Integrated Mosquito Management Program

Alameda County Mosquito Abatement District

Final Programmatic EIR

Responses to Comments / Revisions to Draft PEIR

June 2016

State Clearinghouse No. 2012052037

Document Information

Prepared for	Alameda County Mosquito Abatement District
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Acronyms

°C	degrees Celsius
°F	degrees Fahrenheit
µg/kg	microgram(s) per kilogram
µg/L	microgram(s) per liter
2,4-D	2,4-dichlorophenoxyacetic acid
AB	Assembly Bill
ACCPP	Alameda County Climate Protection Project
AGO	Autocidal Gravid Ovitrap
AHM	acutely hazardous materials
AMMs	Avoidance and Minimization Measures
APAP	Aquatic Pesticide Application Plan
APEs	alkylphenol ethoxylates
ATSB	attractive toxic sugar bait
ATCM	Airborne Toxic Control Measure
ATV	all-terrain vehicle
BAAQMD	Bay Area Air Quality Management District
Basin Plan	Water Quality Control Plan
BCDC	San Francisco Bay Conservation and Development Commission
BMP	best management practice
BP	boiling point
Bs	*Bacillus sphaericus*
BTEX	benzene, toluene, ethylbenzene, xylenes
Bti	*Bacillus thuringiensis israelensis*
BTU	British Thermal Units
C_2H_3Cl	vinyl chloride
CAA	Clean Air Act of 1970
CAAQS	California Ambient Air Quality Standards
CAL FIRE	California Department of Forestry and Fire Protection
Cal-EPA	California Environmental Protection Agency
CAP	Climate Action Plan
CARB	California Air Resources Board
cc	cubic centimeter(s)
CCD	colony collapse disorder
CCG	Contra Costa Goldfields
CCR	California Code of Regulations

CDC	Centers for Disease Control and Prevention
CDFA	California Department of Food and Agriculture
CDFW	California Department of Fish and Wildlife (formerly Fish and Game [CDFG])
CDPH	California Department of Public Health (formerly Health Services [CDHS])
CDPR	California Department of Pesticide Regulation
CDR	Chemical Data Reporting
CDWR	California Department of Water Resources
CEC	California Energy Commission
CEDEN	California Environmental Data Exchange Network
CESA	California Endangered Species Act
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CH_4	methane
CLT	California Least Tern
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent(s)
CRLF	California Red-Legged Frog
CTS	California Tiger Salamander
CVEC	Center for Vector-borne Diseases
CWA	Clean Water Act
dB	decibel(s)
dBA	A-weighted sound level/decibel(s)
DPM	diesel particulate matter
EBMUD	East Bay Municipal Utility District
EBRPD	East Bay Regional Parks District
ECAP	Energy and Climate Action Plan
ESA	Endangered Species Act
EVS	Encephalitis Vector Survey
FAA	Federal Aviation Administration
FFDCA	Federal Food, Drug, and Cosmetic Act
FHSZ	Fire Hazard Severity Zone
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FYLF	Foothill Yellow-Legged Frog
GHG	greenhouse gas

GPS	global positioning system
GWP	global warming potential
H_2S	hydrogen sulfide
HCP	Habitat Conservation Plan
ICLEI	International Council for Local Environmental Initiatives
IMM	Integrated Mosquito Management
IMMP	Integrated Mosquito Management Program
IPCC	Intergovernmental Panel on Climate Change
IPM	Integrated Pest Management
LC_{50}	50 percent lethal concentration
LCFS	Low Carbon Fuel Standard
LD_{50}	50 percent lethal dose
L_{dn}	day/night average sound level
L_{eq}	energy-equivalent sound/noise descriptor
LOAEL	lowest observed adverse effect level
LS	less than significant
MCLs	Maximum Contaminant Levels
MEI	Maximally Exposed Individual
mg/L	milligram(s) per liter
MLLW	Mean Lower Low Water
MMT	million metric tonne(s)
MRP	Monitoring and Reporting Program
MSDS	material safety data sheet
MT	metric tonne(s)
MTL	Mean Tide Level
MVCAC	Mosquito Vector Control Association of California
N	no impact
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NCCP	Natural Community Conservation Plan
ng/L	nanogram(s) per liter
NGVD	National Geodetic Vertical Datum
NMFS	National Marine Fisheries Service
NO	nitric oxide
NO_2	nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NOAEL	no observed adverse effect level

NOP	Notice of Preparation
NO_X	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NWR	National Wildlife Refuges
O_3	ozone
OP	organophosphate
PAH	polycyclic aromatic hydrocarbons
PAP	Pesticide Application Plan (NPDES)
Pb	lead
PBBB	Palmate-Bracted Bird's Beak
PBO	piperonyl butoxide
PCBs	polychlorinated biphenyls
PEIR	Programmatic Environmental Impact Report
PERP	Portable Equipment Registration Program
PHG	Public Health Goal
PM_{10}	respirable particulate matter
$PM_{2.5}$	fine particulate matter
POD	pelagic organism decline
POM	particulate organic matter
ppb	part(s) per billion
ppm	part(s) per million
ppmv	part per million by volume
ppt	part(s) per trillion
PUP	Pesticide Use Proposal (USFWS)
RAMP	Rapid Analyte Measurement Platform
RHA	Rivers and Harbors Act
RIM	rotational impoundment management
ROC	reactive organic compound
ROG	reactive organic gas
RR	Ridgway's Rail
RT-PCR	reverse transcription polymerase chain reaction
RWQCBs	Regional Water Quality Control Boards
SB	Senate Bill
SBSPRP	South Bay Salt Pond Restoration Project
SF_6	sulfur hexafluoride
SFBAAB	San Francisco Bay Area Air Basin
SFBRWQCB	San Francisco Bay Regional Water Quality Control Board

SIP	State Implementation Plan
SJVAPCD	San Joaquin Valley Air Pollution Control District
SLE	Saint Louis encephalitis
SM	potentially significant but mitigable
SMHM	Salt Marsh Harvest Mouse
SO_2	sulfur dioxide
SO_4	sulfates
SP	service population
SU	significant and unavoidable
SUP	Supplemental Use Proposal (USFWS)
SVOC	semivolatile organic compounds
SWRCB	California State Water Resources Control Board
TCB	Tricolored Blackbird
TMDL	total maximum daily load
ULV	ultralow volume
USACE	US Army Corps of Engineers
USDA	US Department of Agriculture
USEPA	US Environmental Protection Agency
USFS	USDA Forest Service
USFWS	US Fish and Wildlife Service
VCMS	Vector Control Management System
VOC	volatile organic compound
VPTS	Vernal Pool Tadpole Shrimp
VVOC	very volatile organic compounds
WEE	western equine encephalomyelitis
WNV	West Nile virus
WPT	Western Pond Turtle
WSnPl	Western Snowy Plover
WST	Western Spadefoot Toad

1 Introduction

This Responses to Comments/Revisions to Draft PEIR document has been prepared subsequent to the Draft Programmatic Environmental Impact Report (Draft PEIR) dated July 2015 for the proposed Integrated Mosquito Management Program (IMMP or Program) by the Alameda County Mosquito Abatement District (District or ACMAD). The Draft PEIR (State Clearinghouse No. 2012052037) identified the environmental consequences associated with a range of chemical and nonchemical treatment alternative methods/tools for its ongoing program of surveillance and control of mosquitoes, vectors of human and animal disease and discomfort. It includes discussion of best management practices (BMPs) to avoid and/or minimize potential impacts, additional proposed mitigation measures to reduce potentially significant impacts to less than significant, and one significant and unavoidable impact. The Responses to Comments/Revisions document presents responses to public comments received on the Draft PEIR, and it explains revisions to the Draft PEIR text and appendices, as necessary, in response to the comments or for clarification of technical information. The revisions to the Draft PEIR have been incorporated into a revised Final PEIR. **Together with the Final PEIR (April 2016), this Response to Comments/Revisions to Draft PEIR document constitutes the entire Final PEIR for the District's proposed IMMP.**

The District is the lead agency under the California Environmental Quality Act (CEQA) with responsibility for preparing responses to public comments and the Final PEIR. The Final PEIR is an informational document that must be considered by the District's Board of Trustees decision makers before approving or denying the Proposed Program. CEQA Guidelines (§15132) require the following contents for the Final PEIR:

a. Draft PEIR or a revision of the draft

b. Comments and recommendations received on the Draft PEIR, either verbatim or in summary

c. A list of persons, organizations, and public agencies commenting on the Draft PEIR

d. Responses of the lead agency to significant environmental points raised in the review and consultation process

e. Any other information added by the lead agency

1.1 Environmental Review Process

The District released the *Integrated Mosquito Management Program, Alameda County Mosquito Abatement District, Draft Programmatic EIR* on July 16, 2015 for public review (State Clearinghouse No. 2012052037). The Notice of Availability was sent to by the District to its mailing list of 170 agencies and organizations. Copies of the Draft PEIR on CD were distributed to the State Clearinghouse and to the Albany, Castro Valley, Dublin, Fremont Main, Livermore, Newark, Oakland Main, and Union City Public Libraries. The 45-day public review and comment period began on July 16 and concluded on September 4, 2015, which allowed for additional time after the official close of review by the State Clearinghouse on August 30, 2015. Time extensions for comments were granted to the Citizens Committee to Complete the Refuge and the California Department of Fish and Wildlife. All comments were received by September 17, 2015. During this public review period, the District held a public hearing on August 5th from 6:00 pm to 8:00 pm at the San Leandro Marina Community Center at 15301 Wicks Blvd., San Leandro, CA within the Program Area. No one appeared to provide oral comments.

The State of California Governor's Office of Planning and Research State Clearinghouse and Planning Unit provided a letter dated September 1, 2015 that the District has complied with the State

Clearinghouse review requirements for draft environmental documents pursuant to the California Environmental Quality Act. This letter is provided herein at the end of this chapter.

The Responses to Comments document of the Final PEIR is being circulated for a 10-day final review. Section 21092.5 of the Public Resources Code requires that the lead agency provide the "written proposed response" to a public agency on comments made by that public agency on the EIR at least 10 days before the lead agency certifies the document. See also State CEQA Guidelines §15088(b). The written response describes the disposition of significant environmental issues raised.

Following this review and receipt of any further comments, the District Board of Trustees will consider all comments and any additional responses from staff prior to certification of the Final PEIR. Certification is a finding that the PEIR complies with the requirements of CEQA. Following PEIR certification and prior to approval of alternatives to comprise the IMMP, the Board shall make findings for each significant environmental impact that are supported by substantial evidence in the record and shall adopt the Mitigation Monitoring and Reporting Program (MMRP).

Based upon material contained in the responses to comments and minor revisions of the Draft PEIR provided in the Final PEIR, recirculation of the PEIR is not required under the CEQA Guidelines §15088.5 because no new significant information is added to the PEIR, and under subsection (b) recirculation is not required where the new information added merely clarifies or amplifies or makes insignificant modifications in an adequate EIR.

1.2 Report Organization

This Responses to Comments document and Final PEIR contains the following chapters with a brief explanation of chapter contents.

> **Chapter 1. Introduction:** Introductory material on the CEQA process and public review of the Draft PEIR is provided along with a description of document contents. The State Clearinghouse letter is located at the end of this chapter.

> **Chapter 2. Key Comments and Master Responses:** This chapter organizes comments received from many commenters into 10 “key comments” and then provides responses to those key comments. Many of the public comments received during the public review of the Draft PEIR are overlapping or similar in content. This section identifies comments frequently raised by commenters and provides comprehensive responses to those comments. These responses help to clarify Program information and technical analyses and provide an overview of several important comments. They are referenced in the responses to individual comments as appropriate.

> **Chapter 3. Public Agency Comments and Responses:** Comments received from federal (1), state (1), and regional agencies (1) are provided with District responses following each letter or email.

> **Chapter 4. Organization Comments and Responses:** Two letters were provided from private organizations and special interest groups. District responses to comments follow each letter or attachments to a letter.

> **Chapter 5. Revisions to Draft PEIR:** This chapter presents minor revisions to text and appendices based on comments received or errors/errata discovered by the Draft PEIR preparers. None of these text changes results in any changes to the conclusions and determinations of significant impact. In other words, no “less than significant” impacts were changed to “potentially significant” or “significant and unavoidable” impacts.

The following is a list of all public agencies (coded F, S, R) and private organizations (coded O) who submitted written comments on the Draft PEIR during the comment period. Each letter is assigned a code that includes at least three letters for the agency or organization name.

Public Agencies

F-USFWS	United States Department of Fish and Wildlife Service, San Francisco Bay National Wildlife Refuge Complex
S-CDFW	California Department of Fish and Wildlife, Bay Delta Regions
R-ACWD	Alameda County Water District

Private Organizations

O-STF	SAVE THE FROGS!
O-CCCR	Citizens Committee to Complete the Refuge

STATE OF CALIFORNIA

GOVERNOR'S OFFICE *of* PLANNING AND RESEARCH

STATE CLEARINGHOUSE AND PLANNING UNIT

EDMUND G. BROWN JR.
GOVERNOR

KEN ALEX
DIRECTOR

September 1, 2015

Erika Castillo
Alameda County Mosquito Abatement District
23187 Connecticut Street
Hayward, CA 94545

Subject: Integrated Mosquito Management Program
SCH#: 2012052037

Dear Erika Castillo:

The State Clearinghouse submitted the above named Draft EIR to selected state agencies for review. The review period closed on August 31, 2015, and no state agencies submitted comments by that date. This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act.

Please call the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process. If you have a question about the above-named project, please refer to the ten-digit State Clearinghouse number when contacting this office.

Sincerely,

Scott Morgan
Director, State Clearinghouse

1400 10th Street P.O. Box 3044 Sacramento, California 95812-3044
(916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov

Document Details Report
State Clearinghouse Data Base

SCH#	2012052037
Project Title	Integrated Mosquito Management Program
Lead Agency	Alameda County Mosquito Abatement District
Type	EIR Draft EIR
Description	The District undertakes mosquito control activities through its Program to control all mosquitoes that may be vectors of disease and/or discomfort in the Program Area. In order to effectively control those mosquitoes, the District may potentially undertake control measures for yellow jacket wasps and noxious/invasive weeds.

Lead Agency Contact

Name	Erika Castillo		
Agency	Alameda County Mosquito Abatement District		
Phone	(510) 783-7744	*Fax*	
email			
Address	23187 Connecticut Street		
City	Hayward	*State* CA	*Zip* 94545

Project Location

County	Alameda			
City				
Region				
Lat / Long				
Cross Streets				
Parcel No.				
Township		*Range*	*Section*	*Base*

Proximity to:

Highways	
Airports	
Railways	
Waterways	
Schools	
Land Use	

Project Issues Coastal Zone; Recreation/Parks; Toxic/Hazardous; Vegetation; Water Quality; Wetland/Riparian

Reviewing Agencies Resources Agency; California Coastal Commission; Department of Fish and Wildlife, Region 3; Department of Parks and Recreation; San Francisco Bay Conservation and Development Commission; Department of Water Resources; California Highway Patrol; Caltrans, District 4; Department of Food and Agriculture; Air Resources Board; Regional Water Quality Control Board, Region 2; Department of Toxic Substances Control; Native American Heritage Commission; Department of Pesticide Regulation

Date Received 07/16/2015 *Start of Review* 07/16/2015 *End of Review* 08/31/2015

Note: Blanks in data fields result from insufficient information provided by lead agency.

2 Key Comments and Master Responses

2.1 Introduction

This chapter of the Responses to Comments document of the Final Programmatic Environmental Impact Report (PEIR) explains important comments from the public and the Alameda County Mosquito Abatement District's responses. It organizes comments received from several commenters into "key comments" and then provides responses to those key comments. Many of the public comments received during the public review of the Draft PEIR are overlapping or similar in content. This section identifies comments frequently raised by commenters and provides comprehensive responses to those comments. Subsequent sections will address each written or oral comment and provide individual responses that will refer back to these specific "master responses," as appropriate. In this manner, the public is provided an overview of comments and a coordinated response to facilitate a better understanding of important concerns and issues on the District's proposed Integrated Mosquito Management Program.

A number of the key comments are focused on the potential chemical control options under the Vegetation Management and Chemical Control Alternatives as components of the District's overall Proposed Program. The chemical active ingredients associated with the lists of potential pesticide/herbicide products for use by the District have undergone several levels of testing to determine potential toxicity to humans, wildlife and vegetation. The intended and expected use of each chemical, its likely mosquito/vector target, and many of the potential nontarget receptors are usually included in the tests. While each listed chemical has had numerous toxicity values generated for a multitude of animal and plant species and human receptors, it was not feasible to include and address all the possible data published for all active ingredients and all species/receptors. Those reviewed and evaluated as potential products (active ingredients) are listed in Table 6-1 of the Appendix B included as a part of the PEIR. The values in Table 6-1 have been included to represent a realistic set of potential species that might be affected by exposure to typical applications used for mosquito control by the District.

Numerous additional toxicity data are available in a multitude of publications, particularly the several compendia produced by the USEPA, the European Union, Canada and the many state and national environmental regulatory agencies. Appendix B, Chapter 7 References includes a list of many of those additional sources, some of which were reviewed but not considered critical or important additions to the relevant use and application scenarios. As in all determinations of the potential toxic effects of a chemical, the key is the exposure to the chemical in the environment, regardless of the potential hazard (toxicity) demonstrated in laboratory tests.

Additional publications have been reviewed since the original work on the PEIR was completed and in response to public comments. These are included in this Final PEIR as Attachment A, Additional Literature Review. They are listed with summaries of potential toxicity to nontarget receptors. Each of these additional publications, including the studies suggested by the commenters, have been considered in the overall determination of the potential hazards of each chemical application scenario. Those additional studies that address the potential toxicity of a product or active ingredient that also reflect reasonably foreseeable exposure concentrations and/or reasonably foreseeable possible length of exposure when used as proposed in the District's Program are addressed and included in the responses below for the Final PEIR.

2.2 Key Comments and Master Responses

All of the agency and organization comments have been reviewed to identify those issues, concerns, and questions that were raised by several commenters. The District has prepared 10 topics as "key comments" and has prepared comprehensive responses to those issues (i.e., master responses). A list of

the master response topics is provided first, followed by each response. These responses help to clarify Program information and technical analyses. Each response begins with a concise summary of the issues raised by the key comments. Then the Master Responses are referred to in the responses to agency and organization comments as appropriate. The master response topics are:

> A: Program Alternatives Terminology

> B: Preferred Alternative

> C: Use of BMPs in Impact Analysis

> D: Protocol Surveys by a Qualified Biologist

> E: Limitations of the CNDDB

> F: Maps of Areas Where Mosquito Management Activities Occur

> G: Water Quality and BMPs

  - 1. Aquatic buffer (15 ft inadequate)
  - 2. Buffers for unintentional drift/no spray zones

> H: Glyphosate

> I: Nonylphenol Polyethoxylate Impacts to Aquatic Species/Amphibians

> J: Spinosad Impacts to Nontarget Species

A: Program Alternatives Terminology

Comment

The use of the term “alternatives” under the Proposed Program Alternatives is misleading and suggests they are separate from one another when they would be combined into one comprehensive alternative. Also, Program activities are optional components of the Program, not alternatives to the Program as a whole. CEQA alternatives to the entire Program are presented insufficiently.

Response

The alternatives terminology referenced in this comment is explained further and clarified herein. Traditionally, CEQA documents have the resource chapters examine the entire program/project for environmental impacts based on applicable environmental topics or concerns. Then, alternatives to the proposed program/project that would reduce or avoid any significant impacts and no program/no project are discussed in a separate chapter that may be supplemented by an appendix on the alternatives selection process explaining how the proposed program/project was developed. This traditional format is followed in the District’s document. Chapters 3 through 12 discuss the environmental impacts associated with the Proposed Program in its entirety, while alternative programs are described in Chapter 15.

The proposed project is a continuation of the District’s ongoing Program for mosquito management. The District currently employs a Program consisting of five alternatives (which the Draft PEIR characterizes as “tools” or “components” of the overall Program), that are implemented as necessary and appropriate based on the Program needs and objectives. These Program alternatives are groups of related or similar activities by type. The District has hundreds of sites that it monitors on a regular basis for mosquito abundance, species, and life cycle. At each site where treatment is needed, the District has to determine which of the alternative components within its Program is best suited to dealing with the mosquito problem. As described in the Draft PEIR, the District’s management practices emphasize the fundamentals of integrated pest management (IPM), specifically integrated mosquito management (IMM),

which involves the use of multiple tools, including source reduction (physical control), habitat modification, and biological control, when appropriate before using pesticides. So on a site-specific basis, the District selects from its nonchemical control alternatives first, then from its chemical control alternative, if necessary. Site conditions, including the potential for special status species to be present, affect the alternative(s) selected for application.

The PEIR's use of the term "alternatives" in the context of the project description is described in Chapter 2, Program Description, as alternative components of the proposed Integrated Mosquito Management Program (IMM Program or Program). The role of these alternative components in the Program is described in Chapter 2, Section 2.3, page 2-5, which explains:

> The District has, since its inception, taken an integrated systems approach to mosquito control, utilizing a suite of tools that consists of surveillance, vegetation management, and physical, biological, and chemical controls along with public education. These Program "tools" or components are described in the subsequent subsection as "Program alternatives" for the CEQA process (except for public education, which is exempt from CEQA).

Section 2.3, page 2-6, further explains:

> The District's Program consists of the following alternatives, which are general types of coordinated and component activities, as described below: surveillance, physical control, vegetation management, biological control, and chemical control. The Proposed Program is a combination of these alternatives with the potential for all of these alternatives to be used in their entirety along with public education.

Thus, the contention that the EIR's use of "alternatives" in the context of the project description and environmental analysis suggests the program components "are separate from one another when they would be combined into one comprehensive alternative" is not correct. These Program components are distinguished as alternatives in separate sections of each impact chapter to ensure that they are fully evaluated on a comparable basis, in similar depth, and so that impacts are explained clearly for each resource or environmental topic. This approach was selected because the various alternative components of the Program (e.g., Vegetation Management, Water Management, etc.) differ in their objectives, method and potential impacts. Each resource chapter considers the environmental impacts of the same Program alternatives or "components." While the District could have referred to its suite of proposed tools as "components" rather than "alternatives," that choice would not have changed the analysis nor would it have affected the District's separate evaluation of CEQA alternatives that would avoid or substantially lessen the significant environmental impacts of the Project, which was provided in Chapter 15.

CEQA alternatives to the Proposed Program are thoroughly addressed in Chapter 15, Alternatives, which describes CEQA requirements, the process used for screening alternatives (Section 15.1), alternatives that were considered but rejected from further consideration (Section 15.2), impacts of the No Program Alternative (Section 15.3), and alternatives that would avoid or substantially lessen the significant environmental effects of the Program (Section 15.4). Two such alternatives were identified: the Reduced Chemical Control Alternative Program (Section 15.4.1) and the No Chemical Control Program (Section 15.4.2). The impacts of the Proposed Program and these "alternative programs" were compared (Section 15.5). From this comparison, the environmentally superior alternative was identified and reported in the Program Alternatives Section of Chapter 2 under subsection 2.7.4 and in the Summary Chapter (Section S.5.3). Thus, all of CEQA requirements for alternatives were addressed.

B: Preferred Alternative

Comment

It is not clear what the Preferred Alternative is or how it differs substantially from other alternatives. The commenter desires a preferred alternative comprised of "methodologies within each element that provide the greatest economically and logistically feasible control with the least environmental harm.

Response

The term "Preferred Alternative" is not used in the PEIR because it is not required under CEQA and used more commonly under the National Environmental Policy Act (NEPA) by federal agencies in their Record of Decision. The Proposed Program in its entirety is sufficiently described in Chapter 2, Program Description. Details regarding the components comprising the Program are included in Section 2.3, Proposed Program. Alternative Programs are described in Chapter 15, Alternatives. As required by Section 15126.6(a) of the CEQA Guidelines, alternatives were identified that "could feasibly attain most of the basic project objectives and would avoid or substantially lessen any of the significant environmental impacts of the proposed project." Two alternative programs were identified that potentially could perform this role, although the No Chemical Control Alternative was found to not meet the District's Program objectives and IMM principles, and it could lead to substantial impacts to human health due to the reduced effectiveness of the Program in controlling mosquito populations. This alternative was therefore not considered to be environmentally superior. Section 2.7.4, pages 2-45 and 2-46, identifies the environmentally superior alternative, noting that:

> To the extent the District can modify elements of the Chemical Control Alternative to mitigate identified impacts by avoiding ~~completely~~ the potentially significant impacts associated with some pesticide products by using less of any of these products or by eliminating one or more them in favor of other, less odorous products, then the **environmentally superior alternative would be a Program incorporating these modifications to this alternative as components of the overall IMMP as long as Program effectiveness is maintained.** Excluding air quality and the odor issue, the impacts to all of the other resources would be the same as for the proposed Program. Since naled would only be used when absolutely necessary to protect public health, there is no reduced chemical option.

Thus, the environmentally superior alternative is logistically feasible and causes the least environmental harm. It remains to be determined by the District if any of the chemical options can be eliminated, but it is possible that changes in the adulticides/other insecticides used can be implemented without substantial risk to overall Program effectiveness from pesticide resistance. CEQA does not require an analysis of the most economically feasible alternative. In fact, CEQA is not concerned with socio-economic impacts except where these impacts can be related to a physical change in the environment.

The District may modify its Proposed Program based on public comments or other factors such that the program that is ultimately approved may be different from the Proposed Program described in the Draft PEIR. The District will make findings of fact on the Program to be approved following certification of the PEIR.

C: Use of BMPs in Impact Analysis

Comment

CDFW states that many of the Best Management Practices (BMPs) listed in Table 2-6 do not adequately minimize or avoid impacts to special status species or their habitats. For example, BMP C2 should state the minimum amount of vegetation removal and the minimum amount of excavation, fill, or construction activity to minimize/avoid loss of SMHM. Therefore, the PEIR needs to adequately analyze all potential

impacts and include appropriate avoidance measures and minimization and mitigation measures for impacts that cannot be completely avoided.

Response

The District has been engaged in mosquito control since 1930. The current Program is being evaluated as the Proposed Program along with additional activities or chemical treatments that the District would like to have available for use in the future. The BMPs have evolved over many years of practice and coordination with wildlife refuge managers and USACE on previous permits including measures to minimize disruption to special status species and their habitats. In some cases, the BMPs are less specific than similar mitigation measures to provide for flexibility in dealing with a variety of sites. In other cases, they are very specific; i.e. do not allow for deviation from product application label requirements. The District has agreed to these BMPs and is using them in the current Program.

It is possible District BMPs could be modified over time to meet resource agency requirements or site conditions. For example, the process for renewing the District's 5-year regional permit with the USACE and its Supplemental Use Permit for mosquito control on USFWS lands will identify more specific requirements. The USACE permit application is submitted to CDPH who then sends it to the resource agencies, including CDFW. The District will continue to coordinate with CDFW on future refinements to BMPs to address specific habitat or site conditions, including provisions for vegetation and sediment removal in drainage channels and ongoing responsibilities for maintenance of the affected areas.

D: Surveys by a Qualified Biologist

The District received several comments addressing the need for surveys by a qualified biologist with regards to special status species, off-road vehicle usage, and vegetation removal. Below are examples of such comments.

Comments D1, D2, D3

D1: CDFW recommends that surveys be conducted by a qualified biologist in possession of the appropriate permits during appropriate breeding/nesting/blooming seasons for each special status species that could be present prior to any Project activity.

D2: If vehicles are required to go off-road, a survey, conducted by qualified botanists at the appropriate time of year to avoid impacts to listed plants, should be conducted to identify any special status plants.

D3: The value of the CNDDB is limited to areas where surveys have been conducted in the past and data has been submitted and the same is true for other online sources, therefore, surveys should be conducted prior to vegetation removal.

Responses D1, D2, and D3

ACMAD has been performing mosquito management at the same or similar sites since 1930, and current staff are very experienced with the access points, habitats affected, and potential for special status species occurrence in the District's more sensitive habitat areas. After almost a century of work in and around sensitive habitat areas the District has no evidence to suggest that its activities are having adverse effects on the species or their habitats. The District attributes its success in providing effective public health protection while also safeguarding sensitive species and their habitats to the high level of training, education, adherence to scientifically sound BMPs and ongoing coordination and consultation with resource agencies with specialized expertise.

The District values education and it emphasizes and provides for specialized training of staff relevant to its mission and duties. The District makes available and requires that its staff receive and successfully complete annual health and safety training, as well as continuing education concerning Alameda County ecological systems, sensitive habitats, and special status species. This training comes in the form of: (1)

formal sit down and out in the field sessions with biologists, ecologists, and recognized experts in the field (including resource agencies); (2) continuing education classes; (3) seminars and webinars; and (4) sessions with management and the District scientist.

The term “qualified biologist” lends itself to subjective interpretation and evaluation. Different institutions, and for that matter individuals, will have different requirements for course work, training, experience, and even specialization in order to meet their definition of “qualified or professional biologist.” Although most District staff do not hold a degree in biology, they have had and continue to receive District sponsored and funded education that allows them to understand the environments within which they perform their work. Emphasis is placed on identification and recognition of special status species and sensitive habitats, and on how to perform their work in such a manner as to preserve natural resources while also effectively managing mosquito populations. The District also maintains a large library of specialized journals and books concerning birds, insects, plants, mammals, aquatic organisms, and vector identification and management that is readily available to all staff for their use. Research and curiosity is encouraged and supported.

The District believes that its ongoing program and standards for staff education and training are adequately protective of sensitive species and their habitats. However, to address the concerns raised in the comment, the District reiterates and clarifies its commitment to the following policies and currently implemented practices.

- District staff members holding the position of Biologist, Scientist, or higher, who must also have a degree in the biological/ecological sciences from an accredited institution, will utilize the CNNDD as a baseline (starting point) to begin the assessment of sites for presence and potential presence of special status species. Use of HCP and NCCP documents (including adjacent counties), reports (published and unpublished) by consultants and research scientists, and consultations with biologists and resource agency personnel will also be utilized to verify data, observations and update the District’s information concerning special status species and sensitive habitat areas. This information will then be used to determine whether additional assessment(s) may be needed to support the District’s goal of protecting sensitive biological resources while also providing effective integrated mosquito management for a given site. If in the professional judgment of the District’s biologist/scientist, additional assessment and/or protective measures are necessary to assure identification and protection of special status species, the District will implement such assessment and/or protective measures. The District biologist/scientist must also undergo specific special status species-related training by resource agency staff (e.g., avoidance and recognition training), be able to effectively communicate District operations to resource agency staff and biologists, as well as convey information obtained to the District’s field staff. Staff members at ACMAD who do not have this specialized knowledge and experience will work under the direction of the District’s biologist/scientist that has knowledge and training concerning special status species and sensitive habitats. Consistent with its current operations, District staff members will implement the BMPs stated in the PEIR in habitats where special status species may be present (whether confirmed or suspected). The District biologist/scientist(s) will regularly communicate with District staff regarding confirmed and potential locations of special status species as well as the precautionary measures to be implemented. The District has performed its IMMP at sites currently known to support mosquito production (e.g., tidal marsh, seasonal wetlands, riparian corridors) for many years and has ongoing communications with resource agency staff. If mosquito activity is discovered or suspected at new sites relevant to the District’s operations and interagency communications, the District will contact the appropriate resource agency staff to coordinate its activities and minimize impacts to sensitive habitats and species.
- District will regularly communicate with resource agency staff regarding mosquito management operations, and flora and fauna in sensitive habitats (BMPs A1 and A2) which will also assist in determining the likelihood that special status species occur in a given area.

Given the size of the District's Service Area and the hundreds of individual surveillance and control sites that the District covers, the District cannot commit to performing "protocol" surveys at all locations for surveillance and for every treatment. Moreover, protocol level surveys at all treatment locations are not necessary to ensure that impacts to sensitive species and their habitats will be less than significant. Implementation of the protective measures included through the BMPs and additional measures described above, are sufficient to ensure that the District's ongoing program activities will not have a substantial adverse effect on sensitive species or their habitats.

The PEIR analysis assumes that presence will be determined before physical or vegetation management "treatment" is conducted based on the BMPs. For selected Physical Control or Vegetation Management treatments, i.e., those which may require permits from CDFW, USFWS, USACE, or RWQCB, surveys will be conducted using the latest databases (CNDDB and District), published reports, and consultation with resource agency staff. ACMAD will assume presence for surveillance activities.

ACMAD understands that CDFW and the Citizen Committee to Complete the Refuge want assurance that the biological surveys will be able to adequately determine presence of a special status species if potentially present. Surveys would be species-specific (i.e., fish, frogs, salamanders, various birds, plants, etc.) and somewhat habitat-specific and could be generalized for many groups of organisms (i.e., floristic surveys for plants in the appropriate seasons; possible protocol surveys for those species for which they are available such as CRLF, CTS, etc.; visual surveys for birds; etc.). However, it is known and understood that protocol surveys can be quite intensive, time-consuming (over multiple seasons or years), and costly, and the District does not have the financial resources to do them for its ongoing mosquito management activities (in contrast to the permanent, construction-related activities of land development or utility pipeline projects where protocol surveys are most often performed). For some species, a survey may require capture of the species, which would require special permits (i.e., fish in waters with low visibility), which would be infeasible in light of the time sensitive nature of the District's mosquito management activities when preparing for mosquito control outside of the wildlife refuges/management areas. Inside the refuges, District staff contact and work with the appropriate refuge staff to review control activities to be performed and rely on the refuges' surveys and data for special status species.

Specific survey protocols for special status species and their habitats can be developed for those specific sites determined to require such surveys and in consultation with CDFW. A District staff biologist with approved training for a particular species (or other approved biologist) would conduct the initial evaluation for sites that may require protocol surveys. Protocol surveys would need to be done by an approved biologist. Criteria for the initial evaluation would be developed in consultation with CDFW (and USFWS and NMFS as needed) and could be incorporated into the MMRP. District staff will meet with CDFW to review sites most often requiring physical/vegetation control measures and develop a plan for determining presence of special status species or presuming presence of such species and what additional protection measures (if any) are needed.

E: Limitations of the CNDDB

Comment

The CNDDB is a positive-sighting database. However, many areas in California have still not been surveyed for many special status species, so the CNDDB does not provide an exhaustive list of species distribution. The value of the CNDDB is limited to areas where surveys have been conducted in the past and data has been submitted and the same is true for other online sources.

