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Mediterranean Fruit Fly Cooperative Eradication Program

San Diego County, California

Environmental Assessment
August 2015

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I. Need for the Proposal

The Mediterranean fruit fly (Medfly), *Ceratitis capitata* (Wiedemann), is a major pest capable of devastating crops throughout many parts of the world. Because of its wide host range (over 250 species of fruits and vegetables) and its potential for rapidly expanding infestation, the Medfly represents a serious threat to U.S. agriculture. Medfly was detected in Hawaii in 1910, and subsequently became established there (NAPIS, 2015). Although Medfly has been periodically introduced to the U.S. mainland since 1929 (APHIS, n.d.), successful eradication programs have prevented it from becoming an established pest in the conterminous United States.

Medfly establishment would be disastrous to agricultural production in States where host plants are grown. The unchecked presence of Medfly on the U.S. mainland would result in the widespread destruction of crops such as apricot, avocado, grapefruit, nectarine, orange, peach, and cherry. Commercial crops, as well as dooryard production of host fruits, would suffer if Medfly populations became established. Fruit infested by Medfly is unfit to eat because the larvae tunnel through the fleshy part of the fruit, damaging it, and subjecting it to decay from bacteria and fungi.

On July 22, 2015, two adult male Medflies were collected from a McPhail trap on a citrus host in the city of La Mesa, San Diego County, California (CDFA, 2015a). Delimitation and larval surveys outward from the detection site were initiated. The detections were sent for molecular lab sequencing and confirmed as wild Medfly on July 30, triggering participation by the U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS) in a quarantine and control program for this outbreak.

On July 31, a third male adult Medfly was collected from a Jackson trap in a citrus tree about half a mile east of the first detection (CDFA, 2015b). On August 4 another male adult Medfly was found in a trap placed the day before on a lemon tree in a neighborhood of Spring Valley; this find caused a southeasterly expansion of the proposed quarantine boundary (CDFA, 2015c).

APHIS and the California Department of Food and Agriculture (CDFA) are proposing a cooperative program to eradicate the Medfly infestation and prevent the spread of Medfly to noninfested areas of the United States. APHIS' authority for cooperation in the program is the Plant Protection Act (Title 4 of the Agricultural Risk Protection Act of 2000), which authorizes the Secretary of Agriculture to carry out operations to eradicate insect pests, and to use emergency measures to prevent the dissemination

of plant pests new to, or not widely distributed throughout, the United States.

Working cooperatively with States and territories, APHIS identifies and eradicates Medfly infestations. APHIS has cooperated with the California, Florida, Puerto Rico, and Texas Departments of Agriculture on fruit fly eradication programs since 1984. To date, every fruit fly population targeted by APHIS' cooperative programs was successfully eradicated.

The State of California initiates *Ceratitis* spp. delimitation and eradication programs in locations where the types and number of detections are not yet triggering quarantine regulatory actions. Delimitation and eradication programs try to eliminate fruit fly infestations before reaching a quarantine threshold and imposing regulatory quarantines. Monitoring for Medfly continues throughout all susceptible counties of California.

Many Medfly-host plant species are grown in San Diego County and adjacent regions, which increases the potential environmental impact of the current infestations. Commercial production of three avocado varieties begins within 4.5 miles of the Medfly detections; persimmon trees are in commercial production about 15 miles from the Medfly detections (APHIS, 2015). There are at least five commercial plant nurseries within 5 miles of the Medfly detections. (To view the proposed program area[1], see the map in appendix A.)

APHIS and its cooperating partners have discussed and comprehensively analyzed alternatives for Medfly eradication since 1984. APHIS first evaluated the environmental impacts of fruit fly control technologies in the *Fruit Fly Cooperative Control Program, Final Environmental Impact Statement—2001* (EIS1) (APHIS, 2001). APHIS reexamined its findings and introduced an additional tool for eradication in the *Use of Genetically Engineered Fruit Fly and Pink Bollworm in APHIS Plant Pest Control Programs, Final Environmental Impact Statement—2008* (EIS2) (APHIS, 2008). Both EIS1 and EIS2 consider fruit fly risks and mitigations at the programmatic level. This case-specific EA incorporates the findings of EIS1 and EIS2 by reference.

This environmental assessment (EA) analyzes the environmental consequences of alternatives considered for Medfly eradication, and analyzes, from a site-specific perspective, environmental issues relevant to this particular program. The eradication measures being considered for this program were discussed and comprehensively analyzed within APHIS' fruit fly chemical risk assessments (APHIS, 2014a, 2003, 1999, 1998a, and 1998b). These documents are incorporated by reference and

[1] For the purposes of this document, "program area" refers to everywhere inside the quarantine boundary, and includes both eradication treatment and regulatory control zones.

summarized within this EA. Environmental documentation for APHIS fruit fly control programs may be viewed online via the following links: APHIS fruit fly control program environmental documentation and APHIS GE control applications for plant health.

II. Alternatives

Alternatives considered for this proposed program include: (A) no Federal action, (B) quarantine and commodity certification, and (C) the preferred alternative, eradication using an integrated pest management (IPM) approach. Component techniques of alternative C include the use of regulatory controls, high density trapping, host larval survey, and chemical and biological control (sterile insect technique (SIT)) to facilitate the timely elimination of the current Medfly infestation. These alternatives and their component techniques were discussed and comprehensively analyzed within EIS1 and EIS2 (APHIS, 2001 and 2008), and are incorporated by reference and summarized within this EA.

A. No Action

Under the no action alternative, there would be no Federal efforts to eradicate Medfly or restrict expansion of the Medfly population from the infested area. In the absence of a Federal effort, quarantine and control would be left to State and local government, grower groups, and individuals. Expansion of the infestation would be influenced by any controls exerted over it, by the proximity of host plants, and by climatic conditions.

"No treatment" might be the only reasonable alternative for some sensitive sites. In such cases, lack of treatment could lead to a continuing and expanding infestation. An expansion of the infestation would likely result in substantial economic losses to growers in the United States, as well as the loss of U.S. export agricultural markets.

Under the no action alternative, APHIS would continue cooperative practices to support the CDFA detection trapping program and research. (For details about the California State program to control Medfly, please use the following link: CDFA Medfly project information.)

B. Quarantine and Commodity Certification

This alternative combines a Federal quarantine with commodity treatment and certification, as stipulated under Title 7 of the Code of Federal Regulations (CFR) § 301.32. Regulated commodities harvested within the quarantine area would not be allowed to move unless treated with prescribed applications and certified for movement outside the area. For a

large infestation, intensive quarantine enforcement activities could be necessary, including safeguarding of local fruit stands, mandatory baggage inspection at airports, and judicious use of road patrols and regulatory checks. The quarantine actions of this alternative are designed to reduce Medfly movement outside treated areas, and reduce human-mediated transport of Medfly in host plant materials to areas outside the quarantined area; however, the infestation could remain established within the quarantine boundaries. Any Medfly eradication efforts would be managed by, and wholly under the control of, CDFA.

