Animal and Plant Health Inspection Service
U.S. DEPARTMENT OF AGRICULTURE

Tau Fruit Fly Cooperative Eradication Program

Los Angeles County, California

Environmental Assessment, July 2023

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List of Abbreviations and Acronyms

Abbreviation or Acronym	Meaning
APHIS	Animal and Plant Health Inspection Service
CA-ARB	California Air Resources Board
CA-DWR	California Department of Water Resources
CABI	Centre for Agriculture and Biosciences International
CC	Climate change
CCC	Climate Change Connection
CDFA	California Department of Food and Agriculture
CDPR	California Department of Pesticide Regulation
CFR	Code of Federal Regulations
CH_4	Methane
ChE	Cholinesterase
CNDDB	California Natural Diversity Database
CO_2	Carbon dioxide
CREFF	Cuelure-responding exotic fruit fly
DPS	Distinct Population Segment
EA	Environmental assessment
EO	Executive Order
EXTOXNET	Extension Toxicology Network
FFEIS	APHIS' November 2018 environmental impact statement for cooperative fruit fly control programs
FIFRA	The Federal Insecticide, Fungicide, and Rodenticide Act
GHG	Greenhouse gases
GWP	Global warming potential

Abbreviation or Acronym	Meaning
IAEA	International Atomic Energy Agency
IPaC	Information for Planning and Consultation
IPCC	Intergovernmental Panel on Climate Change
IPM	Integrated pest management
LAEDC	Los Angeles County Economic Development Corporation
MAT	Male attractant technique
MB	Methyl bromide
MEDFLY	Mediterranean fruit fly, *Ceratitis capitata*
MEXFLY	Mexican fruit fly, *Anastrepha ludens*
MOU	Memorandum of Understanding
n.d.	Not dated
N_2O	Nitrous oxide
NDMC	National Drought Mitigation Center
NEPA	The National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPIC	National Pesticide Information Center
NRHP	National Register of Historic Places
NWS	National Weather Service
OFF	Oriental fruit fly, *Bactrocera dorsalis*
SERA	Syracuse Environmental Research Associates
SCVWA	Santa Clarita Valley Water Agency
SHPO	State Historic Preservation Officer

Abbreviation or Acronym	Meaning
spp.	Species (plural)
USC	United States Code
USCB	U.S. Census Bureau
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGCRP	U.S. Global Change Research Program
Z.	Genus *Zeugodacus*
Z. tau	Tau fly, *Zeugodacus tau*

1 Purpose and Need for the Proposed Action

The U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS) is considering actions that will assist in the eradication of *Zeugodacus* spp. in California. Fruit flies in the *Zeugodacus* genus are not native to the United States; their ongoing detection in or near U.S. ports of entry presents a risk to cultivated and naturally occurring plant hosts in the United States.

The genus *Zeugodacus* contains at least 192 species (De Meyer et al. 2015). *Zeugodacus* spp. of particular concern to United States agriculture are:

- melon fly, *Zeugodacus cucurbitae* (Coquillett-1899) (formerly *Bactrocera cucurbitae*)
- Tau fruit fly, *Zeugodacus tau* (Walker-1849) (formerly *Bactrocera tau*) ("*Z. tau*")

California recorded the first confirmed detection of *Z. tau* in the conterminous United States in April 2016 (CDFA 2016). *Z. tau* was detected at quarantine levels California in July 2023 (APHIS 2023a). Figure 1 illustrates the life cycle of *Z. tau* from egg to adult. Female adults deposit eggs inside host fruit; the larvae emerge to pupate and mature in soil. *Z. tau*'s adult life span is roughly 125-145 days for males and 130-150 days for females (Jaleel et al. 2018). *Z. tau* sexual maturity depends on seasonal conditions and quality of food. At least three generations a year are completed when bred under laboratory conditions (Singh et al. 2010).

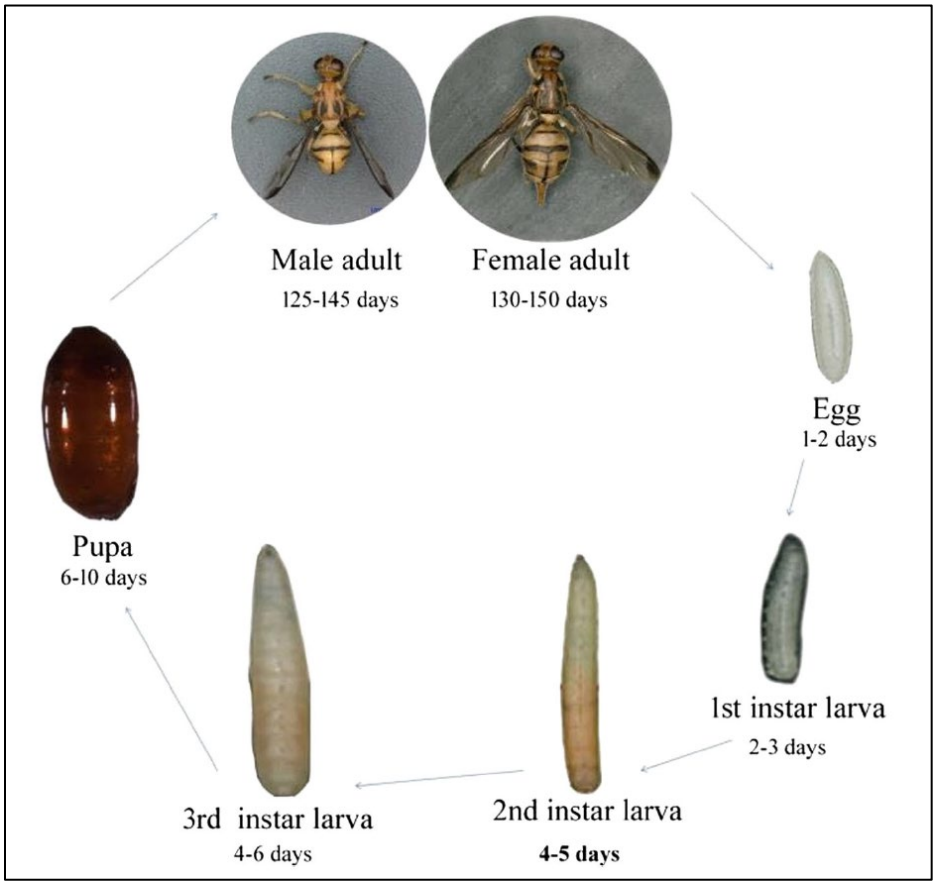


Figure 1. Life cycle of *Zeugodacus tau*.
Source: Jaleel et al. 2018

In many countries *Z. tau* is an economically important agricultural pest of vegetables, fruits, and nuts. *Z. tau* infests cucurbit crops (gourds, melons, squashes) and other plants and is found in regions of Asia and certain Pacific Islands (Bangladesh, Bhutan, Brunei, Cambodia, China, India, Indonesia, Japan, Laos, Malaysia, Myanmar, Nepal, Pakistan, Philippines, Singapore, Sri Lanka, Taiwan, Thailand, Vietnam). APHIS lists 110 hosts for *Z. tau* (APHIS 2016; see Appendix A); preferred hosts belong to the family Cucurbitaceae (this family includes annual vines, lianas, shrubs, and trees). *Z. tau* infestation can intensify where the population of competing melon flies (*Z. cucurbitae*) is low (Abbas Ahmad and Vasudha 2019).

The puncturing of fruit during egg laying admits decay organisms that cause tissue breakdown. Larval feeding reduces the interior of fruit to a rotten mass. Damaged fruit is generally unfit for human consumption (CDFA 2016). Adult flight and the transport of infested fruit or soil are the major means of movement and dispersal to previously uninfected areas (CABI 2021).

The California Department of Food and Agriculture (CDFA) begins an emergency eradication project when it determines that a *Z. tau* infestation exists within the state. APHIS accepts CDFA's standard for two flies as the trigger for an eradication response (CDFA 2016). Eradication activities by the state commence prior to a federal quarantine. Any of the following *Z. tau* detection criteria may trigger a federal quarantine:

- Two flies found within three miles of each other within a timeframe equal to one *Z. tau* life cycle,
- One mated female, or
- Larvae or pupae.

Los Angeles County is in southern California, where the fruit fly season stretches from late summer through fall. This is due to the region's climate and availability of host plant spp. Table 1 lists *Z. tau* detections in California between June 6 and July 5. Nine adult male and female *Z. tau* were found during that period (CDFA 2023a, 2023b, 2023c, 2023d). The number, timing, and location of these detections triggered federal participation in a new regulatory quarantine and pest eradication program in California. Four more *Z. tau* were collected on July 6, 2023 (CDFA 2023e). Between June 6 and July 13, 2023, CDFA confirmed that a minimum of twenty tau fruit flies (*Z. tau*) were trapped in the community of Stevenson Ranch in Los Angeles County. CDFA considers *Z. tau* to be a significant, clear, and imminent threat to the natural environment, agriculture, and economy of California. The state's combined 2021 gross production value of host commercial commodities potentially affected by *Z. tau* was over $10.09 billion (CDFA 2023f).

All previous fruit fly quarantines in California ended with successful eradication of their invading populations; the most recent in Los Angeles County was the Oriental Fruit Fly (OFF) Quarantine removed on September 26, 2022 (APHIS 2023b). In 2019 individual *Z. tau* were detected at pre-quarantine levels at other locations in Los Angeles County (CDFA 2019a, 2019b). Because CDFA authorities consider the Stevenson Ranch *Z. tau* outbreak a serious agricultural threat and because they cannot rely exclusively on state and local funding to control invasive fruit fly populations, they contacted APHIS.

Table 1. *Z. tau* Detections Triggering the Proposed Quarantine.

# of Flies	Detection Date	Confirmed Date	Host	Trap Type	Location	County
1	06/06/23	06/07/23	Fig	McPhail	Stevenson Ranch	Los Angeles
1	07/05/23	07/06/23	Plum	McPhail	Stevenson Ranch	Los Angeles
1	07/05/23	07/06/23	Ornamental	Melon Fly	Stevenson Ranch	Los Angeles
6	07/05/23	07/06/23	Fig	McPhail	Stevenson Ranch	Los Angeles

Source: CDFA 2023a, 2023b, 2023c, 2023d.

1.1 Requestor's Goal

Z. tau has the capability of causing significant irreparable harm to California's agricultural industry as well as some possible adverse environmental impacts (CDFA 2016). CDFA seeks to eradicate *Zeugodacus* spp. from the State of California. Unless emergency action is taken, there is high potential for ongoing *Z. tau* infestation in Los Angeles County (CDFA 2023f). CDFA seeks funding and other federal support needed to eradicate the Stevenson Ranch *Z. tau* outbreak.

1.2 Agency Authority

APHIS cooperates with states and U.S. territories in implementing pest control programs that prevent the spread of exotic fruit flies to uninfested areas of the United States. The agency's authority for pest control and grower support programs is the Plant Protection Act (Title 4 of the Agricultural Risk Protection Act of 2000, 7 United States Code (USC) §§ 7701–7786). Various sections authorize operations to control insect pests (§ 7714); conduct pest detection, surveillance (§ 7721), and inspections (§ 7731); compile information, conduct enforcement investigations (§ 7732), enter into agreements (§ 7752), transfer funds (§ 7772); and to use emergency measures to prevent the dissemination of plant pests new to, or not widely distributed throughout, the United States (§§ 7715, 7721). In particular, the Secretary of Agriculture may cooperate with State authorities or other persons in the administration of programs for the improvement of plants, plant products, and biological control organisms (§ 7751(d)).

In connection with an emergency in which a plant pest or noxious weed threatens any segment of the agricultural production of the United States, the Secretary may transfer from other appropriations or funds amounts as the Secretary considers necessary to be available in the emergency for the arrest, control, eradication, and prevention of the spread of the plant pest or noxious weed, and for related expenses (§ 7772(a)).

After a comprehensive review of existing and potential action alternatives, APHIS published an environmental impact statement (FFEIS) in November 2018 for its fruit fly cooperative control programs (APHIS 2018a). The FFEIS addresses technological and scientific advances made in the 17 years since publication of the first cooperative fruit fly program environmental impact statement (APHIS 2001), and incorporated feedback received during the public comment period. This environmental assessment (EA) incorporates by reference the contents of the FFEIS in its entirety.

This EA analyzes the environmental consequences of alternatives considered for eradication of a *Zeugodacus* spp. population, and analyzes modifications proposed for the existing program.

APHIS is making this EA available to the public, will consider comments received, and will review the program, updating the analysis and supporting documentation as necessary.

APHIS prepared this document to comply with the provisions of the National Environmental Policy Act of 1969 (NEPA, 42 USC §§ 4321 *et seq*.), with NEPA implementing regulations (40 Code of Federal Regulations (CFR) parts 1500-1508), and with APHIS' implementing procedures (7 CFR parts1b and 372) for the purpose of evaluating the potential effects of the proposed action on the human environment. "Human environment" means comprehensively the natural and physical environment and the relationship of present and future generations of Americans with that environment (40 CFR § 1508.1(m)).

APHIS' fruit fly chemical risk assessments (APHIS 2018b, 2018c, 2018d, 2018e, 2018f, 2018g, 2014, 2003) discuss and comprehensively analyze the eradication measures being considered for implementation in the potential program area. In this document, the "program area" is everywhere inside the quarantine boundary, including eradication treatment cores and regulatory control zones. This EA incorporates the fruit fly chemical risk assessments by reference in their entirety. (Environmental documentation for APHIS' fruit fly control programs is available online via the following links: APHIS fruit fly control program environmental documentation and APHIS GE control applications for plant health.)

APHIS and cooperating agencies communicate to interested parties the potential for implementation of a pest emergency program to affect the quality of the human environment. The public involvement process for fruit fly emergency programs typically includes notices to industry, public meetings, and door-to-door interviews with growers and residents. Further, APHIS coordinates with federal, state, county and Tribal governments and international trade partners to provide advance notice to people who may be affected by program activities. APHIS' environmental documentation is available upon request. Where a choice of actions is possible, APHIS adjusts the local provisions of the cooperative pest control program to mitigate potentially adverse effects to affected entities and avoid conflict with local law or requirements. Working cooperatively with States and U.S. territories, APHIS identifies and eradicates Tephritid[1] infestations. To date APHIS has cooperated with the California, Florida, New York, Puerto Rico, and Texas Departments of Agriculture on exotic fruit fly control programs.

[1] *Z. tau* belongs to the Tephritidae family of insects. Tephritid fruit flies cause major losses in fruit and vegetables; their economic consequences are so great that countries free of the major tephritids prohibit the import of fresh produce from countries where these pests are endemic. The United States has detection and emergency response programs in place to maintain a Tephritid-free status (IAEA 2023).