Response

Regarding comments on the District's approach to the evaluation of special status species occurrence, the District acknowledges that lack of identification in CNDBB or other databases is not conclusive

evidence that no sensitive species are present in potential treatment areas, or that they necessarily would not be in the future. However, the District presumes presence where suitable habitat occurs based on biological investigations, which may include some protocol surveys at selected locations where District activity is of greatest concern. Moreover, visual observations by staff in the field can assist in minimizing impacts and in expanding the locations of special status species observations (C7, D8, E4, F4).

Given the large size of the Program Area and the number and diversity of sites treated, it is not feasible for the District to conduct detailed surveys at every location. The District is doing everything feasible short of this to determine the potential presence of special status species through advance research and onsite visual observations by trained staff at the time of surveillance and control/treatment. The District also is implementing every feasible precaution and BMP to avoid or minimize impacts to special status species.

Information from databases is just one tool to assess potential impacts (see Response D above). Because the PEIR covers a long-term, ongoing program over a vast area (522,240 acres or 812 square miles), it is not feasible to know now whether a protected species will be present in a potential treatment area at the time treatment is proposed. For this reason, the Draft PEIR identifies the types of species that may be present in the Program Area and their habitat (Tables 4-3 and 4-4), and impacts are evaluated by habitat type and type of activity, based on the potential species that could occur in those habitat types.

District policy is that its IMMP be an adaptive management program protecting sensitive species and habitats while also providing effective mosquito management that utilizes IPM principles. BMPs, which are an integral part of the Program, are designed to ensure that the potential for special status species to occur is assessed on an ongoing basis throughout the life of the IMMP, relying on a combination of tools including database searches, individualized habitat assessment and, where indicated based on habitat type, site-specific inspection and/or surveys, as warranted, as well as ongoing discussion of the District's activities with resource agencies. BMPs are regularly reviewed and updated to reflect the best available information and science. Furthermore, it is District policy that new BMPs be developed and added as needed to address new species and habitats of concern. See also Response D above.

F: Maps of Areas Where Mosquito Management Activities Occur

Comment

A map of where activities/alternatives occur, especially by habitat type would be informative.

Response

The District relies on an adaptive management approach for its mosquito control efforts so maps may not properly reflect where activities/alternatives may be occurring within the District's Service Area. Maps are static, whereas the locations creating mosquito issues change from season to season based on where standing water collects. For certain activities (e.g. maintaining ditches in coastal marshes) maps are required as a part of the annual permitting process. However, locations for source reduction activities can change from year to year. Due to the nature of a Programmatic EIR and the many variables that must be considered when implementing a IPM program (mosquito species that are active, their population size or density, their age structure, location, time of year, local climate and weather, potential for mosquito-borne disease, proximity to human populations, etc.) the accuracy of maps would be highly variable.

G: Water Quality and BMPs

The District received several comments addressing the adequacy of proposed buffer areas between the application of a pesticide and aquatic habitat/water body. These are divided into two comments with responses for each.

Comment G1

A no spray application within 15 ft of the aquatic feature or habitat is an inadequate buffer to keep pesticides out of the water.

Response G1

CDPR coordinates endangered species protection strategies with the Department of Fish and Wildlife, the Department of Food and Agriculture, and the county agricultural commissioners in accordance with the *California State Plan for Protection of Endangered Species from Pesticide Exposure* (CDPR 1995). CDPR protection strategies are subject to USEPA authorization and US Fish and Wildlife Service approval. CDPR and USEPA requirements are based on assessment of peer-reviewed data submitted by the scientific community. Issues assessed include ecological toxicity to nontarget species, including aquatic invertebrates, fish, birds, and mammals, and effects from application practices such as pesticide drift. These assessments are updated periodically, so that new information from recent studies are used to inform pesticide use restrictions and label requirements.

The USEPA has been subject to several citizen suits, which has required the USEPA to conduct additional scientific assessments and make effects determinations for numerous pesticides, including assessing the effects of products containing any of:

> 36 pesticide active ingredients to listed salmon and steelhead.

> 66 pesticide active ingredients to California red-legged frog.

> 75 pesticide active ingredients to 11 species in the greater San Francisco Bay area.

Interim protective measures were put into place by the courts, establishing no-spray buffers during pesticide application near specific species habitat, until these assessments and biological consultation are complete. (Although some assessments are still pending, completed assessments can be found at: http://iaspub.epa.gov/apex/pesticides/f?p=CHEMICALSEARCH:23:0.) These no-spray buffers were established primarily for agricultural applications. Specific exemptions or modifications were put into place for low risk application practices. No buffers are required when pesticides are applied as part of a public health vector control program and only minimal buffers apply for invasive species and noxious weed control programs, such as15-foot buffers near California red-legged frog aquatic breeding critical habitat or non-breeding aquatic critical habitat (USEPA 2015; Moreno 2007).

The District applies all chemicals in strict conformance with label requirements, which have been approved by California Department of Pesticide Regulation (CDPR) for use in California. Pesticide labels are application requirements and include instructions informing users how to apply the product and precautions the applicator should employ to protect human health and the environment (which include limiting the potential for drift). Pesticide applications would comply with label restrictions on application rates and methods, storage, transportation, mixing, and container disposal.

Chemicals used for mosquito control are applied in conformance with a Pesticide Application Plan (PAP) as required by the National Pollutant Discharge Elimination System (NPDES) Permit for Biological and Residual Pesticide Discharges to Waters of the US from Vector Control Applications (Vector Control Permit). Permitted larvicide active ingredients for mosquito abatement include monomolecular films, methoprene, *Bacillus thuringiensis* subspecies *israelensis* or Bti, *Bacillus sphaericus* or Bs, temephos, petroleum distillates, and spinosad. Permitted adulticide active ingredients for mosquito abatement include malathion, naled, pyrethrin, deltamethrin, lambda-cyhalothrin, permethrin, resmethrin, sumithrin, prallethrin, the synergist piperonyl butoxide (PBO), etofenprox, and N-octyl bicycloheptene dicarboximide (MGK-264). All BMPs included in the PAP and product labels are implemented by the pesticide applicator.

Algaecides and aquatic herbicides would be applied in conformance with an Aquatic Pesticide Application Plan (APAP) as required by the NPDES Permit for Residual Aquatic Pesticide Discharges to Waters of the

US from Algae and Aquatic Weed Control Applications (Weed Control Permit). Permitted algaecides and aquatic herbicides include 2,4-D, acrolein, copper, diquat, endothall, fluridone, glyphosate, imazamox, imazapyr, penoxsulam, sodium carbonate peroxyhydrate, triclopyr-based algicides and aquatic herbicides, and adjuvants containing ingredients represented by nonylphenol. All BMPs included in the APAP and product labels would be implemented by the pesticide applicator.

The District implements label requirements and additional BMPs to reduce adverse effects to surface-water and groundwater resources from the applied chemicals during and following pesticide applications. To minimize the amount of pesticide applied, pesticide applications are informed by surveillance and monitoring of mosquito populations. Materials are applied at the lowest effective concentration for the environmental conditions. For non-Ultra Low Volume (ULV) applications, spray nozzles are adjusted to produce larger droplet size, low nozzle pressures are used where possible, and spray nozzles are maintained at a predetermined maximum distance from target areas. ULV applications sprays are calibrated for the proper droplet size. Applicators are aware of wind conditions to minimize unwanted drift to waterbodies and adjacent areas, and avoid applications when there are likely potential rain events, when rain is a determining factor on material application (e.g., Bti and methoprene products). If special status aquatic wildlife species are potentially present, only pesticides and adjuvants approved for aquatic areas are applied within a predetermined distance from aquatic features. District staff monitors sites post-treatment to determine if the target weeds or vectors are effectively controlled with minimum effect to the environment and nontarget organisms. This information is used to help design future treatment methods in the same season or future years to respond to changes in site conditions. Implementation of these BMPs reduce unwanted exposure of applied chemicals to surface-water and groundwater resources during and following application of the material as demonstrated by water quality monitoring activities discussed below following Table 2-1.

Many pesticides used for mosquito control are formulated to be applied directly to waterbodies, while others are intended only for terrestrial uses. In both cases, the label provides specific instructions for application of the material. These label requirements are based upon information submitted to the USEPA from the scientific community for each active ingredient. In general, the BMPs used by the District are determined by the label requirements, although additional measures may be used. See Table 2-1 below for examples of pesticide label requirements, including measures used to prevent unintentional drift.

Table 2-1 Examples of Pesticide Label Requirements

Pesticide Product	Active Ingredient	Label Requirements
Larvicides		
BVA 2 Mosquito Larvicide Oil	Mineral Oil	> A variety of factors (e.g., wind direction, wind speed, temperature, and relative humidity) and method of application (e.g., handgun, hand wand, ground or aerial) can influence pesticide drift. The applicator must evaluate all factors and make appropriate adjustments when applying this product. Do not apply at wind speeds greater than 15 mph at the application site. Do not make applications into areas of temperature inversions or stable atmospheric conditions. Apply as a medium or coarser spray, and the minimum volume mean diameter for spinning atomizer nozzles.

Table 2-1 Examples of Pesticide Label Requirements

Pesticide Product	Active Ingredient	Label Requirements
Natular 2EC™	Spinosad	> The following spray drift management requirements must be followed to avoid off-target drift movement from applications. > The boom width must not exceed 75% of the wingspan or 90% of the rotor blade. > Nozzles must always point backward, parallel with the air stream, and never be pointed downward more than 45 degrees. > Making applications at the lowest height that is safe reduces exposure of droplets to evaporation and wind. > Do not apply when wind speed favors drift beyond the treatment area.
Adulticides		
Pyrenone 25-5	Pyrethrins	> Both ground and aerial application should be made when the meteorological conditions create a temperature inversion and wind speed does not exceed 10 miles per hour. The application should be made so the wind will carry the insecticidal fog into the area being treated.
Allpro Evoluer 4-4 ULV	Permethrin	> Treat when mosquitoes or insects are most active and weather conditions are conductive to keeping the fog close to the ground (e.g., cool temperatures and wind speed are not greater than 10 mph). Apply when wind speed is greater or equal to 1 mph. Applications during the cool hours of night or early morning are preferable. Do not apply when air temperature is below 50˚ F. When this product is applied as a barrier application using low pressure hand sprayers, hydraulic sprayers or ground ULV equipment, do not apply within 100 feet (30 meters) of lakes and streams.
Anvil 10+10 ULV	Sumithrin	> For best results, apply when mosquitoes are most active and weather conditions are conducive to keeping the fog close to the ground. Application in calm conditions is to be avoided. Apply only when ground wind speed is greater than 1 mph. Air temperature should be greater than 50°F when conducting all types of applications. Aerial equipment: Spray equipment must be adjusted so that the volume median diameter produced is less than 60 microns and that 90% of the spray is contained in droplets smaller than 115 microns.
Zenivex E4 RTU	Etofenprox	> Apply when wind is greater than or equal to 1 mph. Do not apply when wind speeds exceed 10 mph. A temperature inversion is preferable to keep the fog close to the ground and applications should be made when labeled insects are most active. Conduct applications when temperatures are between 50-95° F. Aerial applications: Spray equipment must be adjusted so that the volume median diameter produced is less than 60 microns and that 90% of the spray is contained in droplets smaller than 100 microns. Apply at altitudes from 100-300 feet.

Table 2-1 Examples of Pesticide Label Requirements

Pesticide Product	Active Ingredient	Label Requirements
Dibrom 8 Emulsive Naled Insecticide	Naled	> Do not apply over bodies of water (lakes, rivers, permanent streams, natural ponds, commercial fish ponds, swamps, marshes or estuaries), except when necessary to target areas where adult mosquitoes are present, and weather conditions will facilitate movement of applied material away from the water in order to minimize incidental deposition into the water body. To minimize hazard to bees, avoid applying more than 2 hours after sunrise or 2 hours before sunset, limiting application to times when bees are least active. Aerial applications: Spray equipment must be adjusted so that the volume median diameter is less than 75 microns and that 90% of the spray is contained in droplets smaller than 145 microns.

Ongoing monitoring efforts by the District continue to show effective control of target species with no observed effects to nontarget species. In addition, monitoring efforts by the District and other vector control agencies in 2011 to 2012 found almost no differences in visual observations or physical measurements between background, event, and post-event observations that could not be explained by diurnal factors or subjective observations by different field personnel (Mosquito and Vector Control Association of California 2013). The single exception in more than a hundred visual observations and physical monitoring samples was an observation of “light” water surface oils following application of monomolecular films in an agricultural setting – effects to nontarget species were not observed. The results of the chemical monitoring of the active ingredients applied by the District were similar. A few samples exceeded monitoring triggers, but an associated ecotoxicology study found no water toxicity during those application events (Mosquito and Vector Control Association of California 2013). As discussed in the Vegetation Management and Chemical Control alternatives, implementation of District BMPs will minimize adverse effects and substantially avoid degradation of water quality.

Comment G2

Buffers for adulticide applications need to be large enough for unintentional drift into areas harboring threatened or endangered species. One study found naled residues downwind in no spray zones established in the Florida wildlife refuge to protect these species and several butterflies and pollinators (Hennessey et al. 1992).

Response G2

One of the comments refers to a study that found pesticide drift after aerial fogging of naled in Florida (Hennessey et al. 1992). Although this study describes some of the physical conditions associated with the pesticide application (such as application rate and altitude) and indicates that the wind was “blowing,” it is unclear if the BMPs used during the pesticide application were the same as those required in California by current pesticide labels.

Pesticide drift is an issue that has been studied by the scientific community, as well as by the USEPA and CDPR. Pesticide formulations designed for aerial, truck-mounted, and/or backpack spray applications have spray drift management requirements specified on the product labels (see Table 2-1 above under Response D1 for example label requirements). The District applies all chemicals in strict conformance with label requirements and implements required spray drift management BMPs, such as restricting aerial applications to specific altitudes during specified wind and temperature conditions and using equipment calibrated for the appropriate droplet size and nozzle orientation. As discussed in Response G1, the

District uses spray drift management BMPs, in combination with ongoing visual monitoring efforts, to evaluate site-specific conditions and reduce unwanted exposure of applied chemicals to nontarget species. In the specific case of naled applications, the District's use of this pesticide is limited to cases where resistance to pyrethoid products have been confirmed.

H: Glyphosate

Comment

Comments on the use of the herbicide active ingredient glyphosate as a vegetation management tool for control of vector habitat include the following:

Concern with the use of glyphosate near wetlands and aquatic areas because it is toxic to aquatic life and can have negative effects on amphibians especially tadpoles and CRLF. See the review conducted by the North Carolina Partners in Amphibian and Reptile Conservation. (http://www.ncparc.org/pubs/Herbicide%20Choices%20&%20Amphibian%20Conservation.pdf). For effects on tadpoles also "The Lethal Impact of Roundup on Aquatic and Terrestrial Amphibians" by Rick A. Relyea published in Ecological Applications, 15(4), 2005, pp. 1118–1124).

Response

Both of the reports cited in the preceding paragraph are focused on determining the potential impact of glyphosate and glyphosate products on several life stages of amphibians and the habitats they usually inhabit. Both reports suggest adverse effects, using both high doses and numerous sequential lower doses in their laboratory studies. In addition to studying these temporal and dose related exposures, the use of mesocosms (outdoor studies in confined ponds) is said to expand the results of the laboratory studies to more realistic environmental conditions. However, even in these reports the exposure parameters are far in excess of the possible dose that would be received by amphibians in a real environmental application by the District. Also, concerning "The Lethal Impact of Roundup on Aquatic and Terrestrial Amphibians" by Rick A. Relyea published in Ecological Applications, 15(4), 2005, pp. 1118–1124, this paper's conclusion is far from appropriate. The exposures used were direct overspray of the mesocosm units which is completely arbitrary and unrealistic if the author intends to extrapolate the results to field exposures. The applications used in the Relyea report resulted in considerably more potential exposure to the test species than would be expected to be associated with typical District applications. Typical of such mesocosm studies, the purpose was to provide a large exposure to the mesocosm ponds resulting in little actual relationship to the careful, focused hand applications that would be utilized by the District.

While it has been reported that the addition of some surfactants to the base chemical glyphosate may make the products more toxic to some biota, the primary concern for red-legged frog is toxicity based on high, continuous exposures in the laboratory tests. The exposures in the laboratory studies are clearly not representative simulations of the potential exposures in field applications because the laboratory studies involve captive test species, unable to choose uncontaminated food or habitat. Many laboratory tests are designed and conducted to determine the 'worst-case" exposure to a chemical and then to lower the test concentrations slowly until a test concentration shows no adverse effect to the test animals (USEPA 2012b; Williams et al. 1994). In this way, the concentrations that produce exposures with little or no adverse response can be documented and used to define the applications that should be safe to the animals and environment. As in all of the relevant laboratory toxicity studies, the exposures in laboratory conditions are essentially 100% with no ability to choose areas of lessor concentrations, and use non-representative exposures. The primary causes identified as leading to an adverse impact on the status of the threatened California red-legged frog are loss of habitat and overwhelming predation, invasive species, and competition for foraging items (NWF listings). The potential impact of glyphosate on the CRLF is marginal and only applicable in situations of excess exposure to incorrectly treated areas; the toxicity reported in laboratory studies would not be expected to occur as a result of the District herbicide

applications for mosquito control in the field, because of the much lower potential exposures and District's adherence to its BMPs. Special care is taken to avoid applications where CRLF have been identified and reported by resource agency personnel or District biologists based on observations and database investigations.

I: Nonylphenol Polyethoxylate Impacts to Aquatic Species/Amphibians

Comment

The use of the product R-11® Spreader Activator should be discontinued due to its negative effects on native aquatic species. The active ingredient in R-11® Spreader Activator, nonylphenol polyethoxylate, has been linked to estrogenic effects in wildlife, including aquatic species, such as fish and amphibians (USDA Forest Service 2003). In addition, R-11® has been shown to be moderately toxic to tadpoles (Trumbo, J. 2005. An assessment of the hazard of a mixture of the herbicide Rodeo® and the non-ionic surfactant R-11® to aquatic invertebrates and larval amphibians. California Fish and Game 91:38-46).

Response

This topic is also covered in the Appendix B main Section 4.6.2 on glyphosate and glyphosate products. Review of the cited report (USDA Forest Service 2003) suggests that the potential for additional or a different level of toxicity to selected nontarget species (amphibians) is of concern but is not clearly supported. It is apparent that many of the products that contain surfactants and emulsifiers may exhibit toxicity characteristics different than the glyphosate products without additives against amphibians (Kiesecker et al. 2001). The listed tests have been conducted in laboratories, and the results do not reflect the likely exposures in the environment. Although this is a very active area of research, there are, to date, no definitive studies that clearly provide a statistical, uncompromised, causality of the toxicity of the additives versus the toxicity of the active ingredient glyphosate. Each glyphosate formulation is carefully screened for potential adverse effects by the District as a part of the process for selecting the specific chemical to be used at a treatment site, and applications are tailored to achieve project objectives with least potential impact (i.e. lowest effective dose).

J: Spinosad Impacts to Nontarget Species

Comment

Natular G30 and Natular XRT are labeled toxic to aquatic organisms. Nontarget aquatic invertebrates may be killed in waters where this pesticide is used. Nontarget effects are significant (Lawler and Dritz 2013. Efficacy of spinosad in control of larval Culex tarsalis and chironomid midges, and its nontarget effects. Journal of the American Mosquito Control Association, 29(4):352-357). The information is already outdated for Spinosad in Appendix B, Section 4.3.3, and information within the Draft PEIR should include new research and actual treatment locations that are documented in Appendix B Use Tables. In addition to the habitats listed in Appendix B, Section 4.3.3, Spinosad has also been used in reclaimed marshes, marshes, natural ponds and creeks which are not listed in the description.

Response

Lawler and Dritz (2013) (cited by the commenter) reported that spinosad is an effective treatment for insect larvae but that it also "kills mayflies and other nontarget insects". The authors report that spinosad was effective against mosquitoes and midges for about a month and that spinosad caused mortality of mayflies and other nontarget insects. However, inspection of the results reported in this study indicate that spinosad was considerably less toxic to mayflies than to desired targets, and the minimal effects on mayflies were undetectable after 21 days. The results reported by the authors (Lawler and Dritz 2013) suggest that while the impact on the target larvae was appropriately effective, the potential impact on nontarget insect populations would be far less and temporary. Even with a possible minimal impact on some of the nontarget insects such as mayflies, the impact would not be sufficient to adversely impact

them overall. The authors further suggest that the higher toxicity for mosquitoes provides a potential means to further determine “application rates that reduce nontarget effects while maintaining high efficacy”. This statement by the authors further supports the ability of spinosad to be effective against target mosquitoes while not resulting in unacceptable adverse impacts to the nontarget species. The low levels of spinosad used by the District compared to the typical testing levels reported in this study, combined with the careful application restrictions embodied in the BMPs, results in the effective, yet safe treatment for mosquitoes.

Spinosad has been shown in other studies to be of minimal risk to human health while demonstrating that it is particularly effective against mosquito larvae (Garza et al. 2011). In still other studies, Miles and Dutton (2000) demonstrated the efficacy of spinosad and the lack of apparent significant impact on other aquatic organisms in their tests. In a related study, Williams et al. (2003) reported that even with the effective treatment of the larvae in the test chambers (tires), there was no adverse effect to the mosquito predator *Toxorhynchites sp*. in the tires treated with spinosad (Cisneros et al 2002). Other researchers (Williams et al. 2003) evaluated the relative efficacy and nontarget toxicity of spinosad and report that “spinosad is highly active against Lepidoptera but is reported to be practically nontoxic to insect natural enemies” .In the studies by Cisneros et al, 2002 and by Williams et al, 2003, very large direct doses of spinosad in a laboratory setting were toxic to nontarget insect predators, while low doses in these studies did not exhibit the same level of toxicity to nontargets. With the bulk of studies reported and evaluated, spinosad has been shown to be an effective treatment for the integrated management of mosquito larvae and relatively safe against the bulk of the insect predators. In all, the effectiveness of spinosad far outweighs the potential adverse effects to recognized nontarget receptors (Williams et al 2003).

Spinosad is covered in detail in Appendix B, Section 4.3.3.

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3 Public Agency Comments and Responses

Comments received from one federal agency (F), the United States Fish and Wildlife Service (F-USFWS), one state agency (S), the California Department of Fish and Wildlife (S-CDFW), Bay Delta Region, and one regional agency (R), the Alameda County Water District (R-ACWD) are provided with District responses following each numbered comment.

(F)-USFWS

United States Department of the Interior

FISH AND WILDLIFE SERVICE
San Francisco Bay National Wildlife Refuge Complex
1 Marshlands Road
Fremont, California 94555

September 4, 2015

Erika Castillo
CEQA Project Manager for Alameda County Mosquito Abatement District
23187 Connecticut Street
Hayward, CA 94545

SUBJECT: Comments regarding the Draft Programmatic Environmental Impact Report for the Alameda County Mosquito Abatement District's Integrated Mosquito Management Program SCH# 2012052037 (Draft PEIR)

Dear Ms. Castillo:

The U.S. Fish and Wildlife Service, Don Edwards San Francisco Bay National Wildlife Refuge (Refuge) appreciates the opportunity to comment on the Draft Programmatic Environmental Impact Report for the Alameda County Mosquito Abatement District's Integrated Mosquito Management Program (Draft PEIR).

We are pleased to see much of our joint effort to develop a Refuge Mosquito Management Plan carried forward in your plan. We encourage you to consider implementing many of the best management practices identified for Refuge lands in similar habitats of non-Refuge lands. Our review of the document yielded several concerns. We offer these comments for your consideration.

General

- There is no discussion or table on treatment thresholds to show when physical, biological, or chemical controls would be conducted. How is treatment triggered for disease and for discomfort? Some type of quantitative range in a table format would be informative. 1
- "Alternatives" under the proposed program seem misleading. It suggests that they are separate and optional from one another, when it reality, they are a suite of actions that would be used together as one comprehensive alternative to respond to different mosquito population conditions. 2
- The food web on 4.2.2.3 suggests that removal of one species from the web is simply replaced by another species. This may not be accurate as some species may rely on particular species as their main food source. For instance, mosquitoes are the primary food source for bats. 3
- A map of where activities/alternatives occur, especially by habitat type, would be informative. 4

(F)-USFWS

USFWS

2

Best Management Practices (Table 2-6, Table 4-6, Table 5-3)

- Why does the terrestrial section discuss BMPs for tidal marsh when it has been discussed in the aquatic chapter? Also, why are there no BMPs specific to terrestrial habitat?
- We encourage you to use the same BMPs for known and potential listed species habitats as for listed species habitat on Refuge lands.
- In the following BMP for Salt Marsh Harvest Mouse and Ridgway's Rail, the extreme high tide height should be 6.5, rather than 6.9 feet:

  "Activities [surveillance, treatment (excluding aerial applications), source reduction] within or adjacent to harvest mouse habitat will not occur within two hours before or after extreme high tides of 6.9 feet National Geodetic Vertical Datum (NGVD) or above as measured at the Golden Gate Bridge (corrected for time and tide height for the site) or when the marsh plain is completely inundated because suitable upland refugia cover is limited and potentially disturbance-creating activities could prevent mice from reaching available cover."
- BMPs for snowy plovers should include BMPs in seasonal wetlands, as plovers use managed ponds and adjacent levees in Alameda County and the South Bay.
- We suggest adding the following BMPs:
  1. To reduce the spread of non-native invasive plants all equipment, vehicles and personnel gear will be cleaned of seeds, soil or plant material between sites
  2. To avoid transferring disease or pathogens between aquatic habitats, mosquito abatement technicians will follow the Declining Amphibian Population Task Force's Fieldwork Code of Practice
  3. BMP's appropriate for California Red Legged Frog and Foothill Yellow Legged Frog

5

Vegetation Management

- Maps of where maintenance activities (physical control and vegetation management alternative) historically occur would be informative. Also, it would be helpful to differentiate between ditches, natural channels, and stream tributaries on a map.
- We request notification of and the opportunity to observe vegetation management activities that occur on the Refuge.

6

Herbicides

- Currently, your agency does not have permission to administer herbicides on the Refuge. If herbicide treatment is necessary on the Refuge, approval must be sought from the Refuge manager and the herbicide must have an approved Pesticide Use Proposal.
- We recommend the discontinued use of R-11 Spreader Activator due to its negative effects on native aquatic species. The active ingredient in R-11® Spreader Activator, nonylphenol polyethoxylate, has been linked to estrogenic effects in wildlife, including aquatic species, such as fish and amphibians (USDA Forest Service 2003). In addition, R-11 has been shown to be moderately toxic to tadpoles (Trumbo 2005).
- In addition, R-11, a nonionic surfactant (NPE), should be added to Table 4-7: Herbicide Toxicity to Fish and Aquatic Invertebrates.

7

Pesticides

- With regard to the pesticide Spinosad, U.S. Fish and Wildlife Service does not allow the use of Saacharopolyspora spinosa on national wildlife refuges due to its moderate to high toxicity to non-target aquatic and terrestrial invertebrates. We highly caution the use of Spinosad in Alameda County. We recommend that more research be conducted to reduce effects to non-target insects prior to the broad use of Spinosad products in Alameda County.
- We suggest separating Bacterial larvicides in Table 8 to more accurately display toxicity difference between Bti, BS and Spinosad.

8

9

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3

- In Chapter 4, *Biological Resources –Aquatic*: Natular G30 and Natular XRT are labeled toxic to aquatic organisms. Non-target aquatic invertebrates may be killed in waters where this pesticide is used. From the Natular MSDS: Spinosad is moderately toxic to aquatic organisms on an acute basis. "Spinosad caused mortality of mayflies and other non-target insects. Spinosad was less toxic to mayflies than to targets, and effects on mayflies were undetectable after day 21. The higher toxicity for mosquitoes indicates that future research could identify rates that reduce non-target effects while maintaining high efficacy. In summary, both the Natular 2EC and G30 formulations showed excellent efficacy and the expected duration (or more) of control for *Culex tarsalis*, and they also controlled midge larvae well. Nontarget effects were significant (Lawler and Dritz 2013)". 10
- In Chapter 5, *Biological Resources – Terrestrial*: Terrestrial 5.2.7.1.1 should accurately reflect that "Spinosad is highly effective against lepidopteron larvae (e.g., butterflies and moths), as well as some Diptera (mosquitoes and flies), Coleoptera (beetles), Thysanoptera (e.g., thrips), and Hymenoptera (e.g., bees, wasps)" and this should be considered in the effects determination.
- The information is already outdated for Spinosad in Appendix B 4.3.3 and information within the DEIR should include new research and actual treatment locations that are documented in Appendix B Use Tables. In addition to the habitats listed in Appendix B, 4.3.3, Spinosad has also been used in reclaimed marshes, marshes, natural ponds and creeks which are not listed in the description.
- A reminder that your agency does not have permission to administer adulticides on the Refuge. If adulticide treatment is necessary on the Refuge, your agency must contact the Refuge and initiate an Emergency Section 7 Consultation. 11
- With regard to the Chemical Control Alternative, the impact determinations for AR-26, AR 27, TR-25 and TR-26 appear correct for larvicide use, however we do not agree with the "Less Than Significant" determinations for the use of adulticides which may have a significant impact on candidate, sensitive, or special status species, aquatic species including fish and non-target species and terrestrial species. 12
- Table 4-8 is formatted differently than table 5-9, making it difficult to see the overall toxicity of the adulticides for both aquatic and terrestrial habitats. We combined the information from Table 4-8, Table 5-9 and Appendix B table 4.1 below, to create a more comprehensive toxicity table. 13

	Toxicity				
chemical	**fish**	**Nontarget aquatic inverts**	**birds**	**Pollinators (bees, butterflies)**	**mammals**
Pyrethrins	high	high	Practically non toxic		Low to moderate
Phenothrin (sumithrin or d-phenothrin)	high	high	Practically non toxic		
Deltamethrin	Very high & bioaccumulation	Very high & bioaccumulation	Practically non toxic	Highly toxic to non-target insects, including honey bees	
Resmethrin	high	high	moderate	Highly toxic to honey bees	
Permethrin	high	high	practically non toxic	Highly toxic to honey bees	Low to mammals, Dermal exposure can cause

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					life threatening effects to cats.
Etofenprox	high	high			
PBO Piperonyl butoxide	Moderate to high	high	low	low	
Naled	moderate	moderate	lethal	Lethal to honey bees	

- Most of the adulticides are highly toxic to honey bees and most of the chemicals in Appendix B state that since these products are used at night, honey bees will not be affected. However in 5.2.7.2.4 of the DEIR, it states that "The District would implement BMPs such as adulticiding during the evening when bees are inactive"; however, bees tend to cluster outside around the entrance to the hive during the evening. To further minimize potential effects on non-target pollinators, the District should avoid spraying pesticides anywhere within a pre-determined proximity to bee hives. To protect honey bees during adulticiding, this BMP should be added for the protection of honey bees from all adulticides.
- We request notification of any fogging events near the Refuge.

14

Special Status Species (Table 4-4)

- Longfin smelt should be added to Table 4-4 as a federal candidate. This is a U.S. Fish and Wildlife Service Candidate Species and it is found in Alameda County.
- Snowy plover habitat should include seasonal wetlands, as plovers use managed ponds and adjacent levees in Alameda County and the South Bay.

Chapter 4 Biological Resources- Aquatic

- Please add the Marine Mammal Protection Act to the Federal Regulatory Setting (4.1.3.1). There are significant harbor seal haul outs and pupping areas in Alameda County, including District's areas.

Format/Typos

- Page 4-64: The word Napa should be removed from this page "Napa Alameda County".
- Page 4-66: This paragraph is repeated on page 4-47.

  "However, these, and other, coordinated and focused laboratory tests are designed to document the effects of the chemical when a continuous, controlled, exposure exists and do not realistically reflect the likely exposures or toxicity in the District field application scenarios. As such, the toxicity information is intended as an overview of potential issues and guidance for understanding the completely "safe" maximum exposure levels of applications that would not adversely impact humans or nontarget plant and animal species."

15

Literature Cited

Lawler and Dritz. 2013 Efficacy of spinosad in control of larval Culex tarsalis and chironomid midges, and its nontarget effects. Journal of the American Mosquito Control Association, 29(4):352–357.

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ionic surfactant R-11® to aquatic invertebrates and larval amphibians. California Fish and Game 91:38–46.

USDA Forest Service, 2003. Human and ecological risk assessment of nonylphenol polyethoxylate-based (NPE) surfactants in Forest Service herbicide applications. Unpublished Report, written by David Bakke, Pacific Southwest Region Pesticide-Use Specialist. May 2003. 182 pages.

Thank you for considering our comments. We appreciate and look forward to continued coordination with you on mosquito management on Refuge lands. We also encourage you to coordinate with the U.S. Fish and Wildlife Service, Bay Delta Field Office and Sacramento Field Office on mosquito management. If you have questions regarding our comments, please contact Refuge Planner, Winnie Chan at winnie_chan@fws.gov or (510) 792-0222 (Ext. 145).