Interstate movement of regulated commodities would require the issuance of a certificate, or limited permit, contingent upon commodity treatment or the grower or shipper complying with specific conditions designed to minimize pest risk and prevent the spread of Medfly. Eradication methods that may be used in this alternative include (1) regulatory chemicals, (2) cold treatment, (3) vapor heat treatment, and (4) irradiation treatment. Regulatory chemical treatments may include fumigation with methyl bromide (MB), and bait spray with a mixture of protein hydrolysate (a food bait) and spinosad. (Refer to EIS1 (APHIS, 2001) for more detailed information about these chemicals and their uses.) Cold treatment, vapor heat treatment, or irradiation treatment of certain produce, as a requirement for certification and shipping, must be done in facilities that are inspected and approved by APHIS.

C. Eradication Using an IPM Approach (Preferred Alternative)

APHIS' preferred alternative for the La Mesa Medfly program is eradication using an IPM approach. This alternative combines quarantine and commodity certification with eradication treatments, and is designed to be biologically effective while minimizing impacts to the environment, public intrusiveness, and program operating costs (CDFA, 2015d). Successful eradication of a Medfly infestation in Los Angeles County, using a similar IPM strategy, was declared in August 2014 (APHIS, 2014b).

CDFA (2014d) has determined there are no cultural options available to eradicate Medfly that allow CDFA to meet its statutory obligations. APHIS concurs with its assessment. Eradication efforts may therefore include any or all of the following:

- no action,
- regulatory quarantine treatment and movement control of host materials and regulated articles,

- host survey for evidence of breeding Medfly,
- host removal,
- eradication chemical applications,
- mass trapping to delimit the infestation and monitor post-treatment Medfly populations, and
- sterile insect technique (SIT).

Adult Medflies can fly and be carried for long distances by the wind (UFL, 2010), making it possible for host-plant growing areas outside an eradication zone to become infested. The program area for the Medfly infestation includes those portions of San Diego County centered on Medfly detection sites (see map in appendix A). The current boundary may be expanded to include other properties if additional adult flies or life stages are found.

APHIS' cooperative programs to eradicate Medfly infestations in California use established procedures and treatments (APHIS, 2001, 2004 and 2015; CDFA, 2015d) designed with the species' life stages in mind:

1. Delimitation

Several types of traps—including Jackson sticky trimedlure traps, ChamP™ sticky trimedlure traps, and Multilure® traps using a 3-component lure-formulation—are used to delimit the infestation and to determine the efficacy of treatments. All monitoring traps will be serviced for a period equal to three Medfly life cycles beyond the date of the last fly detection. Fruit of host plants will be sampled for the presence of eggs and larvae in a 200-meter radius around each detection site.

2. Treatment

Should evidence of a breeding Medfly population be confirmed, a targeted, ground-based foliar bait treatment will be applied. Host trees and plants within a 200-meter radius of the find site are treated with highly localized spray that consists of an organic formulation of the pesticide spinosad and protein hydrolysate, a food bait. Treatments are repeated every 1 to 2 weeks for one life cycle of the fly (typically 2 to 3 months, dependent on temperature).

Protein hydrolysate is a common attractant used in fruit fly treatments, increasing the efficacy of chemical applications, and reducing the area of pesticide treatments needed for control (Prokopy et al., 1992). Pest fruit flies are attracted to the protein hydrolysate, which can be derived from plants or yeast, where they then receive a lethal dose of the pesticide that is mixed with the attractant.

Evidence of a breeding population (immature life stages, mated female Medfly, or multiple adult captures within a certain distance and time-frame) will result in removal of host fruit from each detection site and from all properties within a 100-meter radius of each detection site.

SIT will be used to limit expansion of the Medfly infestation—the eradication area will receive a periodic release of sterilized male Medflies in order to disrupt the reproduction cycle and control the wild population. The release area currently proposed covers a 3.5-mile radius around each find site. Releases will be repeated twice a week to achieve a minimum weekly release rate of 250,000 sterile Medflies per square mile, and will continue for two life cycles beyond the last Medfly detection date (typically 4 to 6 months, dependant on temperature).

A quarantine boundary will be established to ensure any host material that leaves the program area is free of Medfly. Host material may be treated in enclosed areas or containers by cold treatment, vapor heat treatment, irradiation, or fumigation with MB. Should the Medfly quarantine spread to federally protected historical sites, wilderness, or tribal lands, program treatments will be restricted to those approved for the type of site in question.

Growers will be able to move their harvested fruit out of the quarantined area, under a limited permit, to enclosed facilities for processing into juice or for packing, after the fruit receives APHIS-approved MB treatment in the field or at the packing shed. Growers of host fruits may also treat their production areas using approved program treatments (field and/or premise treatment) and, under compliance agreement, have crops certified for movement to packing sheds.

Before taking action, program officials are to inform the public and impacted industry via press releases, meetings, and other forms of communication appropriate for the recipients. Residents whose property will be treated or whose fruit will be removed are to be notified at least 48 hours in advance. Notification letters will be sent to trading partners as they are identified. Given the potential impacts to commercial production, grove owners, packing sheds, nurseries, vendors, and other industry operations handling Medfly host material will be notified of the Medfly quarantine location and treatment schedule.

For more detailed information regarding the alternatives considered for Medfly control and their component methods, refer to the previously mentioned fruit fly risk assessments (APHIS, 2014a, 2003, 1999, 1998a, and 1998b).

III. Potential Environmental Consequences

This EA analyzes the potential environmental consequences of alternatives considered for Medfly control. The site-specific characteristics of the Medfly program area were considered with respect to the preferred alternative's potential to affect human health, nontarget species (including threatened and endangered species), and environmental quality. Potentially sensitive sites were identified, considered, and accommodated through special selection of eradication methods and use of specific mitigation measures. APHIS will conduct any necessary additional environmental analyses if Medfly detections lead to an expansion of the program boundary.

A. No Action

Lack of Federal action would place the burden of eradication on the State of California. It is reasonable to expect Medfly populations would continue to expand in size and area, leading to increased quarantine efforts. Any failure of those efforts could lead to the establishment of this pest within the conterminous United States. If eradication attempts are unsuccessful, APHIS expects substantial economic losses to growers in the United States. Crop loss is likely to lead to commodity scarcity, higher costs for U.S. consumers, and the temporary or permanent loss of valuable U.S. export markets.