2 Alternatives

APHIS considered three action alternatives:

1. No action

2. Quarantine and commodity certification

3. Eradication using an integrated pest management (IPM) approach that includes multiple eradication treatment options ("preferred alternative")

These alternatives and their component methods were considered in the FFEIS (APHIS 2018a) as they related to emergency eradication efforts. Under all these alternatives, trapping and host surveys for *Zeugodacus* spp. would continue to measure baseline pest populations. All the alternatives would involve the use of regulatory controls and chemical pesticides to facilitate the timely elimination of the identified *Zeugodacus* infestation. For all alternatives, the standard operating procedures and mitigation measures would remain as described in the prior analyses. Alternatives may select pesticides from among those analyzed in the FFEIS (APHIS 2018a). The preferred alternative would use pesticide eradication treatments only in certain locations based on the site-specific needs; applications would be targeted, and ground based.

All pesticide use in APHIS programs complies with the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) of 1910 as amended (7 USC Chapter 6). To fulfill obligations under this statute, APHIS ensures that a full pesticide registration (i.e., a Section 3 Registration), a special local need registration (i.e., a Section 24(c) Registration) and/or an emergency quarantine exemption (i.e., a Section 18 Exemption) are approved by the U.S. Environmental Protection Agency (USEPA) for each pesticide use pattern in fruit fly program applications.

2.1 No Action

Under the no action alternative, there would be no federal efforts to eradicate *Zeugodacus* spp. or restrict expansion of a *Zeugodacus* population from an infested area. Federal involvement may end, for example, if there is a change in federal regulation, loss of program funding, or lack of sufficient resources to eradicate an invasive quarantine pest. In the absence of a federal effort, fruit fly quarantine and control would be left to state and local governments, grower groups, and individuals. Expansion of the infestation would be influenced by any quarantines and controls, by the proximity of host plants, and by climatic conditions.

In cooperation with APHIS, CDFA monitors for *Zeugodacus* spp. in counties of California where there are susceptible host plants and a conducive environment for fruit fly establishment. CDFA initiates delimitation and eradication programs in locations where the number of *Zeugodacus* spp. detections are not yet sufficient to trigger quarantine regulatory actions. The state program intensifies surveys in the vicinity of each confirmed *Zeugodacus* detection until triggering a quarantine or the immediate fruit fly threat ends.

The *Z. tau* detections in Stevenson Ranch indicate that a breeding population exists in the area. CDFA evaluated possible eradication methods and determined that there are no cultural or biological methods available to eliminate *Z. tau* from the infested region. On July 17, 2023, CDFA issued an emergency proclamation for a *Z. tau* eradication project in the Stevenson Ranch

region (CDFA 2023f). Tau fly is a cuelure-responding exotic fruit fly (CREFF), i.e., males are attracted to cuelure (4-(4-Acetoxyphenyl)-2-butanone). The treatment program used by CDFA for control of CREFFs employs an area-wide chemical treatment called male attractant technique (MAT), a targeted foliar bait spray treatment using an organic pesticide and host fruit removal, as needed (CDFA 2023f).

Under the no action alternative, APHIS would not fiscally support actions that are part of CDFA's control program and research. Current CDFA information is available at https://www.cdfa.ca.gov/plant/PDEP/treatment/index.html (under "Tau fly"). For details about California's initial strategy to control *Z. tau* in 2016, use the following link: CDFA (*Bactrocera tau*) finding of emergency.

2.2 Quarantine and Commodity Certification

This alternative combines a quarantine with commodity treatment and certification, as described in 7 CFR § 301.32. Regulated commodities harvested within the quarantine area would not be allowed to move outside the quarantine boundary prior to treatment with prescribed applications and certification for movement outside the area.

Intensive quarantine enforcement activities would be necessary for areas with a large infestation. Activities could include safeguarding of local fruit stands, mandatory baggage inspection at airports and seaports, and judicious use of road patrols and regulatory checks. Under this alternative, the interstate movement of regulated commodities would require the issuance of a limited permit contingent on commodity treatment. The grower or shipper would need to comply with specific conditions to minimize the pest risk and prevent the spread of *Zeugodacus* spp.

Eradication methods that may be used under Alternative 2 include treatment with (1) regulated chemicals, (2) cold, (3) vapor heat, and (4) irradiation. Treatments of certain produce, as a requirement for certification and shipping, would occur in APHIS inspected and approved facilities. Program chemicals and their use would be as described in the FFEIS (APHIS 2018a). Chemical treatments could include ground-based foliar application of bait sprays or fumigation of harvested regulated commodities with methyl bromide (MB).

2.3 Eradication Using an IPM Approach (Preferred Alternative)

APHIS and CDFA propose a cooperative program to eradicate the Stevenson Ranch *Z. tau* population. Eradication using an IPM approach was selected as the preferred alternative by considering biological effectiveness combined with acceptable levels of intrusion on the public, cost, and effects to the environment (APHIS 2001). APHIS' cooperative fruit fly eradication programs in California rely on surveillance, targeted chemical applications, and host fruit removal.

The proposed quarantine for the Stevenson Ranch *Z. tau* Program encompasses a portion of western Los Angeles County (map in Appendix B). Program areas and activities would center on confirmed *Z. tau* detection sites. APHIS and CDFA would expand surveillance, quarantine, and treatment boundaries as necessary when there are additional detections of *Zeugodacus* spp.

The proposed Program will employ materials and methods like those targeting melon fly (*Z. cucurbitae*) that are known to be effective against *Z. tau*. All of APHIS' cooperative programs to eradicate exotic fruit fly populations use established procedures and treatments (APHIS 2018a, 2004). The following subsections briefly review existing program components (APHIS 2018a, 2018b, 2018c, 2018d, 2018e, 2018f, 2018g, 2014, 2003) and updated information.

2.3.1 Delimitation

To delimit the infestation and monitor posttreatment populations, placement of McPhail food bait traps and Jackson pheromone lure traps occurs in varying densities throughout the program area, with the highest density in the square mile around each *Zeugodacus* detection. The McPhail trap is an invaginated glass flask baited with Torula yeast and borax in water. The cardboard Jackson sticky trap is baited with the attractant cuelure mixed with a pesticide (naled). The baited Jackson trap is strongly attractive to sexually maturing males, while the baited McPhail trap is attractive to both sexes of the fly. Mass trapping involves program use of natural or synthetic lures to attract fruit flies to traps, sticky panels, wicks, or fiberboard squares. Killing occurs either by fruit flies becoming stuck to a sticky substance, by drowning, or by being exposed to minute quantities of pesticide. Servicing of traps by the Program would occur on a regular schedule for a period equal to three *Z. tau* life cycles beyond the date of the last *Z. tau* find. Life cycle durations are dependent on temperature (CDFA 2023f; APHIS 2018a).

As part of the ongoing surveillance inside the quarantine boundary, Program personnel sample fruit of potential host plants within a 200-meter radius around each *Zeugodacus* detection site for the presence of eggs and larvae; fruit on properties adjacent to a trap catch may also be examined (APHIS 2023a). Suspect *Zeugodacus* are sent to a program laboratory for further examination. Sampled fruit is disposed of as described in the FFEIS (APHIS 2018a).

2.3.2 Eradication Treatments

For many species of exotic fruit flies, there are no effective nonchemical control or eradication techniques (APHIS 2001). Other less effective techniques may not allow CDFA or APHIS to achieve eradication of *Zeugodacus* infestations. Consequently, APHIS' eradication strategies for the proposed *Zeugodacus* cooperative eradication program rely on combinations of the following mitigation measures:

- no action
- regulatory quarantine treatment, and movement control of host materials and regulated articles
- host survey for evidence of breeding *Zeugodacus*
- host removal
- eradication chemical applications
- mass trapping (to delimit the infestation and monitor post-treatment *Zeugodacus* populations)

"No action" may be the only reasonable alternative for sensitive sites within a proposed program area. Eradication efforts would occur only along the perimeter of sensitive sites to prevent expansion of a *Zeugodacus* population. APHIS categorizes sites as sensitive when there are biological or regulatory reasons to avoid treating an area. Examples include the unavoidable presence of children, critical habitat, or threatened or endangered species in the area (APHIS 2018a).

APHIS and CDFA consider any single male or immature female *Z. tau* fly caught within a 15-mile radius of an eradication treatment area as a possible satellite infestation. The Program's decision on whether to treat a new area is based on when and where the flies are trapped (CDFA 2016).

Z. tau males are attracted to cuelure (4-(p-acetoxyphenyl)-2-butanone). The Program's male attractant technique (MAT) uses small amounts of the attractant cuelure mixed with the pesticide naled (Dibrom® Concentrate), soaked into cotton wicks placed inside Jackson traps. Cuelure is a hormonal attractant for male *Bactrocera* and *Zeugodacus* fruit flies. Male flies are lured to the traps, where they are killed by the pesticide when they feed at the wicks. MAT is applied as traps placed in trees, shrubs, or other inanimate objects, placed six to eight feet above the ground and out of the reach of the public. The MAT boundaries will be nine square miles around each site where flies were detected. Application is made to a targeted density of 1000 evenly distributed sites in each square mile. Traps are replaced every four weeks for two life cycles (typically four to six months). Life cycle durations are dependent on temperature (CDFA 2023f; APHIS 2023a).

If evidence indicates a breeding *Z. tau* population on a property (i.e., immature stages, mated female, or multiple adults are detected), host removal (fruit stripping) may be used in conjunction with the other treatment options. All host fruit will be removed from all properties within a minimum of a 100-meter radius around the detection sites (APHIS 2023a). The fruit is double bagged then taken to a landfill for deep burial using regulatory compliance protocols. Fruit removal will occur once at the beginning of the project but may be repeated if additional flies are detected (CDFA 2023f).

Also, with confirmation of a breeding *Z. tau* population on a property, Program personnel will treat the foliage of host trees and shrubs within 200 meters of each detection site with an organic formulation of spinosad bait spray (GF-120 NF Naturalyte® Fruit Fly Bait) using hand spray or hydraulic spray equipment. Following treatment, completion notices are left with the homeowners detailing precautions to take and postharvest intervals applicable to any fruit on the property. Treatments are repeated at seven-to-14-day intervals for one life cycle of the fly (typically two to three months, dependent on temperature) (CDFA 2023f). The spinosad bait is not sprayed on low-growing host plants (cabbage, eggplant, gourds, melons, tomatoes, etc.) to protect children and pets in the community. Instead, *Z. tau* traps are placed on higher plants and posts in the vicinity of low-growing hosts.

APHIS recognizes that, in areas receiving repetitive treatments with only the insecticide spinosad, there may be development of chemical resistance in surviving fruit fly populations (Guillem-Amat et al. 2020; El-Gendy 2018; Kakani et al. 2010; Hsu and Feng 2006). Alternating spinosad treatments with treatments containing a different insecticide may be necessary to eradicate resistant fly populations. Spinosad resistance has occurred under laboratory conditions and exists in wild fruit fly populations in the State of Hawaii (Hsu et al. 2021). Spinosad tolerance rather

than resistance was demonstrated in wild olive flies (*Bactrocera oleae*) in California.[2] As of July 2023, APHIS has no evidence of *Z. tau* resistance to spinosad treatments (R. Johnson, personal communication, 2023-07-17).

To prevent the spread of fruit flies via infested fruits and vegetables, APHIS routinely urges people never to move any fresh produce from any property under quarantine. Public outreach is done using local media and other forms of communication. Fruits and vegetables may only move outside the quarantine after they are processed (i.e., canned, baked, frozen, or preserved). Waste produce must be double bagged in plastic bags for municipal garbage collection (CDFA 2023g; APHIS 2015). CDFA routinely informs the public that host fruit removed from properties by program personnel is taken to a landfill for burial using regulatory compliance protocols (CDFA 2023f).

Establishment of the quarantine boundary will ensure any host material that leaves the program area is free from infestation by *Z. tau*. Harvested regulated materials may be treated in enclosed areas or containers with a prescribed method: cold temperature, vapor heat, irradiation, or MB fumigation (APHIS 2018a, 2004). Harvested fruit may be moved out of the quarantined area under a temporary certificate to enclosed facilities for packing only after the fruit receives an APHIS-approved treatment on the premise. If a *Zeugodacus* quarantine spreads to federally protected sites or Tribal lands, then program treatments would be modified to meet the needs of those sites.

Before eradication actions begin, program officials inform the public and potentially effected industry via press releases, meetings, and other forms of communication appropriate for the recipients. APHIS notifies foreign trading partners as it identifies exotic fruit fly outbreaks. Notification of residents whose property would be treated, or whose fruit must be removed, occurs at least 48 hours in advance of treatment or fruit removal (CDFA 2023f). Given the potential for effects to commercial production, owners or operators of groves, packing sheds, nurseries, vendors, and industry operations handling host material would be notified of quarantine locations and treatment scheduled in their area.

The success of the eradication program is monitored by intensive trapping levels for three life cycles of the fly after the last *Z. tau* has been detected. If no *Z. tau* are caught during that time, trap densities return to detection levels. McPhail and Jackson traps will be hung from branches of host trees at specified densities in susceptible areas. County or state employees inspect these traps weekly or bi-weekly throughout the year in southern California (CDFA 2023f).

[2] From a single fly detected in 1998, the olive fly spread to all olive growing areas of California by 2009, threatening both commercial and fruit-bearing ornamental olive plantings (Zalom et al. 2009).

3 The Affected Environment and Potential Effects to the Environment

NEPA requires federal agencies to assess the potential effects of their proposed actions on the human environment prior to making decisions. This EA analyzes the potential environmental consequences of alternatives considered for a program of *Zeugodacus* spp. control and eradication in California. APHIS proposes to prevent the artificial spread of a serious insect pest in California, which is a mandated statutory goal. Preventing the spread of *Z. tau* to noninfested areas would protect California's agricultural industry and noninfested areas of the United States.

For this EA, APHIS identified the potentially affected environment as Los Angeles County (map in Figure 2). APHIS considered the site-specific characteristics of the potential program area with respect to the way implementation of the preferred alternative might affect environmental quality, human health, and nontarget species (including threatened and endangered species). Potentially sensitive sites are accommodated through the selection of eradication methods and mitigation measures.

Figure 2. Map of Los Angeles County with inset of Stevenson Ranch.
Sources: https://www.laalmanac.com/images/mapLACountyLarge.jpg and https://www.bestplaces.net/city/california/stevenson_ranch

3.1 Land and Demographics

Many *Z. tau*-host plant species are grown in Los Angeles County and adjacent regions, which increases the potential environmental impact of the current infestation. Commercial production of host commodities (citrus and avocado groves) occurs in Ventura County, about eight miles west of the *Z. tau* detection sites (APHIS 2023a). The location and timing of *Z. tau* detections determines the quarantine boundary for the Stevenson Ranch *Z. tau* Program; at the outset, the proposed quarantine encompasses 79.1 square miles of Los Angeles County, its western boundary at the Ventura County border (map in Appendix B).