Sincerely,

Christopher J. Barr
Acting Project Leader
San Francisco Bay National Wildlife
Refuge Complex

cc:
Kim Turner, U.S. Fish and Wildlife Service, Endangered Species Division, Bay-Delta Office (email)
Jennifer Norris, U.S. Fish and Wildlife Service, Endangered Species Division, Sacramento Office (email)

RESPONSE USFW

US Department of Fish and Wildlife **Christopher J. Barr, Acting Project Leader**
September 4, 2015

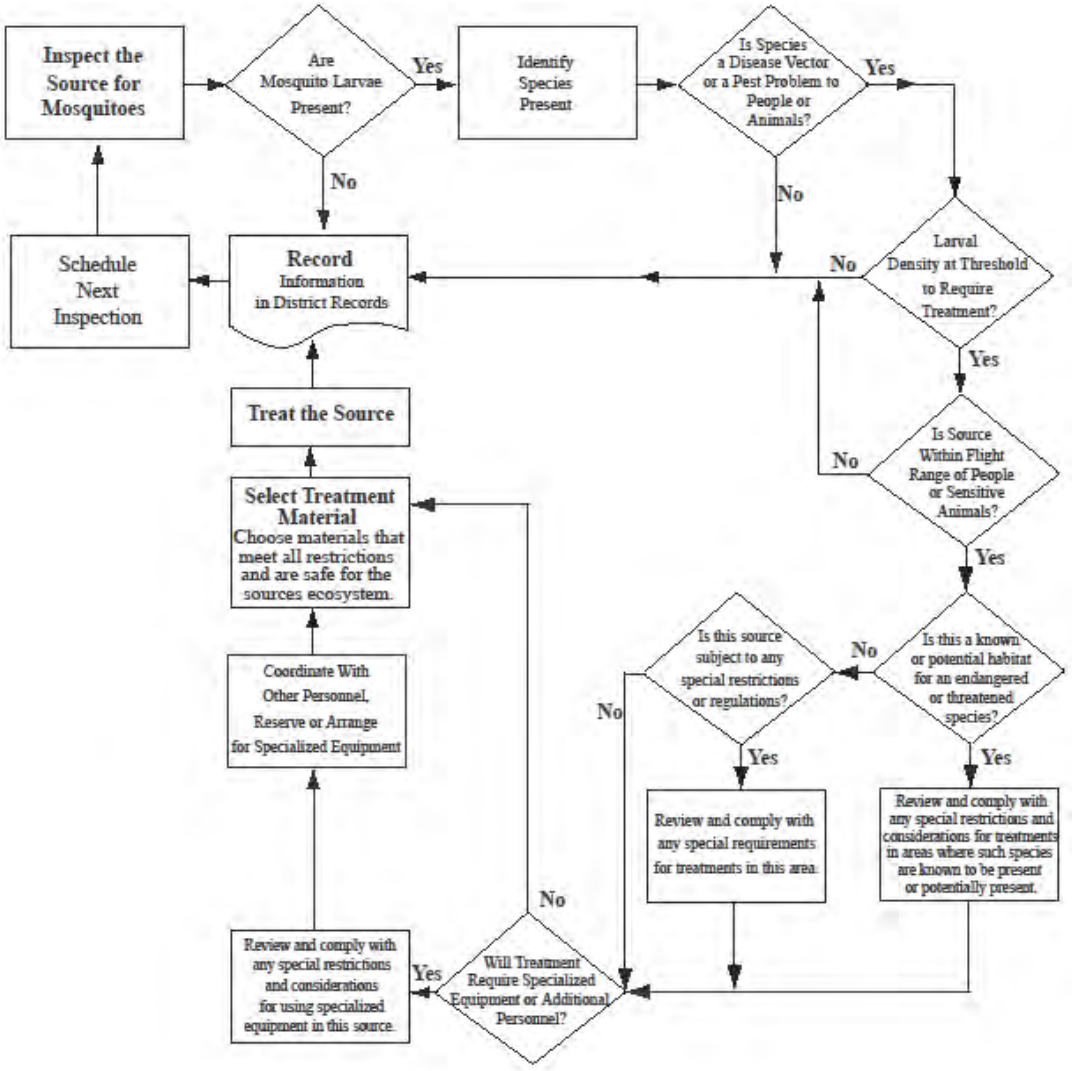
1

A table depicting ACMAD mosquito larvae treatment thresholds (Figure 2-2) for the 22 mosquito species that are present in Alameda County has been added to Chapter 2, Section 2.3, Proposed Program. In addition, Figure 2-3, Larval Treatment Decision Model, was added to Section 2.3.5.1.1, Mosquito Larvicides.

Figure2-2 Mosquito Larvae Treatment Thresholds

	Species	Most Common Larval Habitats	Distance to Populated Area	Larval Treatment Threshold	Notes
AEDES	**Salt marsh mosquito** *Aedes dorsalis*	Salt marshes	0 meters - 2 miles	≥1 per 10 dips	High Pest Significance
	Aedes aegypti *Aedes albopictus*	Small Containers, Tires	ANY DISTANCE	IMMEDIATE TREATMENT IF ANY DETECTED	Invasive Mosquito Species High Vector Potential
	Aedes melanimon	Irrigated Fields	0 meters - 2 miles	≥1 per 10 dips	High Pest Significance
	Pasture mosquito *Aedes nigromaculis*	Irrigated Fields	0 meters - 2 miles	≥1 per 10 dips	High Pest Significance
	Treehole mosquito *Aedes sierrensis*	Treeholes, Tires, Miscellaneous Containers	0 - 300 meters	≥1 per dip or baster sample	High Pest Significance Vector of Canine Heartworm
	Winter salt marsh mosquito *Aedes squamiger*	Salt Marshes Reclaimed Marshes	0 meters - 10 miles	≥1 per 10 dips	High Pest Significance
	River mosquito *Aedes vexans*	Temporary Pools	0 meters - 1 mile	≥1 per 10 dips	Has not Been Found Since the 1950's
	Woodland pool mosquito *Aedes washinoi*	Temporary Woodland Pools	0 meters - 1 mile	≥1 per 10 dips	High Pest Significance
ANOPHELES	*Anopheles franciscanus*	Shallow Pools and Streams in Algae mats	0 - 500 meters	≥1 >3rd instar larva per dip	Low Pest Significance
	Western malaria mosquito *Anopheles freeborni*	Seepages, Streams, Lakes, Gravel Pits	0 meters - 1 mile	≥1 >3rd instar larva per dip	Low Pest Significance Vector of Malaria
	Anopheles occidentalis	Streams, Lakes, Pools Occasionally in Brackish Water	0 - 500 meters	≥1 >3rd instar larva per dip	Low Pest Significance
	Anopheles punctipennis	Temporary Pools, Streams	0 meters - 1 mile	≥1 >3rd instar larva per dip	Moderate Pest Significance Vector of Malaria
CULEX	*Culex apicalis*	Woodland Creeks, Pools	NO TREATMENT	NO TREATMENT	No Pest Significance
	Culex boharti	Slow Streams, Pools	NO TREATMENT	NO TREATMENT	No Pest Significance
	Tule mosquito *Culex erythrothorax*	Lakes and Ponds Associated with Tules	0 - 500 meters	≥1 per dip	High Pest Significance Vector of Encephalitis & WNV
	House mosquito *Culex pipiens*	Storm Drain Systems, Septic Tanks, Roadside Ditches, Cemetery Urns, Flooded Basements, Utility Vaults	0 meters - 1 mile	≥1 per 10 dips	High Pest Significance Vector WNV
	Foul water mosquito *Culex stigmatosoma*	Foul Water, Sewage, Temporary Pools	0 - 300 meters	≥1 per dip	Low Pest Significance
	Encephalitis mosquito *Culex tarsalis*	Creeks, Marshes, Temporary Pools, Roadside Ditches, Fresh Water	0 meters - 2 miles	≥1 per 10 dips	Moderate Pest Significance Vector of Encephalitis & WNV
	Culex thriambus	Rock pools, isolated ponds, hoofprints, alond streams and creeks	NO TREATMENT	NO TREATMENT	No Pest Significance
CULISETA	**Fish pond mosquito** *Culiseta incidens*	Fish Ponds, Temporary Pools, Catch Basins, Roadside Ditches	0 meters - 1 mile	≥1 per dip	High Pest Significance Possible Vector of Canine Heartworm
	Winter salt marsh mosquito *Culiseta inornata*	Marshes, Temporary Pools, Roadside Ditches	0 meters - 1 mile	≥1 per dip	High Pest Significance
	Culiseta particeps	Shaded Clean Pools, Streams	0 - 300 meters	≥1 per dip	Low Pest Significance
	Orthopodomyia signifera	Treeholes	NO TREATMENT	NO TREATMENT	Adults Found in Light Trap Larvae not Found

Figure 2-3 Larval Treatment Decision Model



2

Please see response A in Section 2.2, Key Comments and Master Responses.

3

Mosquitoes have several natural predators but none are known to rely exclusively on mosquitoes as a food source. Appendix E, Section 2.8, Biological Control Predators, examines the efficacy of invertebrates, amphibians, fish, bats, and birds to effectively control mosquito populations. Section 2.8.1.1.4 focuses on using bats for mosquito control. It points to several studies that have examined either the gut contents or guano of bats and found that flies, especially mosquitoes, constitute a small portion of the diet for most bats. Since mosquitoes are not the sole food source for bats or any other predator, and the District would be incapable of completely eliminating all mosquitoes from an area for an extended period of time, the effect District activities would have on the food web would be less than significant.

4

Please see response F in Section 2.2, Key Comments and Master Responses.

5

Aquatic habitat types have been removed from Chapter 5, Biological Resources – Terrestrial. BMPs for terrestrial habitats (A8, A9, A10, K3, K4, K5, K6, K7, L6) are not separated by habitat type but are mixed among other BMP categories. The extreme high tide in BMPs C1 and D1 were changed from 6.9 to 6.5. Following the Declining Amphibians Population Task Force's Fieldwork Code of Practice was added to all special status amphibian BMPs.

BMP A10 has been modified to:

> A10. Properly train all staff, contractors, and volunteer help to prevent spreading weeds and pests to other sites. Equipment and personnel gear will be cleaned between sites. The District headquarters contains wash rack facilities (including high-pressure washers) to ~~regularly (in many cases daily) and~~ thoroughly clean vehicles and equipment to prevent the spread of weeds.

BMPs were added for CRLF and FYLF:

P. California Red-Legged Frog (CRLF)

1. Vegetation management and water manipulation in CRLF habitat shall not occur from November through March to avoid the CRLF breeding season and will be further delayed if tadpoles are present to allow them time to attain full metamorphosis.
2. Mosquitofish (Gambusia affinis) will not be introduced into any site containing CRLF.
3. The Declining Amphibian Populations Task Force Fieldwork Code of Practice will be followed in CRLF habitat.
4. If nonnative/introduced predators of CRLF (e.g. bullfrogs) are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.
5. If CRLF are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.
6. District staff will receive training on measures to avoid impacts to CRLF.

Q. Foothill Yellow-Legged Frog (FYLF)

1. Vegetation management and water manipulation in FYLF habitat shall not occur from April to July avoid the FYLF breeding season and will be further delayed if tadpoles are present to allow them time to attain full metamorphosis.
2. Mosquitofish (Gambusia affinis) will not be introduced into any site containing FYLF.
3. The Declining Amphibian Populations Task Force Fieldwork Code of Practice will be followed in FYLF habitat.
4. If nonnative/introduced predators of FYLF (e.g. bullfrogs) are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.
5. If FYLF are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.
6. District staff will receive training on measures to avoid impacts to FYLF.

6

Please see response F in Section 2.2, Key Comments and Master Responses. In addition, the District annually submits maps of proposed source reduction projects as part of the USACE permit process. These maps detail the locations, types of ditches, and the amount of linear footage the District is requesting to maintain. The District will work with refuge staff regarding source reduction projects on refuge lands and will inform refuge staff on times when source reduction work will be taking place so observation of vegetation maintenance activities can be done if desired.

7

Please see response I in Section 2.2, Key Comments and Master Responses. The District acknowledges that we currently do not have permission to use herbicides on the Don Edwards National Wildlife Refuge. If the need arises for the use of herbicides on the refuge, the District will seek approval from the refuge manager and follow the Pesticide Use Proposal (PUP) process. R-11 Spread Activator was included in Table 4-7 under APEs, however, nonionic surfactants (NPEs) has been added in as well.

Table 4-7 Herbicide Toxicity[1,2] to Fish and Aquatic Invertebrates

Chemical	Toxicity to	
	Fish	Aquatic Invertebrates
Imazapyr, glyphosate, sulfometuron methyl, mod. vegetable oils and methylated seed oil	Low	Low
Triclopyr (triclopyr acid, TEA)	Moderate	Moderate
Triclopyr (TBEE), alkylphenol ethoxylates (APEs), nonionic surfactant (NPE)	High	High
Polydimethylsiloxane,	Unknown	Unknown

[1] Toxicity information is summarized from the information provided in Appendix B (Table 4-1).

[2] The toxicity data are derived from rigidly controlled laboratory animal studies designed to determine the potential adverse effects of the chemical under several possible routes of exposure (see Appendix B for further information). In these studies, the species of interest is continuously exposed to 100 percent chemical at several doses. In actual practice, the amounts applied in the District's Program Area are substantially less than the amounts used in the toxicity studies, and organisms are not continuously exposed to the chemical. Furthermore, actual application rates by the District may be less than label requirements. Thus, the laboratory test results do not provide a realistic assessment of field exposure.

8

ACMAD acknowledges that it does not currently have permission to use spinosad on the Don Edwards National Wildlife Refuge. PUPs will continue to be submitted annually for all pesticides proposed for use on the Refuge. Although spinosad is used to control larval mosquito populations throughout Alameda County, the vast majority of applications are to non-natural sources such as catchbasins, ornamental ponds, and swimming pools. In 2015, 98% of all spinosad treatments made by the District were not in natural sources. These treatments accounted for 97% of the total product used.

9

Table 4-8 has been modified to separate spinosad from Bs and Bti and better represents the differences in their toxicities and modes of action.

Table 4-8 Chemical Classes and their Toxicity[1] to Fish and Nontarget Aquatic Invertebrates

Class	Chemical	Mechanism of Action	Toxicity to	
			Fish	Nontarget Invertebrates
Mosquito Larvicides				
Bacterial Larvicides	Bs, Bti,	Paralyzes gut	Low	Low
Bacterial Larvicide	Spinosad	Disrupts central nervous system	Moderate	Moderate
Hydrocarbon esters	Methoprene and s-methoprene	Interferes with maturation process of insects	Moderate	High
Surfactants	Alcohol ethoxylated surfactant, aliphatic solvents	Drowns larvae	Very low	Affects Only Surface Breathing Insects
Organo-phosphates	Temephos	Cholinesterase inhibitor	Slight to Moderate	High

10

Please see response J in Section 2.2, Key Comments and Master Responses. Changes to spinosad have been made in Chapters 4 and 5 to more accurately reflect usage by the District and information in the new SDS for Natular (spinosad) products.

Section 4.2.7.1.1 Bacterial Larvicides:

> Spinosad is a biologically derived insecticide produced from the fermentation of *Saacharopolyspora spinosa*, a naturally occurring soil organism. Spinosad activates the central nervous system of insects through interaction with neuroreceptors and causes continuous stimulation of the insect nervous system. In water, spinosad is degraded primarily through photolysis, which has a half-life of less than 1 day. It is ~~slightly to~~ moderately toxic to fish and most aquatic invertebrates on an acute basis. It may ~~have slight~~ impact~~s on~~ some aquatic invertebrates with chronic exposure, but application for mosquitoes tends to be episodic, and given the rapid breakdown of spinosad in the environment, chronic exposure is unlikely.

Section 5.2.7.1.1 Bacterial Larvicides:

> Spinosad is a natural insecticide derived from the fermentation of a common soil microorganism, Saacharopolyspora spinosa. Spinosad causes neurologic effects in insects consistent with the general activation of nicotinic acetylcholine receptors, but by a mechanism that is novel among known insecticides (Mayes et al. 2003). Exposure manifests as constant involuntary nervous system impacts ultimately leading to paralysis and death of the insect. Spinosad is highly effective against lepidopteron larvae (e.g., butterflies and moths), as well as some Diptera (mosquitoes and flies), Coleoptera (beetles), Thysanoptera (e.g., thrips), and Hymenoptera (e.g., bees, wasps) (Mayes et al. 2003). The effects of spinosad on beneficial pollinators such as honeybees are of concern. The District incorporates BMPs that are designed to minimize exposure of bees to spinosad, such as utilizing granular and tablet forms and ~~limiting~~ minimizing applications. to natural sources Predominant usage of spinosad is in artificial sources such as catch basins, storm drains and swimming pools. If a liquid form is used, additional BMPs include restricting applications to nighttime hours when bees are inactive, covering hives where possible with wet burlap and maintaining buffer zones. Bees and other nontarget insects may contact spinosad residues following applications; however, residues are generally are below acute toxicity thresholds to honeybees. Field studies evaluating typical spinosad applications have

demonstrated low risk to adult honeybees and little to no effect on hive activity and brood development, provided that the residue is allowed to dry for up to three hours (Mayes et al. 2003).

11

The District acknowledges that we currently do not have permission to use adulticides on the Don Edwards National Wildlife Refuge. If the need arises for the use of adulticides on the refuge, the District will initiate an emergency Section 7 consultation.

12

No additional studies or publications have been located or provided regarding the impact determinations for the use of adulticides. The "less than significant" determination for the use of adulticides in the Draft PEIR are based on the review of available literature, studies, and BMPs implemented by the District.

13

USFWS's tabular representation of the overall toxicity of adulticides for both aquatic and terrestrial organisms appears to be correct. No response is needed.

14

BMP M11 has been expanded to include buffers around beehives. If any adulticiding application are planned near the Don Edwards National Wildlife Refuge, advanced notification will be given to Refuge staff.

BMP M11 has been modified to:

> Do not apply pesticides that could affect insect pollinators in liquid or spray/fog forms over large areas (more than 0.25 acres) during the day when honeybees are present and active or when other pollinators are active. Preferred applications of these specific pesticides are to occur in areas with little or no honeybee or pollinator activity or after dark. These treatments may be applied over smaller areas (with hand held equipment), but the technician will first inspect the area for the presence of bees and other pollinators. If pollinators are present in substantial numbers, the treatment will be made at an alternative time when these pollinators are inactive or absent. If beehives are present, establish a buffer of reasonable distance, when feasible, and do not allow applications of pesticides within this buffer whenever possible.

15

All suggested corrections have been made;

Table 4-4 changes:

Longfin smelt - San Francisco Bay-Delta DPS *Spirinchus thaleichthys*	FC, ST, SSC	Euryhaline, nektonic and anadromous. Found in open waters of estuaries, mostly in middle or bottom of water column. Prefer salinities of 15-30 ppt, but can be found in completely freshwater to almost pure seawater.
Western snowy plover *Charadrius nivosus nivosus (Charadrius alexandrinus nivosus)*	FT	Sandy beaches, salt pond levees, seasonal wetlands, and ~~shores of large alkali~~ lakes managed ponds. Flat, open areas with sandy or saline substrates, with usually sparse or absent vegetation or driftwood . Needs sandy, gravelly or friable soils for nesting.

Added to Chapter 4, Federal Regulatory Section:

4.1.3.1.6 Marine Mammal Protection Act

This law established a national policy to prevent marine mammal species and population stocks from declining beyond the point where they ceased to be significant functioning elements of the ecosystems of which they are a part. The MMPA established a moratorium on the taking of marine mammals in U.S. waters. It defines “take” to mean “to hunt, harass, capture, or kill” any marine mammal or attempt to do so. The Department of Commerce through the National Marine Fisheries Service is charged with protecting whales, dolphins, porpoises, seals, and sea lions. Walrus, manatees, otters, and polar bears are protected by the Department of the Interior through the U.S. Fish and Wildlife Service. The Animal and Plant Health Inspection Service, a part of the Department of Agriculture, is responsible for regulations managing marine mammals in captivity.

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State of California – The Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Bay Delta Region
7329 Silverado Trail
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***EDMUND G. BROWN JR.**, Governor*
***CHARLTON H. BONHAM**, Director*

September 17, 2015

Ms. Erika Castillo, CEQA Project Manager
Alameda County Mosquito Abatement District
23187 Connecticut Street
Hayward, CA 94579

Dear Ms. Castillo:

Subject: Integrated Mosquito Management Program, Draft Programmatic Environmental Impact Report, SCH #2012052037, Alameda County

The California Department of Fish and Wildlife (CDFW) has reviewed the draft Programmatic Environmental Impact Report (PEIR) for the Alameda County Mosquito Abatement District (District) Integrated Mosquito Management Program (IMMP; Project). CDFW is providing comments on the draft PEIR as a Trustee Agency and Responsible Agency.

CDFW is a Trustee Agency pursuant to the California Environmental Quality Act (CEQA) Section 15386 with responsibility under CEQA for commenting on projects that could affect biological resources. As trustee for the State's fish and wildlife resources, CDFW has jurisdiction over the conservation, protection, and management of the fish, wildlife, native plants, and the habitat necessary for biologically sustainable populations of such species for the benefit and use by the people of California. CDFW also acts as a Responsible Agency pursuant to CEQA Section 15381 if a project requires discretionary approval, such as issuance of a California Endangered Species Act (CESA) Incidental Take Permit (ITP) [Fish and Game Code section 2080 *et seq.*], or Lake or Streambed Alteration Agreement (LSAA) (Fish and Game Code section 1600 *et seq.*).

Under CESA, CDFW has regulatory authority over activities that could result in take of a species listed, or is a candidate for listing, by the State as threatened or endangered. If the proposed Project or activities could result in take of a state listed or candidate species, the District should apply for an ITP for the Project. Fish and Game Code Section 86 defines take as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill".

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Under the LSAA Program, CDFW has regulatory authority over projects that could divert or obstruct the natural flow, or substantially change or use any material from the bed, bank or channel (which may include associated riparian, wetland and pond habitat) of a river or stream. CDFW may require a LSAA with the District, for activities proposed in or near streams, wetlands or ponds located within the Project area.

CDFW has jurisdiction over actions that may result in the disturbance or destruction of active nest sites or the unauthorized take of birds. Fish and Game Code sections protecting birds, their eggs and nests include 3503 (regarding unlawful take, possession or needless destruction of the nests or eggs of any bird), 3503.5 (regarding the take, possession or destruction of any birds-of-prey or their nests or eggs), and 3513 (regarding unlawful take of any migratory nongame bird). Species designated as Fully Protected may not be taken or possessed at any time (Fish and Game Code section 3511).

Conserving California's Wildlife Since 1870

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CDFW is submitting comments on the draft PEIR as a means to inform the District, as the Lead Agency, of our concerns regarding sensitive species and their habitats, including wetland and riparian resources which could potentially be affected by the Project. On September 10, 2015, the District accepted CDFW's request to extend the deadline to submit comments to September 17, 2015.

Project Location and Description

The proposed Project area consists of the District's Service Area boundaries, and includes all developed and undeveloped lands located within the County of Alameda including portions of the Don Edwards National Wildlife Refuge, Santa Clara County, Contra Costa County, Stanislaus County and San Joaquin County. Mosquito control activities are conducted at a wide variety of locations or sites throughout the District's Service Area, including tidal marshes, duck clubs, other diked marshes, lakes and ponds, rivers and streams, vernal pools and other seasonal wetlands, stormwater detention basins, flood control channels, spreading grounds, street drains and gutters, wash drains, irrigated pastures, or agricultural ditches, as well as animal troughs, artificial containers, tire piles, fountains, ornamental fishponds, swimming pools, and liquid waste detention ponds.

The District undertakes activities for its IMMP to control and/or provide information on mosquitoes, vectors of disease and/or discomfort, within the IMMP area. The District also performs vegetation management (including control of noxious and/or invasive plants) to facilitate access to mosquito habitat, improve efficiency and effectiveness of mosquito control operations, and as a source reduction measure.

The draft PEIR evaluates the effects of the continued implementation of the mosquito control strategies and methods prescribed in the IMMP. The Project proposes to implement the following general types of activities: surveillance, physical control, vegetation management, biological control and chemical control. The specific actions taken in response to current or potential mosquito activity at a specific place and time depend on factors of mosquito and pathogen biology, physical and biotic environment, human settlement patterns, local standards, available control methods, and institutional and legal constraints.

Page 2-48 of the draft PEIR states that for work on State of California lands and riparian zones, wetlands, or other sensitive habitats, the District coordinates, reviews activities, and often collaborates with several agencies including the U.S. Fish and Wildlife Service (USFWS), CDFW, and Alameda County agencies, municipalities, and property owners.

Biological Resources

CDFW is concerned that the draft PEIR does not provide adequate avoidance, minimization, and mitigation measures for special-status species, such as salt marsh harvest mouse (*Reithrodontomys raviventris*), California tiger salamander (*Ambystoma californiense*), Palmate-bracted bird's-beak (*Chloropyron palmatum*), and their habitats. Failure to adequately consider potential impacts of the Project on special-status species and the requirements of all their life history stages may lead to elimination or reduction of local populations of plant or wildlife species. The PEIR should evaluate the potential impacts of the IMMP control methods to both aquatic habitat as well as terrestrial habitat used as access routes. The PEIR should include a

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mosquito control program that avoids the use of biological, physical and chemical treatments at sites where special-status species are present. Spraying of biological and chemical agents in waterways where special-status species are present should be avoided during critical time periods such as during migration, breeding and nesting. If an IMMP control method results in extirpation of a species or plant community from a particular habitat, the result could be altered population dynamics and reduced potential for recolonization and reduction in habitat connectivity. 2

Special-Status Species
Special-status species should include those species designated as Fully Protected such as California black rail (*Laterallus jamaicensis coturniculus*), American peregrine falcon (*Falco peregrinus anatum*), Ridgway's rail (*Rallus longirostris obsoletus*) and salt marsh harvest mouse. Fully Protected species may not be taken or possessed at any time so potential impacts to these species must be avoided. 3

Table 4-3 in the draft PEIR titled, "California Natural Diversity Database Occurrences for Plant Species in Alameda County Mosquito Abatement District and its Adjacent Program Area" and Table 4-4, "California Natural Diversity Database Occurrences for Special Status Wildlife Species in Alameda County Mosquito Abatement District and its Adjacent Program Area" only represent the data that have been submitted to California Natural Diversity Database (CNDDB). The CNDDB is a positive-sighting database. However, many areas in California have still not been surveyed for many special-status species, so the CNDDB does not provide an exhaustive list of species distribution. Even if a species is not reported to the database, it may still exist in given locations. Therefore, CDFW recommends that the potential presence of special-status species at Project sites be based on a detailed assessment of suitability of habitat for fish and wildlife species using various methods such as aerial imagery, historical and recent survey data, field reconnaissance, site-specific surveys, scientific literature and reports, as well as "positive occurrence" databases such as CNDDB. 4

Best Management Practices

CDFW does not consider many of the Best Management Practices (BMPs) listed in Table 2-6, 4-6, and 5-3 as adequately minimizing or avoiding impacts to special-status species or their habitat. For example, BMP C-2 salt marsh harvest mouse (SMHM) states, "Vegetation removal is limited to the minimum amount necessary to allow for surveillance, treatment, and mosquito habitat reduction (vegetation management) to minimize or avoid loss of SMHM. Similarly, excavation, fill, or construction activities will also be limited to the minimum amount necessary to minimize/avoid loss of SMHM." Since the draft PEIR does not identify minimum amounts for each of these Project-related activities, it is impossible for CDFW to determine the level of Project impact to SMHM. Clearing and vegetation maintenance in pickleweed habitat may impact SMHM. CDFW recommends that all potential impacts be analyzed in the PEIR for each of the habitat types present in the Project area and mitigation measures be developed in consultation with CDFW for habitats that likely contain special-status species. 5

Many of the BMPs in the draft PEIR defer to consultation with agencies. Deferring to consultation with agencies and obtaining appropriate permits is not an appropriate minimization or mitigation measure. CDFW recommends that the District provide feasible mitigation measures along with avoidance and minimization measures in the PEIR.

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Several BMPs in the draft PEIR, including BMPs A-7 and M-9 in Table 2-6, discuss using CNDDB, existing Habitat Conservation Plans or other documents to determine the potential presence of special-status species. As stated above, reliance on CNDDB and using this approach will likely underrepresent the scope of impacts and their significance on special-status species. The CNDDB contains only records of species and natural communities which have been observed and documented. Absence of data in such sources does not confirm that the species is absent from the Project area. CDFW recommends that surveys be conducted by a qualified biologist in possession of the appropriate permits during appropriate breeding/nesting/blooming seasons for each special-status species that could be present prior to any Project activity. 6

Table 4-1 includes stock ponds under "ponds and lakes" but under Table 4-3, California tiger salamander is only identified in vernal pools. Please be advised that these state-listed salamanders are also found in stock ponds (especially in Alameda County) and roadside ditches. 7

Surveillance Alternative

The draft PEIR, under Impact AR-1 and TR-1, identifies that activities associated with the Surveillance Alternative would have a less-than-significant impact. CDFW believes that these activities may have a significant impact. This Surveillance Alternative includes activities such as maintaining paths and clearings to allow access to inspections sites. Within the Project area, several special-status species may be affected by such actions. As noted above, clearing and vegetation maintenance in pickleweed habitat may impact SMHM.

Driving off-road vehicles in special-status species habitat could crush or injure special-status plants. If off-road vehicles must be used, CDFW recommends the vehicles stay on existing roadways or trails. If vehicles are required to go off-road, a survey, conducted by qualified botanists at the appropriate time of year to avoid impacts to listed plants, should be conducted to identify any special-status plants. Once a pathway is surveyed and no special-status species are identified, that same route shall continue to be used for that season. If impacts to special-status plants cannot be avoided, an ITP may be required in areas where activities could cause take of a state-listed plant. 8

CDFW recommends that Surveillance Alternative impacts be analyzed in the PEIR by the habitat types present in the Project area and avoidance, minimization and mitigation measures be developed in consultation with CDFW for habitats that likely contain special-status plant and wildlife species.

Physical Control Alternative and Vegetation Management Alternative

The Physical Control Alternative is divided into the following habitats: freshwater habitats including livestock ponds and retention ponds; seasonal wetlands and vernal pools; freshwater marshes and seasonal wetlands managed as waterfowl habitat; saline and brackish habitats; temporary standing water and artificial ponds; riparian areas; tree holes; wastewater treatment facilities/septic systems; and artificial container habitats. The types of physical controls are categorized into maintenance, new construction and cultural practices. Maintenance activities include: sediment removal from ditches; removal of debris, weeds and emergent vegetation from channels; clearing, trimming, and removal of brush for access; and filling of ditches. New construction activities include the creation of new ditches to enhance tidal flow. Cultural

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practices include vegetation and water management, placing of culverts or other engineering works, and making other physical changes to the land. The draft PEIR states that some of these activities are not currently being conducted by the District but may be used in the future.

Please be advised that actions such as physically altering (including draining or filling, etc.) ponds, streams, or lakes; vegetation management and use of chemicals may require an LSAA and/or ITP from CDFW, and/or take authorization for federally-listed species under a federal Biological Opinion. 9

The draft PEIR states that the impacts of Physical Control Alternative and Vegetation Management Alternative activities on terrestrial species in all habitat types are considered to be less-than-significant due to the implementation of BMPs. As noted above, many of these BMPs may not adequately minimize or avoid impacts to special-status species or their habitat. Therefore, CDFW recommends that the PEIR adequately analyze all potential impacts of the Project and include appropriate avoidance measures, and minimization and mitigation measures for impacts that cannot be completely avoided. 10

Conclusion

CDFW is concerned that many of the general types of activities listed above as described in the draft PEIR could result in impacts or "take" of species listed by the State as threatened, endangered or candidate and may require an ITP or may result in impacts to waterways, which may require an LSAA. CDFW recommends that the District consult with CDFW permitting staff and apply for any necessary State permits. 11

Issuance of an ITP and LSAA is subject to CEQA. CDFW recommends the District work with CDFW, as well as other resource agencies in developing avoidance, minimization and mitigation measures that are capable of reducing impacts to less-than-significant. Once those measures are developed, CDFW recommends the PEIR be recirculated for public review.

If you have any questions, please contact Ms. Marcia Grefsrud, Environmental Scientist, at (707) 644-2812; or Ms. Brenda Blinn, Senior Environmental Scientist (Supervisory), at (707) 944-5541.

Sincerely,

for Scott Wilson
Regional Manager
Bay Delta Region

cc: State Clearinghouse

Mr. Ryan Olah
U.S. Fish and Wildlife Service
Ryan_Olah@fws.gov

RESPONSE S-CDFW

CA Department of Fish and Wildlife **Marcia Grefsrud, Environmental Scientist**
September 17, 2015 **Scott Wilson, Regional Manager**

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While the District does not anticipate undertaking any action that would result in a take of any protected species, it will apply for a CESA permit if it does pursue such an action. The need for any project-level CEQA review at a particular source control/treatment site would be considered at the time the District applied for a CESA permit (if required).

The District does not anticipate undertaking any project that would require a Lake and Streambed Alteration Agreement; however, if it does pursue such a project, it would request a LSAA for the particular activity. The need for any subsequent project-level CEQA review at a particular source control/treatment site would be considered at the time the District applied for a required LSAA permit.

2

Please see response C in Section 2.2, Key Comments and Master Responses. In addition, District BMPs for CTS and several other special status species have been expanded (underlined sections) to address life stages and habitat types. These additional BMPs are a reflection of existing District practices.

G. California Tiger Salamander (CTS):

> G1. Trucks and ARGOs will be restricted to established roads and berms in vernal pool and stockpond areas. Only small ATVs (e.g. Polaris) will be utilized near vernal pools and stockponds.

> G2. Methoprene, monomolecular films, and adulticides will not be used in vernal pool and stockpond areas during CTS breeding season (November-March) or if CTS larvae are present.

> G3. Vegetation management and water manipulation in CTS habitat shall not occur from November through March to avoid the CTS breeding season and will be further delayed if CTS larvae are present to allow them time to attain full metamorphosis.

> G4. Mosquitofish (Gambusia affinis) will not be introduced into any site containing CTS.

> G5. The Declining Amphibian Populations Task Force Fieldwork Code of Practice will be followed in CTS habitat.

> G6. If nonnative/introduced predators of CTS (e.g. bullfrogs) are encountered in CTS habitat during mosquito management activities, findings will be reported to the appropriate resource agency.

> G7. If CTS are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

H. Vernal Pool Tadpole Shrimp (VPTS)

> H1. Trucks and ARGOs will be restricted to established roads and berms in vernal pool areas. Only small ATVs (e.g. Polaris) will be utilized near vernal pools.

> H2. Methoprene, monomolecular films, and adulticides will not be used in vernal pool areas if VPTS are present.

> H3. Vegetation management and water manipulation in VPTS habitat shall not occur if VTPS are present.

> H4. Mosquitofish (Gambusia affinis) will not be introduced into any site containing VPTS.

> H5. If VPTS are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

> H6. District staff will receive training on measures to avoid impacts to VPTS.

P. California Red-Legged Frog (CRLF)

> P1. Vegetation management and water manipulation in CRLF habitat shall not occur from November through March to avoid the CRLF breeding season and will be further delayed if tadpoles are present to allow them time to attain full metamorphosis.

> P2. Mosquitofish (Gambusia affinis) will not be introduced into any site containing CRLF.

> P3. The Declining Amphibian Populations Task Force Fieldwork Code of Practice will be followed in CRLF habitat.

> P4. If nonnative/introduced predators of CRLF (e.g. bullfrogs) are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

> P5. If CRLF are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

> P6. District staff will receive training on measures to avoid impacts to CRLF.

Q. Foothill Yellow-Legged Frog (FYLF)

> Q1. Vegetation management and water manipulation in FYLF habitat shall not occur from April to July avoid the FYLF breeding season and will be further delayed if tadpoles are present to allow them time to attain full metamorphosis.

> Q2. Mosquitofish (Gambusia affinis) will not be introduced into any site containing FYLF.

> Q3. The Declining Amphibian Populations Task Force Fieldwork Code of Practice will be followed in FYLF habitat.

> Q4. If nonnative/introduced predators of FYLF (e.g. bullfrogs) are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

> Q5. If FYLF are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

> Q6. District staff will receive training on measures to avoid impacts to FYLF.

