rate per acre (active ingredient)	Spray Line Width	Spray Line Displacement	Pheromone Droplet/Particle Size Range	Specific Gravity of Spray Material	Specific Gravity of Carrier	Release Height of Material	Number of Nozzles Used For Spray	Typical Spray Speed (mph)
Hercon Bio-Flake	136–227 grams	(E)-11-Tetradecen-1-yl Acetate; (E,E)-9,11-Tetradecen-1-yl Acetate	33189-72-9; 54664-98-1	10.48%	0.52%	300°F	Not applicable	Not applicable	Insoluble	15–25 grams	16.78 meters	0	2,000–5,500 micrometers	Not applicable	1	91.5 meters	2	209
SPLAT	150–300 grams	(E)-11-Tetradecen-1-yl Acetate; (E,E)-9,11-Tetradecen-1-yl Acetate	33189-72-9; 54664-98-1	9.50%	0.50%	Not applicable	212°F	6.88	Limited	15–30 grams	16.78 meters	0	52–2,460 micrometers	0.93	1	91.5 meters	2	209

2.3.3.1 Timing of Applications

Areas that cannot be treated aerially (such as proximity to environmentally sensitive areas, buffer zones), contiguous areas with low-level LBAM detections, and contiguous areas with heavy populations (more than 50 LBAM detections) would be treated. Treatments would occur at 30- to 60-day intervals and would be applied at a target rate of 600 to 1,200 male attractant treatment sites per square mile.

2.3.3.2 Completion of Applications

After two life cycles of treatment without any LBAM detections, treatments would cease. Delimitation traps would be deployed and remain in place for one additional life cycle. Trap density would be nine traps per square mile throughout the treatment area. If no additional LBAMs are detected, this area would be declared LBAM free; and trapping levels would return to detection levels.

2.3.4 Organically Approved Insecticides (Alternatives Btk and S)

Pesticidal control alternatives include use of *Bacillus thuringiensis kurstaki* (Alternative Btk) and spinosad (Alternative S) and may be used in targeted areas. Both of these treatments would be applied by hydraulic spraying using either truck-based or backpack-based equipment. The key properties and parameters of the organically approved insecticides are presented in Table 2-5.

Table 2-5 Organically Approved Insecticides Treatment Data

Organically Approved Insecticide Product Name	Eradication Methodology	Application Equipment	Application Rate (Active Ingredient)	Maximum Coverage Rate	Fraction of Active Ingredient	Droplet Size Delivered (range)	Number of Treatments for Eradication Goal	Intervening Period Between Treatments
Bacillus thuringiensis kurstaki DiPel DF, DiPel DF PRO	Ground Application	Hydraulic Spray from Truck or Backpack	490 g/ac	3 acres per day (8 hours)	54%	ASAE Medium (Truck) to Course (Backpack)	3	14 days
Spinosad Entrust	Ground Application	Hydraulic Spray from Truck or Backpack	19 g/ac	3 acres per day (8 hours)	80%	ASAE Medium (Truck) to Course (Backpack)	3	14 days

2.3.4.1 Timing of Application

Foliar ground treatments with *Bacillus thuringiensis kurstaki* (Btk) or spinosad may be made where heavier larval populations are detected. Areas proposed for treatment (both public and private lands) would have the approved label application rate and a maximum of three treatments over the overall treatment period. Treatments would continue until two full life cycles are surveyed without evidence of LBAM detection.

2.3.4.2 Completion of Application

Populations are detected or expected based on a temperature-driven developmental model. Larval treatments would be applied when (1) the Program has found larvae in the field or (2) within 7 to 10 days of a flight peak of trapped moths when large numbers of small larvae will be present.

2.3.5 Inundative Parasite Wasp Releases (Alternative Bio-P)

Inundative *Trichogramma* species (stingless parasite wasp) releases may be made in areas with moderate to heavy LBAM detections. This form of biological control would use native, commercially available parasitic wasps.

The estimated number of the native wasp species (*Trichogramma platerni* and *T. pretiosum*) to be released is 1,000,000 per square mile (based on release rates used in commercial agriculture for the same insects). Wasp pupae in host eggs are attached to index cards with Elmer's® glue and then attached to foliage where LBAM has been detected.

2.3.5.1 Timing of Application

Trichogramma releases will be made in conjunction with the use of other tools especially the male moth attractant treatments and the release of sterile moths. Due to the seasonal availability of the *Trichogramma*, their use in the Program will be limited to the time period between April and October. Releases may be made at any time during these months but every effort will be made to release the wasps just after a peak in trap catch in the area depending on their availability.

2.3.5.2 Completion of Applications

One to two releases would be made per LBAM generation with a maximum of four releases per year. Releases would be conducted when LBAM are most actively breeding, between February and November.

2.3.6 Sterile Insect Technique (Alternative SIT)

SIT will be the primary tool for LBAM eradication in California when it becomes fully operational. The Program would release sterile moths into the environment to mate with wild moths and eradicate the population. The USDA has already accelerated the process of developing large-scale mass-rearing capabilities in support of LBAM eradication. The goal is to produce and release a minimum of 20 million sterile male moths per day at full capacity. Approximately 500,000 moths per square mile could be released (e.g., a few moths per square foot density). The equipment used for aerial application is a Beechcraft twin engine A90, flying at a minimum of 300 feet with an average projected altitude of about 2,000 feet during daylight hours. The actual altitudes will be set by the Federal Aviation Administration (FAA).