Los Angeles County has a land area of 4,059 square miles and the largest population of any county in the nation: over ten million residents who account for more than 25 percent of California's population (USCB 2023; County of Los Angeles 2023). Its geography includes a group of inland valleys, a coastal plain separated by low mountains that are interspersed with steep passes, an arc of still higher mountains, and a long seacoast. The climate is historically semiarid or Mediterranean, with two seasons: dry and moderately warm from April to November, wet and moderately cool from November to April. In July 2023, Stevenson Ranch is experiencing poor air quality (smog) and daily temperatures up to 106 degrees Fahrenheit, triggering excessive heat warnings (NWS 2023). The county has a dynamic history of earthquakes, firestorms, and mudslides.

Ranching, farming, and urbanization have destroyed much of the area's original flora and fauna. Because nearly every kind of plant can grow in the area, hundreds of species of flora have been successfully introduced (Britannica Online Encyclopedia 2023). The City of Los Angeles is the county seat and has a recorded population of 3,898,747 (USCB 2023). Los Angeles County is an international entertainment, manufacturing, and trade hub and has fast growing high-tech and digital media industries (LAEDC 2023).

Santa Clarita Valley, located in northern Los Angeles County, is at the crossroads of Los Angeles, Ventura, and Kern counties and is of strategic economic importance to Southern California. The Valley is a center for industry clusters such as film production, aerospace manufacturing, biomedical, and high tech (LAEDC 2023). Stevenson Ranch is in Santa Clarita Valley. The nearest incorporated city to Stevenson Ranch is the City of Santa Clarita (population 228,673 in 2020) (USCB 2023). The City of Santa Clarita the third largest city in Los Angeles County and is about 30 miles north of downtown Los Angeles; the surrounding Valley and canyons are popular with hikers (City of Santa Clarita 2023).

The Census Designated Population of Stevenson Ranch had a resident population of 20,178 in 2020, in a land area of approximately 6.4 square miles (USCB 2023). Stevenson Ranch is a planned community set in the foothills of the Santa Susana Mountains, west of Interstate Freeway 5 and about three miles south of Six Flags Magic Mountain amusement park. The community has about 1,000 acres of parkland, recreation areas, and open space (Stevenson Ranch Homeowners Association 2023). The proposed *Z. tau* quarantine boundary includes a residential portion of Stevenson Ranch, a portion of the city of Santa Clarita, and a region of unincorporated Los Angeles County. The current *Z. tau* infestation may spread slowly due to the hilly terrain and limited host cultivation in the area, but local highways and airports may provide convenient corridors for human-assisted transport of flies and fruit hosts.

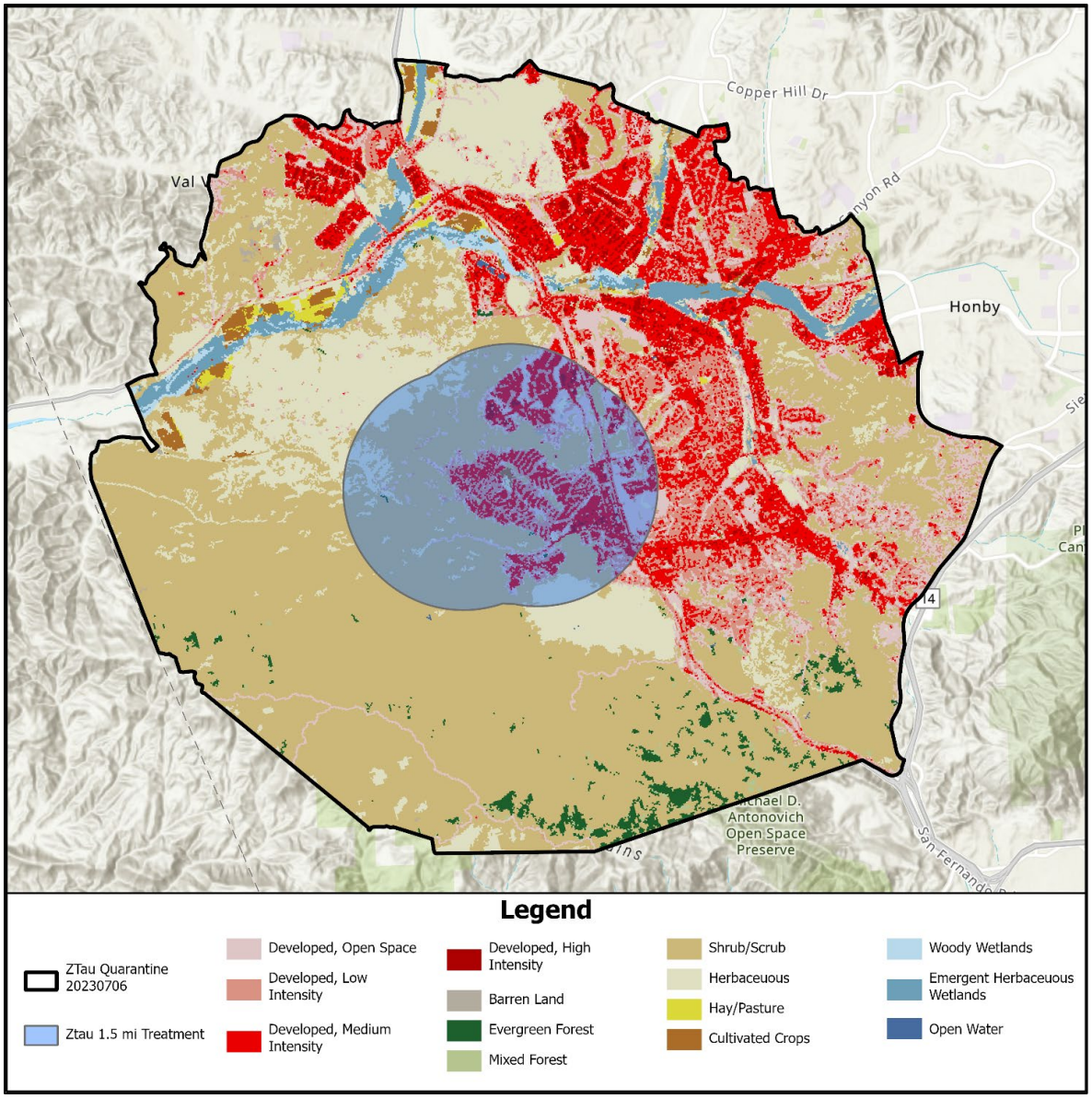


Figure 3. Land Cover in the proposed Tau Fly Quarantine area.
Source: See Appendix C for data source.

Some land in the proposed program area might be suitable for agriculture, but there is no report of commercial crop production within 4.5 miles of the *Z. tau* detections (APHIS 2023a). There are plant nurseries and landscape businesses in the proposed treatment area and elsewhere inside the proposed quarantine boundary; they may offer potential *Z. tau* hosts for sale. The National Agricultural Statistics Service (see Appendix C for data source) reports a variety of land types and uses in the Stevenson Ranch *Z. tau* Program area:

- Within the quarantine there are 20 acres of open water, 106.7 acres of barren land, and 33,346.6 acres of shrubland/herbaceous/wetland/forest/grass/pasture. The rest is developed land (32,124.3 acres, including 4,675.4 acres of developed open space). Figure 3 shows the location of different types of land cover in the proposed *Z. tau* quarantine area. Naturally occurring hosts may occur in undeveloped areas; other hosts may be cultivated in the community (e.g., residential vegetable gardens, fruit trees).

- There are 436.3 acres of cropland within the quarantine, of which 9.1 acres are fallow or idle. Crops may include alfalfa and other hay/non-alfalfa, barley, cotton, potatoes, and sunflowers.

- Land in the proposed treatment area is developed primarily for residential use.

The transportation network in the proposed *Z. tau* program area includes major roads such as Interstate Highway 5 and State Routes 14 and 126. Parkland, golf courses, rivers and other water resources lie within the proposed quarantine. Table 2 shows the proximity of the Stevenson Ranch *Z. tau* Program area to land sites of potential concern.

Table 2. Select Land Sites in Relation to the Proposed *Z. tau* Program Area.

Designated Land Use	Site	Location
Nearest International Border	Mexico	168.0 miles from the proposed quarantine boundary
Certified Organic Production; Certified Farmers Markets	None	Within proposed treatment area
	2 organic operations; 2 farmers markets	Within the proposed quarantine
Local, State, and Federal Lands	Richard H. Rioux Memorial Park Pico Canyon Park Jake Kuredjian County Park	Within proposed treatment area
	18 local and county parks; at least 4 golf courses	Within the proposed quarantine
Tribal Land	Ceded land	Within proposed treatment area
	Ceded land	Within the proposed quarantine
Schools, Public and Private	3 elementary schools 1 junior high school 2 high schools	Within proposed treatment area
	28 elementary through high schools	Within the proposed quarantine
Airports and Airfields	31 domestic, international, and military facilities	Within 100 miles of proposed quarantine
Seaports	Port Long Beach Port Los Angeles Port Heuneme	Within 100 miles of proposed quarantine

Designated Land Use	Site	Location
Cemeteries	None	Within proposed treatment area or the proposed quarantine
National Register of Historic Places (NRHP) Property	None	Within proposed treatment area or the proposed quarantine

Source: See Appendix C for data sources.

3.2 Water Resources

Ground water and surface water resources in the proposed program area may be affected by weather events, such as drought and hurricanes. There is a projected decline in natural water resources in the state; to promote water conservation and to reallocate water resources California governors periodically call for voluntary reductions in water use or set water use limits. Beginning in the late 1980s, California adopted regulations to protect groundwater from contamination by pesticides; certain uses of pesticides are restricted in protected areas (State of California 2023a). The State and Regional Water Boards assess water quality data for California's waters every two years to determine if they contain pollutants at levels that exceed protective water quality criteria and standards (State of California 2020). The proposed *Zeugodacus* control program calls for highly localized chemical applications in designated properties, and treatment buffers around all sensitive areas, including all waterbodies. This method of application is designed to minimize the potential for introduction of program chemicals to local water resources.

Stevenson Ranch is in the Santa Clarita Valley and Los Angeles County Waterworks District #36. There are four main sources of water for the Valley's electric power, irrigation, and drinking water: imported water (about 63%), groundwater (about 33%), recycled water (about 1%), and an emergency supply stored nearby in Kern County (SCVWA 2022).

Two watershed units (a portion of land whose runoff drains into a creek, river, or other body of water) occur in the proposed treatment area: South Fork Santa Clara River, and Salt Canyon-Santa Clara River. Nine watershed units occur inside the quarantine boundary: Browns Canyon Wash, Bull Creek, Lower Bouquet Canyon, Lower Castaic Creek, Salt Canyon-Santa Clara River, San Francisquito Canyon, Sand Canyon-Santa Clara River, South Fork Santa Clara River, and Upper Simi Arroyo (data source in Appendix C). These units form part of the Santa Clara River Watershed. The Santa Clara River is the largest river system in southern California, draining about 1,200 square miles and approximately 100 miles in length. The river originates in the northern slope of the San Gabriel Mountains in Los Angeles County, traverses Ventura County and flows into the Pacific Ocean (State Water Resources Control Board n.d.).

Riverine, freshwater pond and freshwater emergent/forested/shrub types of wetlands occupy over 2,233.4 acres of the quarantine and 178.2 acres in the proposed treatment area (data source in Appendix C). Table 3 shows distances between the proposed *Z. tau* program and water resources of potential concern.

Table 3. Select Water Resources in Relation to the Proposed *Z. tau* Program Area.

Type of Resource	Name or How Many	Location
Impaired Waters	• Santa Clara Reach 5 (Blue Cut gaging station to West Pier Hwy 99 Bridge) • Santa Clara Reach 6 (W Pier Hwy 99 to Bouquet Cyn Rd) • Santa Clara Reach 7 (Bouquet Canyon Rd to above Lang Gaging Station)	Within the proposed quarantine; none within proposed treatment area
Other Waterbodies	• South Fork Santa Clara River • Salt Canyon-Santa Clara River	Within proposed treatment area
	• Castaic Creek Reach 1 (confluence of Santa Clara River to Castaic Lagoon) • Tributary to South Fork Santa Clara River • Wiley Canyon	Within the proposed quarantine

Source: See Appendix C for data sources.

APHIS considers recurring drought to be a possible influence on the Stevenson Ranch *Z. tau* Program's affected environment, especially in terms of the area's available water resources. The climate in the proposed Program area is variable; droughts of notable duration and/or intensity occur periodically (see Figure 3). In 2021, the Secretary of USDA felt it necessary to designate most of California as a primary disaster area due to drought (Canon 2021). Following the three driest years on record for California, periods of heavy precipitation between December 2022 and March 2023 relieved surface water shortages. Critical water supply challenges remain in parts of the state (CA-DWR 2023). In the first half of July 2023, the state is experiencing abnormally dry to moderate drought in the north and southeast (NDMC 2023). California maintains emergency provisions to support regions and communities still affected by historic drought and to build long-term water resilience. There is a ban on wasteful water use and emergency orders in place for groundwater supply and specific watersheds that did not benefit sufficiently from this year's precipitation (State of California 2023b). Figure 4 graphs the drought occurrence for California during the past twenty years (citation).

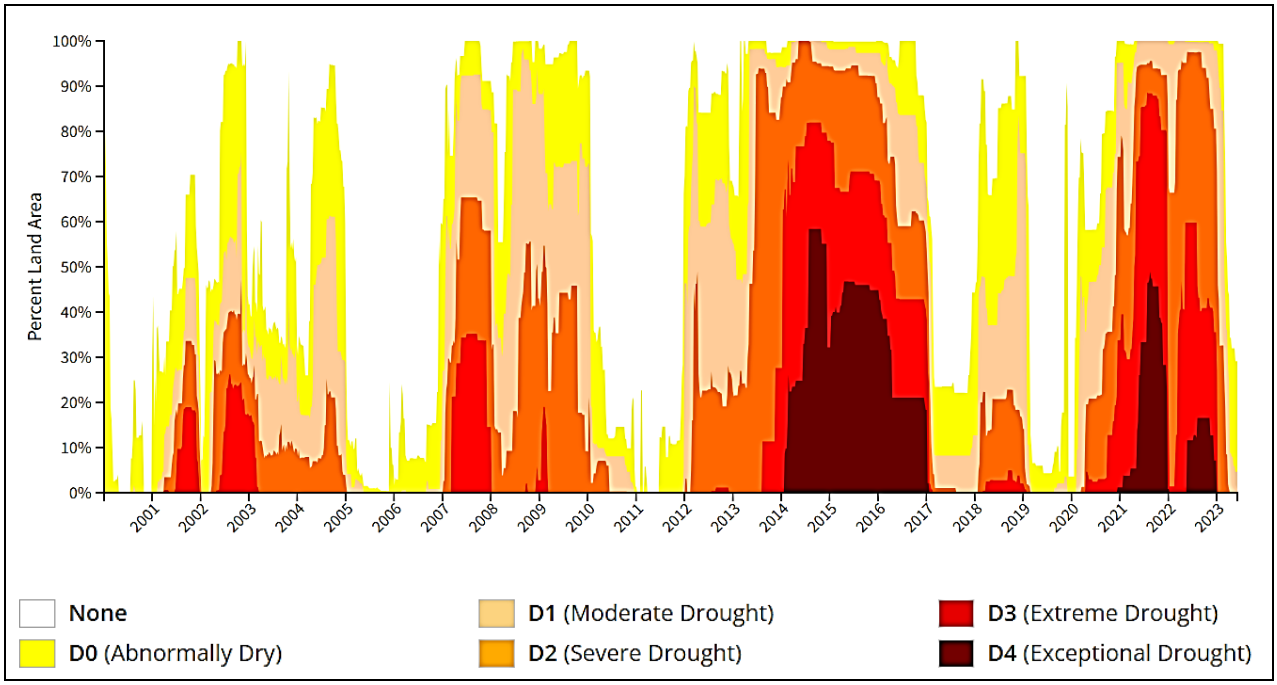


Figure 4. Historical Drought Conditions in California, 2000-present.
Source: https://www.drought.gov/states/california.