R. Western Spadefoot Toad (WST)

> R1. Vegetation management and water manipulation in WST habitat shall not occur from January to May to avoid the WST breeding season and will be further delayed if tadpoles are present to allow the them time to attain full metamorphosis.

> R2. Mosquitofish (Gambusia affinis) will not be introduced into any site containing WST.

> R3. The Declining Amphibian Populations Task Force Fieldwork Code of Practice will be followed in WST habitat.

> R4. If nonnative/introduced predators of WST (e.g. bullfrogs) are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

> R5. If WST are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

> R6. District staff will receive training on measures to avoid impacts to WST.

S. Western Pond Turtle (WPT)

> S1. Vegetation management and water manipulation in WPT habitat shall not occur during April and May to avoid the WPT breeding season.

> S2. If nonnative/introduced turtle species (e.g. red-eared sliders) are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

> S3. If nonnative/introduced predators of WPT (e.g. bullfrogs) are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

> S4. If WPT are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

> S5. District staff will receive training on measures to avoid impacts to WPT.

T. Tricolored Blackbird (TCB)

> T1. Monomolecular films and oils will not be used in areas of TCB nesting during the nesting season.

> T2. Vegetation management and water manipulation in TCB nesting areas shall not occur during the breeding season (March – August)

> T3. District staff will receive training on measures to avoid impacts to TCB.

Biological control currently consists of the use of mosquitofish and is not used in locations with special status species. Physical and vegetation control are also restricted during critical time periods for special status species. In several cases, use of certain chemical control options is also restricted (BMPs G2, H2, M9, T1). In all cases where special status species occur, the feasibility of limiting pesticide applications is considered (BMPs A7, M9).

BMP A7:

Identify probable (based on historical experience) treatment sites that may contain habitat for special status species every year prior to work to determine the potential presence of special status flora and fauna using the CNDDB, relevant Habitat Conservation Plans (HCPs), NOAA Fisheries and USFWS websites, Calfish.org, and other biological information developed for other permits. Establish a buffer of reasonable distance, when feasible, from known special status species locations and do not allow application of pesticides/herbicides within this buffer whenever possible. Nonchemical methods are acceptable within the buffer zone when designed to avoid damage to any identified and documented rare flora and fauna.

BMP M9:

9. Special Status Aquatic Wildlife Species:

- A CNDDB search was conducted in 2012 and the results incorporated into Appendix A for this PEIR. District staff communicates with state, federal, and county agencies regarding sites that have potential to support special status species. Many sites where the District performs surveillance and control work have been visited by staff for many years and staff is highly knowledgeable about the sites and habitat present. If new sites or site features are discovered that have potential to be habitat for special status species, the appropriate agency and/or landowner is contacted and communication initiated.
- Use only pesticides, herbicides, and adjuvants approved for aquatic areas or manual treatments within a predetermined distance from aquatic features (e.g., within 15 feet of aquatic features). Aquatic features are defined as any natural or man-made lake, pond, river, creek, drainage way, ditch, spring, saturated soils, or similar feature that holds water at the time of treatment or typically becomes inundated during winter rains.
- If suitable habitat for special status species is found, including vernal pools, and if aquatic-approved pesticide, herbicide, and adjuvant treatment methods have the potential for affecting the potential species, then the District will coordinate with the CDFW, USFWS, and/or National Marine

Fisheries Service (NMFS) before conducting treatment activities within this boundary or cancel activities in this area. If the District determines no suitable habitat is present, treatment activities may occur without further agency consultation.

The PEIR takes into account these BMPs and evaluates the potential impacts of the IMMP on aquatic habitats in Chapter 4 Biological Resources – Aquatic and terrestrial habitats in Chapter 5 Biological Resources – Terrestrial.

3

Table 4-4 has been updated to properly reflect fully protected species. The District understands that fully protected species may not be taken or possessed at any time.

4

Please see response E in Section 2.2, Key Comments and Master Responses.

5

Please see response C in Section 2.2, Key Comments and Master Responses. Additionally, District BMPs address habitat types where work is done by the District in several ways. Tidal marshes (where a large portion of mosquito control activities within natural sources take place) have their own BMP section (BMPs B1-6) and are also addressed individually in General BMPs (BMPs A3, A8, A10), special status species BMPs (e.g. BMPs C2, C3, C4, C5, D2, D5, D6), and Maintenance/Construction and Repair of Tide Gates and Water Structures in Waters of the U.S. BMPs (BMPs L1-17). Other habitat (vernal pools, riparian areas, etc.) BMPs are organized according to relevant categories, such as General BMPs (BMPs A3, A10), Vegetation Management (BMPs K4, K6, K7) or by the special status species that occur in that habitat (e.g. BMPs G1, G2, G3, G5, H1, H2, H3, I2, I4).

With regard to source reduction work (i.e. ditch maintenance) done in SMHM habitat (i.e. pickleweed) and the lack of a defined minimum amount for vegetation trimming and removal of sedimentation, the amounts necessary are not static. However, as a part of the source reduction permitting process, the District annually submits information on the amount proposed/requested for maintenance and the actual work done for the prior year. As a reference, for the 2010-2011 ditching season the District cleaned out sediment and trimmed vegetation in 9,424 lineal feet of ditches. Each ditch was approximately 2 feet wide so the amount cleaned by the District was .43 acres. In the 2011-2012 ditching season the District cleaned out sediment and trimmed vegetation in 10,155 lineal feet of ditches. Again, each ditch was approximately 2 feet wide so the amount cleaned by the District was less than .47 acres. All work was done using hand tools (i.e. shovels, pitch forks, etc.). Copies of the Districts source reduction work plans are annually submitted to regulatory agencies including USACE, SFBRWQCB, BCDC, USFWS, CDFW, CA State Lands Commission, CA Coastal Commission, USEPA, and NMFS.

Deferring to consultation with agencies as a part of the District's BMPs is a way to further refine the mosquito control work that is done based on site specific needs. All BMPs are implemented as a part of the District's overall program but at times scenarios arise or projects may be undertaken that require additional BMPs or permits.

6

Please see responses D and E in Section 2.2, Key Comments and Master Responses.

7

Table 4-4 has been updated and now includes stock ponds and roadside ditches as California tiger salamander habitat.

California tiger salamander *Ambystoma californiense*	FT, ST, SSC	Central Valley DPS federally listed as threatened. Need underground refuges, especially ground squirrel burrows and vernal pools, stock ponds, roadside ditches, or other seasonal water sources for breeding

8

In comments on ACMAD activities under the Surveillance Alternative, CDFW should note that:

> Most of the access ways are preexisting, and few new access pathways are created in any year.

> Access ways are only 3 to 6 feet wide and vegetation is only trimmed when necessary to allow access for mosquito management activities (BMP K4).

> Maintenance/clearing of paths is typically not necessary in SMHM habitats because pickleweed rarely impedes the ability to inspect a mosquito source and upland vegetation is normally not dense enough to restrict access. Vegetation maintenance and clearing of pickleweed is typically done as a source reduction activity and is addressed in Response 5 above.

We disagree that impacts of the Surveillance Alternative may have a significant impact. The CEQA definition of substantial adverse change/significant impact vs less-than-significant impact (minor, short term, limited effects) is based on the physical change to the environment over the existing condition (May 2012 when the NOP was issued). Habitat loss is extremely limited because few new access ways would be created in natural areas and because of the small size of these access ways (see above). The area of disturbance is extremely small in relation to the total potential sensitive species habitat area. Moreover, to offset this access disturbance, District staff perform beneficial cleanup activities. Staff find and remove tires, trash, buckets, old appliances, pieces of metal, etc., and properly disposes of them at landfills and/or recycling centers. To remove the trash sometimes requires access be made to get the “garbage” out. No access has been wider than 6 feet and usually about 3 feet wide is the access needed.

Surveillance is a monitoring activity that focuses on sampling, not habitat alteration. Vegetation trimming to facilitate surveillance by itself would have a less-than-significant impact on habitat and the species depending on that habitat, especially since vegetation is being trimmed/maintained and not completely removed or cleared. As explained in Section 4.2.3 of the PEIR: “These disturbances would be very minor and of short duration, so would likely not cause these animals to abandon the area.” In any given area, District staff would typically be on site to conduct surveillance activities less than once every ten days during periods favorable to mosquito breeding. Quantifying number of breeding periods annually is problematic as weather patterns and site conditions (temperature, rainfall, tidal regimes, hydroperiod, etc.), species of mosquito, time of year, and ease of access all play an important role in determining surveillance patterns, frequency of site visits, and time spent on the site. Frequency and duration of visits will vary and must in order to properly and effectively implement IPM principles and integrated mosquito management practices. Mosquito control is by its very nature an adaptive integrated ecosystem management process.

CDFW cites a concern regarding driving off-road in special status species habitat. ACMAD engages in the following BMPs to avoid or minimize disturbance:

> When working in state or federally managed wildlife refuges, the District informs and/or coordinates its surveillance (and treatment) activities with the appropriate resource agency staff to minimize impacts (BMPs A1 and A2).

> District staff receives training from USFWS and CDFW biologists regarding special status species (BMP A4) and uses existing access routes whenever available (BMP A3).

- > Most of the other BMPs cited in Table 2-6 and included as part of the project minimize impacts to special status species or their habitats in areas where they are likely to occur. These BMPs are implemented in all areas where special status species have the potential to occur, not just the wildlife refuges/management areas.
- > It is the District's understanding that CDFW staff use vehicles to travel out near to a desired site and then walk in from where the vehicle was parked. District staff essentially do the same thing, whenever possible and reasonable. Thus the District's occasional use of vehicles is consistent with ongoing wildlife area management activities and would not represent a substantial adverse change that is reasonably likely to have a significant effect on protected species or their habitat.
- > When it is necessary to move through salt marsh habitat using vehicles (e.g., it is not always practical to avoid use of motorized equipment for access given the large size of some sites), vehicles are kept on pre-existing access ways as much as practicable (BMPs A3, B2) and are operated in a manner to minimize impacts (A8, B2).

There are times when many large areas are flooded at the same time, and the limitation of time and staff may require that they access known historical breeding sites with ATVs to facilitate timely monitoring and effective least toxic treatment if breeding is found. There is a narrow time window for many of the materials the District uses to effectively manage mosquitoes (i.e., Bti and Bs works on immatures, typically first through early fourth instar; methoprene works on larvae only, etc.). Other factors such as weather conditions, temperature (ambient and water), access issues, and limited staffing necessitate the occasional use of less favorable access methods than walking for monitoring and treatment. Without this approach, the District is relegated to adulticiding large areas (to a much greater extent than at present), a method that is least desired by the District and the public that it serves.

Please see response D in Section 2.2, Key Comments and Master Responses regarding the need for a survey by a qualified biologist. The impact analysis in the Draft PEIR relied on all of the above listed measures to reach the preparers' determination that surveillance activities would have a less-than-significant impact on special status species and their habitats.

9

Under the California Fish and Game Code, Lake and Streambed Alteration Agreement requirements apply to any activity that will:

- > substantially divert or obstruct the natural flow of any river, stream or lake; or
- > substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake; or
- > deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake; **and**
- > substantially adversely affect fish or wildlife.

The District does not anticipate undertaking any project that would require a Lake and Streambed Alteration Agreement; however, if it does pursue such a project, it would request a LSAA for the particular activity. The need for any subsequent project-level CEQA review at a particular source control/treatment site would be considered at the time the District applied for a required LSAA permit.

Take is defined in Section 86 of the Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." Under the federal ESA, the term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Under the federal ESA, "harm" includes any act which actually kills or injures fish or wildlife. This definition emphasizes that such acts may include significant habitat modification or degradation that significantly impairs essential behavioral patterns of fish or wildlife. Based on the BMPs and additional

mitigation measures included in the Draft PEIR, with modifications based on agency consultations and public comments for this responses to comments component of ACMAD's Final PEIR, and based on its long history and extensive experience implementing the Program activities, the District does not anticipate that its actions will result in take of any species.

Mosquito control actions could result in some organism potentially being unintentionally harassed (i.e., prompted or forced to temporarily leave its specific location). There is the potential for such inadvertent disturbance any time humans come into proximity of protected species, including through visits to or management of wildlife refuges. However, it is not reasonably foreseeable that such disturbance would constitute harm that actually kills or injures fish or wildlife. If physical surveillance or treatment of areas occupied by special status species were avoided, then there would be no potential for take. It also is not expected that any District IMMP activities would cause "significant habitat modification or degradation" that would significantly impair essential behavioral patterns of fish or wildlife. Potential impacts associated with maintenance of drainage ditches and limited vegetation management can be avoided or minimized using the BMPs and mitigation measures identified in the PEIR. It should also be noted that there is the option of using chemical treatment if physical control methods were to be avoided. Furthermore, all activity at the Don Edwards National Wildlife Refuge to control mosquitoes is coordinated with the refuge manager/staff, and the need to address mosquito populations and breeding habitat at state/county /city parks and lands is also coordinated with the staff of these areas, which further minimizes the potential for any direct or indirect take of species.

10

Please see response C in Section 2.2, Key Comments and Master Responses and responses 2 and 5 above.

11

Please see responses 1 and 9 above regarding the need for an ITP and LSAA.

The District has responded to CDFW in these responses to comments and in text changes to the Draft PEIR as part of the Final PEIR document. The District has determined that all of the identified impacts can be mitigated to less than significant, with the exception of the use of naled and there are no new significant impacts from the IMMP or from a new mitigation measure. Therefore, we have determined that the additional material to be added as part of the Final PEIR is not significant new information and therefore, there is no need to recirculate the Draft PEIR. This response to CDFW comments and subsequent text changes clarify or amplify or make insignificant modifications to the Draft PEIR. See CEQA Guidelines Section 15088.5.

(R)-ACWD

ALAMEDA COUNTY WATER DISTRICT

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September 1, 2015

Erika Castillo, CEQA Project Manager
Alameda County Mosquito Abatement District
23187 Connecticut Street
Hayward, CA 94545

Dear Ms. Castillo:

Subject: Comments on the Draft Programmatic Environmental Impact Report for the Alameda County Mosquito Abatement District's Integrated Mosquito Management Program

Thank you for the opportunity to provide comments on the Draft Programmatic Environmental Impact Report (PEIR) for the Alameda County Mosquito Abatement District's (ACMAD) Integrated Mosquito Management Program (IMMP). Alameda County Water District (ACWD) acknowledges the importance of the IMMP to manage the human health impacts of mosquitoes in Alameda County. ACWD is supportive of the IMMP described in the Draft PEIR; however, we would like to take this opportunity to provide comments on the IMMP operations within the Alameda Creek Watershed and within our agency's service area.

Background

ACWD provides drinking water to a population of over 344,000 in the cities of Fremont, Newark, and Union City. ACWD uses run-off in Alameda Creek to recharge the Niles Cone Groundwater Basin, which provides a major portion of the drinking water supply for ACWD's customers. ACWD manages the recharge of the groundwater basin by operating a series of Groundwater Recharge Facilities in and adjacent to Alameda Creek in Fremont. Additionally, ACWD is participating in the ongoing steelhead restoration efforts to restore fish passage within the Alameda Creek Watershed. Protection of the water quality in Alameda Creek, its tributaries, ACWD's Groundwater Recharge Facilities, and the Niles Cone Groundwater Basin is critically important to ACWD and the people and businesses we serve.

Comments

1. The PEIR describes an integrated systems approach to mosquito control; however, ACWD would appreciate consideration of an approach that avoids chemical controls unless absolutely necessary. Fundamentally, no chemicals should be used that are not

(R)-ACWD

acceptable for use in California by the Department of Pesticide Regulation for drinking water resource areas. ACWD strongly supports ACMAD's use of best management practices, strict adherence to product label instructions, and the adherence to the application criteria described in the Draft PEIR.

2. Pesticides applied to properties in the extensive Alameda Creek Watershed could be transported downstream via rainfall run-off into Alameda Creek and then into ACWD's service area. ACWD utilizes the run-off in Alameda Creek to recharge the Niles Cone Groundwater Basin, which supplies drinking water wells that provide drinking water for the residents of Fremont, Newark, and Union City. ACWD operates a series of percolation ponds in Fremont known as the Groundwater Recharge Facilities. Any chemical constituent present in the surface water of the ponds or in Alameda Creek has a significant likelihood of being percolated into the groundwater basin. Additionally, ACWD is involved in the ongoing steelhead restoration efforts within the Alameda Creek watershed. Although the chemical products applied by the ACMAD as part of the IMMP are approved by various agencies, ACWD suggests minimizing their use as much as possible, in order to avoid any possible impacts to the many beneficial uses of Alameda Creek. If chemical control is absolutely essential, the use of products that break down quickly into inert components is preferred to lessen the potential threat to the environment and human health. Some products warn against specific applications in sensitive riparian areas important for municipal water supply; these applications must be avoided and alternative strategies employed.

3. Please note that trucking of hazardous materials along Highway 84 through Niles Canyon is prohibited by CalTrans.

4. ACWD should be immediately notified of any significant spills of pesticides, herbicides, or hazardous materials in Alameda Creek Watershed so that appropriate actions can be taken to secure facilities and minimize the threat to water quality. Notification should be made to Evan Buckland, Water Supply Supervisor, at (510) 668-6539 or at (510) 304-8046 (incident notification only).

5. The Draft PEIR states on pages 9-40 that "Although the District has not used [the organophosphate] naled in the past, it could be used in the future if needed." ACWD strongly urges ACMAD to avoid, if not completely eliminate the use of naled, which degrades into the highly toxic compound dichlorvos. Additionally, ACWD requests that ACMAD provide notification to ACWD at least 48 hours in advance of any application of naled within the Niles Canyon watershed or within ACWD's service area.

(R)-ACWD

Thank you again for the opportunity to provide comments on the Draft PEIR. Should you have any questions about these comments or about ACWD's water supply and groundwater recharge operations, please contact Douglas Chun, Water Supply Manager, at (510) 668-6510 or by email at doug.chun@acwd.com.

Sincerely,

Steven D. Inn
Manager of Water Resources

sm/mh
By Email

RESPONSE ACWD

Alameda County Water District **Steven D. Inn, Manager of Water Resources**
September 1, 2015

1

Chapter 15, Alternatives, considers the effects of both a No Chemical program and a Reduced Chemical program. The No Chemical program is not a reasonable alternative because it results in potentially significant impacts to human health. As the District program currently stands chemical control is used when surveillance data indicates that treatment thresholds have been met. When choosing a treatment material, the product that has the least impact and can effectively control the target population is preferred and used when appropriate. In general, this progression of choices would be: 1) bio-rationals (B.t.i., B.s., Spinosad), 2) insect growth regulators (methoprene), 3) surface agents (oils and monomolecular films) and 4) adulticides (ACMAD 2011).

2

When pesticides are applied, the District implements label requirements and BMPs to reduce adverse effects to surface-water and groundwater resources during and following pesticide applications. Label requirements and BMPs are described in Key Comments and Master Responses comment G1. Some pesticide labels restrict applications within 24 hours following rain events or in areas where intense or sustained rainfall is forecasted to occur within 24 hours following application. In such cases, the District would not apply pesticides until weather conditions are appropriate. Implementation of this label requirement would reduce the potential for pesticides in runoff or in mobilized soils and sediments.

The environmental fate of a particular pesticide is influenced by its chemical properties and by the environmental conditions in which it is applied. The PEIR's Appendix B, Ecological and Human Health Assessment Report, provides a detailed description of the fate and transport in air, water, and soil for each of the active ingredients applied or potentially applied by the District. Many second- and third-generation insecticides are formulated to act quickly and then dissipate quickly in the environment, often within hours or days. Others bind to soils and sediments where they are degraded abiotically or by soil organisms. These effects, and the potential for mobilization after pesticide application, are considered in the discussion of the Vegetation Management and Chemical Control alternatives (see Sections 9.2.5 and 9.2.7 of the PEIR), which concluded that most of the active ingredients did not impact surface water or to groundwater. Clearly, there is minimal movement of pesticides in sediments or soils into water bodies, that is determined by the binding and half-life characteristics of the chemical used. Concerning the use of naled, its breakdown product dichlorvos can increase aquatic toxicity, so the District limits its use for adulticides to only those situations where mosquitoes are resistant to other, less hazardous products. This is described in Impact WR-25, where the use of naled in the District's integrated mosquito management program is a significant and unavoidable impact to surface waters.

3

ACMAD understands that the trucking of hazardous materials along Highway 84 through Niles Canyon is prohibited. The District will not be in violation of this mandate.

4

If any significant spills of pesticides or herbicide were to occur by ACMAD into the Alameda Creek Watershed, ACWD will be notified.

5

ACMAD acknowledges the significant effects adulticide treatments with naled could have. However, naled would only be used in situations where pesticide resistance makes treatment with another product

ineffective. As discussed in Section 2.3 of the PEIR, the District employs integrated pest management (IPM) principles by first determining the species and abundance of mosquitoes through evaluation of public service requests and field surveys of immature and adult mosquito populations and, then, if the populations exceed predetermined criteria, using the most efficient, effective, and environmentally sensitive means of control. For all mosquito species, public education is an important control strategy for minimizing or avoiding mosquito-breeding conditions on private property. In some situations, water management or other physical control activities can be instituted to reduce mosquito-breeding sites. In some cases, the District can also use biological control such as the planting of mosquitofish in ornamental fish ponds, water troughs, water gardens, fountains, and unused swimming pools. When these nonchemical approaches are not effective, or are otherwise deemed inappropriate, then pesticides are used to treat specific mosquito-producing or mosquito-harboring areas.

The District uses a phased approach to pesticide treatments. When choosing a treatment material, the product that has the least impact and can effectively control the target population is preferred and used when appropriate. In general, this progression of choices would be: 1) bio-rationals (B.t.i., B.s., Spinosad), 2) insect growth regulators (methoprene), 3) surface agents (oils and monomolecular films) and 4) adulticides (ACMAD 2011). If it is determined that treatment with naled is necessary, the District will provide the requested notification to ACWD.

3.1 References

References from Commenters

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4 Organization Comments and Responses

4.1 Public Agency and Organization Comments and Responses

Comments received by two organizations (O), Save the Frogs (O-STF) and Citizens Committee to Complete the Refuge (O-CCCR) are provided with District responses following each numbered comment.

(O)-STF

To: Erika Castillo
CEQA Project Manager for Alameda County Mosquito Abatement District
23187 Connecticut St., Hayward, CA 94545
enspec@mosquitoes.org

Dear Erika,

On behalf of SAVE THE FROGS! and our worldwide network of supporters, staff and volunteers, I am writing to submit an official comment related to the Notice of Availability (NOA) of a Draft Programmatic Environmental Impact Report for the Alameda County Mosquito Abatement District's Integrated Mosquito Management Program (SCH# 2012052037).

SAVE THE FROGS! (www.savethefrogs.com) is the world's leading amphibian conservation nonprofit. Our mission is to protect amphibian populations and to promote a society that respects and appreciates nature and wildlife. Headquartered in California, we work throughout the Bay Area, across the USA and around the world to prevent the extinction of amphibians, and to create a better planet for humans and wildlife. Since 2008, SAVE THE FROGS! scientists and volunteers have held over 1,600 educational events in 60 countries to educate people about the plight of frogs and teach them ways to protect amphibians.

SAVE THE FROGS! opposes the spraying of pesticides to combat mosquitoes in Alameda as the project would harm humans and wildlife and does not provide a long-term solution to mosquito control.

Pesticides are intended to kill. The pesticide industry has a long history of selling chemicals that are eventually found out to be extremely harmful to humans and wildlife, and with the billions of dollars these companies have at their disposal, they have managed to lobby their way towards legality for chemicals that should be banned, and that in many other countries are banned. Many pesticides that are currently legal have large bodies of scientific information describing the lethal and/or sub-lethal harms they cause to humans and wildlife. There is no health organization in the world that suggests the ingestion of pesticides as part of a healthy lifestyle. It is extremely evident that spraying pesticides in Alameda County communities contaminates the air and water and puts humans and wildlife at direct risk of exposure to chemicals intended to kill.

1

Pesticides Are Harmful To Humans And To Wildlife

One of the pesticides proposed for use by Alameda County is glyphosate (commercial names: Roundup, Rodeo, aqua master), which is known to cause direct mortality of tadpoles (see "The Lethal Impact of Roundup on Aquatic and Terrestrial Amphibians" by Rick A. Relyea published in

2

Dr. Kerry Kriger
Executive Director
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savethefrogs.com

(O)-STF

Ecological Applications, 15(4), 2005, pp. 1118–1124). Glyphosate is manufactured by Monsanto Company (St. Louis, Missouri), who also brought us other harmful chemicals such as DDT, Dioxins, PCB's and Agent Orange. I do not think that many Alameda residents would be very happy if they knew their tax dollars were being used to spray them with poisons created by the makers of Agent Orange. Would you sign your name authorizing Alameda residents to have their neighborhoods sprayed with such a chemical? 2

Another pesticide proposed for use is permethrin, the chemical that gets used to coat mosquito nets and clothing to prevent malaria. These chemicals come with instructions to wear gloves and not to touch. So why would Alameda County think that it is safe to spray such a chemical in Alameda neighborhoods? 3

Alameda County's Spraying Guidelines Do Not Protect the Environment

The proposed guidelines on where and when county employees could spray should not be approved in their current state. Alameda County proposes to allow pesticide spraying up to but not closer than 15 feet of aquatic breeding critical habitat or non-breeding aquatic critical habitat within critical habitat areas, and not within 15 feet of aquatic features within non-critical habitat sections. If Alameda sprays pesticides within 15 feet of a waterbody, those pesticides WILL enter the water. Do you know anybody who would want to drink pesticides? Probably not. Neither do aquatic organisms want to drink pesticides. Thus the distance for spraying near water bodies should be *at least* a 50 meter buffer zone in order to provide a bare minimum of protections for aquatic organisms. 4

Another problem with Alameda's plan is that it requires no spraying of pesticides if precipitation is forecast to occur within 24 hours. What is necessary is at least 96 hours. Otherwise a significant amount of the sprayed chemicals would inevitably end up in the waterbody. After all, **the half life of glyphosate is 47 days!** 5

Alameda County should be aware that pesticide sprays result in "pesticide drift", meaning much of the pesticide spray mist gets carried by the wind and eventually gets deposited far from the location where it was sprayed. Alameda should thus assume that these pesticides will be inhaled in the Alameda breezes by Alameda children. Do you know anyone who would want their children inhaling pesticides? Probably not. Would you feel right authorizing an activity that resulted in the inhalation of pesticides by Alameda residents? 6

A Safer Path Forward

Mosquito-borne illnesses are extremely rare in Alameda County and were rare prior to the commencement of mosquito spraying. If the County has noticed an increase in mosquitoes in Alameda it is likely due to the significant destruction of wetlands, which serve as homes to frogs, salamanders, bats, birds, fish and other wildlife species that love to eat mosquitoes. If the County wants less mosquitoes, it should focus on improving wildlife habitat. This will provide the County with healthy ecosystems that regulate themselves. Alameda County should divert funds away from 7

(O)-STF

pesticide spraying and towards programs to build wetlands. The County can also put more effort into educating people about how to reduce man-made mosquito habitats such as old tires and pots that hold stagnant water. The County can also utilize "mosquito dunks" (*Bacillus thurigiensis*) as mosquito control. 7

Amphibians Worldwide and in Alameda County

Amphibian populations have been declining worldwide at unprecedented rates, and nearly one-third of the world's amphibian species are threatened with extinction. Up to 200 species have completely disappeared since 1980, and this is NOT normal: amphibians naturally go extinct at a rate of only about one species every 500 years. Amphibian populations are faced with an array of environmental problems, including pollution, infectious diseases, habitat loss, invasive species, climate change, and over-harvesting for the pet and food trades. Unless we act quickly, amphibian species will continue to disappear, resulting in irreversible consequences to the planet's ecosystems and to humans.

Alameda County is home to populations of two very threatened amphibian species: the Foothill Yellow-Legged Frogs (*Rana boylii*) and our official state amphibian, the California Red-Legged Frog (*Rana draytonii*). These frogs already face so many threats: habitat destruction, chytridiomycosis, predatory invasive species, road mortality. Alameda should not be using any pesticides anywhere remotely in the vicinity of streams or ponds that harbor these amazing native animals. 8

Foothill Yellow-Legged Frog, Alameda Creek

(O)-STF

Our official state amphibian, the California Red-Legged Frog.

The Harms Caused By Mosquitofish

The District's policy to use mosquitofish in artificial water bodies (including ornamental fish ponds, water troughs, water gardens, fountains, and unmaintained swimming pools), will likely result in the spread of mosquitofish to nearby natural waterbodies, including habitats used by threatened, endangered, or rare species. This is because natural disasters including floods inevitably occur, causing high water that overflows into previously isolated waterbodies, releasing the fish into the greater ecosystem. Also, people often move fish around, either on purpose or through ignorance of the potential ecological harm they are causing. Birds can eat fish and later deposit the fish's eggs into local water bodies. There is a significant body of evidence demonstrating the harm that mosquitofish cause to amphibian populations, so SAVE THE FROGS! strongly opposes their use in Alameda County. 9

Save The Frogs and Save Alameda Citizens

Frogs eat mosquitoes; provide us with medical advances; serve as food for birds, fish, mammals and reptiles; and their tadpoles filter our drinking water. Plus frogs look and sound cool, and kids love them -- so there are lots of reasons to protect Alameda's remaining amphibian populations. And of course there are many reasons to keep Alameda residents from being exposed to harmful pesticides funded by and applied with their taxpayer dollars.

Please feel free to contact me with any questions regarding amphibians or these comments.

Sincerely,

Kerry Kriger

Kerry Kriger, Ph.D.

3-September-2015

RESPONSE (O)-STF

SAVE THE FROGS! **Kerry Kriger, Ph.D., Executive Director**
September 3, 2015

1

As discussed in Section 2.3 of the PEIR, the District employs integrated pest management (IPM) principles by first determining the species and abundance of mosquitoes through evaluation of public service requests and field surveys of immature and adult mosquito populations and, then, if the populations exceed predetermined criteria, using the most efficient, effective, and environmentally sensitive means of control. For all mosquito species, public education is an important control strategy for minimizing or avoiding mosquito-breeding conditions on private property. In some situations, water management or other physical control activities can be instituted to reduce mosquito-breeding sites. In some cases, the District can also use biological control such as the planting of mosquitofish in ornamental fish ponds, water troughs, water gardens, fountains, and unused swimming pools. When these nonchemical approaches are not effective, or are otherwise deemed inappropriate, then pesticides are used to treat specific mosquito-producing or mosquito-harboring areas.

The District uses a phased approach to pesticide treatments. When choosing a treatment material, the product that has the least impact and can effectively control the target population is preferred and used when appropriate. In general, this progression of choices would be: 1) bio-rationals (B.t.i., B.s., spinosad), 2) insect growth regulators (methoprene), 3) surface agents (oils and monomolecular films) and 4) adulticides (ACMAD 2011).

The PEIR's Appendix B, Ecological and Human Health Assessment Report, provides a detailed description of the fate and transport in air, water, and soil for each of the active ingredients applied or potentially applied by the District. Many second- and third-generation insecticides are formulated to act quickly and then dissipate quickly in the environment, often within hours or days. Others bind to soils and sediments where they are degraded abiotically or by soil organisms. These effects, and the potential for mobilization after pesticide application, are considered in the discussion of the Vegetation Management and Chemical Control alternatives (see Sections 9.2.5 and 9.2.7 of the PEIR), which concluded that most of the active ingredients did not impact surface water or groundwater.

2

Please see response H in Section 2.2, Key Comments and Master Responses. In addition, glyphosate exposure was not associated with cancer incidence overall or with most of the cancer subtypes studied by de Roos et al. (2005). Given the widespread use of glyphosate, and the paucity of information providing significant and relevant causality amid the often barrage of emotional claims that glyphosate exhibits numerous low-level or sub-lethal adverse effects (Seneff nd), in reality there have been no demonstrated significant adverse health effects (even in pesticide applicators). The studies reporting potential human health effects are associated with extreme exposures to applicators during misuse scenarios and spills and/or working in the preparation of the commercial products (Mink et al 2012). These conditions and potential exposure conditions are neither typical nor likely in the use and applications by trained District staff. All application directions include detailed procedures to deal with a spill. Glyphosate remains a reasonably safe product for use in the numerous situations where control of vegetation is needed for habitat management (for mosquito control). Importantly, it has been demonstrated that herbicides are a different class of chemicals than those classified as insecticides that have specific, demonstrated autonomic effects.

3

The District applies all chemicals in strict conformance with label requirements, which are registered by the USEPA and have been approved by California Department of Pesticide Regulation (CDPR) for use in California. Pesticide labels are application requirements and include instructions informing users how to apply the product and precautions the applicator should employ to protect human health and the environment. Pesticide applications would comply with label restrictions on application rates and methods, storage, transportation, mixing, and container disposal.

Permethrin use is limited to adult mosquitoes (adulticiding) which is infrequent in Alameda County. Most of the District's chemical treatments are to mosquito larvae and pupae. To minimize the amount of pesticide applied, pesticide applications are informed by surveillance and monitoring of mosquito populations. Materials are applied at the lowest effective concentration for the environmental conditions. For non-Ultra Low Volume (ULV) applications, spray nozzles are adjusted to produce larger droplet size, low nozzle pressures are used where possible, and spray nozzles are maintained at a predetermined maximum distance from target areas. ULV applications sprays are calibrated for the proper droplet size. The District has adulticided 4 times in the last five years, however, permethrin was not used.

4

Please see response G1 in Section 2.2, Key Comments and Master Responses.

5

Many pesticides used for mosquito control are formulated to be applied directly to waterbodies, while others are intended only for terrestrial uses. In both cases, the label provides specific instructions for application of the material. These label requirements are based upon information submitted to the USEPA from the scientific community for each active ingredient. In general, the BMPs used by the District are determined by the label requirements, although additional measures may be used. In addition, each organic chemical, whether toxic or not, decays in both activity and toxicity over time. For some chemicals, the half-life can be hours, days, or weeks. By design, few chemicals used as pesticides have half-lives greater than a week and are further degraded by the environmental conditions of the application area. When pesticides get into soil, or water, or are taken up by plants and animals, the half-life characteristics are altered. The environmental fate of pesticides depends on the physical and chemical properties of the pesticide, particularly the pH of the medium, modifying how likely it is to travel through soil (soil mobility), how well it dissolves in water (water solubility), and how likely it is to become airborne (volatility).

Once a pesticide has been released into the environment, it can be broken down by exposure to sunlight, (photolysis), exposure to water (hydrolysis), exposure to other chemicals (oxidation and reduction), microbial activity (bacteria, fungi, and other microorganisms), and other plants or animals (metabolism). Pesticide labels set out safety and use guidelines that usually focus on three aspects: rates of application (single and cumulative) for registered crops and pests, timing of application, and restrictions on areas of application.