Timing of Applications

The releases would occur on a schedule of 7 to 14 days over a large area such as a county or region and over a time period of at least two LBAM life cycles past the last wild LBAM detected in each treatment area. Any subsequent events at a particular location, if necessary, would be approximately every 30 to 60 days.

Completion of Applications

Eradication applications are applied for a time interval equal to at least two LBAM life cycles beyond the last LBAM detected within that treatment area. Duration of LBAM life cycles is calculated using a local daily temperature-driven computer model maintained by the CDFA. The model is based on research done on the effects of temperature on LBAM growth and development (Mo 2006; New South Wales Department of Primary Industries Agriculture 2008).

2.4 IMPLEMENTATION TIMELINE

The Program is to be implemented as follows (CDFA 2008a):

- **2009.** Suppress heavily infested areas around production nurseries, begin suppressing and eradicating populations in outlying counties to remove these counties from regulation, and begin small-scale sterile moth releases.
- **2010.** Continue suppressing and eradicating populations in outlying counties to remove these counties from regulation, and expand use of sterile moths.
- **2011–2015.** Eradicate LBAM populations throughout California with the full implementation of sterile moth releases.

2.5 MONITORING ACTIVITIES

2.5.1 Detection Survey/Trapping

LBAM traps are the primary tool for detection and program evaluation. The following trapping plan will be implemented by the CDFA and USDA (CDFA 2008b). The county agricultural commissioners will be informed of trapping actions in their respective counties.

- Extension of detection trapping at a density of 5 traps per square mile into previously untrapped areas inside the regulated counties, such as rural and industrial areas, will be implemented as needed.
- Delimitation trapping arrays will be put in place where LBAM has been detected for those sites that are 3 miles from other detection sites at 100 traps per square mile in the core square mile and 25 traps per square mile in the adjacent 8 square miles. An additional detection within any delimitation area and within 3 miles and one life cycle will trigger an eradication project.
- Traps in eradication areas will be stationary, placed at nine .traps per square mile, inspected biweekly, and baited with 100-microgram lure.

2.5.2 Environmental Health Monitoring and Reporting

Treatments in undeveloped areas will be monitored for quality control and illness complaints within the treatment areas.

- Program Managers will consult with the DPR.
- Program Managers will consult with any other appropriate governmental agencies concerning threatened and endangered species and sensitive environmental site, and obtain all of the required permits (see Section 1.6, Potential Permits, Approvals, and Consultations.
- Program Managers will provide the OEHHA with information concerning the pesticides to be used in LBAM eradication for their use in any public outreach activities, for educating physicians, and for tracking/evaluating community health complaints in the eradication areas. The DPR and OEHHA will review and analyze the acute toxicity studies and other information to assess the health impacts of pesticides to be used in the LBAM Program.
  - Prior to treatments, the OEHHA will work with local health officers to ensure that physicians and other health-care providers are given information on the application; what, if any, symptoms are likely to be seen; reporting requirements and direction on other concerns. In general, the physicians and health-care providers will be informed of the illness-reporting requirements; and will receive training on pesticide poisoning recognition and management.

– The OEHHA and DPR will team with other public health organizations to develop and oversee a program for the reporting, tracking and scientific evaluation of reported illness incidents.

2.5.3 Program Evaluation

The Program will be regularly monitored to determine its progress in meeting short- and long-term goals, including periodic updates and review by the USDA's LBAM Technical Working Group. The Technical Working Group is composed of outside experts from the University of California, USDA, HortResearch in New Zealand, and Western Australia Department of Agriculture, who are familiar with LBAM and the tools to be used in the Proposed Program. The CDFA and USDA will conduct a thorough program review in December of each year.

2.5.4 Buffer Areas

Buffer areas are nontarget areas around sensitive habitats that are defined by responsible governmental agencies including the CDFG, USFWS, DPR, NOAA Fisheries, etc., for each tool/alternative in the LBAM Program. The CDFA has determined that they will not use the organically approved insecticides Btk and spinosad within 25 feet of water bodies to protect aquatic resources.

2.6 PUBLIC OUTREACH AND COMMUNICATION

Working with government agencies, and organizations representing farmers, environmental interests, and others, the Program will initiate a statewide public education effort on California's initiative to manage LBAM and other invasive species. The objectives of the statewide outreach and education effort include:

- Educating the public about potential environmental, agricultural and economic damage caused by specific pests (i.e., LBAM) and the consequences associated with not taking immediate action – such as the potential for increased pesticide use if the pest becomes established
- Informing the public of measures taken to safeguard the environment and protect public health

Additionally, public outreach at the local level will continue to engage residents and provide them with the information needed to understand how California responds to invasive species, and to inform them about proposed or ongoing treatment activities in their area. These activities will include, but are not limited to the following:

- Informational open houses and/or public meetings will be held in each county where eradication activities occur, as needed.
- Residents whose property will be treated will receive written notification prior to treatment. Residents may sign up for an e-mail notification for updates on the treatment schedules and areas scheduled to be treated or call an informational phone line to have questions answered.
- The CDFA's website will be updated with pertinent information following each male moth attractant treatment and aerial mating disruption and/or Btk/spinosad application.

Additional Program information will be available on the website (www.cdfa.ca.gov/lbam). Press releases will be issued for new events.