Drought may have short- and long- term impacts in the state (see Table 4). Wildfire damage, lack of potable water, hot weather, and a threatened power grid are recurring issues for California residents. Climate change is extending and intensifying California's wildfire season (CA-ARB 2023). As of July 7, there are active wildfires in Kern and Madera Counties but none currently in Los Angeles County (State of California 2023c). APHIS' fruit fly control program activities are designed to have minimal to no impact to water supply and water quality.

Table 4. Drought Impacts Specific to California.

Intensity	Historically observed impacts
D0	• Soil is dry; irrigation delivery begins early. • Dryland crop germination is stunted. • Active fire season begins. • Winter resort visitation is low; snowpack is minimal.
D1	• Dryland pasture growth is stunted; producers give supplemental feed to cattle. • Landscaping and gardens need irrigation earlier; wildlife patterns begin to change. • Stock ponds and creeks are lower than usual.

Intensity	Historically observed impacts
D2	• Grazing land is inadequate. • Producers increase water efficiency methods and drought-resistant crops. • Fire season is longer, with high burn intensity, dry fuels, large fire spatial extent; more fire crews are on staff. • Wine country tourism increases; lake- and river-based tourism declines; boat ramps close. • Trees are stressed; plants increase reproductive mechanisms; wildlife diseases increase. • Water temperature increases: programs to divert water to protect fish begin. • River flows decrease; reservoir levels are low, and banks are exposed.
D3	• Livestock need expensive supplemental feed, cattle and horses are sold; little pasture remains, producers find it difficult to maintain organic meat requirements. • Fruit trees bud early; producers begin irrigating in the winter. • Federal water is not adequate to meet irrigation contracts; extracting supplemental groundwater is expensive. • Dairy operations close. • Fire season lasts year-round; fires occur in typically wet parts of State; burn bans are implemented. • Ski and rafting business is low, mountain communities suffer. • Orchard removal and well drilling company business increase; panning for gold increases. • Low river levels impede fish migration and cause lower survival rates. • Wildlife encroaches on developed areas; little native food and water is available for bears, which hibernate less. • Water sanitation is a concern, reservoir levels drop significantly, surface water is nearly dry, flows are very low; water theft occurs. • Wells and aquifer levels decrease; homeowners drill new wells. • Water conservation rebate programs increase; water use restrictions are implemented; water transfers increase. • Water is inadequate for agriculture, wildlife, and urban needs; reservoirs are extremely low; hydropower is restricted.
D4	• Fields are left fallow; orchards are removed; vegetable yields are low; honey harvest is small. • Fire season is very costly; number of fires and area burned are extensive. • Many recreational activities are affected. • Fish rescue and relocation begins; pine beetle infestation occurs; forest mortality is high; wetlands dry up; survival of native plants and animals is low; fewer wildflowers bloom; wildlife death is widespread; algae blooms appear. • Policy changes; agriculture unemployment is high, food aid is needed. • Poor air quality affects health; greenhouse gas emissions increase as hydropower production decreases; West Nile Virus outbreaks rise. • Water shortages are widespread; surface water is depleted; federal irrigation water deliveries are extremely low; junior water rights are curtailed; water prices are extremely high; wells are dry, more and deeper wells are drilled; water quality is poor.

Source: NDMC 2022.

3.3 Potential Effects Associated with the No Action Alternative

Under the no action alternative, uncoordinated or insufficient eradication efforts could result in the survival and establishment of *Zeugodacus* spp. within the contiguous United States. If there are established *Zeugodacus* populations APHIS expects substantial economic effects to U.S. growers, processors, shippers, and consumers. *Zeugodacus* feeding damages fruit and reduces harvestable yield, resulting in commodity scarcity, higher costs for production and purchase, agricultural land abandonment, and the temporary or permanent loss of domestic and foreign markets for U.S. grown commodities.

Lack of federal action would place the burden of fruit fly control on the State of California and members of the agricultural industry. While the State is likely to retain surveillance and trapping activities, members of the agricultural industry are likely to increase pesticide use to protect their crops. Crop producers may experience a reduced capability to comply with organic crop production practices. The likelihood of potential pesticide impacts on consumers would increase. Increased use of pesticide to protect host plants would risk faster development of pesticide resistance in *Zeugodacus* spp. *Z. tau* populations would continue to increase and disseminate until achieving an environmental equilibrium with host availability.

3.4 Potential Effects Associated with the Quarantine and Commodity Certification Alternative

This alternative would reduce the human-mediated movement of *Zeugodacus* spp. by preventing the transportation of uninspected host plant materials beyond the quarantine boundary. Under this alternative, APHIS expects resident pest populations would persist within the quarantine boundary. A persistent infestation threatens the survival of host species in California and may lead to fruit fly populations with increased resistance to pesticides. Any failure in quarantine actions could lead to *Zeugodacus* establishment outside quarantine boundaries via natural spread or human-assisted transport. In response, new or expanded quarantine areas would be needed to contain pest populations. Ongoing surveillance outside of quarantine areas would be needed to identify and respond to natural spread.

APHIS also expects there would be adverse effects to U.S. agriculture and the economy from an ongoing exotic fruit fly infestation in California. Commodity certification requirements would create a necessary additional layer of governmental presence in the marketplace. This situation could create inspection jobs; however, trade would be restricted until the produce was inspected and certified for sale. Infested crops would be destroyed, reducing the volume of marketable fruit. Crop loss due to uncontrolled fruit fly populations is likely to lead to commodity scarcity and higher costs for U.S. consumers. A persistent *Zeugodacus* population that is not under an official control program is likely to jeopardize U.S. trade relations. Implementation of this alternative is likely to increase the marketing and transportation costs passed to consumers.

3.5 Potential Effects Associated with the Preferred Alternative

This section considers potential effects to the human environment that are associated with implementation of the preferred alternative. This section also summarizes APHIS' findings on the potential effects associated with the eradication measures in the preferred alternative.

Eradication using an IPM approach, is the preferred alternative that would employ any or a combination of the following measures:

- no action
- regulatory treatments and movement control
- host survey
- host removal
- chemical control
- mass trapping (to delimit and monitor *Zeugodacus* presence)

No Action (described under Alternative 1) is an option at sensitive sites where other components of the integrated management system cannot be accommodated. Sensitive sites are locations where unique features of the site could lead to significant environmental impacts. Eradication of *Zeugodacus* from sensitive sites would be difficult, requiring ongoing commitments of personnel and resources to contain the infestation within site boundaries. Failure to contain these pests would likely lead to the *Zeugodacus* population's expansion into previously uninfested areas of California and the surrounding region.

The quarantine actions (described under Alternative 2) are expected to (a) reduce *Zeugodacus* spp. movement beyond treated areas, and (b) reduce human-mediated transport of *Zeugodacus* in host-plant materials to areas outside the quarantine. Any *Zeugodacus* spp. eradication efforts would be managed by, and wholly under the control of, CDFA. Consequently, infestations within the quarantine boundaries would not be directly addressed by federal action. Successful eradication of exotic fruit fly populations by the State's action under this alternative could lead to short-term reductions in the overall area under quarantine, but this would not diminish trapping and survey activities.

Fruit fly program risk assessments included a thorough analysis of trap application technology and use (APHIS 2018c, 2018f, 2018g). USEPA approval of new materials and chemical formulations precedes APHIS revision of trap application information. APHIS' review of the treatment protocols found the small quantity of chemical formulations used as fruit fly pheromone lures and food baits is unlikely to result in adverse environmental or human health risks, due to low toxicity in animal testing, high target specificity, and low exposure to humans and the general environment (APHIS 2018c, 2018e, 2018f, 2018g, 2014, 2003; Reilly, 2003).

APHIS expects the traps approved for *Zeugodacus* spp. to pose little threat to nontarget plants and animals when used as directed. APHIS anticipates the small number of nontarget arthropods that may be caught in program traps would have a minimal and transitory effect on the overall populations of their species. Program traps are placed out of the reach of the public so individuals living in the treatment areas are not likely to be exposed to chemical compounds used in the traps. To inform the public, traps display the appropriate warning on the label for the level of chemical risk. There is minimal exposure risk to applicators during trap preparation and placement based on the required use of personal protective equipment and adherence to proper

application procedures. Depending on the frequency of trap placement and monitoring, there could be minimal disturbance of the soil surface or vegetation from vehicular and foot traffic.

The traps and chemical treatments administered by APHIS' fruit fly programs pose minimal risk to the human environment, as determined in the FFEIS (APHIS 2018a) and associated impact and risk assessments (APHIS 2018b, 2018c, 2018d, 2018e, 2018f, 2018g, 2014, 2003). The prescribed uses of bait spray, MAT spot applications, and MB would likely result in shorter periods of quarantine and/or commodity certification requirements, potentially reducing effects to agriculture and trade-related industries.

3.5.1 Effects Associated with Chemical Treatments

APHIS seeks to minimize the risk of environmental contamination to air and water associated with chemical treatment of *Zeugodacus* spp. A controlled release of chemicals into the environment is inherent in the limited program use of pesticides.

Environmental Fate

The environmental fate of a chemical depends on the combination of the chemical's properties with the prevailing environmental characteristics (temperature, pH, dilution, etc.). Both direct contact with waterbodies and runoff of program pesticides into water are highly unlikely due to the targeted application methods, the use of distance buffers, and the environmental fate of the pesticides selected for use in the program. The methods used to mitigate for adverse effects to waterbodies are described in the FFEIS (APHIS 2018a). APHIS' fruit fly program operations allow unique sites to depart from standard operating procedures while providing effective pest control. Typically, the selection of control methods and use of specific mitigation measures accommodates sensitive sites in pest program areas.

APHIS compared the active ingredients in the treatment options with respect to their potential to affect the human environment and found the combined risk for all the pesticides in the preferred alternative is minimal. A well-coordinated eradication program using IPM technologies would result in the least use of pesticides. Implementation of Alternative 3, the preferred alternative, is likely to eliminate a *Zeugodacus* population more effectively than the other alternatives, and consequently, the program would make fewer pesticide applications over time. Taking no action or limiting program actions to quarantine and commodity certification (Alternatives 1 and 2), would likely result in an expanding infestation. This would lead to more widespread use of pesticides by homeowners and commercial growers, with correspondingly greater potential for adverse effects to human health and ecosystems.

The remainder of this section reviews the active ingredients in the prescribed pesticides by summarizing information in prior NEPA analyses and chemical risk assessments (i.e., APHIS 2018a, 2018b, 2018c, 2018d, 2018e, 2018f, 2018g, 2014, 2007, 2003, 2002, 2001), but should not be considered encyclopedic. Please consult USEPA's website at Pesticide Registration - USEPA for additional information.

Active ingredients for the proposed treatments

MB is an organobromine compound used as a broad-spectrum fumigant to control insects, mites, rodents, plant pathogens, nematodes, termites, and weeds. It may be used as a soil

fumigant, as a post-harvest treatment of commodities, and for structural fumigation (USEPA 2008). Currently, APHIS allows limited use of MB as a pesticide for certain agriculture, quarantine, and pre-shipment purposes. Additional uses were removed because MB is an odorless, colorless gas that depletes the ozone layer in Earth's atmosphere, allowing increased ultraviolet radiation to reach the planet's surface. APHIS determined that use of MB fumigation as a fruit fly quarantine treatment poses negligible potential for additive or synergistic effects to the environment (APHIS 2002, 2007). An international treaty called The Montreal Protocol—which the United States signed in 1987—aims to phase out the production and use of methyl bromide and almost 100 other chemicals. APHIS plant protection programs are therefore finding alternatives to MB fumigation (APHIS 2023b).

- MB may be used to allow movement of *Zeugodacus*-host materials outside the quarantined area. MB fumigation could be used as a commodity treatment prior to regulatory certification but will not be used as an eradication treatment. This type of use would occur under a FIFRA Section 18 Quarantine Exemption and APHIS would meet all reporting requirements. Fumigation chambers vent the small quantities used to treat for *Zeugodacus* spp. MB volatilizes into air from soil and water and is known to contribute to stratospheric ozone depletion. Volatilization of MB from surface soil is rapid, with a half-life ranging from 0.2 to 0.5 days. The degradation half-life of MB in soil ranges from 31 to 55 days. MB has a low affinity to bind to soils; however, it is not considered a major contaminant of ground water (NPIC 2000). 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.

Naled is an organophosphate insecticide the program uses for detection, not eradication; a small amount of naled is in each Jackson trap the program deploys to delimit a *Z. tau* infestation. It is also used as an insecticide for large-area mosquito control and as an acaricide to kill mites and ticks. Naled is registered to control blackflies and leaf-eating insects on a variety of fruits, vegetables, and nuts; it may be used in barns, greenhouses, and at processing plants. Naled has been used to treat dogs for nematode infestation (PubChem 2023; APHIS 2018f).

- Naled degrades quickly in the environment to dichlorvos (a registered insecticide) and dichloroacetic acid via chemical hydrolysis and biodegradation. Studies show that naled dissipates rapidly with half-lives of less than two days under terrestrial, aquatic, and forestry field conditions. The dissipation is also rapid for dichlorvos. The presence of sunlight accelerates degradation with photolysis half-lives of 0.4 days (soil) and 4.4 to 4.7 days (aqueous). The bioaccumulation potential for naled and dichlorvos is expected to be low (APHIS 2018c, 2018f). Soil microbes break down most of the naled in the soil and, therefore, it should not present a hazard to ground water. The half-life of naled on foliage ranges from 2.3 to 2.5 days. Plants remove bromine from naled to form dichlorvos which may evaporate or be further metabolized (Extoxnet 1996).