B. Quarantine and Commodity Certification

The quarantine actions of this alternative are designed to reduce the human-mediated movement of Medfly by preventing the transportation of host-plant materials beyond the quarantine boundary. A resident Medfly population would be expected to remain within the quarantine boundary. Any failure in quarantine actions could lead to Medfly establishment outside the program area. The commodity certification requirement would create a necessary but new layer of ongoing governmental presence in the marketplace. This situation could create inspection jobs, however, would restrict trade until the produce was inspected and certified for sale. Host plants would likely cease being grown for domestic use as landowners shifted to non-Medfly host plants.

C. Preferred Alternative

This section considers to what extent implementation of the preferred alternative might affect the human environment. It begins with a brief description of the physical aspects of the region and its residents, both

within and near the proposed program area The preferred alternative, eradication using an IPM approach, may employ any or a combination of the following measures:

- no action,
- regulatory quarantine treatment and movement control of host materials and regulated articles,
- host survey for evidence of breeding Med flies,
- host removal,
- eradication chemical applications (foliar bait spray),
- mass trapping using pheromone lures or food bait as an attractant, and
- SIT.

Pheromone lures present little or no risk to human health or to the general environment, based on their low toxicity in animal testing, high target specificity, and low exposure to humans and the environment (EPA, 2011; NAFTA, 2003). Review of the treatment protocols by APHIS indicates the chemical formulations used as pheromone lures in Medfly program traps are unlikely to result adverse environmental or human health risks (APHIS, 2014a, 2003, 1999, 1998a and 1998b). Therefore, the discussion in this section will focus on the other eradication measures of the preferred alternative.

1. Affected Environment

a. Land Characteristics and Demographics

San Diego County covers approximately 4,207 square miles and had an estimated population of 3,263,431 in 2014. Numerous hills and mountain ranges cross the county. The city of La Mesa lies in a hilly region to the east of one of California's major cities, San Diego. La Mesa occupies about 9 square miles in the southwestern portion of the county, and reported a population of 58,769 in 2014. The Census Designated Place of Spring Valley lies about 4 miles from La Mesa; it occupies an area of about 7 square miles and reported a population of 28, 205 in 2010. Spring Valley is the largest unincorporated community in San Diego County, and relies on the county for public services and governance (USCB, 2015; La Mesa, 2015; SVCC, 2015).

The State of California continues to experience extreme drought that is broken to a limited extent by storms bearing unusually heavy rainfall. The

La Mesa region has a semi-arid, steppe climate with an average low temperature in winter of 47 ^{o}F, and an average high temperature in summer of 98 ^{o}F. Total annual precipitation historically averages 13.8 inches, accumulating chiefly between November and March (La Mesa, 2015; Kauffman, 2003).

Land use in the immediate program area is suburban and rural residential. Schools, municipal parks, biking and hiking trails, golf courses, and other public and private recreational facilities also occur within or near the program area. Medfly-host vegetation in the program area occurs on both private and public property. Major transportation routes passing through the program area include Interstate 8 and California Highways 54, 67, 94 and 125. Although the current infestation is in a highly developed location, there are numerous potentially-sensitive sites located within 15 miles of the Medfly detections. (For more information see tables 1 and 2.)

b. Water Resources

The La Mesa region obtains electric power, irrigation and drinking water from various local and imported sources including the Colorado River, the State Water Project, and local streams and reservoirs (WEF, 2014). Water located beneath the program area or that drains off it may enter the San Diego watershed designated as HUC8 18070304 (see appendix B for data source). APHIS Medfly program treatments are designed to prevent contamination and degradation of water quality in program area watersheds.

Severe drought conditions since 2012 led to unusual surface and ground water loss in California. Both short-term (i.e., less than 6 months' duration) and long-term adverse impacts are predicted for California's agriculture, ecology, and hydrology (Heim, 2015). (See figure 2 for a map of drought intensity.)

The State-implemented water conservation programs and continues to seek additional ways to reduce water use. The Governor declared a drought State of Emergency in January 2014. On April 1, 2015, the State Water Resource Control Board (SWB) was ordered to implement mandatory water reductions in cities and towns across California to reduce potable urban water usage by 25 percent statewide. Cities with higher per capita use are facing mandatory water use reductions up to 36 percent based on their usage in 2013. The SWB required these areas to achieve proportionally greater reductions than those with lower use, to help reduce statewide water consumption by 25 percent (LA County, 2015).

Table 1. Distance from Center of Detections to Certain Land Sites.*

Designated Land Use	Distance Rounded Off to Nearest Tenth of a Mile
Nearest Airports	• El Centro Naval Air Facility, 7.3 • Montgomery Field, 9.0 • Marine Corps Air Station Miramar, 6.42 • San Diego International, 11.4 • North Island Naval Air Station, 11.6
Mexico	• U.S.- Mexico border, 18.0 • City of Tijuana, 21.0
City, State and Federal Lands	• 4 city parks within proposed treatment area • Coronado Naval Amphibious Base, 11.1 • Cleveland National Forest, 11.9 • San Diego Naval Submarine Base, 12.3 • Barona Rancheria, 12.9 • San Diego Naval Training Center, 14.5
Nearest Historic Sites	• 1 within the proposed treatment area 5 registered sites, <6.0
Nearest International Seaport	• San Diego Harbor, 9.4
Nearest Native American Reservation	• Jamul Indian Village, 9.0 • Sycuan Indian Reservation, 9.4 • Capitan Grande Indian Reservation, 14.9
Organic Production and Farmers Markets	• 1 organic farm within proposed treatment area • 2 organic farms, <6.0 • 1 farmers market within proposed treatment area
Schools and Academic Institutions	• 13 schools within proposed treatment area • 143 schools and institutions, <6.0

* See appendix B for data sources.

In 1985, California enacted legislation to protect the potability of its ground water; potential contaminants are identified and pesticide use restrictions are implemented for vulnerable areas (State of California, 2013). Ongoing surveys of California's waters continue to show substantial pollutant and toxicity levels; the percentage increases, however, may reflect more thorough site assessment rather than increasing pesticide discharge and runoff (EPA, 2012).

The Medfly eradication program calls for highly localized chemical applications in designated properties and no-spray buffers around all sensitive areas, including all water bodies. This method of application is designed to minimize the potential for introduction of program chemicals to local water resources.

Table 2. Distance from Center of Detections to Certain Water Resources.*

Type of Resource	Distance Rounded Off to Nearest Tenth of a Mile
Wetlands	• About 6 acres within proposed treatment area
Nearest Access to Pacific Ocean	• San Diego Bay, 9.1

Water Bodies within 6 miles	• 4 within proposed treatment area
	  o Mount Helix Reservoir, 0.8
	  o Grossmount Reservoir, 1.3
	  o Lake Murray, 2.7
	  o Forester Creek, 3.0
	• 4 reservoirs, <6.0
	• 2 lakes, <6.0
	• 1 river, <6.0
	• 1 pond, <6.0

Impaired Waters within 15 miles	• 2 segments, <6.0 • 11 segments, <15.0

* See appendix B for data sources.