The environmental fate of pesticides used by the District are influenced by their chemical properties and by the environmental conditions in which they are applied. The PEIR's Appendix B, Ecological and Human Health Assessment Report, provides a detailed description of the fate and transport in air, water, and soil for each of the active ingredients applied by the District. A summary of the potential uses of glyphosate products by the District is included in Appendix B Table 6-1 and the narrative in section 4.6.2 of Appendix B. Many second-and third-generation insecticides are formulated to act quickly and then dissipate quickly in the environment, often through photolysis or microbial breakdown. Others bind to soils and sediments where they are degraded abiotically or by soil organisms. These effects, the potential for mobilization after pesticide application and the methods used to minimize exposures to unwanted receptors, are considered in the discussion of the Vegetation Management and Chemical Control Alternatives (see Sections 9.2.5 and 9.2.7 of the PEIR).

Glyphosate has been shown to have a half-life of a few days in some conditions to longer in some soils. The generally accepted, conservative, half-life for soils is reported to be approximately a month to 42 days, depending on the soil type, pH, and other characteristics of the soils. Vegetation residues of glyphosate have been measured in numerous studies, and it is typical that the measurable residue of glyphosate in target vegetation diminishes rapidly after incorporation into the plant tissue (Zhang et al. 2015). Glyphosate changes from the primary chemical to the lessor resulting product chemicals. The half-life denotes the time for the parent compound to decrease in detectable concentration by ½ the application concentration essentially halving the exposure concentration available. When applied to typical areas targeted for vegetation management, glyphosate is transformed to less toxic and different chemical constituents in normal soil within a few days, or even quicker when used for most general uses such as those by the District. It can be rapidly bound to soil particles and inactivated, and the unbound glyphosate can be degraded by bacteria.

6

Please see response G2 in Section 2.2, Key Comments and Master Responses.

7

The statement “If the County has noticed an increase in mosquitoes in Alameda it is likely due to the significant destruction of wetlands…” is factually incorrect. The Alameda County Abatement District formed in 1930 to control the significant numbers of mosquitoes that emerged seasonally from the marshlands surrounding the Bay. Prior to established countywide mosquito control “the insects came in such hordes with every westerly breeze that life outdoors in the infested regions became unendurable during the morning and evening hours” (Berkeley Daily Gazette 1931). *Aedes squamiger* and *Aedes dorsalis* are two aggressive daytime biting mosquito species native to the Bay Area. “At times when the mosquito plague is at its worst, it has adversely affected real estate sales, property values, labor efficiency and all outdoor sports and recreation in the afflicted districts” (Berkeley Daily Gazette 1931).

The District takes its authority to proactively manage mosquito populations and protect public health, while also meeting its goal of preserving natural resources, very seriously. The District was created and performs its duties pursuant to the Mosquito and Vector Control District Law (Health and Safety Code, §2000 et seq.). In enacting that law the California Legislature recognized the importance to public health and the economy of active management of pests. The Legislature thus found and declared:

Health and Safety Code, § 2001

(1) California's climate and topography support a wide diversity of biological organisms.

(2) Most of these organisms are beneficial, but some are vectors of human disease pathogens or directly cause other human diseases such as hypersensitivity, envenomization, and secondary infections.

(3) Some of these diseases, such as mosquito-borne viral encephalitis, can be fatal, especially in children and older individuals.

(4) California's connections to the wider national and international economies increase the transport of vectors and pathogens

The Legislature granted the District broad powers to address the threat to public health and the economy posed by vectors and specified its duties as follows:

Health and Safety Code, § 2040

Within the district's boundaries or in territory that is located outside the district from which vectors and vector-borne diseases may enter the district, a district may do all of the following:

(a) Conduct surveillance programs and other appropriate studies of vectors and vectorborne diseases.

(b) Take any and all necessary or proper actions to prevent the occurrence of vectors and vector-borne diseases.

(c) Take any and all necessary and proper actions to abate or control vectors and vectorborne diseases.

(d) Take any and all actions necessary for or incidental to the powers granted by this chapter.

The threat of mosquito-borne diseases does exist in Alameda County and would be far greater if it were not for the 86 years of established mosquito control in the County. West Nile virus activity has been detected every year since entering the County in 2004. On several occasions, invasive *Aedes* mosquitoes (*Aedes aegypti* and *Aedes albopictus*) were detected in Alameda County. These mosquito species are capable of transmitting several debilitating and potentially deadly disease such as dengue, chikungunya, Zika, and yellow fever (*Aedes aegypti* only). Without established mosquito control the chance of these vectors and disease establishing and spreading throughout the County increase significantly.

As stated in Section 2.4 of the Draft PEIR, "Public education is a key component that is used to encourage and assist reduction and prevention of mosquito habitats on private and public property. While this component is a critical element of the District's Program, public education activities are categorically exempt from CEQA review (CEQA Guidelines Section 15322)." ACMAD agrees with the important of putting effort into educating the public about how to reduce man-made mosquito habitats. Bti (*Bacillus thurigiensis israelensis*) is also one of the products most frequently used for mosquito control by the District. However, resistance management via product rotation is also a vital component of a sound IPM program.

8

BMPs specific to California Red-Legged Frog (CRLF) and Foothill Yellow-Legged Frog (FYLF) have been added to the District BMPs.

P. California Red-Legged Frog (CRLF)

1. Vegetation management and water manipulation in CRLF habitat shall not occur from November through March to avoid the CRLF breeding season and will be further delayed if tadpoles are present to allow them time to attain full metamorphosis.

2. Mosquitofish (Gambusia affinis) will not be introduced into any site containing CRLF.

3. The Declining Amphibian Populations Task Force Fieldwork Code of Practice will be followed in CRLF habitat.

4. If nonnative/introduced predators of CRLF (e.g. bullfrogs) are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

5. If CRLF are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

6. District staff will receive training on measures to avoid impacts to CRLF.

Q. Foothill Yellow-Legged Frog (FYLF)

1. Vegetation management and water manipulation in FYLF habitat shall not occur from April to July avoid the FYLF breeding season and will be further delayed if tadpoles are present to allow them time to attain full metamorphosis.

2. Mosquitofish (Gambusia affinis) will not be introduced into any site containing FYLF.

3. The Declining Amphibian Populations Task Force Fieldwork Code of Practice will be followed in FYLF habitat.

4. If nonnative/introduced predators of FYLF (e.g. bullfrogs) are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

5. If FYLF are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

6. District staff will receive training on measures to avoid impacts to FYLF.

Vector control agencies are exempt from the specific injunction concerning CRLF, an acknowledgement of the need for chemical use by vector control to protect public health. However, it is the application method, concentration of chemical used, adherence to product label requirements, selection of chemical over physical or biological control “alternatives” and options, and District BMPs that serve to lessen the potential impact to amphibians and CRLF in particular to less than significant.

9

Mosquitofish are valuable component of the Districts IMMP. Their use in artificial sources such as ornamental ponds, water troughs, water gardens, fountains, and unmaintained swimming pools reduces the need for chemical control and saves the time and money expended on treating a reoccurring mosquito source. The District does not agree with the assertion that mosquitofish will inevitably be introduced into natural sources via a natural disaster. In addition, the District provides everyone who request mosquitofish with our “Mosquitofish Prevention for Fishponds” brochure, which clearly states, “It is against California Department of Fish and Game regulations for private citizens to plant mosquitofish into waters of the state without a permit. (California Code of Regulations, Title 14, Sections 1.63 and 238.5; and California Fish and Game Code, Section 6400).” Mosquitiofish are viviparous so there is no danger of birds depositing mosquitofish eggs into local water bodies.

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CITIZENS COMMITTEE TO COMPLETE THE REFUGE

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Comments sent via email, no hard copy to follow

Erika Castillo 9 September 2015
CEQA Project Manager for Alameda County Mosquito Abatement District
23187 Connecticut Street
Hayward, CA 94545

Re: Draft Programmatic Environmental Impact Report (DPEIR) for the Alameda County Mosquito Abatement District's (ACMAD's) Integrated Mosquito Management Program SCG # 2012052037

Dear Ms. Castillo,

Thank you for the opportunity to provide comments and for the time extension. The Citizens Committee to Complete the Refuge has reviewed the DPEIR for ACMAD's Integrated Mosquito Management Program. This is an extremely large document with many attachments, our comments below are only based on a brief review, but based upon that review we have the following substantive comments.

Summary:

- ☒ The DPEIR refers to "Proposed Program Alternatives" but it is not clear what the preferred alternative is, or how it differs substantively from other alternatives considered. We are assuming, the preferred alternative would necessarily incorporate elements of surveillance, physical control, vegetation management, biological control and chemical control, as these elements are all currently employed by ACMAD. So we question why the DPEIR presents these elements as separate "alternatives" (Chapter 2)? It would have been much more useful for the public, had the DPEIR presented a preferred alternative that included the methodologies within each of these elements that the ACMAD felt would provide the greatest economically and logistically feasible mosquito control with the least environmental harm, rather than posing these each of these elements themselves as alternatives that might be used in isolation of the other techniques of mosquito control. As an example, there is probably no scenario under which ACMAD could effectively utilize "surveillance" as its sole means of dealing with mosquito control. 1

  What is sorely missing from the Summary Comparison of Impacts of Alternatives, is the analysis of the cumulative impacts on the biotic environment of the combined use of an alternative that utilizes physical control, vegetation management, biological control, and chemical control, or how changes in the magnitude of any of those elements might reduce significant adverse impacts to the biotic environment. 2

- ☒ Based upon the growing body of knowledge regarding the impacts of insecticides and herbicides on water quality and the biological environment, we find it difficult to comprehend how the only significant impact identified is that of "objectionable odors." One needs to look no further than the Best Management Practices (BMPs), and the fact that there are no BMPs for listed sensitive amphibian species other than the California tiger 3

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salamander (CTS). And although BMPs exist for CTS, the only habitat identified as sensitive are vernal pools, despite the fact that stockponds are known to provide important breeding habitat. 3

The larvicide methoprene is reported to be toxic to amphibians[1] and it has been reported that s-methoprene (Altosid) and its degradation products may be responsible for frog deformities.[2] While BMPs for CTS have been proposed, the BMPs only restrict the use of methoprene in vernal pools, and not for stockponds or any of the other habitats in which CTS are known to occur. Thus use of methoprene in stockponds could have significant adverse impacts for breeding CTS and for other listed and special status amphibians. 4

Chapter 2:

- ☒ Does ACMAD provide resource and regulatory agencies an advanced listing and maps of work that is anticipated to be performed during the year? Does ACMAD provide resource and regulatory agencies a yearly list of activities that have been performed along with maps depicting where the work occurred? 5

Surveillance Methodologies:

- ☒ Use of New Jersey Light Traps - A recent study[3] of 5 traps, including the New Jersey light trap, found the standard CMC and the new black light trap were more successful at trapping mosquitoes, while capturing the fewest non-target species. 6
- ☒ Maintenance of paths and clearings - "...periodic vegetation management may be necessary to maintain accessibility to water bodies." In tidal marsh habitats, critical habitat areas (e.g. that of California red-legged frog), or vernal pool complexes consultation with resource agencies is necessary before any such actions occur. 7

Physical Control Alternative:

- ☒ 2.3.2.1 - This section focuses on the need to improve circulation within marsh areas, and "connection of backwaters or isolated pools on floodplains to the main channels.." Pans are naturally occurring habitats within the upper edges of the tidal marsh. These areas may provide important habitat for special status plant and animal species and artificial drainage of such areas may significantly reduce their habitat values. Drainage of naturally occurring pans should not be undertaken, and should not occur without consultation of the appropriate regulatory and resource agencies. 8
- ☒ We concur that any physical control activities require consultation with appropriate resource and regulatory agencies prior to implementation.
- ☒ 2.3.2.1.1 - The description of "artificially ponded" areas requires elaboration. The section refers to "artificial ponds for holding drinking water for livestock, and retention ponds created for holding of rainwater." The passage also references "filling or draining artificially ponded areas" as "cost-effective and environmentally acceptable" and does mention that this may not be appropriate in "natural areas." This section should also clarify that such ponded areas may provide vitally important foraging or breeding habitat for listed and special status species such as the California tiger salamander (CTS), California red-legged frog (CRLF), foothill yellow-legged frog (FYLG), western spadefoot toad (WTS), western pond turtle (WPT), etc. In addition, such areas may provide habitat for the Tri-Colored Blackbird. In areas where listed or special status species, or aquatic 9

[1] Extension Toxicology Network (EXTOXNET), http://pmep.cce.cornell.edu/profiles/extoxnet/haloxyfop-methylparathion/methoprene-ext.html, publication date: 9/95

[2] Henrick, Clive A, Jinren Ko, Jack Nguyen, Jim Burleson, George Lindahl, Douglas Van Gundy, and Julie M. Edge. "Investigation of the relationship between s-methoprene and deformities in anurans." 2002. Journal of the American Mosquito Control Association, 18(3):214-221

[3] Chun-Xiao Li, Michael L. Smith, Ali Fulcher, Phillip E. Kaufman, Tong-Yan Zhao and Rui-De Xue. 2015. "Field Evaluation of Three New Mosquito Light Traps Against Two Standard Light Traps to Collect Mosquitoes (Diptera: Culicidae) and Non-Target Insects in Northeast Florida." Florida Entomological Society, 98(1):114-117

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dependent amphibians, etc. are present, drainage and filling must be discouraged, as should the use of mosquito fish. We concur such areas are likely to fall under the purview of the U.S. Army Corps of Engineers, but also the Regional Water Quality Control Board. Thus not only is the Clean Water Act pertinent, but also state regulations regarding impacts to waters of the State.

- 2.3.2.1.2 - We strongly discourage the use of physical control methods in seasonal wetlands and vernal pools, especially drainage and fill activities.
- 2.3.2.1.3 - We reiterate our concerns regarding impacts to listed or special status species habitats.
- 2.3.2.1.4 - We reiterate our concerns regarding impacts to listed or special status species and their habitats that might result from drainage or fill activities.
- 2.3.2.1.5 - As discussed earlier, listed and special status species do not necessarily distinguish between naturally occurring ponds and "artificial" ponds. Care also needs to be taken when describing "ponding" in agricultural fields, which may in fact be naturally occurring ponded habitat or areas of saturated soils within agricultural fields.

9

- 2.3.2.1.6 - Upon what scientific data is ACMAD basing the comment, "Minor physical activities with insignificant environmental impactscan be accomplished using hand tools to connect small ponded areas to the channel along the edge of streams with highly variable flows"? Please provide documentation to back up this assertion.

10

- 2.3.2.1.7 - "educating the public about filling the holes with sand or other inert materials"? What about the impacts to nesting bird species or existing nests??! How can this impact be less than significant?

11

Vegetation Management Alternative:

- The value of the CNDDB is limited to areas where surveys have been conducted in the past and data has been submitted and the same is true for other online sources, therefore, surveys should be conducted prior to vegetation removal. Heavy equipment should not be utilized for vegetation removal in areas of sensitive species, and care must be taken to restore original topography.

12

- To avoid adverse impacts to special status plants and animals, ACMAD should provide maps of proposed vegetative removal to resource agencies prior to implementation, for their review and comment.

13

- Table 2-1 - We have concerns regarding the use of glyphosphates near wetlands and aquatic areas. As an example, the safety sheet for Alligare Glyphosphate 4 (http://www.alligarellc.com/assets/pdf/Glyphosate_4%20Plus_SDS_(v2.0).pdf), is toxic to aquatic life. A review conducted by the North Carolina Partners in Amphibian and Reptile Conservation urges caution when utilizing glyphosphates in areas supporting amphibians (http://www.ncparc.org/pubs/Herbicide%20Choices%20&%20Amphibian%20Conservation.pdf). One example provided is that of "surfactant-loaded formulations" such as Roundup. The report states recent studies suggest herbicides such as Roundup can have negative effects on tadpoles. In addition, herbicides such as R-11 Spreader Activator should not be utilized due to its estrogenic effects in wildlife, and for its reported toxicity for tadpoles.

14

Biological Control Alternative:

- We support the District policy to limit the use of mosquito fish to ornamental fish ponds, water troughs (as long as there is no possibility of escape into natural water bodies), water gardens, fountains and unmaintained swimming pools, so long as those artificially constructed waters are not utilized by special status amphibians.

15

Chemical Control Alternative:

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- We do not support the use of spinosid or any adulticides due to their potential adverse impacts to non-target organisms. 16

Chapter 4:

- 4.1.3.2.8 - "Stipulation Injunction and Order, Protection of California Red-Legged Frog from Pesticides" This section discusses the imposition of no-use buffer zones of 60 feet for ground applications and 200 feet for aerial applications away from the edges of CRLF habitat, but then states mosquito control programs are exempt. This section says the injunction permits the use of methoprene, permethrin, and naled for mosquito control. The passage also states :

  > You do not apply the pesticidewithin 15 feet of aquatic breeding critical habitat or non-breeding aquatic critical habitat within critical habitat areas, or within 15 feet of aquatic features within non-critical habitat sections subject to the injunction. [emphasis added]

  The BMPs for CTS are silent with respect to restricting the use of naled. We do not support the use of naled not only because of the toxicity of naled to non-target organisms, but also because of the threat posed by one of naled's breakdown products, dichlorvos. 17
- 4.2.1.1 The environmental review document should reiterate that state and federal permits will be required for "Direct impacts [that] would include habitat modifications, such as draining or changing the hydrology..." 18
- Table 4-3 - Needs to be improved.
  - Livermore tarplant is a state candidate species
- Table 4-4 - There are a number of omissions or inaccuracies.
  - CTS are listed as needing vernal pools or seasonal water sources for breeding. Stock ponds are important habitats for CTS and need to be included.
  - Longfin smelt should be added to the list as a federal candidate.
  - Snowy Plover utilize seasonal wetlands, managed ponds, and saltpond levees.
  - Townsend's big-eared bat is a state candidate species .
  - Swainson's Hawk is State threatened.
  - The American Peregrine Falcon is fully protected.
  - Some species are incorrectly identified as both State listed and SSC, and some species should be identified as State listed and fully protected, but are not.

  19
- Table 4-5 - The Eastern Alameda County Conservation Strategy should be included. 20
- Table 4-6 BMPs -
  - General BPMs - driving off road vehicles could crush or injure special status plants. If off road vehicles must be used, surveys should be conducted by qualified biologists at the appropriate time of year to avoid impacts to listed plants. An incidental take permit may be required in areas where there is a chance of take of a listed plant. 21
  - Avoidance measures for nesting birds includes conducting surveys prior to implementation of mosquito abatement measures.
  - The DPEIR suggests BMPs for CTS, but not for any of the other listed or special status amphibian or aquatic dependent species that occur within Alameda County. (e.g. California red-legged frog, foothill yellow-legged frog, western spadefoot toad, western pond turtle) BMPs should be developed for these species as well, and stockponds should be included in the description of aquatic habitat these species inhabit. As with CTS, methoprene, monomolecular films, and adulticides should not be used in vernal pools, stockponds, and seasonal wetlands utilized by these species. 22

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- The BMP for CTS states adulticides won't be used in vernal pools and seasonal wetlands utilized by CTS, but what about the surrounding uplands? The Xerces Society published a report on ecologically sound management of mosquitoes within wetlands[4] that cited a study in Florida. This study reported naled residues "downwind at up to 750m in no-spray zones on wildlife refuges six hours after routine adulticiding (Hennessey et al. 1992). "These no-spray zones were established because they harbored threatened or endangered species, including several butterflies, including several butterflies and other pollinators, whose survival could be further threatened by unintentional drift." Buffers need to be established that will be large enough to account for unintentional drift. 23
- A BMP should be developed for Tri-Colored Blackbird and in particular, the use of monomolecular films and oils should be prohibited in areas of Tri-Colored Blackbird nesting. 24

Chapter 5 - our concerns are similar to those listed above.

Time permitting, we would have liked to provide additional comments regarding the various herbicides, larvicides and adulticides listed. However, there are substantive concerns that the cumulative effects of the components of the integrated pest management program have not adequately been described or mitigated. In addition, the species accounts need to be corrected and updated, BMPs need to be provided for additional listed and special status species, and significant and substantive concerns exist regarding some of the proposed herbicides, larvicides and adulticides. We hope the proposed Integrated Mosquito Management Program will be revised to address these concerns.

Respectfully submitted,

Carin High

Carin High
Citizens Committee to Complete the Refuge

[4] Mazzacano, Celeste and Scott Hoffman Black. 2013. "Ecologically Sound Mosquito Management in Wetlands". The Xerces Society for Invertebrate Conservation. www.xereces.org

RESPONSE (O)-CCCR

Citizens Committee to Complete the Refuge **Carin High**
September 9, 2015

1

Please see responses A and B in Section 2.2, Key Comments and Master Responses.

2

Please see response B in Section 2.2, Key Comments and Master Responses. Cumulative effects of District alternatives are addressed in Chapter 13 of the PEIR, Cumulative Impacts.

3

Stockponds have been added to the habitat descriptions for California Tiger Salamander. In addition, District BMPs for CTS and several other special status species have been expanded (underlined sections) to address life stages and habitat types. These additional BMPs are a reflection of existing District practices.

> G1. Trucks and ARGOs will be restricted to established roads and berms in vernal pool and stockpond areas. Only small ATVs (e.g. Polaris) will be utilized near vernal pools and stockponds.

> G2. Methoprene, monomolecular films, and adulticides will not be used in vernal pool and stockpond areas during CTS breeding season (November-March) or if CTS larvae are present.

> G3. Vegetation management and water manipulation in CTS habitat shall not occur from November through March to avoid the CTS breeding season and will be further delayed if CTS larvae are present to allow them time to attain full metamorphosis.

> G4. Mosquitofish (Gambusia affinis) will not be introduced into any site containing CTS.

> G5. The Declining Amphibian Populations Task Force Fieldwork Code of Practice will be followed in CTS habitat.

> G6. If nonnative/introduced predators of CTS (e.g. bullfrogs) are encountered in CTS habitat during mosquito management activities, findings will be reported to the appropriate resource agency.

> G7. If CTS are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

BMPs for California Red-Legged Frog (CRLF), Foothill Yellow-Legged Frog (FYLF), and Western Spadefoot Toad (WST) were also added to more accurately reflect current District practices.

P. California Red-Legged Frog (CRLF)

> P1. Vegetation management and water manipulation in CRLF habitat shall not occur from November through March to avoid the CRLF breeding season and will be further delayed if tadpoles are present to allow them time to attain full metamorphosis.

> P2. Mosquitofish (Gambusia affinis) will not be introduced into any site containing CRLF.

> P3. The Declining Amphibian Populations Task Force Fieldwork Code of Practice will be followed in CRLF habitat.

> P4. If nonnative/introduced predators of CRLF (e.g. bullfrogs) are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

> P5. If CRLF are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

> P6. District staff will receive training on measures to avoid impacts to CRLF.

Q. Foothill Yellow-Legged Frog (FYLF)

> Q1. Vegetation management and water manipulation in FYLF habitat shall not occur from April to July avoid the FYLF breeding season and will be further delayed if tadpoles are present to allow them time to attain full metamorphosis.

> Q2. Mosquitofish (Gambusia affinis) will not be introduced into any site containing FYLF.

> Q3. The Declining Amphibian Populations Task Force Fieldwork Code of Practice will be followed in FYLF habitat.

> Q4. If nonnative/introduced predators of FYLF (e.g. bullfrogs) are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

> Q5. If FYLF are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

> Q6. District staff will receive training on measures to avoid impacts to FYLF.

R. Western Spadefoot Toad (WST)

> R1. Vegetation management and water manipulation in WST habitat shall not occur from January to May to avoid the WST breeding season and will be further delayed if tadpoles are present to allow the them time to attain full metamorphosis.

> R2. Mosquitofish (Gambusia affinis) will not be introduced into any site containing WST.

> R3. The Declining Amphibian Populations Task Force Fieldwork Code of Practice will be followed in WST habitat.

> R4. If nonnative/introduced predators of WST (e.g. bullfrogs) are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

> R5. If WST are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

> R6. District staff will receive training on measures to avoid impacts to WST.

4

Henrick et al. (2002) reports on their acute toxicity tests that incorporated direct applications of methoprene to jugs of pond water that resulted in unrealistic exposures when the test species was introduced to the jugs as the test medium. It has been reported by these and other authors that methoprene is toxic to amphibians, such as frogs, toads, and salamanders but at relatively high exposure concentrations. However, methoprene degrades rapidly in water, and low application rates result in substantially lower water concentrations that would, in only unusual conditions reach levels that are lethal to some amphibians. For instance, due to the combination of lower concentrations that would result from actual vector control use and rapid degradation, chronic toxicity is not expected as the District uses very low flow spray equipment and very focused applications to water to substantially reduce the amount of product that is applied. Studies on nontarget impacts of methoprene for mosquito control were reviewed recently (Davis et al. 2007, Davis and Peterson 2008) combined with an ecological risk evaluation of mosquito larvicides in a series of ponds at the Benton Lakes National Wildlife Refuge in Montana. Methoprene was applied directly to water as liquids, and aquatic arthropods were sampled following the applications. No overall treatment effects were observed on aquatic nontarget invertebrates collected in

net samples. Although these studies suggest a possible non-significant acute impact on amphipods immediately following application, there was no significant effect at 7 to 28 days. No trend was seen across dependent groups of nontarget organisms, and there were no persistent biological effects reported by Davis et al. (2007) and Davis and Peterson (2008). Methoprene use as mosquito larvicide poses some minimal hazards to freshwater invertebrates, but major effects are unlikely (EXTOXNET 1995) The exposure to aquatic organisms is reduced and the hazard is minimized when water concentrations of the chemical in the application areas are typically and substantially less than those reported in the laboratory studies. The results reported in these studies are due to exposure of the test species to concentrations of methoprene well above the concentrations (and subsequent potential exposures) as those used in the standard application procedures used by the District.

Numerous studies have reported that methoprene has no significant reproductive, teratogenic, or mutagenic effects in laboratory animals. Effects in aquatic organisms reported suggest that methoprene is moderately toxic to warm water, freshwater fish, and is slightly toxic to cold water, freshwater fish but exposure to this chemical is limited by the low solubility (0.51 ppm) of methoprene in water (USEPA 1991) and by its rapid degradation in aquatic environments.

Additionally, methoprene is not likely to leach, since it is rapidly bound, or adsorbed, to soil. It was shown to be relatively immobile in four experimental soil types (USEPA 1991). In leaching studies, Altosid has been observed only in the top few inches of the soil, even after repeated washings with water (Zoecon 1974).

Although some of the characteristic metrics of toxicity might be of concern, the impact of methoprene in water at the diluted concentrations resulting from spray applications make the adverse effects less likely to be of concern because the toxicity to aquatic animals are at the ppm level. Use of methoprene is not expected to result in exposure to aquatic invertebrates because methoprene is short-lived in aquatic environment and it does not have a particularly high potential for bioaccumulation (EXTOXNET 1995). In a multi-year study conducted in wetlands, researchers found no long-term negative impact on nontarget insects apparent after 8 years of treatment, but effects found in some years. Some chironomid groups were affected, but no detectible difference in total chironomid biomass due to treatment over 8 years in the treated vs non treated wetlands (Hershey et al. 1997).

“Water analyses in field and laboratory conditions and a comparison of reported Altosid use with reported frog deformities in Minnesota demonstrate that a connection between frog deformities and Altosid use is unlikely”. These results indicate that factors other than s-methoprene and its degradation products are contributing to the recent outbreak of frog deformities (Henrick et al. 2002).

5

ACMAD works with both resource and regulatory agencies on several levels. Maps and proposed maintenance footage of source reduction projects are submitted annually to including USACE, SFBRWQCB, BCDC, USFWS, CDFW, CA State Lands Commission, CA Coastal Commission, USEPA, and NMFS prior to project approvals and contact with property owners is also made. Annual summaries of work done are also submitted to those listed above. As a part of the Districts NPDES permit for Vector Control, ACMAD prepares a Pesticide Application Plan and annually reports all pesticide applications (maps and treatments amounts are included) to WOTUS to the State Water Board. Monthly pesticide application reports are sent to the Alameda County Agricultural Commissioner and annual inspections of records and field staff applications occur. Annual reviews of the District are also conducted by CDPH as a stipulation of the cooperative agreement between the District and CDPH. Annual coordination meeting also take place with Alameda County Public Health Department and USFWS. These coordination meetings allow agencies to stay in communication with current District activities. USFWS frequently updates ACMAD on locations where special status species have been detected and ACMAD regularly informs USFWS of areas on the Refuge that will be accessed for mosquito control activities. The District also annually submits PUPs and PURs to USFWS.

6

New Jersey lights traps are a relatively small but integral part of the Districts overall surveillance program. A variety of mosquito traps are used throughout the District because mosquito species tend to vary in their attractiveness to different trapping methods. Currently the District has 14 New Jersey Light trap locations serving the 812 square miles of the District's Service Area. Despite the New Jersey light trap's tendency to attract nontarget species, the low number of traps covering such a broad area is not likely to have a significant effect on nontarget populations.

7

BMPs A1, A2, K1, and K8 all reflect the Districts commitment to working with resource agencies regarding maintenance of paths and clearings.

A. General BMPs

> 1. District staff has had long standing and continues to have cooperative, collaborative relationships with federal, state, and local agencies. The District regularly communicates with agencies regarding the District's operations and/or the necessity and opportunity for increased access for surveillance, source reduction, habitat enhancement, and the presence of special status species and wildlife. The District often participates in and contributes to interagency projects. The District will continue to foster these relationships, communication, and collaboration.

> 2. In particular, District staff will regularly communicate with resource agency staff regarding mosquito management operations, habitat, and flora and fauna in sensitive habitats. Such communications will include wildlife studies and occurrences of special status species in areas that may be subject to mosquito management activities.

K. Vegetation Management

> 1. Consultations will be made with the appropriate resource agency to discuss proposed vegetation management work, determine potential presence of special status species and areas of concern, and any required permits.

> 8. If suitable habitat necessary for special status species is found and if nonchemical physical and vegetation management control methods have the potential for affecting special status species, then the District will coordinate with the CDFW, USFWS, and/or NMFS before conducting control activities within this boundary or cancel activities in this area. If the District determines no suitable habitat is present, control activities may occur without further agency consultations.

8

All source reduction work in tidal marshes is done under the USACE permit (along with a BCDC permit). All agencies listed in Response 5 are notified of work proposed under this permit. BMP L11 - Ditching that drains high marsh ponds will be minimized to the extent possible in order to protect the habitat of native salt pan species - reflects the Districts common goal to protect native salt pan species.

9

Draining and filling of habitats listed in Sections 2.3.2.1.1 – 2.3.2.1.5 rarely occurs with the except of saline and brackish habitats, in which the District applies for a USACE permit. The artificially ponded areas where draining and filling may be cost effective and environmentally acceptable refer to disturbed areas, primarily agriculture areas with irrigated fields/crops which are uneven causing water to stand too long, depressions made by heavy equipment (i.e. tire ruts), and like habitats. District BMPs restrict the use of mosquitofish in all of these habitat types. Language stating the potential these areas have to provide foraging and breeding habitat for special status species was added:

> Filling or draining artificially ponded areas (low spots in flood-irrigated fields, tire ruts, etc.) can be cost-effective and environmentally acceptable, but is not an appropriate strategy in natural areas (however small), large permanent water bodies, or in areas set aside for stormwater or wastewater retention. These areas may provide foraging and breeding habitat for special status

species. In such situations, the other options are more appropriate. At this time, the District is rarely involved in new drainage projects. However, the District may maintain or assist with the maintenance of some existing drainage systems.

10

Section 2.3.2.1.6 has been reworded to more accurately reflect District practices (new text is underlined, deleted text has a line through it).

> Physical control in riparian areas typically consists of removing blockages (e.g. trash, downed tree limbs, etc.) to restore the original water flow. ~~Minor physical control activities with insignificant environmental impacts can be accomplished using hand tools to connect small ponded areas to the channel along the edge of streams with highly variable flows.~~

11

Tree holes in reference to District activities are not nesting habitat for birds. These are holes that form in the trunk of trees (typically in Oaks, Sycamores, and Bay Laurels) and fill up completely with rainwater. Mosquitoes (*Aedes sierrensis*) lay their eggs inside of the treehole when it has dried out in the early summer and the larvae hatch out the following spring when the hole is full of water from the winter rain.

12

Please see response E in Section 2.2, Key Comments and Master Responses. Any heavy equipment usage would require further agency consultations.

13

This action is already done annually as a part of the USACE permit. Agencies who receive this information are listed in Response 5.

14

Please see Response H and I in Section 2.2, Key Comments and Master Responses.

15

Although District BMPs already restrict the usage of mosquitofish in natural areas, an additional BMP was added to CTS (BMP G4), VPTS (BMP H4), CRLF (BMP P2), FYLF (BMP Q2), and WST (BMP R2), restricting the use of mosquitofish in areas where these special status species are present.

16

Please see response J in Section 2.2, Key Comments and Master Responses. In general, although the removal of nontarget species is an issue, it is only significant if a portion of the population is removed for an extended time. Any impact on some individuals in a population would be short lived, and population recovery would be rapid. The number of insects impacted, when compared to the total population(s) would be inconsequential in the long term. The relative impact on target insects versus the nontargets of a pesticide has been demonstrated in other studies as well. Davis et al. (2007) and Davis and Peterson (2008) evaluated the relation of target versus nontarget predators in tests using methoprene. Although these authors were evaluating methoprene, the demographics are similar as the lower toxicity to the predators would likely not be problematic. Similar to the results of the studies by Davis et al. (2007) and Davis and Peterson (2008), adverse effects to a few of the individuals in a nontarget predator population as a result of typical glyphosate applications would be inconsequential.

17

BMP G2 restricts the use of adulticides in vernal pools (and stockponds) with CTS. Naled is an adulticide therefore it is restricted in these areas.

18

It this section it was noted that a LSAA would be necessary:

> Direct impacts would include habitat modifications, such as draining or changing the hydrology of waterways through removal of or placement of sediment and fill, removal of debris and weeds, and trimming or removal of emergent and riparian vegetation. Note: A Lake and Streambed Alteration Agreement would be needed. The District may also request other landowners to perform similar activities. These activities may be undertaken in a variety of aquatic or wetland habitats including creeks and rivers, riparian corridors, ponds and lakes, freshwater marsh and seeps, seasonal wetlands (including vernal pools), lagoons, tidal marsh and channels, as well as wastewater treatment and septic systems, and temporary standing waters and artificial ponds.