Spinosad would be used in the prescribed gel spot applications and as a targeted foliar spray to host tree spp. It is a natural substance made by a soil bacterium that can be lethal to insects (NPIC 2014). As a neurotoxin, spinosad works by disrupting nicotinic acetylcholine receptors (USEPA 2016). It has other labeled food and non-food uses including the control of fire ants, beetles, caterpillars, termites, and thrips (APHIS 2014; Merchant 2004). Implementation of the

proposed *Z. tau* eradication program could lead to an increase in spinosad use and the possible overlap of program and non-program treatments.

- Spinosad is not considered mobile in soil as it 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 days. It is photodegraded quickly on soil exposed to sunlight. Spinosad is quickly metabolized by soil micro-organisms under aerobic conditions and has a half-life of 9.4 to 17.3 days. Spinosad is not sensitive to hydrolysis, but 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 11.7 days on plant 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 (APHIS 2014; Kollman 2003).

Additional chemical considerations

Attractants in APHIS fruit fly program treatments (i.e., fruit fly pheromone lures and food baits) minimally effect air, water, and land resources, based on USEPA-approved use patterns and the rapid degradation of the ingredients. In general, the environmental fate associated with the active ingredients (as described in subsection (a) forms the basis for any effects from the overall attractant. APHIS takes care to keep animals away from spray solutions containing food bait and toxic pesticides if animals might be attracted to a solution to drink it. In accordance with CDFA's National Pollutant Discharge Elimination System best management practices, the program establishes a 30-foot treatment buffer around all waterways. The Program also delays foliar treatments if there is a 40% or higher chance of rain forecast to occur in the next 24 hours, or if wind speeds are over 10 miles per hour (R. Johnson, personal communication, 2023-07-17). APHIS follows all pesticide label and registered use requirements to minimize the potential for effects to the environment.

Overall, APHIS expects limited potential for pesticide interaction or for multiple exposures. The Stevenson Ranch *Z. tau* Program will coordinate with other pest programs in California to avoid any overlap of toxic eradication treatments.

- In addition to the *Z. tau* quarantine proposed for the Stevenson Ranch region of Los Angeles County, there is one active fruit fly quarantine in California (targeting OFF in Orange County) (maps in Appendix B). APHIS lifted a federal Mexfly quarantine in San Diego County on July 1, 2023, declaring successful eradication of that infestation on July 12 (https://content.govdelivery.com/accounts/USDAAPHIS/bulletins/364d953). CDFA is also working to eradicate *Bactrocera* spp. fruit flies detected in other locations before their populations reach quarantine levels (N. Mullaly, personal communication, 2023-06-30). Depending upon local jurisdiction, APHIS and state *Z. tau* programs may employ the same or similar chemical treatments to those described in this document.

- Under the preferred alternative, CDFA's *Z. tau* eradication activities in the Stevenson Ranch region of Los Angeles County would be incorporated in APHIS' proposed *Z. tau* quarantine and eradication program for that area. Current and future in-state *Zeugodacus*

control programs could merge into one larger program, depending on fruit fly dissemination and weather influences. APHIS expects that cooperative program use of *Zeugodacus* trapping and eradication actions in California counties would have beneficial effects: from the reduction in fruit fly populations causing damage to fruit, and from overall reductions in pesticide treatments.

- APHIS considered implementation of the preferred alternative in the context of, and in conjunction with, other pest management projects that might occur in the program area (such as Japanese beetle, glassy-winged sharpshooter, and diaprepes root weevil control efforts). APHIS does not expect significant additive or synergistic effects from pesticide use by these programs, due to differences in pesticide mechanisms of toxic action, targets for pesticide application, affected species and resources, and application timing. Certain pest control programs currently active in the proposed program area may apply the same or similar chemical treatments (including, but not limited to, naled or spinosad formulations and MB fumigation). State programs are requiring regulatory treatments for: Asian citrus psyllid in 31 counties, including Los Angeles County; glassy-winged sharpshooter in 12 counties, including Los Angeles County; *Bactrocera* and *Anastrepha* spp. fruit flies in Los Angeles, Orange, and San Diego Counties (CDFA 2023h).

- Presently CDFA is carrying out *Zeugodacus* and *Bactrocera* spp. delimitation programs in five counties of California, after confirmed detections of guava fruit fly, OFF, and peach fruit fly (N. Mullaly, personal communication, 2022-06-30); each survey's trapping grid is centered on detection sites. None overlap the proposed *Z. tau* program area at Stevensons Ranch. Whether or not there is an active federal quarantine for fruit flies in California, trapping and surveys for exotic fruit fly spp. continue under the state's fruit fly detection and monitoring program. Adverse environmental impacts have not been reported nor are expected to occur from these ongoing actions.

- This is the first *Z. tau* federal quarantine in the United States. California conducts ongoing surveillance for *Zeugodacus* spp. and has successfully eradicated previous incursions of *Z. tau*, melon fly (*Z. cucurbitae*), and striped fruit fly (*Z. scutellatus*). The first California detections of *Z. tau* occurred in San Bernardino County in 2016, and since that time, 3 re-introductions have been delimited and successfully eradicated CDFA 2023i).

- Chemical residues from cooperative fruit fly eradication programs degrade over time in the prevailing weather conditions in California, so it is highly unlikely that pesticide applications from past programs would have additive or synergistic effects with the Stevenson Ranch *Z. tau* Program applications.

APHIS does not know the types or amounts of pesticide use by private entities in the proposed program area. Despite this, APHIS does not expect there to be significant additive or synergistic effects because of implementing the preferred alternative or its component treatment measures based on the very limited amount of pesticide used during the Stevenson Ranch *Z. tau* Program. Under the preferred alternative, program pesticide applications are designed to avoid overlapping treatment cores, and to prevent nontarget exposure until pesticide residues degrade. Therefore, APHIS did not identify any reasonably foreseeable future actions that could result in incremental increases in environmental effects.

3.5.2 Human Health

The principal concerns for human health are related to potential program use of chemical pesticides. Factors that affect the human health risk include pesticide toxicity and the potential for human exposure. Pesticide toxicity varies with the mode of action. These factors are influenced by the use pattern and the environmental transport and fate for each pesticide used. The analyses and data of the FFEIS and its 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 the FFEIS (APHIS 2018a) and the human health sections of the supporting risk assessments (APHIS 2018b, 2018c, 2018d, 2018e, 2018f, 2018g, 2014, 2003) for additional information on risks to human health.

The FFEIS (APHIS 2018a) determined that risks to human health from the proposed pesticide treatments are minimal, based on the low probability of exposure to people and the environment by adherence to label requirements, the use of personal protective equipment, favorable environmental fate and effects data, and the program's proposed use pattern.

- MB binds to the genetic material of living organisms, and to fats and proteins (NPIC 2000). Human exposure to high concentrations of MB can cause central nervous system and respiratory system failures and can harm the lungs, eyes, and skin. Should treatment by MB fumigation be indicated, adherence to USEPA label restrictions and application in enclosed areas or containers would protect applicators and the public from risk of exposure to the fumigant (APHIS 2007, 2002).

- Naled is a cholinesterase (ChE) inhibitor that disrupts the nervous system. Symptoms of ChE inhibition in humans include nausea, dizziness, and confusion. Exposure to high doses of naled, which could occur during an accident or major spill, can result in respiratory paralysis and death. Program application methods (inside traps or in spot applications) and adherence to label requirements substantially reduce the potential for exposure. Adverse health risks to workers are not expected when applications are made according to label directions. Adverse health risks to the public are not expected based on the requirements for public notification as specified on the label, and the placement of traps out of the normal reach of children (APHIS 2018f).

- Spinosad targets the nervous system of invertebrates. Contact may irritate human skin and eyes (NPIC 2014) but overall spinosad has low acute toxicity for oral, dermal, and inhalation routes of exposures. USEPA studies indicate spinosad is unlikely to be neurotoxic, mutagenic, carcinogenic, or immunotoxic in mammals. Ground-based targeted applications of spinosad (as a foliar spray) by APHIS' fruit fly eradication programs are unlikely to pose adverse risks to human health, due to spinosad's low toxicity as well as the low risk of exposure when applications are made in accordance with USEPA label instructions (APHIS 2014, 2003). After pesticide application, the potential for the public's exposure is low because spinosad does not persist in the environment (APHIS 2014; Kollman 2003).

Of the 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. Workers who mix, load, and apply pesticides, and members of the public who live in or visit a *Zeugodacus* spp. eradication area, are the potentially exposed human populations. Exposure of program workers is not expected based on the proper use of personal protective equipment and engineering controls. Accidental exposure is the most likely route of exposure to program workers during pesticide mixing, loading, and spraying. The risk of accidental exposure is minimal because only certified applicators working with federal and state agencies or persons under their guidance, would handle chemicals in the Stevenson Ranch *Z. tau* Program.

Pesticide exposure by the public is unlikely based on program adherence to pesticide label requirements and mitigations. APHIS does not expect adverse health risks to the public because there is a notification process that occurs in advance of the treatment, ground-treatments are highly localized, and the program maintains restricted entry and post-harvest intervals. Public notification includes sharing information concerning program control actions via press releases and media announcements. Depending on the treatment area, either the County's agricultural commissioner, extension agent, or public information officer serves as the primary media liaison. Any resident with property to be treated would be directly contacted or be notified in writing at least 48 hours prior to treatment of the property. Program personnel also leave notices on property after treatment. The notices detail any precautions people should take and identify any intervals of time that should elapse before harvesting fruit on the property. APHIS and CDFA provide information about the program for distribution to property owners and residents, via translators and printed door hangers in multiple languages if available. The risks to the public associated with dietary consumption of fruit from treated plants are low, based on the program's removal of fruit in treated areas and the notification processes.

In addition, program site inspections ensure chemical treatments are not likely to affect humans and ecosystems. Trap placement and chemical applications may be rescheduled if strong winds or rainfall is forecast for the program area or nearby areas. These procedures reduce the potential for pesticide movement in water and air to nontarget locations. The destruction or relocation of traps and treatments due to weather events is unlikely to adversely affect the human environment because the amount of pesticide is diluted during the storm's water and air movement. The program establishes no-spray buffer areas to reduce the potential for pesticide drift and runoff. Traps would be incinerated in a wildfire. For these reasons, program operations are highly unlikely to affect soil and water features in the affected environment.

As of July 17, 2023, Stevenson Ranch has had multiple days of hazardous weather conditions: triple-digit temperatures and poor air quality due to smog. The National Weather Service advised residents to avoid outdoor activities and the use of gasoline powered equipment and household chemicals at certain times of the day (NWS 2023). The *Z. tau* program will schedule chemical treatments and program activities to minimize danger to human health and prevent the release of pollutants.

APHIS recognizes a small portion of the population may have greater than usual sensitivity to certain chemicals, and program treatments may pose heightened risks to these individuals. To mitigate these risks, program personnel will communicate with individuals identified as sensitive before making treatments to their properties and will notify the public before treating public-access areas. The California Department of Pesticide Regulation, in partnership with county agricultural commissioners, is in the initial development phase of a statewide system that provides information to the public about pesticides used around them. The tool is intended to advance environmental justice and further protect public health by providing transparent and equitable

access to information in advance of pesticide applications. The department anticipates system implementation to begin in 2024 (CDPR 2023).

3.5.3 Nontarget Species

For the no action alternative and the quarantine/commodity certification alternative, potential environmental effects on nontarget species could include loss of animal and plant life and habitat from unregulated pesticide use by the public, or from *Zeugodacus* host damage.

Post-harvest treatment of potential *Z. tau*-host material (by MB fumigation, heat, or cold treatment) would be performed indoors or in sealed containers, preventing exposure to nontarget species. Pre-harvest eradication actions by the Program would occur in Los Angeles County and would be limited to removal of host fruits, targeted bait spray applications to host foliage, and placement of gel spot applications to control invasive *Z. tau* populations. These treatments would target *Z. tau* life stages in a manner that minimizes potential exposure and associated risks to nontarget species.

- Baits: The pheromones and food baits approved for Tau fly program traps and treatments may attract certain nontarget species, exposing them to the pesticide ingredient. When used in accordance with USEPA label requirements, McPhail (Torula yeast-borax), Jackson traps utilizing cuelure (4-(p-acetoxyphenyl)-2-butanone) in MAT treatment and Dibrom® in addition to GF-120 NF Naturalyte® (Spinosad A&D with plant proteins, extracts, and sugars) are expected to have only minimal, transient impacts on nontarget animal populations (APHIS 2018a). The food bait in the prescribed foliar treatment and the pheromone cuelure are common attractants used in fruit fly treatments, increasing the efficacy of chemical applications, and reducing the area of pesticide treatments needed for control (Scentry Biologicals Inc. 2007). *Z. tau* fruit flies attracted to the GF-120 NF Naturalyte receive a lethal dose of the pesticide spinosad that is mixed with the attractant. The semiochemical[3] attractant selected for program use (cuelure) is expected to have minimal impacts to environmental quality based on its use pattern and rapid degradation; because of its low toxicity, impacts to nontarget species are unlikely.
- Naled is toxic to birds, terrestrial and aquatic vertebrates, and terrestrial invertebrates, including pollinators (APHIS 2018f). However, the potential exposure of aquatic or terrestrial species to the naled used in Jackson traps is expected to be low (APHIS 2018f).
- 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. Toxicity to terrestrial invertebrates is variable (SERA 2016). Although highly toxic to honeybees and other sensitive terrestrial invertebrates the potential for exposure and risk from spinosad use is reduced based on the two proposed methods of application. Its use in MAT reduces exposure to nontarget invertebrates such as honeybees. MAT uses a gel-like material to mix with spinosad and a fruit fly attractant that is applied as a small dollop to structures such as utility poles. This application method will minimize exposure to honeybees and other sensitive invertebrate exposure. Spinosad use as a spray is directed to the target plant in a large spray droplet that contains a fruit fly attractant reducing exposure to honeybees and other terrestrial invertebrates. The large droplet size

[3] A semiochemical is a pheromone or other chemical that conveys a signal from one organism to another so as to modify the behavior of the recipient organism.

reduces the potential for off-site drift and does not completely cover the plant surface being treated when compared to broadcast applications that would use a smaller droplet size. 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 2014). Proposed foliar bait treatment GF-120 NF Naturalyte® has been reported to be avoided by some non-target insects (Cisneros et al. 2002; Michaud 2003) including some species of bees including the honeybee (Cabrera-Marin et al. 2015; Gómez-Escobar et al. 2014; Mangan and Moreno 2009). 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 2014). APHIS finds the program pesticides under the preferred alternative have a low potential for adverse effects to nontarget species. The small number of nontarget arthropods that may be caught in program traps would have a minimal effect on the overall population of their species (APHIS 2018b). Program performance of the prescribed heat/cold treatments, surveys and fruit removal will not have adverse effects on nontarget species.

APHIS finds the program pesticides under the preferred alternative have a low potential for adverse effects to nontarget species. MB fumigation methods protect nontarget species by preventing exposure to this pesticide (APHIS 2007, 2002). When deployed according to label instructions, the delimitation and monitoring traps pose little threat to nontarget plants and animals. The small number of nontarget arthropods that may be caught in program traps would have a minimal effect on the overall population of their species (APHIS 2018f). Program performance of the prescribed heat/cold treatments, surveys and fruit removal will not have adverse effects on nontarget species.