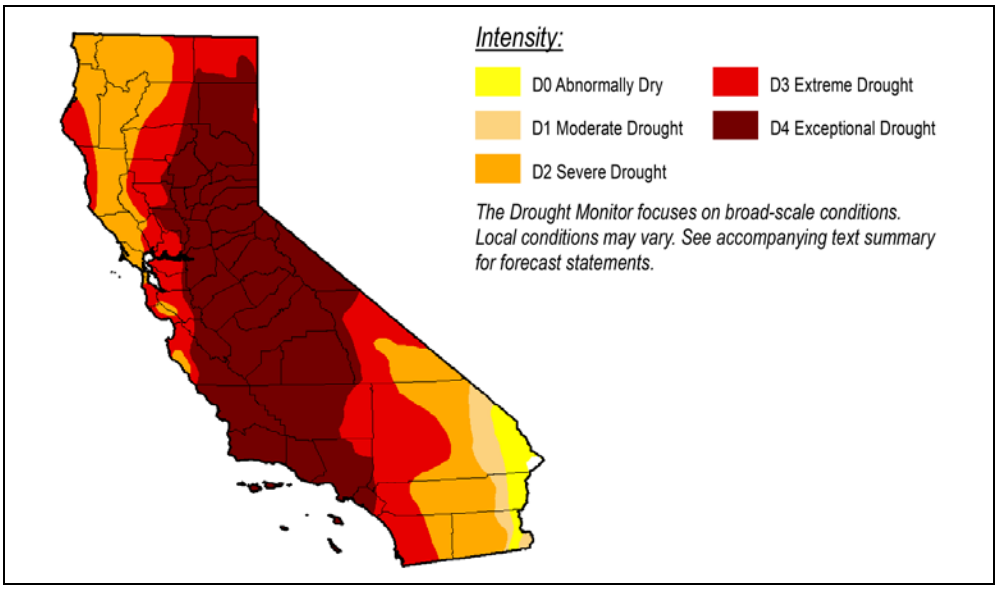

Figure 2. Drought status in California as of July 28, 2015. (Heim, 2015)

2. Human Health

The three major factors influencing the human health risk associated with pesticide use include the fate of the pesticides in the environment, their toxicity to humans, and their exposure to humans. The principal concerns for human health are related to the potential program uses of chemical pesticides, including spinosad protein bait and MB (as a fumigant). Spinosad is toxic to specific invertebrate species but is considered to be nontoxic to humans and other animals. Limited data exist regarding the

toxicity of the protein hydrolysate; the available data suggests low acute toxicity to human health.

Exposure to program pesticides can vary, depending upon the pesticide and the use pattern. The Medfly eradication program will employ ground-based targeted applications of spinosad with protein bait. Commercial applications, should they become necessary, will be applied to properties owned by commercial growers and producers where exposure to the general public is unlikely.

If the spinosad protein bait application is restricted to target surfaces and made in accordance with EPA label instructions, effects to human health and the environment are expected to be incrementally negligible. The use of protein hydrolysate as an attractant in the Medfly program is also expected to present a low risk to human health. The attractant has low toxicity and its ground-based, targeted method of application results in a low probability of exposure and risk to workers and the general public.

Should treatment by MB fumigation be indicated, adherence to EPA label restrictions and application in enclosed areas or containers will protect applicators and the general public from risk of exposure to the fumigant (APHIS, 2007 and 2002).

The analyses and data of EIS1 and EIS2 and the associated human health risk assessments indicate exposures to pesticides from normal program operations are not likely to result in substantial adverse human health effects. (Refer to EIS1 and EIS2 (APHIS, 2001 and 2008) and the human health risk assessments (APHIS, 2014a, 1999 and 1998a) for more detailed information relative to human health risk.).

Another mitigation measure designed to minimize exposure of humans to program pesticides is the requirement for public notification. Information concerning the Medfly eradication project will be shared via press releases and media announcements to the general public. Either the county agricultural commissioner or public information officer will serve as the primary contact to the media. Any resident with property to be treated will be contacted directly or notified in writing at least 48 hours prior to treatment. Following the treatment, notices will be left with homeowners detailing precautions to take and safe intervals of time that should elapse before harvesting fruit on the property. Treatments are repeated at 7 to14 day intervals for one life cycle of the fly (typically 2 to 3 months, sometimes longer dependent on temperature) (CDFA, 2014d).

APHIS recognizes a small portion of the population may have greater than usual sensitivity to certain chemicals, and program treatments may pose higher risk for these individuals. Special communication strategies to

mitigate this risk are discussed in detail in appendix C of EIS1 (APHIS, 2001).

Trap placement and chemical applications may be rescheduled if strong winds or rainfall is forecast for the program area. Site inspections will continue to ensure existing program treatments are not likely to affect humans. The destruction or relocation of traps and treatments due to weather events is unlikely to result in adverse impacts to the human environment, because the potential pesticide toxicity is reduced by dilution during the storm's water and air movement.

Of the three alternatives considered, a well-coordinated eradication program using IPM technologies results in the least use of chemical pesticides and minimizes their potential to adversely affect human health. The no action alternative is not expected to eliminate Medfly as readily or as effectively as the preferred alternative. Over a protracted period of no action, there would likely be broader and more widespread use of pesticides by homeowners and commercial growers, with correspondingly greater potential for adverse impacts to human health.

3. Other Aspects of the Human Environment

APHIS summarizes its findings on potential environmental impacts of implementing the action alternatives on historic sites, minority and/or low-income communities, and tribal interactions in the proposed quarantine program area in this section.

The National Historic Preservation Act of 1966, as amended (16 United States Code (U.S.C.) § 470 et seq.), requires Federal agencies to consider the impact on properties included in, or eligible for inclusion in the National Register of Historic Places (36 CFR §§ 63 and 800). APHIS determined its fruit fly eradication programs are undertakings with no potential to affect historic properties, and is requesting concurrence with this finding from the State Historic Preservation Office for Medfly in San Diego County. There are approximately 125 federally registered historic sites in San Diego County. Of those for which addresses are available, the federally listed historic places generally are buildings with associated plantings that may or may not include potential host plants.