19

Tables 4-3 and 4-4 have been corrected to reflect the suggested changes

20

The Eastern Alameda County Conservation Strategy was not included in Table 4-5 because it is not a HCP or NCCP. However, the Plan was reviewed and it does not appear that the District's activities will be in conflict with the plan.

21

Please see response D in Section 2.2, Key Comments and Master Responses. With regard to an ITP, the District does not anticipate undertaking any action that would result in a take of any protected species.

22

BMPS have been added for CRLF (BMPs P1-6), FYLF (BMPs Q1-6), WST (BMPs R1-6), and WPT (BMPs S1-5). See Response 3 for the additions of CRLF, FYLF, and WST.

S. Western Pond Turtle (WPT)

> 1. Vegetation management and water manipulation in WPT habitat shall not occur during April and May to avoid the WPT breeding season.

> 2. If nonnative/introduced turtle species (e.g. red-eared sliders) are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

> 3. If nonnative/introduced predators of WPT (e.g. bullfrogs) are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

> 4. If WPT are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

> 5. District staff will receive training on measures to avoid impacts to WPT.

23

Please see response G in Section 2.2, Key Comments and Master Responses.

24

BMPS have been added for TCB (BMPs T1-3):

T. Tricolored Blackbird (TCB)

> 1. Monomolecular films and oils will not be used in areas of TCB nesting during the nesting season.

> 2. Vegetation management and water manipulation in TCB nesting areas shall not occur during the breeding season (March – August)

> 3. District staff will receive training on measures to avoid impacts to TCB.

4.2 References

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5 Revisions to Draft PEIR

5.1 Introduction

This chapter presents minor revisions to text and appendices based on comments received or errors/errata discovered by the Draft PEIR preparers and/or District staff. Additional information was added to Appendix B, especially to data in Table 6-1. None of these text changes or additions result in any changes to the conclusions and determinations of significant impact. In other words, no "less than significant" impacts were changed to "potentially significant" or "significant and unavoidable" impacts.

5.2 Text Revisions in Response to Draft PEIR Comments or District Identified Errors and Omissions/Clarifications

The sections below explain both content clarifications and typographical and transcriptional errors that were identified since the public release of the Integrated Mosquito Management Program, Draft Programmatic EIR on July 15, 2015. All page numbers refer to the PDF submittal in July 2015. Material to be added is underlined; material to be deleted is shown with ~~strikethrough font~~.

5.2.1 Summary

Revisions are made as indicated below.

First paragraph page S-1 the last sentence is modified to read as follows:

> The District, as Lead Agency under the California Environmental Quality Act (CEQA), has prepared this PEIR for their ongoing program of surveillance and control of mosquitoes and other vectors of human and animal disease and discomfort.

In Section S.1 Background, page S-1, the paragraph is modified to read as follows:

> The District was established in 1930 to reduce the risk of mosquito-borne disease and discomfort to the residents of its Service Area. The District engages in activities and management practices to control mosquitoes and to address the specific situations within its Service Area. These management practices emphasize the fundamentals of integrated pest management (IPM) wherein source reduction, habitat modification, and biological control are used when appropriate before using pesticides. When pesticides are used, they are applied in a manner that minimizes risk to human ~~health~~ and ecological health. To avoid or manage the risk to human and animal health requires effective, proactive mosquito-borne disease surveillance and control strategies that may fluctuate temporally and regionally. Factors that influence the selected strategies include mosquito and pathogen biology, environmental factors, land use patterns, and resource availability to support production of the vectors in quantities that threaten human and animal health.

In Section S.3 Public Involvement Summary, on page S-3, the following language was added as the last paragraph to update the Summary for the Final PEIR and not as a correction to the Draft PEIR:

> The District released its Notice of Availability (NOA) of a Draft PEIR on July 16, 2015, to 170 agencies and organizations. A public hearing was held to receive agency and public oral comments on the Draft PEIR content on August 5, 2015, from 6:00 pm to 8:00 pm, at the San Leandro Marina Community Center, 15301 Wicks Blvd., San Leandro, CA. No one appeared to provide oral comments. The public comment period closed on September 4, 2015. Time extensions for comments were granted to the Citizens Committee to Complete the Refuge and the California Department of Fish and Wildlife. All comments were received by September 17,

2015. Written comments were received directly from five agencies and organizations. The State Clearinghouse reported that they received the comments from the California Department of Fish and Wildlife after the close of the official comment period. Responses to written comments from all five agencies and organization are contained in a separate Responses to Comments document.

In Section S.4 on page S-3, the header of this section is modified to read as follows:

Areas of Known Public ~~Environmental~~ Concern~~s~~

In Section S.5.1 Proposed Program, on page S-4, the first sentence is modified to read as follows:

Since 1930, the District has, taken a~~n~~ proactive integrated systems approach to mosquito control, utilizing a suite of tools that consist of surveillance, vegetation management, and physical, biological, and chemical controls along with public education.

In Section S.5.1 Proposed Program, on page S-4, the second bullet is modified to read as follows:

Carefully monitoring and surveying for mosquito-borne diseases and their antecedent factors that initiate and/or amplify disease

In Section S.5.1 Proposed Program, on page S-5, five bullets were added at the end of the bulleted BMP list and modified to read as follows:

> Worker Illness and Injury Prevention Program and Emergency Response
> California Red-Legged Frog (CRLF)
> Foothill Yellow-Legged Frog (FYLF)
> Western Spadefoot Toad (WST)
> Western Pond Turtle (WPT)
> Tricolored Blackbird (TCB)

In Section S.5 Proposed Program Alternatives on page S-5, the following paragraph is modified to read as follows:

The District will observe all state and federal regulations. The District will follow all appropriate laws and regulations pertaining to the use of pesticides and herbicides and safety standards for employees and the public, as governed by the USEPA, CDPR, and local jurisdictions (with some exceptions and where applicable). Although the products the District uses are all tested, registered, and approved for use by the USEPA and/or CDPR, the District provides additional margins of safety with the adherence to additional internal guidance based on BMPs and the principles embodied in District IMMP policies, where applicable.

In Section S.5.1.1 Surveillance on page S-5 to S-6, the language is modified to read as follows:

Mosquito surveillance, which is an integral part of the District's responsibility to protect public health and welfare, involves monitoring mosquito populations and habitat, their disease pathogens, and human-mosquito interactions. Surveillance provides the District with valuable information on what mosquito species are present or likely to occur, when they occur, where they occur, how many they are, and if they are carrying disease or otherwise affecting humans. Mosquito surveillance is critical to an IMMP because the information it provides is evaluated against treatment criteria to decide when and where to institute mosquito control measures. Information gained is used to help form action plans that can also assist in reducing the risk of contracting mosquito-borne disease. Equally important is the use of mosquito surveillance in evaluating the efficacy, cost effectiveness, and environmental impacts of specific mosquito control actions. Examples include field counting/sampling and trapping, arbovirus surveillance,

field inspection of known o~~f~~r suspected habitats, maintenance of paths and clearings for access, and documenting public service ~~inquiries and~~ requests.

In Section S.5.1.3 Vegetation Management on page S6, the language is modified to read as follows:

The species composition and density of vegetation are basic elements of the habitat value of any area for mosquitoes, for predators of mosquitoes, and for protected flora and fauna. District staff periodically undertake vegetation management activities as a tool to reduce the habitat value of sites for mosquitoes, to aid production or dispersal of mosquito predators, or to allow District staff access to mosquito habitat for surveillance and other control activities. Vegetation management activities reduce the mosquito habitat value of sites by improving water circulation or access by fish and other predators, reducing harborage, ~~and~~ or allowing District staff access to standing water for inspections and treatments. ¶

In Section S.5.1.4 Biological Control on page S-6, the following language is added at the beginning of this section:

Biological control of mosquitoes involves the intentional use of mosquito pathogens (diseases), parasites, and/or predators to reduce the population size of target mosquito populations.

In Section S.5.1.4 Biological Control on page S-7, the following section is added after the section on Pathogens to read as follows:

Parasites

The life cycles of mosquito parasites are biologically more complex than those of mosquito pathogens and involve intermediate hosts, organisms other than mosquitoes. Mosquito parasites are ingested by the feeding larva or actively penetrate the larval cuticle to gain access to the host interior. Once inside the host, parasites consume the internal organs and food reserves until the parasite's developmental process is complete. The host is killed when the parasite reaches maturity and leaves the host (*Romanomermis culicivorax*) or reproduces (*Lagenidium giganteum*). Once free of the host, the parasite can remain dormant in the environment until it can begin its developmental cycle in another host. Examples of mosquito parasites are the fungi *Coelomomyces* spp., *Lagenidium giganteum, Culicinomyces clavosporus*, and *Metarhizium anisopliae*; the protozoa *Nosema algerae, Hazardia milleh, Vavraia culicis, Helicosporidium* spp., *Amblyospora californica, Lambornella clarki*, and *Tetrahymena* spp.; and the nematode *Romanomermis culicivorax*. These parasites are not generally available commercially for mosquito control at present.

In Section S.5.1.4 Biological on page S-7, the language is modified to read as follows:

Predators

Mosquito predators are represented by highly complex organisms, such as insects, fish, birds, and bats that consume larval or adult mosquitoes as prey. Predators are opportunistic in their feeding habits and typically forage on a variety of prey types, which allows them to build and maintain populations at levels sufficient to control mosquitoes, even when mosquitoes are scarce. Examples of mosquito predators include representatives from a wide variety of taxa: coelenterates, *Hydra* spp.; platyhelminths, *Dugesia dorotocephala, Mesostoma lingua, and Planaria* spp.; insects, *Anisoptera, Zygoptera, Belostomidae, Geridae, Notonectidae, Veliidae, Dytiscidae, and Hydrophilidae*; arachnids, *Pardosa* spp.; mosquito-eating fish *Gambusia affinis*, *Gasterosteus aculeatus*; some species of bats; and birds, *anseriformes, apodiformes, charadriiformes, and passeriformes*. Only mosquitofish (*Gambusia affinis*) are commercially available to use at present, while the District supports the presence of the other species as practical. The District's application of mosquitofish in mosquito habitat is the most commonly used biological control agent for mosquitoes in the world. The District limits planting of mosquitofish to ~~artificial~~man-made water bodies including ornamental fish ponds, water troughs, water gardens,

fountains, and unmaintained swimming pools. Limiting the introduction of the mosquitofish to these sources should prevent their migration into habitats used by threatened, endangered, or rare species.

In Section S.5.1.5 Chemical Control on page S-7, the last sentence of the first paragraph is modified to read as follows:

All of the chemical tools the District uses are evaluated in Appendix B, Ecological and Human ~~Risk~~ Health Assessment Report.

In Section S.5.3 Environmentally Superior Alternative on page S-9, the last sentence of the second bullet point is modified to read as follows:

Depending on atmospheric conditions (i.e., wind direction, wind speed, stability class), this drift could temporarily subject people to objectionable odors near a treatment area.

In Section S.5.3 Environmentally Superior Alternative on page S-9, the Reduced Chemical Control bullet point is modified to read as follows:

To the extent the District can modify elements of the Chemical Control Alternative to mitigate identified impacts by avoiding ~~completely~~ the potentially significant impacts associated with some pesticide products by using less of any of these products or by eliminating one or more of them in favor of other, less odorous products, then the environmentally superior alternative would be a Program incorporating these modifications to this alternative as components of the overall IMMP as long as Program effectiveness is maintained. Excluding air quality and the odor issue, the impacts to all of the other resources would be the same as for the proposed Program. Since naled would only be used when absolutely necessary to protect public health, there is no reduced chemical option.

In Section S.6. Summary of Environmental Impacts and Mitigation Measures on page S-10, the following language was modified to assist in clarification of the CEQA Program Alternatives as follows:

Table S-2 presents the only ~~the~~ potentially significant impact~~s~~ for the Program alternatives, the mitigation required, and the significance following mitigation implementation. The Program alternative with a potentially significant but mitigable impact is Chemical Control. Under the Chemical Control Alternative, a potentially significant impact~~s~~ to air quality exists from the potential for objectionable odors. Mitigation measures represent actions the District ~~(or other agency)~~ will take to reduce ~~all of these~~the impact~~s~~ to a level of insignificance. If mitigation ~~is~~were not feasible or practical to implement, or simply not enough to reduce the impact to less than significant, then the impact ~~is~~would be "significant and unavoidable." All of the ~~potentially~~ significant impacts associated with the Proposed Program alternatives can be mitigated to a less-than-significant level with one exception.

In Table S-1 on page S-11, Summary Comparison of Impacts of Alternatives, the following biological resources impact for both aquatic and terrestrial is changed from N (no impact) to LS (less-than-significant impact):

> Movement of native resident or migratory fish or wildlife species for Surveillance, Physical Control, Vegetation Management, and Chemical Control Alternatives.

In Section S.6, Summary of Environmental Impacts and Mitigation Measures on page S-10, the following language was added as the last paragraph:

Table S-3 presents a comparison of the Reduced Chemical Control Program and the No Chemical Control Program with the Proposed Program.

In Section S.6. Summary of Environmental Impacts and Mitigation Measures on page S-15, a new Table S-3 was added to assist in clarification of the CEQA Program Alternatives as follows:

Table S-3 Comparison of Reduced Program Alternatives to Proposed Program

	Proposed Program	**Reduced Chemical Control Program**	**No Chemical Control Program**
Alternative Component			
Surveillance	Included	Included	Included
Physical Control	Included	Included	Included
Vegetation Management > Physical Methods > Herbicides/Adjuvants	All physical methods and chemical options included	All physical methods and chemical options included	Includes physical methods only. > Excludes all herbicides and adjuvants. > Less effective with greater reliance on physical and mosquitofish options
Biological Control	Mosquitofish	Mosquitofish	Mosquitofish
Chemical Control	Use any or all pesticides and adjuvants, surfactants, and synergists listed in Chapter 2	Use less of or eliminate one or more of the following: > Lambda-cyhalothrin > Deltamethrin > Etofenprox > Permethrin > Resmethrin > Pyrethrin > Bti liquid	Use none of the pesticides and adjuvants, surfactants, and synergists listed in Chapter 2
Impacts			
Biological Resource Impacts (excluding ecological health)	No Impact or Less-than-Significant Impact	No Impact or Less-than-Significant Impact	No Impact or Less-than-Significant Impact
Physical Resource Impacts (excluding air quality odors)	No Impact or Less-than-Significant Impact	No Impact or Less-than-Significant Impact	No Impact or Less-than-Significant Impact
Air Quality - Odors	Potentially Significant but Mitigable Impact Less-than-Significant after Mitigation	Less-Than-Significant Impact	No Impact
Ecological Health Impacts	Less-Than-Significant Impact	Less-Than-Significant Impact	Potentially Significant Impacts
Human Health Impacts	No Impact or Less-than-Significant Impact	No Impact or Less-than-Significant Impact	Potentially Significant Impacts
Water Resources	Significant and Unavoidable Impacts for naled	Significant and Unavoidable Impacts for naled	No Impact or Less-than-Significant Impact

5.2.2 Chapter 1, Introduction

No revisions were made to this chapter.

5.2.3 Chapter 2, Program Description

Revisions are made as indicated to the following sections.

In Section 2.1, Program Area and Vicinity on page 2-1, the following language was added as the last paragraph:

> Mosquito control activities are conducted at a wide variety of locations or sites throughout the District's Service Area, including tidal marshes, duck clubs, other diked marshes, lakes and ponds, rivers and streams, vernal pools and other seasonal wetlands, stormwater detention basins, flood control channels, spreading grounds, street drains and gutters, wash drains, irrigated pastures, or agricultural ditches, as well as animal troughs, artificial containers, tire piles, fountains, ornamental fishponds, swimming pools, and liquid waste detention ponds. Within the larger Program Area, activities would be conducted at similar sites.

In Section 2.2.2, Program Objectives on page 2-2, the following language was added as the last paragraph:

> Most of the relevant mosquito species are quite mobile and cause the greatest hazard or discomfort at a distance from where they breed. Each species has a unique life cycle, and most of them occupy several types of habitats. To effectively control them an IMMP must be employed. District policy is to identify those species that are currently vectors, to recommend techniques for their prevention and control, and to anticipate and minimize any new interactions between mosquitoes and humans or domestic animals, and to watch out for the introduction of new disease vectors.

In Section 2.3, Proposed Program on page 2-5, the following language was modified as the fifth paragraph:

> The District's IMM Program (or IMMP), like any IPM program, seeks by definition to use procedures that will minimize potential environmental impacts. The District's IMMP employs IPM principles by first determining the species and abundance of mosquitoes through evaluation of public service requests and field surveys of immature and adult mosquito populations and incidence of disease, and~~,~~ then, if the populations exceed ~~predetermined criteria~~treatment thresholds (see Figure 2-2) or if diseases are detected, using the most efficient, effective, and environmentally sensitive means of control. For all mosquito species, public education is an important control strategy…

In Section 2.3, Proposed Program on page 2-6, after the last paragraph Figure 2-2, Larval Treatment Thresholds was added:

Figure 2-2 Larval Treatment Thresholds

	Species	Most Common Larval Habitats	Distance to Populated Area	Larval Treatment Threshold	Notes
AEDES	**Salt marsh mosquito** *Aedes dorsalis*	Salt marshes	0 meters - 2 miles	≥1 per 10 dips	High Pest Significance
	Aedes aegypti *Aedes albopictus*	Small Containers, Tires	ANY DISTANCE	IMMEDIATE TREATMENT IF ANY DETECTED	Invasive Mosquito Species High Vector Potential
	Aedes melanimon	Irrigated Fields	0 meters - 2 miles	≥1 per 10 dips	High Pest Significance
	Pasture mosquito *Aedes nigromaculis*	Irrigated Fields	0 meters - 2 miles	≥1 per 10 dips	High Pest Significance
	Treehole mosquito *Aedes sierrensis*	Treeholes, Tires, Miscellaneous Containers	0 - 300 meters	≥1 per dip or baster sample	High Pest Significance Vector of Canine Heartworm
	Winter salt marsh mosquito *Aedes squamiger*	Salt Marshes, Reclaimed Marshes	0 meters - 10 miles	≥1 per 10 dips	High Pest Significance
	River mosquito *Aedes vexans*	Temporary Pools	0 meters - 1 mile	≥1 per 10 dips	Has not Been Found Since the 1950's
	Woodland pool mosquito *Aedes washinoi*	Temporary Woodland Pools	0 meters - 1 mile	≥1 per 10 dips	High Pest Significance
ANOPHELES	*Anopheles franciscanus*	Shallow Pools and Streams in Algae mats	0 - 500 meters	≥1 >3rd instar larva per dip	Low Pest Significance
	Western malaria mosquito *Anopheles freeborni*	Seepages, Streams, Lakes, Gravel Pits	0 meters - 1 mile	≥1 >3rd instar larva per dip	Low Pest Significance Vector of Malaria
	Anopheles occidentalis	Streams, Lakes, Pools Occasionally in Brackish Water	0 - 500 meters	≥1 >3rd instar larva per dip	Low Pest Significance
	Anopheles punctipennis	Temporary Pools, Streams	0 meters - 1 mile	≥1 >3rd instar larva per dip	Moderate Pest Significance Vector of Malaria
CULEX	*Culex apicalis*	Woodland Creeks, Pools	NO TREATMENT	NO TREATMENT	No Pest Significance
	Culex boharti	Slow Streams, Pools	NO TREATMENT	NO TREATMENT	No Pest Significance
	Tule mosquito *Culex erythrothorax*	Lakes and Ponds Associated with Tules	0 - 500 meters	≥1 per dip	High Pest Significance Vector of Encephalitis & WNV
	House mosquito *Culex pipiens*	Storm Drain Systems, Septic Tanks, Roadside Ditches, Cemetery Urns, Flooded Basements, Utility Vaults	0 meters - 1 mile	≥1 per 10 dips	High Pest Significance Vector WNV
	Foul water mosquito *Culex stigmatosoma*	Foul Water, Sewage, Temporary Pools	0 - 300 meters	≥1 per dip	Low Pest Significance
	Encephalitis mosquito *Culex tarsalis*	Creeks, Marshes, Temporary Pools, Roadside Ditches, Fresh Water	0 meters - 2 miles	≥1 per 10 dips	Moderate Pest Significance Vector of Encephalitis & WNV
	Culex thriambus	Rock pools, isolated ponds, hoofprints, alond streams and creeks	NO TREATMENT	NO TREATMENT	No Pest Significance
CULISETA	**Fish pond mosquito** *Culiseta incidens*	Fish Ponds, Temporary Pools, Catch Basins, Roadside Ditches	0 meters - 1 mile	≥1 per dip	High Pest Significance Possible Vector of Canine Heartworm
	Winter salt marsh mosquito *Culiseta inornata*	Marshes, Temporary Pools, Roadside Ditches	0 meters - 1 mile	≥1 per dip	High Pest Significance
	Culiseta particeps	Shaded Clean Pools, Streams	0 - 300 meters	≥1 per dip	Low Pest Significance
	Orthopodomyia signifera	Treeholes	NO TREATMENT	NO TREATMENT	Adults Found in Light Trap Larvae not Found

In Section 2.3, Proposed Program on page 2-6, the following language was added to the seventh paragraph:

> The District's Program consists of the following alternatives, which are general types of coordinated and component activities, as described below: surveillance, physical control, vegetation management, biological control, and chemical control. The Proposed Program is a combination of these alternatives with the potential for all of these alternatives to be used in their entirety along with public education.

In Section 2.3, Proposed Program on page 2-5, the following language was modified as the fifth paragraph:

> Mosquito surveillance, which is an integral part of the District's responsibility to protect public health and welfare, involves monitoring mosquito populations and habitat, their disease pathogens, and human-mosquito interactions. Surveillance provides the District with valuable information on what mosquito species are present or likely to occur, when they occur, where they occur, how many they are, and if they are carrying disease or otherwise affecting humans. Surveillance is critical to an IMMP because the information it provides is evaluated against treatment ~~criteria~~thresholds (see Figure 2-2) to decide when and where to institute mosquito control measures.

In Section 2.3.2.1.1, Freshwater Habitats on page 2-11, the following language was added as the second paragraph:

> Source reduction activities to control mosquito populations in freshwater habitats, i.e., marshes and ponds, generally consist of consultation with landowners or land stewards to implement measures including constructing and maintaining channels to reduce mosquito production in floodplains and marshes. The primary principle governing source reduction is to manipulate water levels in low-lying areas to eliminate or reduce the need for chemical control applications. Physical control of mosquitoes in nontidal habitats typically involves improving the habitat value or dispersal potential of the site for mosquito predators; reducing the habitat value for mosquitoes through vegetation management, increased circulation, steepening banks, or changes in water quality; or by reducing the duration of standing water in areas that produce mosquitoes by filling small areas or improving drainage. Filling or draining artificially ponded areas (low spots in flood-irrigated fields, tire ruts, etc.) can be cost-effective and environmentally acceptable, but is not an appropriate strategy in natural areas (however small), large permanent water bodies, or in areas set aside for stormwater or wastewater retention. These areas may provide foraging and breeding habitat for special status species. In such situations, the other options are more appropriate. At this time, the District is rarely involved in new drainage projects. However, the District may maintain or assist with the maintenance of some existing drainage systems. This maintenance may include upkeep of gates and other water control structures, excavating accumulated spoil materials, and vegetation management such as cutting, mowing, clearing debris, and/or herbiciding overgrown vegetation (see Section 2.3.3 for vegetation management including the use of herbicides).

In Section 2.3.2.1.6, Riparian Areas on page 2-13, the following language was modified as the first paragraph:

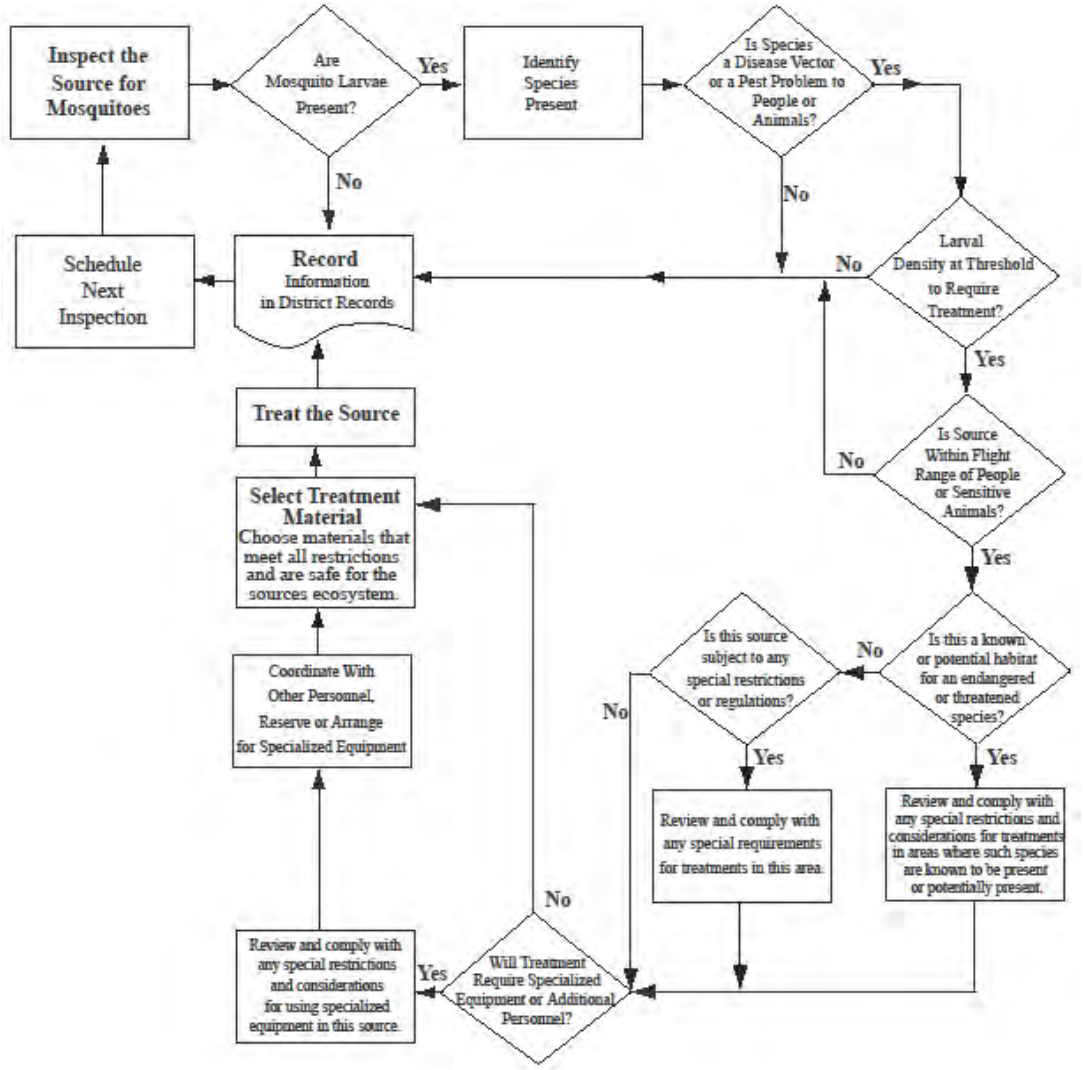
> Control measures will vary depending on the density of the human population, proximity of sensitive species, the vector potential of the mosquito causing the complaint, and access to the larval breeding or adult resting habitat. Physical control in riparian areas typically consists of removing blockages (e.g. trash, downed tree limbs, etc.) to restore the original water flow. ~~Minor Physical Control activities with insignificant environmental impacts can be accomplished using hand tools to connect small ponded areas to the channel along the edge of streams with highly variable flows.~~ Generally, thick brush and complex microtopography preclude extensive physical control in these areas, or chemical control is generally more effective.

In Section 2.3.5.1.1, Mosquito Larvicides on page 2-13, the following language was modified as the first paragraph:

> Larvicides are applied when the chemical control criteria for mosquito larvae are present (see Figure 2-2, Larval Treatment Thresholds and Figure 2-3, Larval Treatment Decision Model) and application rates vary according to time of year, water temperature, the level of organic content in the water, the type of mosquito species present, larval density, and other variables. Larvicide applications may be repeated at any site at recurrence intervals ranging from annually to weekly.

In Section 2.3.5.1.1, Mosquito Larvicides on page 2-13, the following Figure 2-3, Larval Treatment Decision Model, was added after the first paragraph:

Figure 2-3 Larval Treatment Decision Model



In Section 2.9, Best Management Practices on page 2-49, the following language was added to the end of the bullet points:

> Worker Illness and Injury Prevention Program and Emergency Response

> California Red-Legged Frog (CRLF)

> Foothill Yellow-Legged Frog (FYLF)

> Western Spadefoot Toad (WST)

> Western Pond Turtle (WPT)

> Tricolored Blackbird (TCB)

In Section 2.9, Best Management Practices, Table 2-6 starting on page 2-51, the language was modified in the following BMPs:

A-2: In particular, District staff will regularly communicate with resource agency staff regarding mosquito management operations, habitat, and flora and fauna in sensitive habitats. Such communications will include wildlife studies and occurrences of ~~sensitive~~special status species in areas that may be subject to mosquito management activities.

A-10: Properly train all staff, contractors, and volunteer help to prevent spreading weeds and pests to other sites. Equipment and personnel gear will be cleaned between sites. The District headquarters contains wash rack facilities (including high-pressure washers) to ~~regularly (in many cases daily) and~~ thoroughly clean vehicles and equipment to prevent the spread of weeds.

B-1: District staff will continue to implement the measures in the USFWS's "Walking in the Marsh: Methods to Increase Safety and Reduce Impacts to Wildlife/Plants." District staff will receive annual training and review of this document to remain up to date and current on this document and its methodologies for protecting sensitivespecial status species and the marsh habitat.

C-1: Activities [surveillance, treatment (excluding aerial applications), source reduction] within or adjacent to harvest mouse habitat will not occur within two hours before or after extreme high tides of 6.~~9~~5 feet National Geodetic Vertical Datum (NGVD) or above as measured at the Golden Gate Bridge (corrected for time and tide height for the site) or when the marsh plain is completely inundated because suitable upland refugia cover is limited and potentially disturbance-creating activities could prevent mice from reaching available cover.

D-1: Activities [surveillance, treatment (excuding aerial applications), source reduction] within or adjacent to Ridgway's Rail habitat will not occur within two hours before or after extreme high tides of 6.~~9~~5 feet National Geodetic Vertical Datum (NGVD) or above as measured at the Golden Gate Bridge (corrected for time and tide height for the site) or when the marsh plain is completely inundated because suitable upland refugia cover is limited and potentially disturbance-creating activities could prevent clapper Ridgway's Rails from reaching available cover.

F-1: District staff will notify the appropriate resource agency prior to entering potential WSnPl habitats (which may include seasonal ponds, managed ponds, and adjacent levees) between March 1 and September 15 (breeding season) and will regularly coordinate with the resource agency(ies) on the locations of breeding WSnPls and avoid breeding WSnPls to the extent feasible. Any observations of adverse effects to WSnPls will be reported by District staff.

G-1: Trucks and ARGOs will be restricted to established roads and berms in vernal pool and stockpond areas. Only small ATVs (e.g. Polaris) will be utilized near vernal pools and stockponds.

G-2: Methoprene, monomolecular films, and adulticides will not be used in vernal pool and stockpond areas during CTS breeding season (November-March) or if CTS larvae are present.

G-3: Vegetation management and water manipulation in CTS habitat shall not occur from November through March to avoid the CTS breeding season and will be further delayed if CTS larvae are present to allow them time to attain full metamorphosis.

G-4: Mosquitofish (Gambusia affinis) will not be introduced into any site containing CTS.

G-5: The Declining Amphibian Populations Task Force Fieldwork Code of Practice will be followed in CTS habitat.

G-6: If nonnative/introduced predators of CTS (e.g. bullfrogs) are encountered in CTS habitat during mosquito management activities, findings will be reported to the appropriate resource agency.

G-7: If CTS are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

H-2: Methoprene, monomolecular films, and adulticides will not be used in vernal pool areas if VPTS are present.

H-3: Vegetation management and water manipulation in VPTS habitat shall not occur if VTPS are present.

H-4: Mosquitofish (Gambusia affinis) will not be introduced into any site containing VPTS.

H-5: If VPTS are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

I-2: When possible, project actions to be conducted in areas containing suitable habitat for this species (i.e. vernal pools) will occur during the time period when CCG is in bloom and identifiable (March-June), so that any CCG plants observed can be avoided and documented.

K-1: Consultations will be made with the appropriate resource agency to discuss proposed vegetation management work, determine potential presence of ~~sensitive~~special status species and areas of concern, and any required permits.

L-3: All maintenance work will be done at times that minimize adverse impacts to nesting birds, anadromous fish, and other species of concern, in consultation with USFWS, NMFS, and CDFW. Work conducted will, whenever possible, be conducted during approved in water work periods for that habitat, considering the species likely to be present. For example, tidal marsh work will be conducted between September 1 and January 31, where possible and not contraindicated by the presence of other ~~sensitive~~special status species. Similarly, in water work in waterbodies that support anadromous fish, work will be conducted between July 1 and September 30.

M-11: Do not apply pesticides that could affect insect pollinators in liquid or spray/fog forms over large areas (more than 0.25 acres) during the day when honeybees are present and active or when other pollinators are active. Preferred applications of these specific pesticides are to occur in areas with little or no honeybee or pollinator activity or after dark. These treatments may be applied over smaller areas (with hand held equipment), but the technician will first inspect the area for the presence of bees and other pollinators. If pollinators are present in substantial numbers, the treatment will be made at an alternative time when these pollinators are inactive or absent. If beehives are present, establish a buffer of reasonable distance, when feasible, and do not allow applications of pesticides within this buffer whenever possible.

O-2: Train employees on the safe use of pesticides, equipment and machinery, including vehicle operation.

P. California Red-Legged Frog (CRLF)

P-1: Vegetation management and water manipulation in CRLF habitat shall not occur from November through March to avoid the CRLF breeding season and will be further delayed if tadpoles are present to allow them time to attain full metamorphosis.

P-2: Mosquitofish (Gambusia affinis) will not be introduced into any site containing CRLF.

P-3: The Declining Amphibian Populations Task Force Fieldwork Code of Practice will be followed in CRLF habitat.

P-4: If nonnative/introduced predators of CRLF (e.g. bullfrogs) are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

P-5: If CRLF are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

P-6: District staff will receive training on measures to avoid impacts to CRLF.

Q. Foothill Yellow-Legged Frog (FYLF)

Q-1: Vegetation management and water manipulation in FYLF habitat shall not occur from April to July avoid the FYLF breeding season and will be further delayed if tadpoles are present to allow them time to attain full metamorphosis.