Conservation areas in Los Angeles County provide important habitat for a wide variety of wildlife, including native animal and plant species. The proposed program area in Los Angeles County contains 21 county, state, and local parks. Sensitive sites could include irrigation canals, coastal wetlands, and salt lakes of potential ecological importance. Program chemical applications would not occur at these sites or within refuges or other protected areas. Otherwise, program activities at these sites would include surveillance trapping and fruit stripping by hand if *Z. tau* detections occur.

Migratory Birds

Unless permitted by regulation, the Migratory Bird Treaty Act of 1918, as amended (16 USC §§ 703–712) prohibits intentional take[4] of migratory birds or any part, nest, or egg of migratory birds.

Executive Order (EO) 13186, "Responsibilities of Federal Agencies to Protect Migratory Birds," directs federal agencies taking actions with a measurable negative effect on migratory bird

[4] "Intentional take" means the unlawful pursuit, 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.

populations to develop and implement a memorandum of understanding (MOU) with the U.S. Fish and Wildlife Service (USFWS) to promote the conservation the conservation of migratory bird populations. On August 2, 2012, APHIS and USFWS signed an MOU to facilitate the implementation of this EO.

There are more than 491 species of birds recorded in Los Angeles County (Garrett and Miguel 2006). This region of California, which is part of the Pacific Flyway, is an important migration corridor providing suitable habitat for many bird species.

APHIS evaluated the proposed *Z. tau* program in terms of potential impact on migratory birds. Acute and chronic toxicity to birds from spinosad is low (APHIS 2014). Direct application of the prescribed spinosad bait to *Zeugodacus* spp. host plants, or in MAT spot applications, would not affect wild bird food sources, based on the localized, targeted nature of the applications. Birds would not be exposed to harmful concentrations of MB because the vented gas is rapidly dispersed and diluted in the air. Birds would not be exposed to naled inside Jackson traps. 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. No purposeful take of any migratory bird is part of the proposed program.

Endangered Species Act

Section 7 of the Endangered Species Act (16 USC §§1531 et seq.) and its implementing regulations (50 CFR Part 402) require federal agencies to consult with USFWS and/or the National Marine Fisheries Service (NMFS) 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. If listed species or critical habitat are present in the area and program activities may affect them, APHIS consults with USFWS and NMFS, as appropriate.

APHIS reviewed the *Z. tau* program area and proposed treatment activities for potential co-occurrence of federally listed species and critical habitat under USFWS jurisdiction to determine if any proposed program treatments may affect listed species or critical habitat. Coastal California Orcutt grass*, Orcuttia californica*, an ESA endangered species, may be present within the treatment areas (CNDDB 2023). However, this grass occurs in vernal pool habitat and would not be exposed to treatments. Further, Orcutt grass is pollinated by wind and does not rely on insects to pollinate. The *Z. tau* Program will adhere to the same protocols for spinosad as those used for OFF eradication: spinosad will not be applied to any open habitat, wild lands, valley and foothill grasslands or riparian areas (including marshes and swamps (CDFA 2022). Additionally, there are no plans to treat near freeway bridge abutments or drainage ponds (CDFA 2022). A 30-foot treatment buffer will be used around all waterways (CDFA 2022).

The larger quarantine area where trapping would occur contains designated critical habitat for the coastal California gnatcatcher, *Polioptila californica californica*; least Bell's vireo, *Vireo bellii pusillus*; southwestern willow flycatcher, *Empidonax traillii extimus;* Arroyo toad*, Anaxsyrus californicu*s; slender-horned spineflower, *Dodecahema leptoceras; Nevin's barberry, Berberis nevinii;* Santa Ana sucker, *Catostomus santaanae; and* Unarmored threespine stickleback, *Gasterosteus aculeatus williamsoni* (IPaC 2023; CNDDB 2023). There are no ESA-listed insects in the quarantine zone. Trapping will have no effect on these species or any

designated critical habitat. Traps are placed in areas that are easily accessible by road, and animals would not be attracted to or able to access the traps.

APHIS used the National Oceanic and Atmospheric Administration (NOAA) Fisheries Protected Resources App (see Appendix B for data source) and found that there are no listed species or designated critical habitat under NMFS jurisdiction in the program area. NOAA's protected resources website (NMFS 2023) indicates that the nearest ESA-listed species under NMFS jurisdiction is the Southern California Distinct Population Segment (DPS) of the steelhead (*Oncorhynchus mykiss*) may occur in the Santa Clara River which is outside of the MAT and quarantine area (CNDDB 2023). As such, APHIS program activities will have no effect on the Southern California DPS of steelhead.

A complete administrative record of this review is available upon request. If the Stevenson's Ranch *Z. tau* Program area expands, additional species become federally listed as threatened or endangered, or critical habitat is designated in the program area, APHIS will initiate consultation with USFWS and NMFS, as necessary.

3.5.4 Other Aspects of the Human Environment

A lack of federal action ("no action") could result in adverse economic and public health impacts on affected producers and consumers, including decreased harvests, higher consumer prices, loss of local employment, reduced nutritional options, loss of market share, loss of crop or property, and loss of contribution of crop commodities to the U.S. economy and trade. Compromised mental and physical health could be experienced by producers of crops infested by *Z. tau*. These reasonably foreseeable effects, some of which are related to climate change, may occur to a lesser extent under the quarantine and commodity certification alternative. APHIS does not anticipate these types of adverse effects from carrying out the preferred alternative's surveillance activities, trapping, and program chemical applications.

3.5.4.1 Climate Change

Climate change (CC) refers to long-term shifts in average weather patterns that define the Earth's local, regional, and global climates. Certain gases, which naturally occur, or are produced through human activities, have the potential to trap heat in the atmosphere, which leads to a phenomenon termed the "greenhouse effect".[5] These gases are termed "greenhouse gases" (GHGs). The greenhouse effect results in warming of the Earth's atmosphere and surface and long-term shifts in local, regional, and global climates. While the greenhouse effect is a natural process, human activities have contributed to global warming and CC by increasing the atmospheric concentration of GHGs in excess of what would naturally occur.

Climate change includes shifts in average regional weather patterns, average daytime and nighttime temperatures, precipitation patterns/volume/flooding, periods of drought, potential

[5] The greenhouse effect occurs when "greenhouse gases" in a planet's atmosphere cause some of the heat radiated from the planet's surface to build up in the planet's atmosphere and on the planet's surface. Global warming is the long-term heating of Earth's surface observed since the pre-industrial period (between 1850 and 1900) due to human activities, primarily the burning of fossil fuels, which increases heat-trapping greenhouse gas levels in Earth's atmosphere. Climate change is a long-term change in the average weather patterns that have come to define Earth's local, regional, and global climates. Changes observed in Earth's climate since the mid-20th century are driven by human activities that have led to global warming, particularly the burning of fossil fuels.

changes in the periodicity of tornadoes and hurricanes, the incidence and duration of heat waves and wildfires, polar ice melting, and sea level rise (USGCRP 2017; USEPA 2022a).

The Council on Environmental Quality's NEPA implementing regulations (40 CFR 1500–1508) require U.S. federal agencies to examine the reasonably foreseeable effects of a proposed action on the human environment (§ 1508.1(m)). Human-produced impacts on an average global temperature, global warming, may be avoided or reduced by government agencies through consideration of CC and GHG emissions during the NEPA analysis process.

Federal agencies are also required comply with Executive Orders such as EO 13990 –*Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis*, and EO 14008–*Tackling the Climate Crisis at Home and Abroad*, as part of NEPA analyses. Analysis of the association between climate change and *Z. tau* encompasses:

1. Potential impacts of climate change on *Z. tau* epidemiology: CC may affect the ~~the~~ prevalence, persistence, and locations of *Z. tau* outbreaks in United States, and thereby APHIS response actions.

2. Potential impacts of climate change on *Z. tau* control activities: One of the most visible consequences of a warming world is an increase in the intensity and frequency of extreme weather events (USGCRP 2018). Extreme weather events can potentially interfere with APHIS *Z. tau* control/eradication activities.

3. Potential emissions of GHGs as a result of *Z. tau* control activities: *Z. tau* control/eradication activities can result in the release of GHGs. While it is not possible to accurately quantify or forecast GHG emissions from future *Z. tau* control/eradication activities, APHIS provides a qualitative analysis of potential GHG emissions associated with APHIS *Z. tau* response actions.

The primary GHGs that contribute to the greenhouse effect are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and ozone (O_3), which all naturally occur, as well as produced through human activities (USGCRP 2017; USEPA 2022a), and fluorinated gases, which are man-made, the most potent, and longest lasting (USEPA 2022b).

Greenhouse gas emissions are reported as CO_2 equivalents (CO_2-eq), based on the global warming potential (GWP) for each GHG, as described in the 6th Intergovernmental Panel on Climate Change (IPCC) report (IPCC 2021). By example, CO_2 is assigned a GWP value of 1, and over a 100-yr time horizon the GWP of CH_4 is around 27-30 times that of CO_2, and N_2O 265-273 times that of CO_2. The GWP for fluorinated gases ranges in the thousands (CCC 2022). Thus, N_2O and fluorinated gasses are much more potent GHGs than CO_2 or CH_4.

Potential Effects on Greenhouse Gas Emissions and Effects of Climate Change on Z. tau Management Activities

CO_2 is the primary GHG emitted through APHIS Fruit Fly Exclusion and Detection Programs, via use of vehicles, aircraft, and other fossil fuel burning equipment (e.g., motorized sprayers and fumigators) used during program delivery. Management actions taken for *Z. tau* control would be like actions by other fruit fly programs; none of the fuels used for vehicles, aircraft, sprayers,

fumigators, nor insecticides or other chemicals used for *Z. tau* control, would result in N_2O and CH_4.

General CO_2 emissions from vehicles, aircraft, and other equipment that may be used in APHIS Fruit Fly Exclusion and Detection Programs are summarized in Table 5.

Table 5. Fossil Fuel Based CO_2 Emissions.

Fuel Type	Emissions
Gasoline	19.6 lbs CO_2 per gallon [6]
Diesel	22.4 lbs CO_2 per gallon [7]
Aviation Fuel (AVGAS)	18.3 lbs CO_2 per gallon [8]
Jet Fuel	21.1 lbs CO_2 per gallon [9]

The need for APHIS *Z. tau* management action is recent as described, and the action area may yet expand. Currently, the action area has been determined to be 79.1 square miles. APHIS has jointly managed preventive release programs with Texas (Mexfly), Florida (Medfly) and California (Medfly and Mexfly). APHIS cooperative fruit fly eradication programs for Medfly (in CA and FL) and Mexfly (in CA and TX) have used small, fixed-wing Cessna airplanes with IO-520 285 horsepower engines to release sterile insects and to make aerial pesticide applications, as part of an integrated pest management program. In California, the sterile Medfly release area encompassed 1,750 square miles and included portions of Los Angeles, Orange, San Bernardino, and Riverside counties. The California sterile Mexfly release area encompassed 43 square miles in a portion of San Diego County.

There are no sterile insect releases planned for *Z. tau* management at this time, no use of aircraft. No aerial chemical applications are made in California by APHIS' cooperative fruit fly programs. APHIS analysis of APHIS *Z. tau* management actions provides general data on potential GHG emissions; it is not possible to accurately quantify any GHG emission that may derive from APHIS *Z. tau* program activities at this time.

Considerations Relative to Climate Change and Food Security

Changes in climates, namely regional, can have a significant effect on the incidence and prevalence of agricultural pests, such as *Z. tau,* impacting food production, food security, and international trade. APHIS actions taken for *Z. tau* management are essential to ensuring food security in the United States, as well as trade of agricultural commodities among trade partners. Thereby, impacts of *Z. tau* management actions on economies, domestic and international, by ensuring food security and imports/exports, are considered beneficial. Trade of commodities that may be impaired via a plant pest outbreak, needs consideration, such as in fruit fly impairment of

[6] https://www.epa.gov/system/files/documents/2023-05/420f23014.pdf
[7] https://www.epa.gov/system/files/documents/2023-05/420f23014.pdf
[8] https://www.faa.gov/sites/faa.gov/files/2021-11/Aviation_Climate_Action_Plan.pdf
[9] https://www.icao.int/environmental-protection/CarbonOffset/Documents/Methodology%20ICAO%20Carbon%20Calculator_v10-2017.pdf

crops/foods. Changes in climate can influence the distribution of plants and animals, including insects that are considered pests, thereby affecting local commerce and international trade.

3.5.4.2 Tribal Domains

In compliance with EO 13175 ("Consultation and Coordination with Indian Tribal Governments"), EO 13007 (“Indian Sacred Sites”), and the Archaeological Resources Protection Act of 1979 (16 USC 470aa-mm), APHIS communicates and collaborates with Tribal officials whenever its proposed actions have potential implications for tribes, archaeological resources on public and Tribal lands, and Indian religious practices at sacred sites.

Using the online mapping tool *ArcGIS.com* (see Appendix C for data source) to assess possible Indian domains in the proposed program area, APHIS found no Federally recognized Tribal lands near the program area in Los Angeles County, California. Another map resource from the Bureau of Indian Affairs (data source in Appendix C) confirms this assessment.

A review of archived records (Bureau of American Ethnology 1899) indicates that the proposed program area is part of lands that Indian Tribes occupied centuries ago, but that were ceded to the U.S. Government in 1851. The designated Tribal entities for the ceded site:

- Buena Vista; Car-I-se; Cas-take; Hol-mi-uk; Ho-lo-cla-me; Se-na-hu-ow; So-ho-nut; Te-jon; To-ci-a; Uva

APHIS’ Plant Protection and Quarantine’s designated liaisons will reach out to representatives of these Tribes to ascertain if they wish further consultation and collaboration.

The proposed action will not disturb the ground, so program implementation is unlikely to affect Native American sites or artifacts. If program personnel discover any archaeological resources, they will notify the appropriate individuals. If there is an ongoing presence of exotic fruit flies that leads to the expansion of program activities onto Tribal lands, program officials will initiate consultation with the governing Tribal authorities and local Tribal Historic Preservation Officers before taking further action. APHIS will work closely with the Historical Commission for Los Angeles County and with any Tribal entities as appropriate.

3.5.4.3 Socioeconomics and Environmental Justice

APHIS considers socioeconomics and equity for all Americans in APHIS’ program activities to ensure compliance with relevant environmental statutes, including EOs. APHIS analyzed the environmental factors within the proposed program area that are vital to sustaining the social and economic wellbeing of the affected communities, and to “assure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings” (42 USC 4331, Section 101(a)(b)). This analysis helps APHIS determine if its action in the program area would have disproportionately high and adverse environmental impacts to low-income, minority, and/or Tribal populations (i.e., “environmental justice” or “EJ” impacts).