The privately owned Rosecroft Estate is located within 15 miles of the current quarantine area. Its world-renowned collection of *Begonia* species (Family Begoniaceae: Order Cucurbitales) are extremely unlikely to become infested because cucurbits are considered to be poor hosts for Medfly (Thomas et al., 2010). Other federally listed historic places in San Diego County with notable horticultural aspects (including Anza Borrego, the Fages-De Anza Trail, Felicita County Park, and Table Mountrain District) are all more than 15 miles from the current quarantine zone.

In general, APHIS' fruit fly eradication programs are compatible with the preservation of historic sites because control activities are inconspicuously integrated into the site, do not disturb the ground, and do not affect human-made structures. APHIS restricts program treatments and activities to an as-needed basis, and also can modify normal program activities at historically significant locations to reduce pesticide release, if necessary. APHIS will not conduct aerial chemical applications; spraying will be ground-based, directly targeting foliage. This may include hand spraying with a backpack sprayer. In this program, APHIS intends to use aerial SIT, surveillance trapping or bait treatments and, when necessary, fruit stripping by hand. If APHIS discovers any archaeological resources, the appropriate individuals will be notified.

Federal agencies identify and address disproportionately high and adverse human health or environmental effects of its proposed activities, as described in Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. Using 2010 Census Bureau estimates for La Mesa in San Diego County, less than 8 percent of the population self-identify as Black, fewer than 6 percent report being Asian, and less than 21 percent report being Hispanic. While 22 percent of the population self-identify as not speaking English at home, more than 91 percent graduated high school, and fewer than 13 percent are reported as living in poverty (USCB, 2015). Based on the relatively high educational level and low diversity of the population, APHIS does not find it is necessary to provide advance notice of program activities and potential exposure hazards in a variety of languages. Because the preferred method of bait/pesticide application is to use small ground-based sprayers that target foliage above the height humans can reach unassisted, minority and low-income segments of the population are not likely to be disproportionately adversely affected by the bait/pesticide treatments or their methods of application.

Federal agencies comply with Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks*. The preferred alternative does not pose any disproportionate adverse effects to children because maintenance of traps and any pesticide applications would not occur when children are present in the immediate area. The intermittent presence of children at shelters, playgrounds, parks and picnic areas, religious centers, public/private campgrounds and trailer parks, athletic fields, bus depots, and outdoor community facilities means they are likely to frequent locations where fruit fly baits are in use; however, the placement of bait traps is likely to be far above their reach. Measuring from the center of the core treatment area, APHIS estimates there may be as many as 156 schools within the current quarantine zone, but only 13 schools are located within the treatment area. Where possible, bait stations will not be placed on school property. A school's surrounding landscape plants may have fruit removed by hand-picking. If any

pesticide applications are deemed essential, then a bait or backpack sprayer would be used instead of aerial spraying. Any exposure of children to applied products is negligible based on the program's application methods and the product formulations.

Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*, calls for agency communication and collaboration with tribal officials when proposed Federal actions have potential tribal implications. Using the Native American Graves Protection and Repatriation Act Online Databases (NPS, 2015; 25 U.S.C. § 3001 et seq.), APHIS finds there are three Federal reservations (Jamul Indian Village, Sycuan Indian Reservation, and Capitan Grande Indian Reservation) within 15 miles of the treatment area. In addition, the program area contains ceded land from the Campo Band of Diegueno Mission Indians of the Campo Indian Reservation. APHIS notified the tribal governments at the reservations of the program activities and will initiate consultation, if necessary.

Individual tribal members living within the quarantine zone will not be disproportionately affected in comparison to other individuals in the area because eradication treatments are applied to host foliage above the unassisted reach of most humans, and foliar canopy spraying is highly targeted. The proposed action will not disturb the ground, so it is unlikely to affect Native American sites or artifacts. For these reasons, APHIS does not expect any tribal members to be directly affected by program activities.

APHIS considered the potential environmental impacts of implementing the action alternatives on minority and/or low-income communities, tribal interactions, and historical and culturally sensitive sites in the program area. A lack of Federal action could result in adverse economic and health impacts on affected producers and consumers, such as decreased harvests, higher consumer prices, loss of local employment, reduced nutritional options, loss of market share, compromised mental and physical health, loss of property, and so on. These indirect impacts are expected to occur, to a lesser extent, under the quarantine and commodity certification alternative. Adverse effects are not anticipated as a result of carrying out the preferred alternative's surveillance activities, trapping, SIT, or program ground-based chemical applications.

4. Nontarget Species

The principal concerns for nontarget species, including threatened and endangered species, relate to potential harm from the use of program pesticides to eradicate Medfly populations. Paralleling human health risk, the risk to nontarget species is related to the pesticides' fate in the environment, their toxicity, and exposure to nontarget species. APHIS' Medfly programs are designed to prevent the introduction of program chemicals into nontarget areas.

All of the pesticides considered in this EA are highly toxic to invertebrates, even though the likelihood of exposure (and any ensuing impacts) varies among the pesticides and with the specified use pattern. Of the three alternatives considered, a well-coordinated Medfly eradication program using IPM technologies would result in the least use of chemical pesticides, overall, with minimal adverse impacts to nontarget species. The no action alternative and quarantine and commodity certification alternative are less likely to be effective at eliminating Medfly, and would be expected to result in broader and more widespread use of pesticides by homeowners and commercial growers, with a correspondingly greater potential for adverse impacts.

Trap placement and chemical applications may be rescheduled if strong winds and rain storms are forecast for the program area. Site inspections will continue and remedial actions will be undertaken, as necessary, to ensure existing program treatments are not likely to affect nontarget organisms. The destruction or relocation of traps and treatments due to weather events is unlikely to result in adverse impacts to animal species and their habitats, as the potential toxicity should be greatly reduced by dilution of the program materials in water and air.

The eradication program will apply a targeted, ground-based foliar bait treatment if evidence of a breeding Medfly population is detected. For this, host trees and plants within a 200-meter radius of the Medfly find site are treated with a highly localized spray that consists of an organic formulation of the pesticide spinosad combined with a protein hydrolysate food bait.

Protein hydrolysate is a common attractant used in fruit fly treatments, increasing the efficacy of chemical applications and reducing the area of pesticide treatments needed for control (Prokopy et al., 1992; Dowell, 2015). Medfly are attracted to the protein hydrolysate where they then receive a lethal dose of the pesticide (spinosad) that is mixed with the attractant. The attractant is expected to have minimal impacts to environmental quality based on its use pattern and rapid degradation. The protein is not expected to result in impacts to nontarget species, and the method of application is designed to limit exposure and risk to honey bees.

The pesticide spinosad has low to moderate toxicity to wild mammals and birds. Spinosad toxicity to fish is moderate, while aquatic invertebrates are more sensitive in acute and chronic exposures. Risks to nontarget fish and wildlife are anticipated to be negligible based on the proposed use pattern that would result in a low potential for exposure to most taxa. A favorable environmental fate profile and low toxicity to most nontarget organisms further reduces the risk to terrestrial and aquatic animals (APHIS, 2014a).