Q-2: Mosquitofish (Gambusia affinis) will not be introduced into any site containing FYLF.

Q-3: The Declining Amphibian Populations Task Force Fieldwork Code of Practice will be followed in FYLF habitat.

Q-4: If nonnative/introduced predators of FYLF (e.g. bullfrogs) are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

Q-5: If FYLF are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

Q-6: District staff will receive training on measures to avoid impacts to FYLF.

R. Western Spadefoot Toad (WST)

R-1: Vegetation management and water manipulation in WST habitat shall not occur from January to May to avoid the WST breeding season and will be further delayed if tadpoles are present to allow the them time to attain full metamorphosis.

R-2: Mosquitofish (Gambusia affinis) will not be introduced into any site containing WST.

R-3: The Declining Amphibian Populations Task Force Fieldwork Code of Practice will be followed in WST habitat.

R-4: If nonnative/introduced predators of WST (e.g. bullfrogs) are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

R-5: If WST are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

R-6: District staff will receive training on measures to avoid impacts to WST.

S. Western Pond Turtle (WPT)

S-1: Vegetation management and water manipulation in WPT habitat shall not occur during April and May to avoid the WPT breeding season.

S-2: If nonnative/introduced turtle species (e.g. red-eared sliders) are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

S-3: If nonnative/introduced predators of WPT (e.g. bullfrogs) are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

S-4: If WPT are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

S-5: District staff will receive training on measures to avoid impacts to WPT.

T. Tricolored Blackbird (TCB)

T-1: Monomolecular films and oils will not be used in areas of TCB nesting during the nesting season.

T-2: Vegetation management and water manipulation in TCB nesting areas shall not occur during the breeding season (March – August)

T-3: District staff will receive training on measures to avoid impacts to TCB.

5.2.4 Chapter 3, Urban and Rural Land Uses

Revisions are made as indicated to the following sections.

In Section 2.9, Best Management Practices on page 3-2, material is added for clarification.

> Although vector control measures can be implemented on lands irrespective of land ownership, large expanses of aquatic and terrestrial habitat are commonly found on public lands, such as National Wildlife Refuges (NWRs) administered at the federal level by the USFWS. Table 3-1 presents the extent of federal land in the Program Area based on US Department of the Interior information. Many lands within the NWR system administered by USFWS are not eligible for payments in lieu of taxes and are not included in the table, which is focused on lands eligible for "payments in lieu of taxes." Federal lands (e.g, BLM and NWRs) do not pay property taxes to the state, counties or local governments. To address this issue, the federal government has established a program called Payment In Lieu of Taxes (PILT) that makes nominal payments to the state and counties to help defray part of the tax revenues lost due to the establishment of designated federal lands (e.g,, NWRs). Local governments are not eligible to receive the funds, as they are not a state or county taxing entity that has lost tax base due to federal action. For example,…

5.2.5 Chapter 4, Biological Resources - Aquatic

Revisions are made as indicated to the following sections.

In Section 4.1, Environmental Setting on page 4-1, the following paragraph is modified to read as follows:

> Section 4.1.1 identifies the zoogeographic provinces in the Alameda County Mosquito Abatement District's Program Area, Section 4.1.2 describes the special status aquatic species that have the potential to occur within the Program Area, and Section 4.1.3 provides an overview of federal, state, and local ordinances and regulations pertinent to these resources that are applicable to the Program. Section 4.1.4 identifies the Habitat Conservation Plans (HCCPs) and Natural Community Conservation Plans (NCCPs) in the Program Area. Special status species are those organisms that are listed as endangered, threatened, or candidate species under the federal Endangered Species Act, endangered or threatened under the California Endangered Species Act, or listed as species of special concern by the State of California.

In Section 4.1.2, Special Status Species Table 4.3 starting on page 4-6, the following modifications have been made:

> San Joaquin spearscale *Atriplex joaquinana* was removed
>
> Soft salty bird's-beak name modification
>
> Livermore tarplant *Deinandra bacigalupii* status was modified to SC, ~~RPR,~~ 1B
>
> Norris' beard moss *Didymodon norrisii* was removed
>
> Addition of: San Joaquin spearscale *Extriplex joaquinana* RPR, 1B Chenopod scrub, alkali meadow, valley and foothill grassland. In seasonal alkali wetlands or alkali sink scrub with Distichlis Spicata, Frankenia, etc. 1 250 m. Found in: ACMAD and ACMAD adjacent areas. Checked habitats: Shrubland and Grassland

In Section 4.1.2, Special Status Species Table 4.4 starting on page 4-18, the following modifications have been made:

> Tidewater goby *Eucyclogobius newberryi* status was modified to F~~E~~T~~, SSC~~

Steelhead - south/central California coast DPS *Oncorhynchus mykiss irideus* status was modified to FT~~, SSC~~

Addition of: Longfin smelt - San Francisco Bay-Delta DPS *Spirinchus thaleichthys* FC, ST, SSC Euryhaline, nektonic and anadromous. Found in open waters of estuaries, mostly in middle or bottom of water column. Prefer salinities of 15-30 ppt, but can be found in completely freshwater to almost pure seawater. Found in: ACMAD and ACMAD adjacent areas. Checked habitats: Open Water (Marine/Brackish)

California tiger salamander *Ambystoma californiense* FT, ST, SSC Central Valley DPS federally listed as threatened ~~Santa Barbara and Sonoma Counties DPS federally listed as endangered~~. Need underground refuges, especially ground squirrel burrows and vernal pools, stock ponds, roadside ditches, or other seasonal water sources for breeding Checked habitats: Ponds and Lakes added

California red-legged frog *Rana draytonii* FT, SSC Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Also breed in artificial impoundments such as stock ponds. Requires 11-20 weeks of permanent water for larval development. Must have access to estivation habitat. Checked habitats: Seasonal Wetlands (includes Vernal Pools) added

Western spadefoot *Spea hammondii* SSC Occurs primarily in grassland habitats, but can be found in valley-foothill hardwood woodlands. Vernal pools and stock ponds are essential for breeding and egg-laying. Checked habitats: Ponds and Lakes added

San Joaquin coachwhip~~snake~~ (whipsnake) *Masticophis flagellum ruddocki*

Tricolored blackbird (*Agelaius tricolor*) SSC, SC

Swainson's hawk *Buteo swainsoni* ST~~SC~~

Snowy plover (interior population) *Charadrius alexandrines* SSC Alkali or saline lakes in northeastern California and the southern deserts and at agricultural evaporation ponds or remnant alkali playas in the San Joaquin Valley. Found in: ACMAD and ACMAD adjacent areas. Checked habitats: Ponds and Lakes

Western snowy plover *Charadrius nivosus nivosus (Charadrius alexandrinus nivosus)* FT~~, SSC~~ Sandy beaches, salt pond levees, seasonal wetlands, and shores of large alkali lakes or managed ponds. Flat, open areas with sandy or saline substrates, with usually sparse or absent vegetation or driftwood. Needs sandy, gravelly or friable soils for nesting.

Western yellow-billed cuckoo *Coccyzus americanus occidentalis* FT~~C~~, SE

American peregrine falcon *Falco peregrinus anatum* FP~~SSC~~

~~Saltmarsh~~San Francisco common yellowthroat *Geothlypis trichas sinuosa*

California black rail *Laterallus jamaicensis coturniculus* FP, ST

Samuels (San Pablo) song sparrow *Melospiza melodia samuelis*

Ridgway's rail *Rallus longirostris obsoletus* FE, SE, FP

California least tern *Sternula antillarum browni* FE, SE, FP

Townsend's big-eared bat *Corynorhinus townsendii* ~~S~~SC

Salt-marsh harvest mouse *Reithrodontomys raviventris* FE, SE, FP

Footnote added to table: SC = California candidate species

In Section 4.1.3.1.1, Endangered Species Act 1973 on page 4-26, the definition of "take" is added and the modified paragraph reads as follows:

> ~~This law~~The Endangered Species Act of 1973 includes provisions for protection and management of species that are federally listed as threatened or endangered and designated critical habitat for these species. This law prohibits "take" of federally listed species except as authorized under an incidental take permit or incidental take statement. The term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. (http://www.fws.gov/endangered/laws-policies/section-3.html). The United States Fish and Wildlife Service (USFWS) is the administering agency for this authority for freshwater species. The National Marine Fisheries Service (NMFS) is the administering agency for anadromous species.

In Section 4.1.3.1.3, Clean Water Act of 1977 on page 4-26, language is added to the first paragraph and an additional paragraph is provided to read as follows:

> These sections of the Clean Water Act of 1977 (CWA) provide for the protection of wetlands. The administering agency for the above authority is the United States Army Corps of Engineers (USACE). Under CWA Sections 301 and 502, any discharge of dredged or fill materials into "waters of the United States," including wetlands, is forbidden unless authorized by a permit issued by the USACE pursuant to Section 404. These permits are an essential part of protecting streams and wetlands. Wetlands are vital to the ecosystem in filtering streams and rivers and providing habitat for wildlife.
>
> The US Environmental Protection Agency (USEPA) is the federal agency responsible for water quality management and administers the federal Water Pollution Control Act Amendments of 1972 and 1987, collectively known as the Clean Water Act (CWA). The CWA establishes the principal federal statutes for water quality protection. It was established with the intent "to restore and maintain the chemical, physical, and biological integrity of the nation's water, to achieve a level of water quality which provides for recreation in and on the water, and for the propagation of fish and wildlife." Also see Section 9.1.2.1 in Chapter 9, Water Resources.

In Section 4.1.3, Regulatory Setting on page 4-27, the following 4.1.3.1.6 is added to read as follows:

> **4.1.3.1.6 Marine Mammal Protection Act**
>
> This law established a national policy to prevent marine mammal species and population stocks from declining beyond the point where they ceased to be significant functioning elements of the ecosystems of which they are a part. The MMPA established a moratorium on the taking of marine mammals in U.S. waters. It defines "take" to mean "to hunt, harass, capture, or kill" any marine mammal or attempt to do so. The Department of Commerce through the National Marine Fisheries Service is charged with protecting whales, dolphins, porpoises, seals, and sea lions. Walrus, manatees, otters, and polar bears are protected by the Department of the Interior through the U.S. Fish and Wildlife Service. The Animal and Plant Health Inspection Service, a part of the Department of Agriculture, is responsible for regulations managing marine mammals in captivity.

In Section 4.2.1.1, Environmental Concerns on page 4-37, the second paragraph is modified to read as follows:

> Direct impacts would include habitat modifications, such as draining or changing the hydrology of waterways through removal of or placement of sediment and fill, removal of debris and weeds, and trimming or removal of emergent and riparian vegetation. Note: A Lake and Streambed Alteration Agreement would be needed. The District may also request other landowners to perform similar activities. These activities may be undertaken in a variety of aquatic or wetland habitats including creeks and rivers, riparian corridors, ponds and lakes, freshwater marsh and

seeps, seasonal wetlands (including vernal pools), lagoons, tidal marsh and channels, as well as wastewater treatment and septic systems, and temporary standing waters and artificial ponds.

In Section 4.2.2, Evaluation Methods and Assumptions on page 4-40, the third to last paragraph of the section has following text revisions:

The potential impacts of the nonchemical alternatives are based on the type and location of habitats treated and the magnitude and frequency of treatment. The potential impacts of the chemical alternatives were evaluated based on the magnitude and duration of the treatments and the toxicity and application information presented in Chapter 6, Ecological Health, and Appendix B, ~~Human and~~ Ecological and Human Health Assessment Report. The evaluation of all alternatives considered the life histories of the different listed fish and amphibian species and ecological interactions including impacts to the aquatic food chain.

In Section 4.2.2, Evaluation Methods and Assumptions on page 4-40, the last sentence of the second to last paragraph of the section has been split into a separate paragraph and is now modified to read as follows:

This evaluation assumes that all chemical treatments would be made in accordance with label instructions and guidance provided by the USEPA and CDPR and in consideration of the local context for that area (i.e., nearby area land uses and habitats). The USEPA requires mandatory statements on pesticide product labels that include directions for use; precautions for avoiding certain dangerous actions; and where, when, and how the pesticide should be applied. This guidance is designed to ensure proper use of the pesticide and prevent unreasonable adverse effects to humans and the environment. All pesticide labels are required to include the name and percentage by weight of each active ingredient in the product/formulation. Toxicity categories for product hazards and appropriate first-aid measures must be properly and prominently displayed. Pesticide labels also outline proper use, storage, and disposal procedures, as well as precautions to protect applicators. The directions for use specify the target organism, appropriate application sites, application rates or dosages, contact times, and required application equipment for the pesticide. Warnings regarding appropriate wind speeds, droplet sizes, or habitats to avoid during application are also prominently displayed.

In Section 4.2, Environmental Impacts and Mitigation Measures, Table 4-6 starting on page 4-41, the language was modified in the following BMPs:

A-2: In particular, District staff will regularly communicate with resource agency staff regarding mosquito management operations, habitat, and flora and fauna in sensitive habitats. Such communications will include wildlife studies and occurrences of ~~sensitive~~special status species in areas that may be subject to mosquito management activities.

A-10: Properly train all staff, contractors, and volunteer help to prevent spreading weeds and pests to other sites. Equipment and personnel gear will be cleaned between sites. The District headquarters contains wash rack facilities (including high-pressure washers) to ~~regularly (in many cases daily) and~~ thoroughly clean vehicles and equipment to prevent the spread of weeds.

B-1: District staff will continue to implement the measures in the USFWS's "Walking in the Marsh: Methods to Increase Safety and Reduce Impacts to Wildlife/Plants." District staff will receive annual training and review of this document to remain up to date and current on this document and its methodologies for protecting sensitivespecial status species and the marsh habitat.

C-1: Activities [surveillance, treatment (excluding aerial applications), source reduction] within or adjacent to harvest mouse habitat will not occur within two hours before or after extreme high tides of 6.~~9~~5 feet National Geodetic Vertical Datum (NGVD) or above as measured at the Golden Gate Bridge (corrected for time and tide height for the site) or when the marsh plain is completely

inundated because suitable upland refugia cover is limited and potentially disturbance-creating activities could prevent mice from reaching available cover.

D-1: Activities [surveillance, treatment (excuding aerial applications), source reduction] within or adjacent to Ridgway's Rail habitat will not occur within two hours before or after extreme high tides of 6.~~9~~5 feet National Geodetic Vertical Datum (NGVD) or above as measured at the Golden Gate Bridge (corrected for time and tide height for the site) or when the marsh plain is completely inundated because suitable upland refugia cover is limited and potentially disturbance-creating activities could prevent clapper Ridgway's Rails from reaching available cover.

F-1: District staff will notify the appropriate resource agency prior to entering potential WSnPl habitats (which may include seasonal ponds, managed ponds, and adjacent levees) between March 1 and September 15 (breeding season) and will regularly coordinate with the resource agency(ies) on the locations of breeding WSnPls and avoid breeding WSnPls to the extent feasible. Any observations of adverse effects to WSnPls will be reported by District staff.

G-1: Trucks and ARGOs will be restricted to established roads and berms in vernal pool and stockpond areas. Only small ATVs (e.g. Polaris) will be utilized near vernal pools and stockponds.

G-2: Methoprene, monomolecular films, and adulticides will not be used in vernal pool and stockpond areas during CTS breeding season (November-March) or if CTS larvae are present.

G-3: Vegetation management and water manipulation in CTS habitat shall not occur from November through March to avoid the CTS breeding season and will be further delayed if CTS larvae are present to allow them time to attain full metamorphosis.

G-4: Mosquitofish (Gambusia affinis) will not be introduced into any site containing CTS.

G-5: The Declining Amphibian Populations Task Force Fieldwork Code of Practice will be followed in CTS habitat.

G-6: If nonnative/introduced predators of CTS (e.g. bullfrogs) are encountered in CTS habitat during mosquito management activities, findings will be reported to the appropriate resource agency.

G-7: If CTS are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

H-2: Methoprene, monomolecular films, and adulticides will not be used in vernal pool areas if VPTS are present.

H-3: Vegetation management and water manipulation in VPTS habitat shall not occur if VTPS are present.

H-4: Mosquitofish (Gambusia affinis) will not be introduced into any site containing VPTS.

H-5: If VPTS are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

I-2: When possible, project actions to be conducted in areas containing suitable habitat for this species (i.e. vernal pools) will occur during the time period when CCG is in bloom and identifiable (March-June), so that any CCG plants observed can be avoided and documented.

K-1: Consultations will be made with the appropriate resource agency to discuss proposed vegetation management work, determine potential presence of ~~sensitive~~special status species and areas of concern, and any required permits.

L-3: All maintenance work will be done at times that minimize adverse impacts to nesting birds, anadromous fish, and other species of concern, in consultation with USFWS, NMFS, and CDFW.

Work conducted will, whenever possible, be conducted during approved in water work periods for that habitat, considering the species likely to be present. For example, tidal marsh work will be conducted between September 1 and January 31, where possible and not contraindicated by the presence of other ~~sensitive~~special status species. Similarly, in water work in waterbodies that support anadromous fish, work will be conducted between July 1 and September 30.

M-11: Do not apply pesticides that could affect insect pollinators in liquid or spray/fog forms over large areas (more than 0.25 acres) during the day when honeybees are present and active or when other pollinators are active. Preferred applications of these specific pesticides are to occur in areas with little or no honeybee or pollinator activity or after dark. These treatments may be applied over smaller areas (with hand held equipment), but the technician will first inspect the area for the presence of bees and other pollinators. If pollinators are present in substantial numbers, the treatment will be made at an alternative time when these pollinators are inactive or absent. If beehives are present, establish a buffer of reasonable distance, when feasible, and do not allow applications of pesticides within this buffer whenever possible.

O-2: Train employees on the safe use of pesticides, equipment and machinery, including vehicle operation.

P. California Red-Legged Frog (CRLF)

P-1: Vegetation management and water manipulation in CRLF habitat shall not occur from November through March to avoid the CRLF breeding season and will be further delayed if tadpoles are present to allow them time to attain full metamorphosis.

P-2: Mosquitofish (Gambusia affinis) will not be introduced into any site containing CRLF.

P-3: The Declining Amphibian Populations Task Force Fieldwork Code of Practice will be followed in CRLF habitat.

P-4: If nonnative/introduced predators of CRLF (e.g. bullfrogs) are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

P-5: If CRLF are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

P-6: District staff will receive training on measures to avoid impacts to CRLF.

Q. Foothill Yellow-Legged Frog (FYLF)

Q-1: Vegetation management and water manipulation in FYLF habitat shall not occur from April to July avoid the FYLF breeding season and will be further delayed if tadpoles are present to allow them time to attain full metamorphosis.

Q-2: Mosquitofish (Gambusia affinis) will not be introduced into any site containing FYLF.

Q-3: The Declining Amphibian Populations Task Force Fieldwork Code of Practice will be followed in FYLF habitat.

Q-4: If nonnative/introduced predators of FYLF (e.g. bullfrogs) are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

Q-5: If FYLF are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

Q-6: District staff will receive training on measures to avoid impacts to FYLF.

R. Western Spadefoot Toad (WST)

R-1: Vegetation management and water manipulation in WST habitat shall not occur from January to May to avoid the WST breeding season and will be further delayed if tadpoles are present to allow the them time to attain full metamorphosis.

R-2: Mosquitofish (Gambusia affinis) will not be introduced into any site containing WST.

R-3: The Declining Amphibian Populations Task Force Fieldwork Code of Practice will be followed in WST habitat.

R-4: If nonnative/introduced predators of WST (e.g. bullfrogs) are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

R-5: If WST are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

R-6: District staff will receive training on measures to avoid impacts to WST.

S. Western Pond Turtle (WPT)

S-1: Vegetation management and water manipulation in WPT habitat shall not occur during April and May to avoid the WPT breeding season.

S-2: If nonnative/introduced turtle species (e.g. red-eared sliders) are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

S-3: If nonnative/introduced predators of WPT (e.g. bullfrogs) are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

S-4: If WPT are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

S-5: District staff will receive training on measures to avoid impacts to WPT.

T. Tricolored Blackbird (TCB)

T-1: Monomolecular films and oils will not be used in areas of TCB nesting during the nesting season.

T-2: Vegetation management and water manipulation in TCB nesting areas shall not occur during the breeding season (March – August)

T-3: District staff will receive training on measures to avoid impacts to TCB.

In Section 4.2.2.2, Toxicity and Exposure on page 4-51, the third paragraph of the section has been modified to read as follows:

However, these, and other, coordinated and focused laboratory tests are designed to document the effects of the chemical ~~when~~using a continuous, controlled~~,~~ laboratory exposure ~~exists and do~~that does not realistically reflect the likely patchy exposures ~~or toxicity in~~ typical of the District field application scenarios. As such, the toxicity information generated using laboratory tests (and some limited field tests) is intended as an overview of potential issues that might be associated with maximum direct exposures to develop and recommend guidance for ~~understanding the completely "safe"~~ use that should provide maximum exposure levels of applications that ~~would~~are protective of ecological health. These guidelines include numerous "safety margins" in the toxicity calculations that are intended to provide adequate efficacy to target organisms while not adversely ~~impact~~ impacting humans or nontarget plant and animal species. In some instances, the regulatory guidance may include additional suggestions for protective application to assure no significant impact on nontarget species and humans.

In Section 4.2.2.2, Toxicity and Exposure on page 4-51, an additional paragraph is as added after paragraph 3 and reads as follows:

> Although laboratory toxicity testing focuses on tiered concentrations of chemical exposure, the results of these tests produce a series of toxicity estimates of concentrations lower than those that produce mortality. Extrapolation of these data is used to generate estimates of chronic toxicity or possible effects of lower doses that may result in sublethal effects such as reproduction or metabolic changes. In reality, these low-dose exposures need to be sustained over longer periods (and usually at higher concentrations) than are relevant to typical application scenarios for mosquito control including multiple applications in an area such as a wetland.

In Section 4.2.2.2, Toxicity and Exposure on page 4-51, the last sentence of the fourth paragraph has been deleted and the following has been added to the end of the paragraph:

> ~~However, adverse effects may still occur to some non-target organisms.~~ Impacts may occur to some nontarget organisms. Although numerous precautions (BMPs) and use of recommended application guidance are intended to provide efficacy without adverse effects to nontarget organisms, misapplication or unexpected weather conditions may still result in effects on some nontarget organisms in the exposure area. This potential impact is ameliorated/mitigated by careful use of BMPs, advance planning, and intensive staff training by the District.

In Section 4.2.3, Surveillance Alternative on page 4-54, Impact AR-4 is modified to reflect minimal rather than no impacts text and now reads as follows:

> **Impact AR-4.** The Surveillance Alternative would have a **less than significant** ~~**no**~~ impact on the movement of any native resident or migratory fish or wildlife species~~. Nor would it impact~~, any ~~native resident or~~ migratory wildlife corridors, or ~~impede~~ the use of native wildlife nursery sites, as no physical disturbance would occur. Any disruption of migration patterns would be due to the presence of personnel and machinery in the environment. In all cases, this occurrence would be very short term, generally not more than a few hours in any given location. Therefore, this effect would be minimal. No mitigation is required.

In Section 4.2.4.1.10, Impact Determinations on page 4-60, Impact AR-10 is modified to reflect minimal rather than no impacts text and now reads as follows:

> **Impact AR-10.** The Physical Control Alternative would have a **less than significant** ~~**no**~~ impact on the movement of any native resident or migratory fish or wildlife species~~. Nor would it impact~~, any ~~native resident or~~ migratory wildlife corridors, or ~~impede~~ the use of native wildlife nursery sites. This alternative would likely benefit the movement of fish and other aquatic species, as it would deepen channels and improve flow. No mitigation is required.

In Section 4.2.5, Vegetation Management Alternative, Table 4-7 starting on page 4-61, an addition of one chemical was made to the third line:

Triclopyr (TBEE), alkylphenol ethoxylates (APEs), nonionic surfactant (NPE)	High	High

In Section 4.2.5.1.9, Effects on Habitat, Movement, Local Policies and Ordinances and HCP/NCCPs on page 4-64, the first sentence of the last paragraph has the following modifications:

> Several HCPs or NCCPs were identified whose action area is within ~~Napa~~ Alameda County, the primary service area, or in adjacent counties.

In Section 4.2.5.1.10, Impact Determinations on page 4-65, Impact AR-17 is modified to reflect minimal rather than no impacts text and now reads as follows:

> **Impact AR-17.** The Vegetation Management Alternative would have a **less than significant** ~~no~~ impact on the movement of any native resident or migratory fish or wildlife species~~. Nor would it impact~~, any ~~native resident or~~ migratory wildlife corridors, or ~~impede~~ the use of native wildlife nursery sites. This alternative would likely benefit the movement of fish and other aquatic species, as it would and improve flow. No mitigation is required.

In Section 4.2.6, Biological Control Alternative on page 4-65, the beginning of this section, is modified to read as follows:

> This alternative consists of the introduction of mosquito pathogens, parasites, and predators, to reduce the mosquito population. Its emphasis, as it currently exists is on the use of predators, specifically mosquitofish (*Gambusia affin~~u~~is*), into habitats occupied by mosquito larvae.

In Section 4.2.7, Chemical Control Alternative on page 4-66 to 4-67, the following duplicative text has been removed:

> ~~However, these, and other, coordinated and focused laboratory tests are designed to document the effects of the chemical when a continuous, controlled, exposure exists and do not realistically reflect the likely exposures or toxicity in the District field application scenarios. As such, the toxicity information is intended as an overview of potential issues and guidance for understanding the completely "safe" maximum exposure levels of applications that would not adversely impact humans or nontarget plant and animal species.~~

In Section 4.2.7, Chemical Control Alternative, Table 4-8 on page 4-67, the following modifications have been made to the beginning of the table:

Table 4-8 Chemical Classes and their Toxicity[1] to Fish and Nontarget Aquatic Invertebrates

Class	Chemical	Mechanism of Action	Toxicity to	
			Fish	Nontarget Invertebrates
Mosquito Larvicides				
Bacterial Larvicides	Bs, Bti, ~~spinosad~~	Paralyzes gut~~ or disrupts central nervous system~~	Low	Low
Bacterial Larvicide	Spinosad	Disrupts central nervous system	Moderate	Moderate

In Section 4.2.7.1.1, Bacterial Larvicides on page 4-69, the last paragraph has the following modifications:

> Spinosad is a biologically derived insecticide produced from the fermentation of *Saacharopolyspora spinosa*, a naturally occurring soil organism. Spinosad activates the central nervous system of insects through interaction with neuroreceptors and causes continuous stimulation of the insect nervous system. In water, spinosad is degraded primarily through photolysis, which has a half-life of less than 1 day. It is ~~slightly to~~ moderately toxic to fish and most aquatic invertebrates on an acute basis. It may ~~have slight~~ impact~~s on~~ some aquatic invertebrates with chronic exposure, but application for mosquitoes tends to be episodic, and given the rapid breakdown of spinosad in the environment, chronic exposure is unlikely.

In Section 4.2.7.1.3, Surfactants on page 4-70, the section is modified to read as follows:

> Surfactants (alcohol ethoxylated surfactants, ~~and~~ aliphatic solvents, and plant-derived oils) work by making it difficult for mosquito larvae and pupae to attach to the water's surface, causing them

to drown. Surfactants spread across water surfaces and affect only the uppermost layer of the water.

The alcohol ethoxylated surface film used historically as a surfactant in California for mosquito control was Agnique. This material is a last resortno longer registered for use in California. This material was used on an assortment of waterbodies including ornamental ponds, pastures, and irrigation and drainage systems.

Aliphatic solvents such as mineral oil are the product of petroleum distillation and are, therefore, complex mixtures of long-chain aliphatic compounds. These materials are nonpersistent, breaking down within 2 to 3 days. They are applied to a variety of waterbodies, including, but not limited to, swamps, marshes, intermittently flooded areas, wastewater ponds, sumps, ditches, and man-made containers.

Plant-derived oils, whether vegetable or fruit, can be used as a surfactant for the management of vectors, especially immature mosquitoes. CocoBear Mosquito Larvicide Oil is the only plant-based oil that is currently available for use in the District's Program. This product consists mostly of a modified coconut oil (75 percent or more by volume) combined with 10 percent by volume mineral oil and a very small amount of nonionic surfactant and other proprietary ingredients. This material can be used in various waterbodies such as ditches, stagnant pools, swamps, marshes, temporary rainwater pools and intermittently flooded areas, ponds, catch basins, and man-made containers. CocoBear is also nonpersistent, becoming ineffective within 1 to 2 days.

The use of surfactants is employed only when absolutely necessary to prevent emergence of adult mosquito populations and is also a least preferred method for mosquito management. They are nontoxic to most organisms at label application rates, but may impact other surface-breathing aquatic insects. Miles et al. (2002) observed that the numbers of these nontarget surface-breathing insects were temporarily reduced following treatment, but recovered within a few days at Don Edwards Wildlife Area (Miles et al. 2002). These short-term impacts on a small portion of the food chain and in a limited area within a wetland are unlikely to result in substantive impacts to nontarget species in the aquatic environment.

In Section 4.2.7.5, Impact Determinations on page 4-73, Impact AR-29 is modified to reflect minimal rather than no impacts text and now reads as follows:

Impact AR-29. The Chemical Control Alternative would have a **less than significant** ~~**no**~~ impact on the movement of any native resident or migratory fish or wildlife species~~. Nor would it impact~~, any ~~native resident or~~ migratory wildlife corridors, or ~~impede~~ the use of native wildlife nursery sites, as no physical disturbance would occur. Any disruption of migration patterns would be due to the presence of personnel and machinery in the environment. In all cases, this occurrence would be very short term, generally not more than a few hours in any given location. Therefore, this effect would be minimal. No mitigation is required.

In Section 4.2.9, Environmental Impacts Summary, Table 4-9 starting on page 4-77, the following modifications have been made to the table:

> Impact statements AR-4, AR-10, AR-17, and AR-29 have been updated as listed above.

> Impacts for AR-4, AR-10, AR-17, and AR-29 changed from N (no impact) to LS (less-than-significant impact)

5.2.6 Chapter 5, Biological Resources - Terrestrial

Revisions are made as indicated to the following sections.

In Section 5.2.2.2, Pesticide and Herbicide Effects, Table 5-3 starting on page 5-16, the language was modified in the following BMPs:

A-2: In particular, District staff will regularly communicate with resource agency staff regarding mosquito management operations, habitat, and flora and fauna in sensitive habitats. Such communications will include wildlife studies and occurrences of ~~sensitive~~special status species in areas that may be subject to mosquito management activities.

A-10: Properly train all staff, contractors, and volunteer help to prevent spreading weeds and pests to other sites. Equipment and personnel gear will be cleaned between sites. The District headquarters contains wash rack facilities (including high-pressure washers) to ~~regularly (in many cases daily) and~~ thoroughly clean vehicles and equipment to prevent the spread of weeds.

B-1: District staff will continue to implement the measures in the USFWS's "Walking in the Marsh: Methods to Increase Safety and Reduce Impacts to Wildlife/Plants." District staff will receive annual training and review of this document to remain up to date and current on this document and its methodologies for protecting sensitivespecial status species and the marsh habitat.

C-1: Activities [surveillance, treatment (excluding aerial applications), source reduction] within or adjacent to harvest mouse habitat will not occur within two hours before or after extreme high tides of 6.~~9~~5 feet National Geodetic Vertical Datum (NGVD) or above as measured at the Golden Gate Bridge (corrected for time and tide height for the site) or when the marsh plain is completely inundated because suitable upland refugia cover is limited and potentially disturbance-creating activities could prevent mice from reaching available cover.

D-1: Activities [surveillance, treatment (excuding aerial applications), source reduction] within or adjacent to Ridgway's Rail habitat will not occur within two hours before or after extreme high tides of 6.~~9~~5 feet National Geodetic Vertical Datum (NGVD) or above as measured at the Golden Gate Bridge (corrected for time and tide height for the site) or when the marsh plain is completely inundated because suitable upland refugia cover is limited and potentially disturbance-creating activities could prevent clapper Ridgway's Rails from reaching available cover.

F-1: District staff will notify the appropriate resource agency prior to entering potential WSnPl habitats (which may include seasonal ponds, managed ponds, and adjacent levees) between March 1 and September 15 (breeding season) and will regularly coordinate with the resource agency(ies) on the locations of breeding WSnPls and avoid breeding WSnPls to the extent feasible. Any observations of adverse effects to WSnPls will be reported by District staff.

G-1: Trucks and ARGOs will be restricted to established roads and berms in vernal pool and stockpond areas. Only small ATVs (e.g. Polaris) will be utilized near vernal pools and stockponds.

G-2: Methoprene, monomolecular films, and adulticides will not be used in vernal pool and stockpond areas during CTS breeding season (November-March) or if CTS larvae are present.

G-3: Vegetation management and water manipulation in CTS habitat shall not occur from November through March to avoid the CTS breeding season and will be further delayed if CTS larvae are present to allow them time to attain full metamorphosis.

G-4: Mosquitofish (Gambusia affinis) will not be introduced into any site containing CTS.

G-5: The Declining Amphibian Populations Task Force Fieldwork Code of Practice will be followed in CTS habitat.

G-6: If nonnative/introduced predators of CTS (e.g. bullfrogs) are encountered in CTS habitat during mosquito management activities, findings will be reported to the appropriate resource agency.

G-7: If CTS are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

H-2: Methoprene, monomolecular films, and adulticides will not be used in vernal pool areas if VPTS are present.

H-3: Vegetation management and water manipulation in VPTS habitat shall not occur if VTPS are present.

H-4: Mosquitofish (Gambusia affinis) will not be introduced into any site containing VPTS.

H-5: If VPTS are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

I-2: When possible, project actions to be conducted in areas containing suitable habitat for this species (i.e. vernal pools) will occur during the time period when CCG is in bloom and identifiable (March-June), so that any CCG plants observed can be avoided and documented.

K-1: Consultations will be made with the appropriate resource agency to discuss proposed vegetation management work, determine potential presence of ~~sensitive~~special status species and areas of concern, and any required permits.

L-3: All maintenance work will be done at times that minimize adverse impacts to nesting birds, anadromous fish, and other species of concern, in consultation with USFWS, NMFS, and CDFW. Work conducted will, whenever possible, be conducted during approved in water work periods for that habitat, considering the species likely to be present. For example, tidal marsh work will be conducted between September 1 and January 31, where possible and not contraindicated by the presence of other ~~sensitive~~special status species. Similarly, in water work in waterbodies that support anadromous fish, work will be conducted between July 1 and September 30.