U.S. Census Bureau (USCB 2023) provide relevant information on social factors (such as demographics, race and ethnicity, community health, activities, and quality of life) and economic factors (such as employment, income, business ownership, etc.) in the affected environment. The

locations directly affected by the proposed *Z. tau* program are Santa Clarita City and the adjacent unincorporated community of Stevenson Ranch; both are located within the proposed quarantine boundary. A summary of the socioeconomics and EJ reference data in Los Angeles County and the *Z. tau* treatment area (USCB 2021) is as follows:

- The total area of Los Angeles County, California is about 4,749 sq. miles (including 4060 square miles of land and 689 square miles of water (USCB 2022)). This county is the state's largest in terms of population (estimated at 9,721,138 in 2022 and 10,014,042 in 2020). Los Angeles County is also third in the state in terms of population density (2,466.9 residents per sq. mile), behind San Francisco County (17,532 residents per sq. mile) and Orange County (3,989 residents per sq. mile). The reported human density in the proposed *Z. tau* treatment area is 1,398 residents per sq. mile.

- In terms of race, White constitutes the majority (70%) of the Los Angeles County population followed by Asian (15.8%), Black (9%), Two or More Races (3.4%), and Native American (1.5%). In the proposed *Z. tau* treatment area, White makes up the majority (60%) followed up by Asian (14%) and Black (4%).

- Regarding ethnicity, the Hispanic group is the majority (49%) in Los Angeles County, followed by White (25.2%). In the proposed *Z. tau* treatment area, White is the largest group (46%) followed by Hispanic (31%) and Asian (13%).

- Regarding education, high school graduates or higher form 80% of Los Angeles County's 25 and older population; and those with a bachelor's degree or more form 34% of the counties 25 and older population. In the proposed *Z. tau* treatment area, high school graduates or higher form 92% of the areas 25 and older population; and those with a bachelor's degree or more form 45% of the counties 25 and older population.

- Los Angeles County residents speaking only English as their primary language represents 44.7% of the population, and non-English languages total 55.3% (38% speak Spanish, 10.4% speak an Asian or Pacific Island language, 5.6% speak an Indo-European language, and 1.2% speak other languages). In the proposed *Z. tau* treatment area, speaking only English as their primary language represents 68% of the population, and non-English languages total 32% (18% speak Spanish, 8% speak an Asian or Pacific Island language, 3% speak an Indo-European language, and 3% speak other languages).

- Of the above listed non-English languages spoken by Los Angeles County residents, 40.8% of Spanish speakers speak English less than "very well", 51.2% of those speaking an Asian or Pacific Island language speak English less than "very well", and 35% of those speaking an Indo-European language speak English less than "very well". In the proposed *Z. tau* treatment area, linguistically isolated communities are composed of Spanish speakers (49%), Asian or Pacific Island language speakers (30%), and Indo-European language speakers (12%).

- Regarding incomes, households earning above $75,000 per year represent 51.3% of Los Angeles County and those earning less than $15,000 per year represent 10.8%. 38% of county households earn between $15,000-$75,000 per year. In the proposed *Z. tau* treatment area, households earning above $75,000 per year represent 66% and those

earning less than $15,000 per year represent 5%. 29% of county households earn between $15,000-$75,000 per year.

- Persons over 16 years old in the labor force (i.e., employed) represent 64.3% of the county population.

- There are 37,042 occupied housing units within the proposed *Z. tau* treatment area, of which 62% are owner-occupied and 38% are renter-occupied.

- Regarding the quality of life, Los Angeles County has a higher poverty rate (14.2%) when compared to neighboring counties.

If APHIS takes no action to deter the confirmed *Z. tau* infestation in Santa Clarita City and Stevenson Ranch, or if APHIS' response is limited to quarantine and commodity certification, the socioeconomic situation in the infested location could decline. Direct economic impact to nurseries and retail garden centers in the Program area could result in decreased profits and reduced plant inventories. Ongoing *Z. tau* infestation, and its gradual expansion into areas of agricultural production, may lead to other (indirect) consequences such as: possible overuse of pesticides by individual growers, leading to more chemical pollution; increase of farmer's expenses to protect crops and maintain production; possible switch from *Z. tau* host crops to non-*Z. tau* host crops; interruption of orchard activities; farmworker unemployment; increased stress (lower morale) and other health concerns in the producers' communities.

Such socioeconomic impacts could ripple through the general economy; for example, people relying on fruits for food, forage, fuel, or other uses may have to pay more as the local supply of fruits decreases relative to demand, or as local supply must be supplemented by fruit imports. The cost of host commodities may increase due to transportation and handling of imported supplies, and the consequential increased traffic may cause delays. Other examples of possible (indirect) effects through the local economy could include:

- Lower participation in recreational sports, agricultural fairs, and local festivals given that affected producers would have to work harder to compensate for income reductions.

- Residents may continue to leave (Los Angeles County population declined by 2.9% (292,904) between April 1, 2020, and July 1, 2022).

- Low-income farmers may no longer participate in the local economy, cannot afford to purchase homes and health insurance, or pay tuition for their college children. Likewise, minority-owned businesses (particularly farm businesses, food services, transportation and produce warehousing) could also take serious hits.

- Local jurisdictions and non-profit organizations could lose funding if residents and employer firms move away in search for better economic conditions.

- Abandoned and deteriorating properties could result in an increase of diseases, pest prevalence, and public health concerns.

- Los Angeles County's relatively high poverty rate (14.2%) may increase with a potential unemployment rise and income loss from an unsuccessful or lengthy exotic fruit fly control program.

Implementation of APHIS' preferred alternative is expected to eradicate *Z. tau* in Los Angeles County and contribute to maintaining an overall *Z. tau*-free human environment (farmlands, pastures, wetlands, grocery warehouses, residential and other developed areas, etc.), where host crops would be safe to eat and places healthy and pleasant to live. APHIS's proposed action (preferred alternative) is not anticipated to pose any safety concerns or public health risk because of the low potential for exposure to program activities and adequate toxicity profile for the selected chemicals (APHIS 2018a).

In compliance with EO 13045 ("Protection of Children from Environmental Health Risks and Safety Risks"), program personnel would not apply chemical treatment in schools, playgrounds, or other youth-frequented facilities that could raise safety concerns. The proposed program is unlikely to impact transportation systems (e.g., road blockage or traffic), social events (e.g., community gatherings, leagues, and recreations), or the local economy (such as jobs and businesses). Program personnel notify the owners of the properties where *Zeugodacus* spp. are found and inform residents in the proposed quarantine and treatment areas how to avoid any potential exposure to chemicals during treatment activities and trap maintenance. Program personnel shall engage the affected communities in a manner inclusive of their identified ethnicities (e.g., through outreach meetings, with interpreters if needed) to increase public awareness.

Given the language diversity in Los Angeles County (e.g., nation of origin, and ethnicity), program personnel will ensure compliance with EO 13166 ("Improving Access to Services for Persons with Limited English Proficiency") by notifying the public in both English and other languages, as applicable (with the use of translators, as needed), to ensure the communication is timely and clear to affected persons. Given the vulnerable populations and racial diversity in Los Angeles County, *Z. tau* program personnel will ensure compliance with EO 12898 ("Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations"), EO 14096 ("Revitalizing Our Nation's Commitment to Environmental Justice For All") and EO 13985 ("Advancing Racial Equity and Support for Underserved Communities Through the Federal Government") by using formulations and treatment methods (APHIS, 2018a) that do not disproportionately impact minorities and their businesses or lower their employment and income levels.

Researchers at the California EPA discovered significant racial, ethnic, and income disparities in pesticide use, which pose a greater pollution burden compared to air pollutants and other toxic releases. Pesticide use is concentrated in California's zip codes with high percentages of people of color, and the state's most impoverished counties have a disproportionately high use of glyphosate. In 2019, the majority Hispanic counties in California used over eight million pounds of pesticides linked to childhood cancers, while the counties with fewer Hispanic residents used significantly less. Nationally, African Americans and Mexican Americans living in poverty have higher levels of pesticide biomarkers in their blood or urine compared to non-Hispanic whites. Pesticide exposure disparities are also evident among women of color compared to white women, with the greatest disparity observed in biomarkers of pesticide exposure. Mexican Americans and African American women above 40 have higher levels of certain legacy

pesticides in their bodies than white women. The costs and disease burden associated with organophosphate pesticide exposure disproportionately affect non-Hispanic Black and Mexican American individuals compared to non-Hispanic whites. A national analysis of CDC data revealed that Mexican Americans and non-Hispanic Blacks had higher concentrations of most pesticides and metabolites compared to non-Hispanic whites (Donley et al. 2022).

The "Human Health" section of this EA outlines the risks of pesticide exposure from this program. Given the type of pesticides that will be used and the nature of the application, APHIS does not anticipate any disproportionate burdens to minority or low-income communities.

3.5.4.4 Registered Historic Sites

The National Historic Preservation Act of 1966, as amended (16 USC 470 *et seq*.), requires federal agencies to consider the potential impact of their proposed actions on properties on, or eligible for inclusion on, the National Register of Historic Places (NRHP) as defined in 36 CFR parts 63 and 800. Registered properties within Los Angeles County, California include buildings, street patterns and road characteristics, parks, and historic districts. (This is not an exhaustive list).

In general, fruit fly eradication program activities do not use heavy equipment that creates noise levels requiring auditory protection. There would be minimal to no ground disturbance. Any visual, atmospheric, or auditory effects during application of program chemicals would be limited in duration, intensity, and area. The proposed *Z. tau* program activities do not alter, change (restore or rehabilitate), modify, relocate, abandon, or destroy any historic buildings, edifices, or nearby infrastructure, therefore, implementing the preferred alternative will not directly or indirectly alter the characteristics of a historic place that qualify it for inclusion on the National Register.

APHIS evaluates all federally listed historic properties pertaining to a cooperative fruit fly control program area. In 2015, the California State Historic Preservation Office (SHPO) indicated that APHIS need not consult with them for repetitive and recurring fruit fly treatments in California given that these treatments are similar in nature to past efforts (C. Roland-Nawi, SHPO, personal communication, 20 January 2015). If APHIS learns of an archaeological resource in an active treatment area, APHIS will immediately notify the property owner and appropriate government authorities.

APHIS generated a map of properties listed in the National Register of Historic Places (NRHP) within the area of concern for this environmental assessment (data source in Appendix C). The data shows that as of January 2023, there is one property listed on the NRHP in the proposed buffer area (Pioneer Oil Refinery). This property is an old industrial building (pump house, oil and water tanks, and stills) and does not contain *Z. tau*-host cultivation requiring treatment (such as fruit orchards and vegetable gardens). However, this historic property is not within the proposed *Z. tau*-treatment area. Implementation of the proposed action is not expected to impact registered historic properties based on the nature of said property and the impacts of other fruit fly programs on similar properties.

If APHIS discovers there are unanticipated effects on a registered historic property in the Stevenson Ranch *Z. tau* Program area, the property owner and SHPO will be immediately

informed, and the Program will cease its treatment application at that location until both APHIS and the SHPO agree to an appropriate solution.

APHIS' fruit fly eradication activities are compatible with the preservation of historic sites because control activities within the site are discreetly integrated; the proposed Program activities will not disturb the ground, and the treatments will not affect human-made structures. Program treatments and activities are restricted to an as-needed basis and normal program activities at historically significant locations can be modified to reduce pesticide use.

4 Agencies Contacted

California Department of Food and Agriculture
Plant Health and Pest Prevention Services
Environmental Policy and Compliance
1220 N Street, Room 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
Emergency and Domestic Programs–Specialty Crops and Cotton Pests
4700 River Road, Unit 26
Riverdale, MD 20737

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

U.S. Fish and Wildlife Service
Ventura Fish and Wildlife Office
2493 Portolo Road B
Ventura, CA 9300

Appendix A. Tau Fly Host List.

APHIS assembled this list* to prevent the dissemination and establishment of Tau fly (*Zeugodacus tau*) in the United States. The berries, fruit, nuts and vegetables of the listed plant species are considered host articles for Tau fly. Unless proven otherwise, all cultivars, varieties, and hybrids of the plant species listed herein are considered suitable hosts of *Z. tau.*