Toxicity to terrestrial invertebrates is variable for spinosad. Although spinosad is considered highly toxic to honey bees (similar to other native bees), the toxicity of the pesticide is reduced significantly after drying. Lepidoptera, such as butterflies and moths, appear to be less sensitive to spinosad compared to bees (APHIS, 2014a). Risk to pollinators and other beneficial arthropods that may be sensitive to spinosad will be reduced by the method of application and use of an attractant that is specific to fruit flies. In addition spinosad label restrictions specific to pollinators will provide further protection for pollinators. An example of these restrictions for one of the spinosad formulations includes no applications to trees when they are flowering.

For the fumigant MB, the sealed methods for its application are designed to protect nontarget species by preventing their exposure to the pesticide (APHIS, 2007 and 2002). Potential cumulative impacts of MB released to the global environment are considered in section 6 of this chapter.

Sites near the program area that might require special consideration, should the program area expand, include irrigation canals, coastal wetlands, and salt lakes of potential ecological importance. Program chemical applications will not be permitted at these sites or within refuges or other protected areas. Fruit survey and surveillance trapping will continue, and fruit stripping by hand will be undertaken if Medfly detections occur at these types of locations.

a. Migratory Birds

The Migratory Bird Treaty Act of 1918 (16 U.S.C. §§ 703–712) established a Federal prohibition, unless permitted by regulations, to pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird or any part, nest, or egg of any such bird.

Executive Order 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, directs Federal agencies taking actions with a measurable negative effect on migratory bird populations to develop and implement a memorandum of understanding (MOU) with the U.S. Fish and Wildlife Service (FWS) that promotes the conservation of migratory bird populations. On August 2, 2012, APHIS and FWS signed an MOU to facilitate the implementation of this Executive order.

This southern region of California, which is part of the Pacific Flyway, is an important migration corridor providing suitable habitat for many bird species. Approximately 29 species of concern reportedly occur within the

vicinity of the treatment area. However, APHIS evaluated the proposed Medfly program in terms of potential impact on migratory avian species; given the extent of urbanization within the treatment area and the methods of application, implementation of the preferred alternative is not expected to have any adverse effect on migratory birds or their flight corridors. The proposed program would not involve removal or disturbance of any trees, shrubs, or other vegetation on the project site that could be used by birds. In addition, birds would not be exposed to program treatments because of the targeted nature of the applications.

b. Endangered Species Act

Section 7 of the Endangered Species Act (ESA) and ESA's implementing regulations require Federal agencies to consult with FWS and/or the National Marine Fisheries Service to ensure that their actions are not likely to jeopardize the continued existence of threatened or endangered species, or result in the destruction or adverse modification of critical habitat. `

APHIS reviewed the program area and proposed treatment activities for potential co-occurrence of federally listed species and critical habitat to determine if any proposed program treatments may affect listed species or critical habitat. No federally listed species or critical habitat occur within the treatment area. Additionally, no species proposed for listing or critical habitat proposed for designation occur within the treatment area. In a May 19, 2015 report, the California Natural Diversity Database (CNDDB) notes the historic occurrence of least Bell's vireo within the quarantine area, but the most recent observation of the bird in this area was made in 1922. It is therefore presumed extirpated from the area. (See appendix B for CNDDB data source). In the same report, the CNDDB indicates an occurrence of San Diego thornmint. However, the plant was last found in the area in 1945 and is presumed extirpated. The proposed treatment area occurs within a suburban housing development, unlikely to support natural occurrence of the endangered plant species endemic to the coastal sage scrub, chaparral, and native grasslands of San Diego County (FWS, 2009).

Therefore, APHIS did not identify any potential co-occurrence of listed species or critical habitat within the program area. Because the current program activities are limited to developed residential areas, APHIS determined there is no potential for effects to listed species or critical habitat. Should the program area expand or further outbreaks be detected, APHIS, in cooperation with CDFA, will consult with FWS and other appropriate agencies, as necessary. A complete administrative record of this review is available upon request. (Refer to EIS1 and EIS2 (APHIS, 2001 and 2008) and the supporting nontarget risk assessments (APHIS, 2014a, 2003 and 1998b) for more information on risks to all classes of nontarget species.)

5. Environmental Quality

The principal environmental quality concerns are for the protection of air quality, water quality, and the minimization of the potential for environmental contamination. In relation to preserving environmental quality, program pesticides remain the major concern for the public and the program. Although program pesticide use is limited, especially in comparison to other agricultural pesticide use, the proposed action would result in a controlled release of chemicals into the environment. The fate of those chemicals varies with respect to the environmental component (air, water, or other substrate) and its characteristics (temperature, pH, dilution, etc.). The environmental fates of spinosad and MB are outlined below. (Refer to EIS1 and EIS2 (APHIS, 2001 and 2008) and the risk assessments (APHIS, 2014a, 2003, 1999, 1998a and 1998b) for a more detailed consideration of program pesticides' environmental fates.)

Attractant ingredients, such as pheromone lures and protein hydrolysate food bait, have minimal affect on environmental quality, based on EPA-approved use patterns and the ingredients' rapid degradation. Use of these attractants in Medfly program treatments is not expected to result in impacts to environmental quality beyond those described for the below chemicals (EPA, 2011; NAFTA, 2003; Prokopy et al., 1992).

- **Spinosad** adsorbs strongly to soil particles and is unlikely to leach to great depths. Dissipation half-lives for spinosad in the field may last 0.3 to 0.5 day. It is photodegraded quickly on soil exposed to sunlight, but the degradation rate is decreased at longer exposure times. Spinosad is quickly metabolized by soil micro-organisms under aerobic conditions, and has a half-life of 9.4 to 17.3 days. Because natural water bodies and rain are generally not of basic pH, spinosad will not hydrolyze in them or on moist plant surfaces. Aqueous photolysis is rapid in natural sunlight (half-life of less than 1.0 to 1.6 days), and is the primary route of degradation in aquatic systems exposed to sunlight. Under anaerobic conditions, the degradation rate is slower, between 161 and 250 days. Spinosad has a half-life of 2.0 to 5.3 days on foliar surfaces. After initial photodegradation, residues are available for metabolism by plant biochemical processes. Effects from residues of individual treatments are no longer detectable in environmental substrates within a few weeks of application (Kollman, 2003).