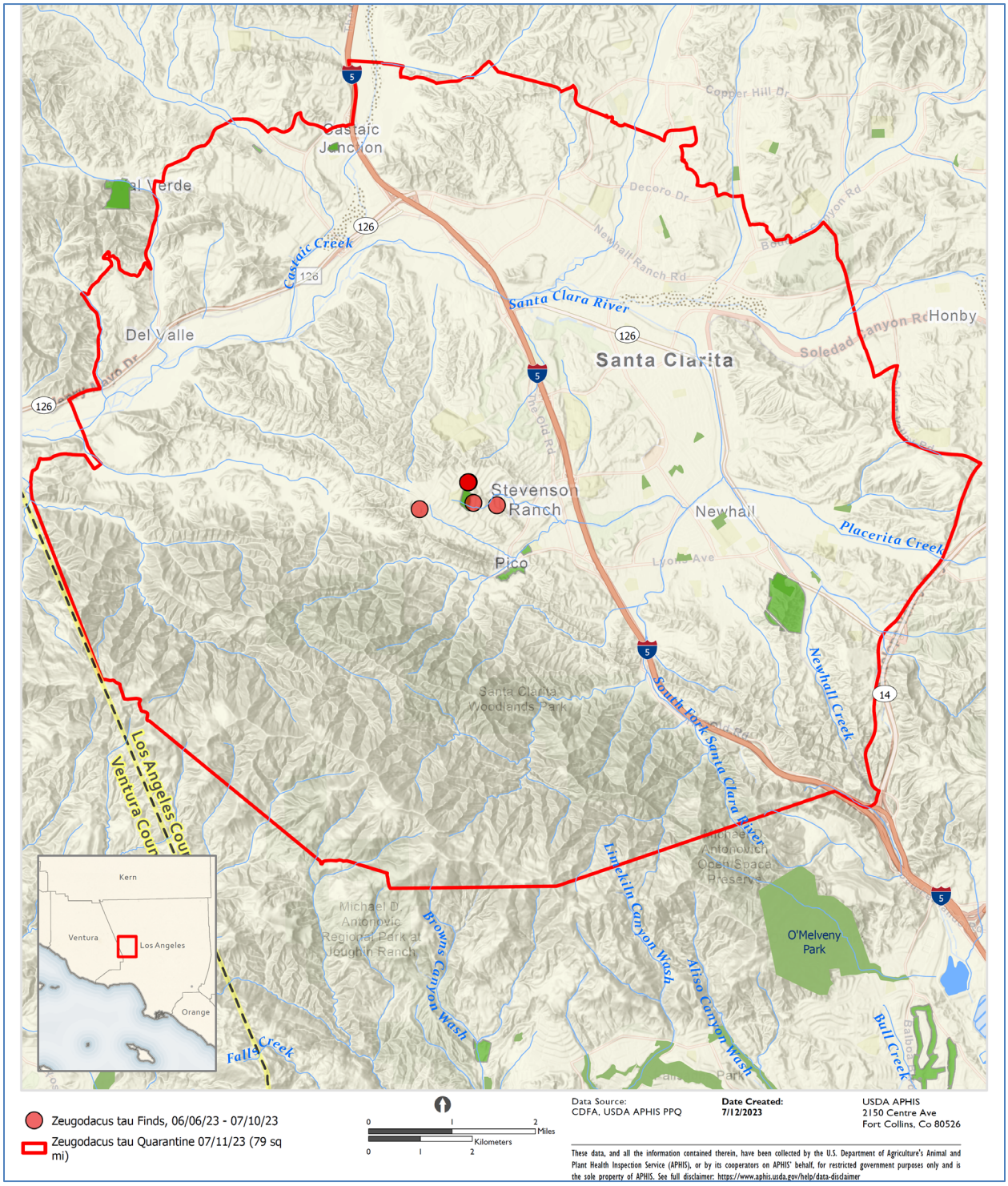
Scientific Name	Common Name
Abelmoschus esculentus (L.) Moench	Okra
Adenia hondala (Gaertn.) W. J. de Wilde	Hondala
Annona muricata L.	Soursop
Annona squamosa L.	Custard apple
Artocarpus heterophyllus Lam.	Jackfruit
Artocarpus integer (Thunb.) Merr.	Chempedak
Averrhoa carambola L.	Star fruit, carambola
Baccaurea angulata Merr.	Red angle tampoi
Bambusa pallida Munro	Bakhal
Benincasa hispida (Thunb.) Cogn.	Ash gourd
Benincasa spp.	Gourd, melon
Bidens biternata (Lour.) Merr. & Sherff	Sendangusa
Borassus flabellifer L.	Palmyra palm, doub palm
Brassica oleracea L.	Cabbage
Capsicum annuum L.	Chili pepper
Capsicum frutescens L.	Bird pepper
Capsicum spp.	Pepper
Carica papaya L.	Papaya
Citrullus colocynthis (L.) Schrad.	Bitter apple
Citrullus lanatus (Thunb.) Matsum. & Nakai	Watermelon
Citrus maxima (Burm.) Merr.	Pummelo
Citrus paradisi Macfad.	Grapefruit
Citrus reticulata Blanco	Mandarin orange
Citrus sinensis (L.) Osbeck	Sweet orange
Citrus spp.	Citrus
Citrus tangelo J. W. Ingram & H. E. Moore	Tangelo
Citrus unshiu Marcow.	Satsuma mandarin
Coccinia grandis (L.) Voigt	Ivy gourd
Cucumis anguria L.	Bur cucumber
Cucumis melo L.	Melon
Cucumis sativus L.	Cucumber
Cucumis spp.	Melon, cucumber
Cucurbita argyrosperma C. Huber	N/A
Cucurbita maxima Duchesne	Pumpkin

Scientific Name	Common Name
Cucurbita moschata Duchesne	Butternut squash
Cucurbita pepo L.	Bitter bottle gourd
Cucurbita spp.	Pumpkin, squash, gourd
Dimocarpus longan Lour.	Longan
Diplocyclos palmatus (L.) C. Jeffrey	Lollipop climber
Dracontomelon dao (Blanco) Merr. & Rolfe	Argus pheasant tree
Eugenia spp.	Eugenia
Fagraea ceilanica Thunb.	Hui li
Ficus racemosa L.	Cluster fig
Ficus tinctoria G. Forst.	Dye fig
Gomphogyne cissiformis Griff.	N/A
Gymnopetalum scabrum (Lour.) W. J. de Wilde & Duyfjes	Feng gua
Hodgsonia macrocarpa (Blume) Cogn.	Chinese lardfruit
Hydnocarpus anthelminthicus Pierre ex Laness.	Chaulmoogra tree
Hydnocarpus spp.	Chaulmoogra
Hylocereus undatus (Haw.) Britton & Rose	Dragon fruit, red pitaya
Lagenaria siceraria (Molina) Standl.	Bottle gourd
Lagenaria spp.	Gourd, calabash
Luffa acutangula (L.) Roxb.	Angled loofah
Luffa aegyptiaca Mill.	Loofah
Luffa spp.	Loofah
Mangifera foetida Lour.	Bachang mango
Mangifera indica L.	Mango
Manilkara zapota (L.) P. Royen	Sapodilla
Melastoma malabathricum L.	Indian rhododendron
Momordica charantia L.	Bitter melon
Momordica cochinchinensis (Lour.) Spreng.	Balsam pear
Momordica dioica Roxb. Ex Willd.	Spine gourd
Momordica spp.	Balsam apple, balsam pear
Morinda citrifolia L.	Noni, Indian mulberry
Morus spp.	Mulberry
Muntingia calabura L.	Calabur tree
Musa paradisiaca L.	Banana
Myxopyrum smilacifolium (Wall.) Blume	Kuo ye jiao he mu
Passiflora edulis Sims	Passionfruit
Persea americana Mill.	Avocado
Phaseolus vulgaris L.	Bean
Pometia pinnata J. R. Forst. & G. Forst	Fijian longan
Pouteria lucuma (Ruiz & Pav.) Kuntze	Lucuma
Prunus pseudocerasus Lindl.	Chinese sour cherry
Prunus salicina Lindl.	Japanese plum

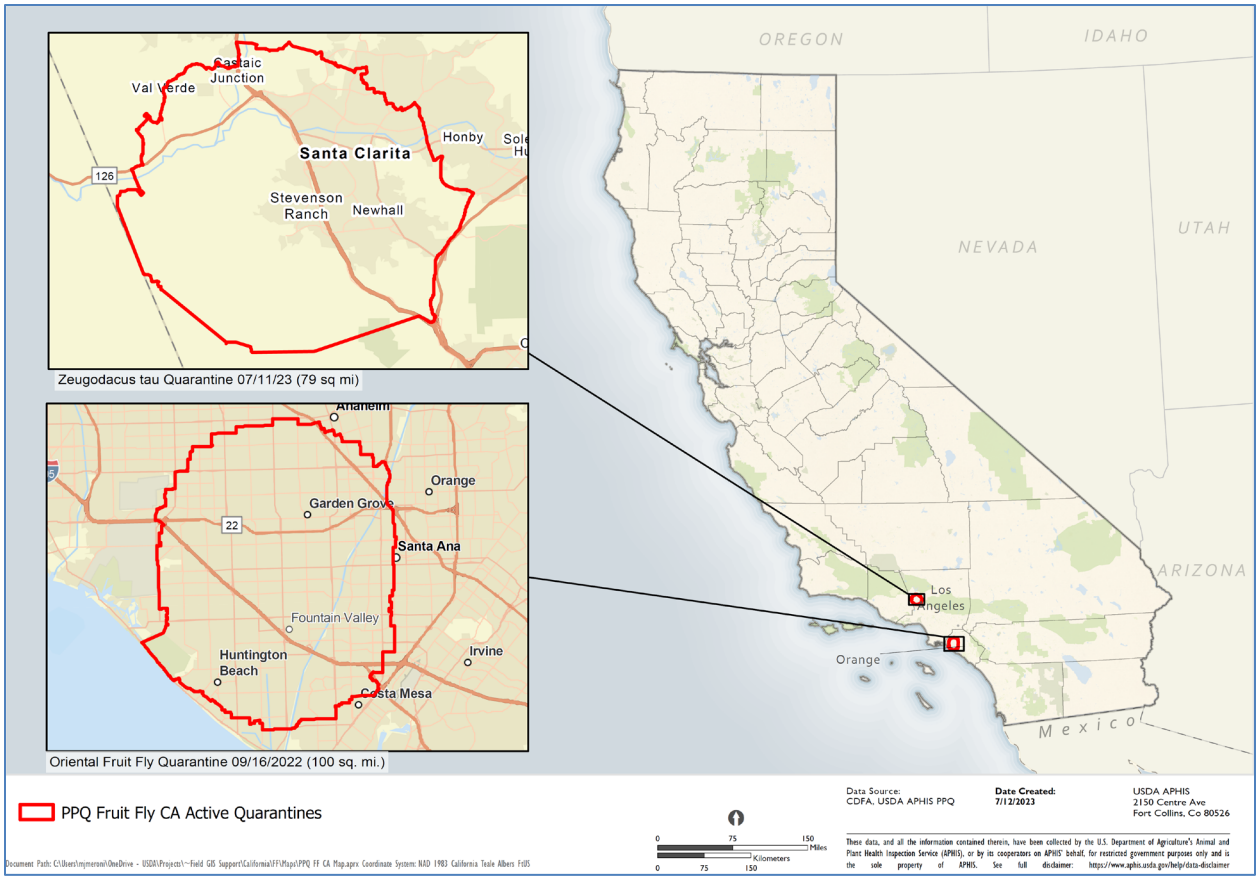
Scientific Name	Common Name
Prunus spp.	Peach, nectarine, cherry, almond
Psidium guajava L.	Guava
Pyrus communis L.	Pear
Pyrus pyrifolia (Burm. f.) Nakai	Sand pear, Chinese pear
Pyrus spp.	Pear
Sechium edule (Jacq.) Sw.	Chayote
Siphonodon celastrineus Griff.	N/A
Siphonodon spp.	N/A
Siraitia grosvenorii (Swingle) A. M. Lu & Zhi Y. Zhang	Monkfruit
Solanum lycopersicum L.	Tomato
Solanum melongena L.	Eggplant
Solanum muricatum Aiton	Melon pear
Strychnos ignatii P. J. Bergius	Ignatius bean
Strychnos nux-vomica L.	Nux-vomica
Strychnos rupicola Pierre	N/A
Strychnos spp.	N/A
Strychnos thorelli Pierre ex Dop	N/A
Syzygium aqueum (Burm. f.) Alston	Watery rose apple
Syzygium jambos (L.) Alston	Rose apple
Syzygium malaccense (L.) Merr. & L. M. Perry	Malay apple
Syzygium samarangense (Blume) Merr. & L. M. Perry	Java-apple
Tetrastigma leucostaphylum (Dennst.) Alston ex Mabb.	Indian chestnut vine
Trichosanthes celebica Cogn.	N/A
Trichosanthes cordata Roxb.	N/A
Trichosanthes costata Blume	N/A
Trichosanthes cucumerina L.	Annual gourd
Trichosanthes dioica Roxb.	Pointed gourd
Trichosanthes pilosa Lour.	Snake gourd
Trichosanthes rubriflos Thorel ex Cayla	N/A
Trichosanthes spp.	Annual gourd, snake gourd
Trichosanthes tricuspidata Lour.	N/A
Trichosanthes wallichiana (Ser.) Wight	N/A
Vigna unguiculata (L.) Walp.	Cowpea
Zehneria wallichii (C. B. Clarke) C. Jeffrey	N/A

*Published in June 2016 as "*Bactrocera tau* Host List" (APHIS 2016).

Appendix B. Tau Fly Program Area and Active Fruit Fly Quarantines in California.



Map 1. Tau Fly (*Zeugodacus tau*) Quarantine and detection sites, Los Angeles County, California.
Map created by APHIS on 12 July 2023.



Map 2. Active fruit fly quarantines in the State of California: Fountain Valley Oriental Fruit Fly (*Bactrocera dorsalis*), and Stevenson Ranch Tau Fly (*Zeugodacus tau*). Map created by APHIS on 12 July 2023.

Appendix C. Geospatial Data Resources Used in Cooperative Fruit Fly Program NEPA Analysis

Web-Based Mapping Application for Environmental Assessments

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

For Information on—

- **Airports:** https://www.bts.dot.gov/ntad
- **Bing Maps Road:** http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html
- **Boundaries:** http://epamap9.epa.gov/arcgis/rest/services/NEPAssist/Boundaries/MapServer
- **Census Populations:** https://www.census.gov/data.html
- **Crop Data:** https://croplandcros.scinet.usda.gov/
- **Environmental Justice:** www.epa.gov/ejscreen **and** https://ejscreen.epa.gov/mapper/.
- **Farmers Markets:** https://www.arcgis.com/home/item.html?id=3e81d95aba194da5816095001da79e04
- **Historic Sites:** https://www.nps.gov/subjects/nationalregister
- **Land Use:** https://www.usgs.gov/centers/eros/science/national-land-cover-database
- **Local Parks:** https://www.arcgis.com/home/item.html?id=f092c20803a047cba81fbf1e30eff0b5
- **National Wildlife Refuges:** http://viewer.nationalmap.gov/
- **Native American Areas**: http://viewer.nationalmap.gov/ **and** http://viewer.nationalmap.gov/
- **NOAA Fisheries Protected Resources App:** https://www.webapps.nwfsc.noaa.gov/portal/apps/webappviewer/index.html?id=7514c715b8594944a6e468dd25aaacc9
- **Nonattainment Areas:** http://geoplatform2.epa.gov/arcgis/rest/services/PM_Designations_Mapping/Nonattainment_Areas/MapServer
- **Nurseries and Garden Centers:** www.googlemaps.com
- **Organic Farms:** https://www.arcgis.com/home/item.html?id=9f0f63bf861442d4ae6de847d19e25b5
- **Places:** http://epamap9.epa.gov/arcgis/rest/services/NEPAssist/Places/MapServer
- **Pesticides**: https://cida.usgs.gov/warp/about/
- **Seaports:** https://www.bts.dot.gov/ntad

- **Transportation:** http://epamap9.epa.gov/arcgis/rest/services/NEPAssist/Transportation/MapServer

- **Tribal Ceded Lands and Tribal Areas (Tribal Connections Viewer):**
  https://www.arcgis.com/home/webmap/viewer.html?useExisting=1&layers=f2fbc6413393487883dd44cb3e907616 **and**
  https://gcc02.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.arcgis.com%2Fapps%2Fwebappviewer%2Findex.html%3Fid%3Dfe311f69cb1d43558227d73bc34f3a32&data=04%7C01%7C%7C0d1129e7b54145c152ba08d98a7f0d71%7Ced5b36e701ee4ebc867ee03cfa0d4697%7C0%7C0%7C637693100557167362%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C1000&sdata=l2eyQ51l9Uq1sPdJPdUuNepNIdIDsPnPjPsWzTh83r4%3D&reserved=0 **and**
  https://www.bia.gov/sites/bia.gov/files/assets/bia/ots/webteam/pdf/idc1-028635.pdf

- **USFWS (Critical Habitat, Migratory Birds):** http://ecos.fws.gov/crithab **and** http://ecos.fws.gov/ipac/ **and**
  https://wildlife.ca.gov/Data/CNDDB

- **Water:** http://epamap9.epa.gov/arcgis/rest/services/NEPAssist/Water/MapServer

- **Wetlands:** https://landscape11.arcgis.com/arcgis/rest/services/USA_Wetlands/FeatureServer

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