- **Methyl bromide** (MB) fumigation will not be used as an eradication treatment, but may be employed as a regulatory treatment. MB volatilizes into air from soil and water, and is known to contribute to stratospheric ozone depletion. The volatilization half-life for MB from surface water ranges from 3.1 hours to 5 days. The degradation half-life of MB in water ranges from 20 to 38 days, depending on

temperature and pH. Volatilization of MB from surface soil is rapid, with a half-life ranging from 0.2 to 0.5 day. The degradation half-life of MB in soil ranges from 31 to 55 days. MB has a low affinity to bind to soils, however, is not considered a major contaminant of ground water (NPIC, 2000). The small quantities used to treat for Medfly disperse when fumigation chambers are vented. (See section 6 of this chapter regarding MB's potential cumulative impacts to the environment.)

Urban and agricultural runoff may flow directly into local waters, picking up trash, dirt, chemicals, and other contaminants along the way. If treatment is indicated in close proximity to a body of water where pesticides might be directly discharged into the water, CDFA will analyze the environmental setting, and establish and follow site-specific best management practices. The prescribed method of spray application directly to host plants is designed to minimize drift and runoff. Mitigation measures will be applied to protect marine and freshwater resources. Personnel will maintain a minimum distance of 98 feet (30 meters) from surface water. Personnel applying pesticides will adhere to label directions, State and Federal laws, and recommendations of the environmental compliance staff associated with the program. Water body contact is not anticipated due to the targeted application measures and the environmental fate of the pesticides used in *Ceratitis* spp. cooperative eradication programs.

The alternatives were compared with respect to their potential to affect environmental quality. Risk to environmental quality is considered minimal. Again, a well-coordinated eradication program using IPM technologies would result in the least use of chemical pesticides overall, with minimal adverse impacts on environmental quality. The no action alternative and the quarantine and commodity certification alternative would likely result in broader and more widespread use of pesticides by homeowners and commercial growers, with correspondingly greater potential for adverse impacts.

The proposed program area was examined to identify characteristics that would tend to influence the effects of program operations. Potentially sensitive areas were identified, considered, and accommodated, as necessary, through special selection of control methods and use of specific mitigation measures. Allowances were made for the special site-specific characteristics that would require a departure from the standard operating procedures. The approaches used to mitigate for adverse impacts to bodies of water are described in EIS1 (APHIS, 2001).

6. Cumulative Impacts

This section considers the potential of the alternatives to cause cumulative impacts on the human environment. Not taking Federal action is expected

to result in the cumulative impacts that arise from tolerating uncontrolled Medfly infestations in the United States. Federal quarantine restrictions and commodity certification requirements would place the burden of control efforts and expense on producers already engaged in complying with other quarantine and commodity certification requirements. Either of these alternatives may increase the time it takes for commodities to reach their intended markets, or may prevent them from reaching consumers at all, which may contribute to consumer shortages and negative public perception of the affected industry.

APHIS considered implementation of the preferred alternative in the context of, and in conjunction with, other pest insect eradication and quarantine projects in the La Mesa program area (such as light brown apple moth and glassy-winged sharpshooter eradication efforts). These programs use pesticides with different chemistries. They target different pests, and are applied at different times. The combination of these different pesticide chemistries, targets for application, and application timings suggest limited interacting or multiple exposures that are not likely to create significant cumulative impacts in the human environment.

Current and future in-State Medfly programs could potentially merge into one larger program area. When Medfly eradication programs are combined with trapping and eradication actions across California counties, APHIS expects a beneficial cumulative impact on the environment from reduced Medfly populations causing damage to fruit combined with overall fewer chemical treatments. Trapping and surveys for Medfly continue under the California fruit fly detection and monitoring program, and sterile Medflies continue to be released over high-risk regions as a preventive measure (CDFA, 2015e).

At present, no Medfly treatment areas overlap one another, and none overlaps the proposed La Mesa treatment area. Use of program pesticides in a Medfly program that overlap with another *Ceratitis* spp. program are monitored and adjusted, where necessary, to minimize environmental impacts. Due to the passage of time and the prevailing weather conditions in southern California during 2015, no chemical residues are believed to remain from previous Medfly programs that could result in additive or synergistic chemical effects with previous program chemical applications.

No significant environmental impacts are expected to result from proper implementation of this Medfly eradication and control program. The differences in pesticide chemistries, targets for application, affected species and resources, and application timing between the Medfly program and other pest control programs in California are not likely to create significant cumulative impacts in the human environment. No synergistic or cumulative impacts from pesticide applications are expected with the following active control programs (CDFA, 2015f)—

- Asian citrus psyllid in 16 counties, including San Diego County

- glassy-winged sharpshooter/Pierce's Disease—Statewide.

Care should be taken, however, when multiple pest species in the same area are targeted for treatment using the same chemical. Spinosad, for example, has other labeled food and non-food uses and is currently used in a variety of pest control efforts, including the control of termites and European grapevine moth (APHIS, 2014a). Implementation of a Medfly eradication program could lead to an increase in spinosad use, and the possible overlap of APHIS and non-APHIS program treatments. The Medfly treatment schedule will be adjusted in locations where another CDFA or APHIS program may have scheduled similar treatments to avoid additive chemical impacts.

Additional programs in place at the time of preparation of this EA which may employ spinosad treatments (CDFA, 2015f) and could combine with Medfly spinosad treatments to have an additive impact have been designed to target the following pests—

- Mexican fruit fly in Los Angeles County;

- Oriental fruit fly in Los Angeles and Santa Clara Counties;

- European grapevine moth in 31 California counties, including San Diego County; and

- light brown apple moth in portions of many California counties, including San Diego County.

It is uncertain how pesticides may be used by private entities in the Medfly program area. In terms of Federal and California State program activity, there are no significant cumulative impacts anticipated as a consequence of implementing the preferred alternative or its component treatment measures. The preferred alternative is designed for pesticide applications to avoid overlapping treatment areas, and to prevent nontarget exposure until pesticide residues are degraded.

APHIS determined uses of MB for fruit fly quarantine treatments pose negligible potential for cumulative impacts to the environment. For information on potential depletion of the ozone layer related to MB released into the atmosphere, see the *Rule for the Importation of Unmanufactured Wood Articles from Mexico, with Consideration for Cumulative Impact of Methyl Bromide Use, Final Environmental Impact Statement* (APHIS, 2002) and subsequent analyses, such as the *Importation*

of Solid Wood Packing Material, Supplement to the Final Environmental Impact Statement (APHIS, 2007).

There were no residual impacts from previous Federal and non-Federal actions targeting fruit fly infestations in the State of California, and there are no reasonably foreseeable future actions that could result in incremental increases in environmental effects. Based on APHIS' review of the context and intensity of the existing, ongoing, and potential future treatments, there will be no cumulative impacts to the human environment resulting from this Medfly cooperative eradication program.

As discussed previously, additional actions may be implemented in this program, including additional quarantines and regulatory treatments. The anticipated use of these treatments is considered to pose minimal risk to the human environment, as determined in EIS1 and EIS2 (APHIS, 2001 and 2008), and the nontarget species and human health risk assessments (APHIS, 2014a, 2003, 1999, 1998a, and 1998b).

IV. Agencies Consulted

California Department of Food and Agriculture
Plant Health and Pest Prevention Services
Environmental Policy and Compliance
1220 N Street, Suite 221
Sacramento, CA 95814

California Department of Food and Agriculture
Plant Health and Pest Prevention Services
Pest Detection/Emergency Projects
1220 N Street, Room 315
Sacramento, CA 95814

State Historic Preservation Officer
California State Office of Historic Preservation
1725 23rd Street, Suite 100
Sacramento, CA 95816

U.S. Department of Agriculture
Animal and Plant Health Inspection Service
Plant Protection and Quarantine
Center for Plant Health Science and Technology
1730 Varsity Drive, Suite 400
Raleigh, NC 27606

U.S. Department of Agriculture
Animal and Plant Health Inspection Service
Policy and Program Development
Environmental and Risk Analysis Services
4700 River Road, Unit 149
Riverdale, MD 20737

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USDA—See U.S. Department of Agriculture

USFWS—See U.S. Department of the Interior, Fish and Wildlife Service

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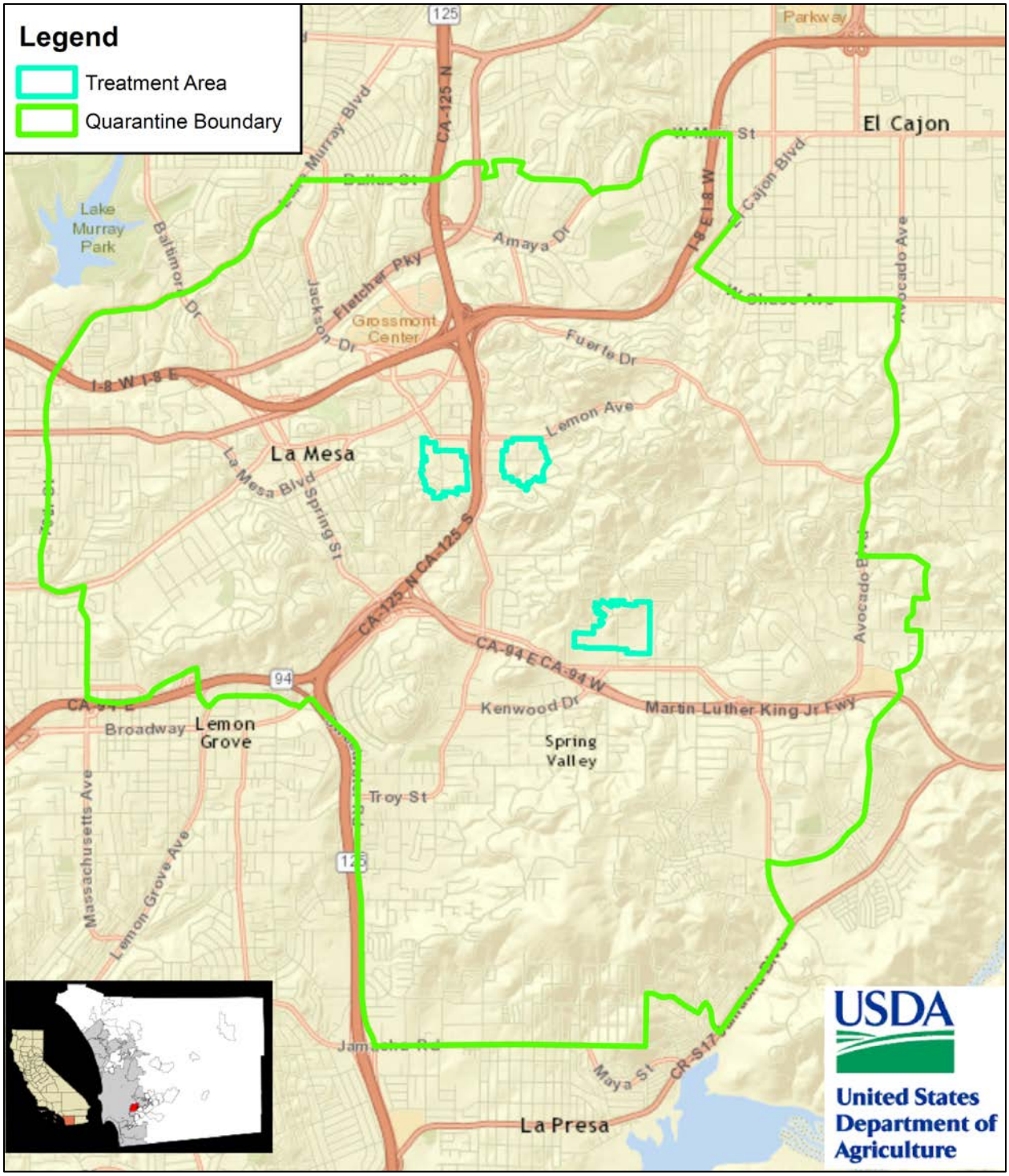
Appendix A. Medfly Quarantine in San Diego County, California, as of August 12, 2015.



Source: USDA APHIS PPD

Appendix B. Outside-APHIS Spatial Data Resources Used to Prepare this Document

The following resources were used by USDA-APHIS-PPD on 31 July 2015.

Web-Based Mapping Application for Environmental Assessments

- **NepaAssist:** http://nepassisttool.epa.gov/nepassist/entry.aspx

For Information on—

- **Bing Maps Road:** http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html
- **Boundaries:** http://epamap9.epa.gov/arcgis/rest/services/NEPAssist/Boundaries/MapServer
- **Historic Sites:** http://www.nps.gov/nr/
- **Native American Areas:** http://viewer.nationalmap.gov/
- **Nonattainment Areas:** http://geoplatform2.epa.gov/arcgis/rest/services/PM_Designations_Mapping/Nonattainment_Areas/MapServer
- **Organic Farms:** http://www.ams.usda.gov/AMSv1.0/nop
- **Places:** http://epamap9.epa.gov/arcgis/rest/services/NEPAssist/Places/MapServer
- **Threatened and Endangered Species:** http://www.dfg.ca.gov/biogeodata/cnddb/
- **Transportation:** http://epamap9.epa.gov/arcgis/rest/services/NEPAssist/Transportation/MapServer
- **Water:** http://epamap9.epa.gov/arcgis/rest/services/NEPAssist/Water/MapServer