M-11: Do not apply pesticides that could affect insect pollinators in liquid or spray/fog forms over large areas (more than 0.25 acres) during the day when honeybees are present and active or when other pollinators are active. Preferred applications of these specific pesticides are to occur in areas with little or no honeybee or pollinator activity or after dark. These treatments may be applied over smaller areas (with hand held equipment), but the technician will first inspect the area for the presence of bees and other pollinators. If pollinators are present in substantial numbers, the treatment will be made at an alternative time when these pollinators are inactive or absent. If beehives are present, establish a buffer of reasonable distance, when feasible, and do not allow applications of pesticides within this buffer whenever possible.

O-2: Train employees on the safe use of pesticides, equipment and machinery, including vehicle operation.

P. California Red-Legged Frog (CRLF)

P-1: Vegetation management and water manipulation in CRLF habitat shall not occur from November through March to avoid the CRLF breeding season and will be further delayed if tadpoles are present to allow them time to attain full metamorphosis.

P-2: Mosquitofish (Gambusia affinis) will not be introduced into any site containing CRLF.

P-3: The Declining Amphibian Populations Task Force Fieldwork Code of Practice will be followed in CRLF habitat.

P-4: If nonnative/introduced predators of CRLF (e.g. bullfrogs) are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

P-5: If CRLF are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

P-6: District staff will receive training on measures to avoid impacts to CRLF.

Q. Foothill Yellow-Legged Frog (FYLF)

Q-1: Vegetation management and water manipulation in FYLF habitat shall not occur from April to July avoid the FYLF breeding season and will be further delayed if tadpoles are present to allow them time to attain full metamorphosis.

Q-2: Mosquitofish (Gambusia affinis) will not be introduced into any site containing FYLF.

Q-3: The Declining Amphibian Populations Task Force Fieldwork Code of Practice will be followed in FYLF habitat.

Q-4: If nonnative/introduced predators of FYLF (e.g. bullfrogs) are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

Q-5: If FYLF are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

Q-6: District staff will receive training on measures to avoid impacts to FYLF.

R. Western Spadefoot Toad (WST)

R-1: Vegetation management and water manipulation in WST habitat shall not occur from January to May to avoid the WST breeding season and will be further delayed if tadpoles are present to allow the them time to attain full metamorphosis.

R-2: Mosquitofish (Gambusia affinis) will not be introduced into any site containing WST.

R-3: The Declining Amphibian Populations Task Force Fieldwork Code of Practice will be followed in WST habitat.

R-4: If nonnative/introduced predators of WST (e.g. bullfrogs) are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

R-5: If WST are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

R-6: District staff will receive training on measures to avoid impacts to WST.

S. Western Pond Turtle (WPT)

S-1: Vegetation management and water manipulation in WPT habitat shall not occur during April and May to avoid the WPT breeding season.

S-2: If nonnative/introduced turtle species (e.g. red-eared sliders) are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

S-3: If nonnative/introduced predators of WPT (e.g. bullfrogs) are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

S-4: If WPT are encountered during mosquito management activities, findings will be reported to the appropriate resource agency.

S-5: District staff will receive training on measures to avoid impacts to WPT.

T. Tricolored Blackbird (TCB)

T-1: Monomolecular films and oils will not be used in areas of TCB nesting during the nesting season.

T-2: Vegetation management and water manipulation in TCB nesting areas shall not occur during the breeding season (March – August)

T-3: District staff will receive training on measures to avoid impacts to TCB.

In Section 5.2.2.4.2, Toxicity and Exposure on page 5-28, the third paragraph of the section has been modified to read as follows:

> However, these, and other, coordinated and focused laboratory tests are designed to document the effects of the chemical ~~when~~using a continuous, controlled~~,~~ laboratory exposure ~~exists and do~~that does not realistically reflect the likely patchy exposures ~~or toxicity in~~ typical of the District field application scenarios. As such, the toxicity information generated using laboratory tests (and some limited field tests) is intended as an overview of potential issues that might be associated with maximum direct exposures to develop and recommend guidance for ~~understanding the completely "safe"~~ use that should provide maximum exposure levels of applications that ~~would~~are protective of ecological health. These guidelines include numerous "safety margins" in the toxicity calculations that are intended to provide adequate efficacy to target organisms while not adversely ~~impact~~ impacting humans or nontarget plant and animal species. In some instances, the regulatory guidance may include additional suggestions for protective application to assure no significant impact on nontarget species and humans.

In Section 5.2.2.4.2, Toxicity and Exposure on page 5-28, an additional paragraph is as added after paragraph 3 and reads as follows:

> Although laboratory toxicity testing focuses on tiered concentrations of chemical exposure, the results of these tests produce a series of toxicity estimates of concentrations lower than those that produce mortality. Extrapolation of these data is used to generate estimates of chronic toxicity or possible effects of lower doses that may result in sublethal effects such as reproduction or metabolic changes. In reality, these low-dose exposures need to be sustained over longer periods (and usually at higher concentrations) than are relevant to typical application scenarios for mosquito control including multiple applications in an area such as a wetland.

In Section 5.2.3.1, Impact Determinations on page 5-31, Impact TR-4 is modified to reflect minimal rather than no impacts text and now reads as follows:

> **Impact TR-4.** The Surveillance Alternative would have a **less than significant** ~~**no**~~ impact on the movement of any native resident or migratory fish or wildlife species~~. Nor would it impact~~, any ~~native resident or~~ migratory wildlife corridors, or ~~impede~~ the use of native wildlife nursery sites, as no physical disturbance would occur. Any disruption of migration patterns would be due to the presence of personnel and machinery in the environment. In all cases, this occurrence would be very short term, generally not more than a few hours in any given location. Therefore, this effect would be minimal. No mitigation is required.

Sections 5.2.4.1.8 to 5.2.4.1.15 on pages 5-33 to 5-36 are aquatic habitats and have been deleted from Chapter 5, Biological Resources - Terrestrial:

> ~~**5.2.6.1.8 Tidal Marsh and Channels**~~
>
> ~~Tidal marsh and tidal channel habitats occur along the margins of San Francisco, San Pablo, and Suisun bays and are subject to tidal action.~~
>
> ~~They are typically bounded by levees and water control structures. The San Francisco Bay-Delta once supported vast tracts of freshwater, brackish, and saline marsh habitat. The vast majority of these marsh habitats have been converted to human uses such as farming, industrial uses, and urban development. Some of the remaining marsh lands are maintained and operated to provide habitat for wildlife or as private or public duck clubs. Several examples of these types of habitats occur along the western portion of Alameda County bordering the San Francisco Bay. These wetlands can be important sources of mosquitoes seasonally. These marshes are seasonally flooded and drained to optimize habitat for ducks, geese, and other wildlife.~~

Physical measures to control mosquitoes in these areas include maintenance of ditches and water control structures, removal of debris and weeds, clearance of brush for access to areas to be treated, and filling of nonfunctional water circulation ditches, as described in Chapter 2. Other measures include retaining water on the surface of the area, and rotational impoundment monitoring, which reduces mosquito populations by increasing the frequency with which suitable habitats are inundated and drained. The District works with landowners and property managers to accomplish these actions on a District determined basis.

These activities would be subject to the BMPs described in Table 5-3, relating to agency communication, environmental training, and pretreatment screening. The tidal marsh specific BMPs would also be employed including conducting this work during appropriate seasons and times of day (when the tide is out and when Ridgway's rail, California black rail, Alameda song sparrow, saltmarsh common yellow throat and salt marsh harvest mouse as well as numerous other special status species are not nesting), making sure staff have appropriate training when working in the marsh, and minimizing the use of mechanical equipment where practical. Channels that have substantial tidal flow and inundation would not support mosquitoes and, thus, would not need to be maintained. The disturbance associated with the Physical Control Alternative would be short term and temporary and with the implementation of the BMPs described in Table 5-3 would not substantially affect special status species.

5.2.6.1.9 Lagoon

Lagoons, located at the mouths of creeks or rivers where they enter the ocean or bay, but isolated from the receiving waterbody by a berm, are indirectly influenced by the tide, which may cause freshwater to back up within the lagoon, and may also allow water to percolate through the berm, with the direction of such movement depending on water levels on either side of the berm. As a result, lagoons often contain a lens of freshwater at the surface and brackish water at the bottom. Thus, lagoons may support species from both creeks and rivers, and from the receiving waterbodies. Lagoons are an important feeding area for special status birds including bald eagles. Lagoons would support mosquitoes in areas of reduced circulation, often associated with emergent vegetation. Physical control in lagoons would include reconnecting isolated areas to the main lagoon. The BMPs in Table 5-3 would be applied to avoid or minimize impacts to environmental resources. With these BMPs, the effects of the Physical Control Alternative on resources within the lagoon would be less than significant.

5.2.6.1.10 Creeks and Rivers and Riparian Forests

Because their rapid currents do not provide suitable habitat for mosquitoes, creeks and rivers generally do not support substantial numbers of mosquitoes, although, some mosquitoes can be found in slow eddies and back channels, or in pools isolated on the banks as flows recede. Creeks and rivers and the surrounding riparian forest may support special status species including yellow warbler, Swainson's hawk, bank swallow, and additional avian species (afforded protection under USFWS and CDFW) and other species including special status plants, as indicated in Tables 4-3 and 4-4. Accessing the site to complete the work during the avian nesting season would be avoided or minimized by implementation of the BMPs in Table 5-3. Habitat alterations to drain such areas will be avoided to the maximum extent possible due to instream special status species addressed in Chapter 4. The District does not routinely conduct this type of activity, but it may be required in some circumstances. The potential effects of this alternative would be avoided or minimized through implementation of the BMPs in Table 5-3, including those relating to agency communication, environmental training, and pretreatment screening. Depending on the species potentially present in an area, species specific BMPs may also be applied, including seasonal avoidance measures. With these BMPs, the effects of this action would be less than significant.

~~5.2.6.1.11 Ponds and Lakes~~

~~The freshwater habitats that could be treated include the margin of reservoirs and ponds (including artificial ponds such as golf course ponds or stock ponds with natural bottoms). These areas are generally man-made habitats, but they may support special status species such as yellow-headed blackbird and additional avian species (afforded protection under USFWS and CDFW) as well as special status plants on the margins. This potential effect would be avoided and minimized by the BMPs in Table 5-3 relating to agency communication, environmental training, and pretreatment screening. Depending on the species potentially present in an area, species-specific BMPs may also be applied, including seasonal avoidance measures. With these BMPs, the effects of this action would be less than significant.~~

~~5.2.6.1.12 Seasonal Wetlands (includes Vernal Pools)~~

~~The USACE defines wetlands as "those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. (33 [Code of Federal Regulations] CFR 328.3(b); 40 CFR 230.3(t))." For the purposes of this document, seasonal wetlands are areas that are flooded for 1 week or more during the year, generally during the rainy season, but do not retain water through the entire year. Seasonal wetlands may be flooded by increased runoff, rainfall, or unusually high tides. The availability of such habitats has been substantially reduced by human land use practices and flood control measures. Reducing the frequency or duration with which such habitats are flooded would adversely affect habitat and terrestrial resources.~~

~~Vernal pools, a specific type of seasonal wetland, often support a unique assemblage of endemic plant and animal species, many of which have been identified as special status species by federal and state agencies (see Tables 4-3 and 4-4). Because of the sensitive nature of these habitat types, the District generally would not undertake Physical Control measures in these areas. In the event that physical control in seasonal wetlands or vernal pools was required, the District would not implement such actions without previously discussing their need with the relevant regulatory agencies to verify that no other option exists to control the mosquito problem and to make sure that any such activity would be done in such a way as to minimize its impacts. As a result, this "consultation prior to implementation" BMP would result in a less-than-significant impact to aquatic or terrestrial resources.~~

~~5.2.6.1.13 Freshwater Marsh/Seeps~~

~~Freshwater marsh and seeps may provide ideal habitat for mosquito breeding due to their substantial areas of shallow water, limited circulation and emergent vegetation. These areas may potentially support a number of special status plants and animals as indicated in Tables 4-3 and 4-4. Physical control in these areas would have the same potential effects as described for lake and pond habitats and would be avoided or minimized by the BMPs in Table 5-3 relating to agency communication, environmental training, and pretreatment screening. Depending on the species potentially present in an area, species-specific BMPs may also be applied, including seasonal avoidance measures. With these BMPs, the effects of this action would be less than significant.~~

~~5.2.6.1.14 Artificial Containers, Temporary Standing Waters and Ornamental Ponds~~

~~Artificial containers do not provide habitat for special status terrestrial species. Thus, physical control of artificial containers (ensuring that these containers do not hold water for a sufficient period to support mosquito larvae) would have no impact on these species or their habitat.~~

~~Temporary standing waters refers to water ponding on an upland habitat because of rainfall or irrigation. Ornamental ponds are small ponds with artificial bottoms. These habitats do not provide habitat for special status aquatic or terrestrial species.~~

~~5.2.6.1.15 Wastewater Treatment Facilities/Septic Systems~~

~~Wastewater treatment facilities may provide nesting habitat for special status avian species such as short eared owl and northern harrier hawk since such facilities may lie close to suitable habitats in streams or the San Francisco Bay Delta system. The extent to which these species may enter these facilities is unknown. Because of the limited number of such facilities, the limited use of such facilities by special status species, and the application of the BMPs described in Table 5-3, physical control measures are not anticipated to substantially affect avian species.~~

~~Septic systems and their associated leach fields may provide habitat for special status avian species associated with riparian and emergent vegetation, such as song sparrows, yellow-breasted chat, yellow billed-cuckoo, and other passerine birds as indicated in Table 4-4, under freshwater marsh/seeps and riparian forest, although their presences would be dependent on suitable vegetation and other habitat conditions, generally not associated with septic systems.~~

~~Winery waste ponds generally contain waste from grape pressings and washwater from cleaning winery equipment. These ponds generally do not provide suitable habitat for special status species, as they are highly managed and often suffer low water quality. The District provides input relating to controlling mosquitoes associated with the ponds and winery operations. Physical control is not typically undertaken in winery waste ponds, although it is possible that it could be required under unusual circumstances. Because of the poor quality habitat provided and because physical control activities would rarely be conducted in these waste ponds, little likelihood of impacts to special status species exists.~~

~~Flood control channels and ditches may support special status species where they have suitable physical and vegetative structure. Physical management activities would be designed to reduce ponding of water within these areas. The application of the BMPs in Table 4-6, particularly those pertaining to agency communication, pretreatment screening, and environmental training, will avoid impacts to any special status species that might occur in these habitats.~~

Section 5.2.4.1.16, Effects on Habitat, Movement, Local Policies and Ordinances, and HCP/NCCPs on page 5-36, is renumbered to 5.2.4.1.8.

Section 5.2.4.1.17, Impact Determinations on page 5-36, is renumbered to 5.2.4.1.9.

In Section 5.2.4.1.9 (formerly 5.2.4.1.17), Impact Determinations on page 5-37, Impact TR-10 is modified to reflect minimal rather than no impacts text and now reads as follows:

> **Impact TR-10.** The Physical Control Alternative would have a **less than significant** ~~**no**~~ impact on the movement of any native resident or migratory fish or wildlife species~~. Nor would it impact~~, any ~~native resident or~~ migratory wildlife corridors, or ~~impede~~ the use of native wildlife nursery sites. Any disruption of migration patterns would be due to the presence of personnel and machinery in the environment. In all cases, this occurrence would be very short term, generally not more than a few hours in any given location. Therefore, this effect would be minimal. No mitigation is required.

Sections 5.2.5.3.8 to 5.2.5.3.15 on pages 5-42 to 5-44 are aquatic habitats and have been deleted from Chapter 5, Biological Resources - Terrestrial:

~~5.2.6.1.8 Tidal Marsh and Channels~~

~~Vegetation management activities are conducted in coordination with landowners or land managers and the resource agencies and generally focus on the removal of nondesired species.~~

~~Tidal marshes may support a number of special status plants, including Hispid bird's-beak, Mason's lilaeopsis, and Hairless popcornflower, and others (Table 4-3), and animals, including salt-marsh harvest mouse, Salt-marsh wandering shrew, Ridgway's rail, northern harrier, tricolored blackbird, and other passerine species (Table 4-4). Vegetation removal in tidal marshes is done using hand tools and in accordance with the BMPs identified in Table 5-3, relating to agency coordination, environmental training, pretreatment screening, disturbance minimization BMPs, as well as Vegetation Management Alternative, tidal marsh and species-specific BMPs. With these BMPs, the effects of the Vegetation Management Alternative on biological resources within tidal marshes would be less-than-significant.~~

~~5.2.6.1.9 Lagoon~~

~~Lagoons would support mosquitoes in areas of reduced circulation, often associated with emergent vegetation, supporting a number of special status species as identified in Tables 4-3 and 4-4, including many of the marsh and riparian species listed previously. Vegetation management in lagoons would be subject to the BMPs in Table 5-3 to avoid or minimize impacts to environmental resources. With these BMPs, the effects of the Vegetation Management Alternative on biological resources within lagoons would be less-than-significant.~~

~~5.2.6.1.10 Creeks and Rivers and Riparian Forests~~

~~Because their rapid currents do not provide suitable habitat for mosquitoes, creeks and rivers generally do not support substantial numbers of mosquitoes, although, some mosquitoes can be found in slow eddies and back channels, or in pools isolated on the banks as flows recede. Creeks and rivers and the surrounding riparian forest may support special status terrestrial species including yellow warbler, Swainson's hawk, bank swallow, and additional avian species (afforded protection under USFWS and CDFW) and other species including special status plants, as indicated in Tables 4-3 and 4-4. Vegetation that requires management would typically be confined to channel margins and backwaters with slow currents. This activity would be done in coordination with landowners or land managers and resource agencies, as well as following the BMPs described in Table 5-3 relating to environmental training, pretreatment screening, disturbance minimization, avian nesting season, habitat and species-specific BMPs, and Vegetation Management Alternative specific BMPs. This activity would result in less-than-significant impacts to special status species associated with creeks, rivers, streams and the associated riparian forests.~~

~~5.2.6.1.11 Ponds and Lakes~~

~~The freshwater habitats that could be treated include the margin of reservoirs and ponds (including artificial ponds such as golf course ponds or stock ponds with natural bottoms). These areas are generally man-made habitats, and they may support special status terrestrial species such as yellow-headed blackbird and additional avian species (afforded protection under USFWS and CDFW), as well as special status plants on the margins.~~

~~Vegetation management would be limited in this habitat type, except in smaller ponds, as the depth and size of these areas would typically preclude emergent vegetation from exceeding 30 percent of the surface area. Where necessary, vegetation management activities would be implemented in stagnant areas along the edges of these habitats where mosquito eggs and larvae occur. Special status avian species would likely not be impacted in reservoirs and ponds, as vegetation removal in these habitats is minimal. Special status plants would likely not be present in lakes or ponds but may be present along the margins. Vegetation management could directly affect these species but substantial areas of similar habitat would remain.~~

This potential effect would be avoided and minimized by the BMPs in Table 5-3 relating to agency communication, environmental training, and pretreatment screening. Vegetation Management Alternative specific BMPs would be applied. Depending on the species potentially present in an area, species-specific BMPs may also be applied, including seasonal avoidance measures. With these BMPs, the effects of this action would be less than significant.

5.2.6.1.12 Seasonal Wetlands (includes Vernal Pools)

Seasonal wetlands, including vernal pools, may also support substantial stands of emergent vegetation, although these areas are typically not inundated for long enough periods to support dense stands of vegetation preferred by mosquitoes. Terrestrial species that might occur here include tricolored blackbird, California tiger salamander, Vernal pool tadpole shrimp, Contra Costa goldfields, and others as indicated in Tables 4-3 and 4-4. As a result, these areas are unlikely to be subject to vegetation management actions. If vegetation management activities were required, potential effects would be avoided and minimized by the BMPs in Table 5-3 relating to agency communication, environmental training, and pretreatment screening. Vegetation Management Alternative specific BMPs would be applied. Depending on the species potentially present in an area, species-specific BMPs may also be applied, including seasonal avoidance measures. With these BMPs, the effects of this action would be less-than-significant.

5.2.6.1.13 Freshwater Marsh/Seeps

Freshwater marsh and seeps may provide ideal habitat for mosquito breeding due to their substantial areas of shallow water, limited circulation and emergent vegetation. These areas may potentially support a number of special status terrestrial plants and animals as indicated in Tables 4-3 and 4-4, such as Loma Prieta hoita, Mason's lilaeopsis, Hairless popcornflower, American peregrine falcon, California black rail, White-tailed kite, and others. Vegetation management in these areas would have the same potential effects as described for lake and pond habitats and would be avoided or minimized by the BMPs in Table 5-3 relating to agency communication, environmental training, and pretreatment screening. Depending on the species potentially present in an area, species-specific BMPs may also be applied, including seasonal avoidance measures. With these BMPs, the effects of this action would be less than significant.

5.2.6.1.14 Artificial Containers, Temporary Standing Waters, and Ornamental Ponds

Vegetation Management does not occur in artificial containers. Artificial containers do not provide habitat for support populations of native or special status terrestrial species. Thus, this alternative would have no impact on these species or their habitat.

Temporary standing waters refer to water ponding on an upland habitat because of rainfall or irrigation. Ornamental ponds are small ponds with artificial bottoms. These habitats do not provide habitat for special status aquatic or terrestrial species. Therefore, no impact would occur to special status species from the vegetation management alternative in these habitats.

5.2.6.1.15 Wastewater Treatment Facilities/Septic Systems

Vegetation management activities may occur in coordination with the owners or operators of wastewater treatment facilities or septic systems. These facilities may provide nesting habitat for special status avian species such as short eared owl and northern harrier hawk since such facilities may lie close to suitable habitats in streams or the San Francisco Bay Delta system. The extent to which these species may enter these facilities is unknown. Septic systems and their associated leach fields may provide habitat for special status avian species, particularly those that nest in riparian or emergent vegetation. Because of the limited number of such facilities and the very limited use of such facilities by special status species, vegetation management

~~measures would have a less-than-significant impact on terrestrial special status species and will be minimized with the implementation of the BMPs in Table 5-3.~~

Section 5.2.5.3.16, Effects on Habitat, Movement, Local Policies and Ordinances, and HCP/NCCPs on page 5-44, is renumbered to 5.2.5.3.8.

Section 5.2.5.3.17, Impact Determinations on page 5-44, is renumbered to 5.2.5.3.9.

In Section 5.2.5.3.9 (formerly 5.2.5.3.17), Impact Determinations on page 5-44, Impact TR-16 is modified to reflect minimal rather than no impacts text and now reads as follows:

> **Impact TR-16.** The Vegetation Management Alternative would have a **less than significant** ~~no~~ impact on the movement of any native resident or migratory fish or wildlife species~~. Nor would it impact,~~ any ~~native resident or~~ migratory wildlife corridors, or ~~impede~~ the use of native wildlife nursery sites. Any disruption of migration patterns would be due to the presence of personnel and machinery in the environment. In all cases, this occurrence would be very short term, generally not more than a few hours in any given location. Therefore, this effect would be minimal. No mitigation is required.

In Section 5.2.7.1.1, Bacterial Larvicides (BS, Bti, spinosad) on page 5-49, the second paragraph of the section has been modified to read as follows:

> Spinosad is a natural insecticide derived from the fermentation of a common soil microorganism, Saacharopolyspora spinosa. Spinosad causes neurologic effects in insects consistent with the general activation of nicotinic acetylcholine receptors, but by a mechanism that is novel among known insecticides (Mayes et al. 2003). Exposure manifests as constant involuntary nervous system impacts ultimately leading to paralysis and death of the insect. Spinosad is highly effective against lepidopteron larvae (e.g., butterflies and moths), as well as some Diptera (mosquitoes and flies), Coleoptera (beetles), Thysanoptera (e.g., thrips), and Hymenoptera (e.g., bees, wasps) (Mayes et al. 2003). The effects of spinosad on beneficial pollinators such as honeybees are of concern. The District incorporates BMPs that are designed to minimize exposure of bees to spinosad, such as utilizing granular and tablet forms and ~~limiting~~ minimizing applications to natural sources. Predominant usage of spinosad is in artificial sources such as catch basins, storm drains and swimming pools. If a liquid form is used, additional BMPs include restricting applications to nighttime hours when bees are inactive, covering hives where possible with wet burlap and maintaining buffer zones. Bees and other nontarget insects may contact spinosad residues following applications; however, residues are generally are below acute toxicity thresholds to honeybees. Field studies evaluating typical spinosad applications have demonstrated low risk to adult honeybees and little to no effect on hive activity and brood development, provided that the residue is allowed to dry for up to three hours (Mayes et al. 2003).

Section 5.2.7.1.4 Surfactants (Alcohol ethoxylated surfactant, alphatic solvents) on page 5-50 is modified and text added from Chapter 6 Ecological Health and Chapter 7 Human Health as follows:

> ~~Petroleum- and plant-based (ethoxylated isostearyl alcohols) oils are used as surface-active agents effective against larvae and pupae. These oils are effective against these immature life stages when inhaled at the water surface or by physically forming a surface film that drowns the mosquito. These~~ treatments~~Surfactants~~ (Alcohol ethoxylated surfactant, alphatic solvents) and plant-derived oils) work by making it difficult for mosquito larvae and pupae to attach to the water's surface, causing them to drown. Surfactants affect only the uppermost layer of the water. The use of these materials is employed only when absolutely necessary to prevent emergence of adult mosquito populations and is also a least preferred method for mosquito management. Surfactant applications may also be effective against adult mosquitoes during adult emergence. These treatments are specific to aquatic environments and are not applied to terrestrial

environments, although some drift may occur. The toxicity of these materials is discussed more thoroughly in Appendix B and summarized in Table 6-1, Appendix B.

Alcohol ethoxylated surfactants (monomolecular films) could result in reductions to populations of surface-breathing insects (other than mosquitoes) during treatment; however, it is unlikely that these reductions would result in lasting or observable effects on nontarget organisms when applied within product label limits. Monomolecular films are not environmentally persistent and typically degrade within 21 days. In addition, populations recover quickly following recolonization from adjacent and neighboring sites and habitats. The alcohol ethoxylated surface film used historically as a surfactant in California for mosquito control was Agnique. This material is no longer registered for use in California and currently no other alcohol ethoxylated surfactants are commercially available for mosquito control at this time.

Aliphatic solvents (e.g., mineral oils) are the product of petroleum distillation and, thus, are complex mixtures of long-chain aliphatic compounds. Aliphatic solvents are often used when monomolecular films (alcohol ethoxylated surfactants) are not available or do not provide sufficient mosquito control. They also break down more rapidly (2 to 3 days) and are practically nontoxic to most nontarget organisms. Therefore, aliphatic solvents should not result in adverse ecological effects when applied using District BMPs.

Plant-derived oils, whether vegetable or fruit, can be used for the management of vectors, especially immature mosquitoes. Plant-derived oils are generally of two types: triglycerides or methylated oils. CocoBear Mosquito Larvicide Oil is the only plant-based oil that is currently available for use in the District's Program (also see Section 4.3.6.4 in Appendix B). This product consists mostly of a modified coconut oil (75 percent or more by volume) combined with 10 percent by volume mineral oil and a very small amount of nonionic surfactant and other proprietary ingredients. CocoBear is also nonpersistent, becoming ineffective within 1 to 2 days. CoCoBear has no reported significant toxicity to any receptors likely to be exposed during or after use as a larvicide.

In Section 5.2.7.2, Mosquito Adulticides on page 5-50, a sentence has been added to the end of the first paragraph of the section and a second paragraph has been added. Inserted text is as follows:

Adulticides, when used, are usually applied from the ground via truck, ATVs, utility vehicles, or handheld devices as an ULV application.

Aerial adulticiding, although the least preferred technique, could potentially be utilized in the future to deal with a severe vector outbreak or risk of mosquito-borne disease transmission. Aerial applications are made using ULV techniques. Aerial application of adulticide may be the only reliable means of obtaining effective control in areas bordered by extensive mosquito production sites with a small, narrow, or inaccessible network of roads, or to cover a very large area quickly in case of unusually severe mosquito outbreaks or mosquito-borne disease epidemics, The decision to conduct aerial application of adulticides is taken with every precaution, and is considered a last resort by the District.

In Section 5.2.7.4, Impact Determinations on page 5-54, Impact TR-28 is modified to reflect minimal rather than no impacts text and now reads as follows:

Impact TR-28. The Chemical Control Alternative would have a **less than significant** ~~**no**~~ impact on the movement of any native resident or migratory fish or wildlife species~~. Nor would it impact~~, any ~~native resident or~~ migratory wildlife corridors, or ~~impede~~ the use of native wildlife nursery sites, as no physical disturbance would occur. Any disruption of migration patterns would be due to the presence of personnel and machinery in the environment. In all cases, this occurrence would be very short term, generally not more than a few hours in any given location. Therefore, this effect would be minimal. No mitigation is required.

In Section 5.2.9, Environmental Impacts Summary, Table 5-10 starting on page 5-57, the following modifications have been made to the table:

> Impact statements TR-4, TR-10, TR-16, and TR-28, have been updated as listed above.

> Impacts for TR-4, TR-10, TR-16, and TR-28 changed from N (no impact) to LS (less-than-significant impact)

5.2.7 Chapter 6, Ecological Health

Revisions are made as indicated to the following sections.

A new Section 6.1.1.3 Bioaccumulation and Biomagnification was added to page 6-3.

Bioaccumulation is the increase in concentration of a chemical from the environment to the first organism in a food chain, while biomagnification is the increase in concentration of a chemical from one trophic level in the food chain to another. In addition to direct exposures, the issues of bioaccumulation of some chemicals (they have all been categorized by USEPA) and their persistence in the environment are all included in the risk calculations wherever the data are available. Several chemicals are identified as persistent, meaning that they remain in the media of application for relatively long periods (i.e., weeks, months). However, most pesticides currently used by the District are selected preferentially for much shorter half-lives of hours to days. These physio/chemical characteristics of the chemicals selected for mosquito control are always considered early in the risk calculation process. Only in some special situations such as an USEPA Section 18 "emergency"[3] are the older, more persistent products allowed. These emergency situations are intended for and only to stop dramatic and sometimes potentially catastrophic mosquito infestations.

Biologically persistent chemicals (and bioaccumulation) by definition address the potential for a chemical to move up the food chain and even increase the tissue concentration (biomagnification) in higher trophic animals. The chemicals known to elicit bioaccumulation and/or biomagnifications are specifically addressed in the assessment as each of the "higher" (predator) receptor species is considered. As a result of this focus on biological and chemical properties of selected pesticides, the risk assessment process provides the best conservative estimate of any potential unwanted adverse effects.

Some chemicals have the potential to be retained in the fatty tissues of organisms and accumulate after their prolonged exposure to contaminated sources (bioaccumulation), resulting in a higher concentration in the organism over time. In some cases, chemicals can even exist in organisms above the exposure media concentrations (biomagnification). However, biomagnification is correlated with an organism that is associated with continued exposure to a contaminated environment (e.g., usually sediments and water) and is not typically associated with the limited and/or short term chemical exposures that might result from District applications for mosquito control. Even chemicals that have a potential to bioaccumulate do not exhibit this phenomenon in all biota, since toxic chemicals are selectively taken up by fat (e.g., a chemical may bioaccumulate in fish but not in all animals). Many toxic substances are excreted or metabolized after ingestion such that bioaccumulation is dependent on the physio/chemical characteristics of the chemical (persistence and toxicity), the concentration of the chemical, and the specific organism exposed.

[3] Section 18 of FIFRA authorizes EPA to allow States to use a pesticide for an unregistered use for a limited time if EPA determines that emergency conditions exist. Current and recent actions under Section 18 are detailed in the FIFRA Section 18 Emergency Exemptions database.

With the exception of a small number of pesticides currently used or planned for use by the District, the majority do not bioaccumulate. The herbicide adjuvants nonylphenol and short-chain nonylphenol ethoxylates are discussed in Section 6.2.5.1.2. See Section 6.2.7 under the Chemical Control Alternative for a discussion of pesticides with potential for bioaccumulation. The persistence, bioaccumulation, and the toxicity of each of the chemicals used or planned for use by the District are presented in each of the respective sections addressing these chemicals in Appendix B and in Appendix B, Table 6-1.

In Section 6.2.1, Evaluation Concerns and Criteria on page 6-7, the bullet points have been reordered from a to l.

In Section 6.2.1, Evaluation Concerns and Criteria on page 6-7, the bullet point c response (formerly i) was revised as follows:

> Bs is a naturally occurring soil bacterium. Data indicate a high degree of specificity with Bs (and Bti) for mosquitoes and demonstrate no toxicity to chironomid larvae at any mosquito control application rate. Bs is capable of cycling in the aquatic environment providing weeks of effective mosquito control after a single dose. It is very effective in water with high organic content and ineffective in brackish and saline waters. The use, fate and transport, and potential toxicity of Bs is discussed in Section 6.2.7 and described in detail in Appendix B.

In Section 6.2.1, Evaluation Concerns and Criteria on page 6-8, the bullet point h response (formerly n) was revised as follows:

> Although larval and adult mosquitoes serve a positive role as potential prey items for some invertebrates, fish, avian insectivores, bats, small reptiles, and amphibians, the loss or reduction of a focus area (~~infested or large~~ population of mosquitoes) will not affect the predator populations overall. Many species of mosquitoes are short lived or seasonal, so they generally serve as only one of many possible prey sources for predators. The decline in one prey species generally means that a predator will shift its food preference. No predators are known that rely exclusively on mosquitoes (larval or adult) for prey.

In Section 6.2.4, Physical Control Alternative on page 6-15, the last sentence of the fourth paragraph was revised as follows:

The presence of special status species at aquatic or terrestrial sites or the presence of suitable habitat for orspecial status species would require consultation and coordination with resource agencies prior to implementation ~~result in cancellation~~ of scheduled physical control activities.

In Section 6.2.5, Vegetation Management Alternative on page 6-16, the third paragraph was revised as follows:

Vegetation management in the form of removal could include the use of weed-whackers, chain saws, and shovels. These activities could lead to physical injury to special status species of terrestrial plants and animals. The District applies BMPs to reduce these impacts, including the identification of special status species in treatment areas, communication with resource agencies, and acquisition of permits, prior to commencing any vegetation removal actions. The nonherbicide component of the Vegetation Management Alternative is not expected to result in adverse ecological effects. These activities are generally coordinated with and monitored by public agencies and conducted during times to alleviate potential impacts to nontarget organisms.

In Section 6.2.7.1.3, Hydrocarbon Esters (Methoprene) on page 6-22, a sentence was added to the end of the second paragraph:

Release rates of extended release methoprene products are also engineered to be at the low levels effective for mosquito control while minimizing impacts to nontarget organisms.

In Section 6.2.7.1.5, Aliphatic Solvents (Mineral Oil) on page 6-23, the first paragraph under this section is deleted.

> ~~Monomolecular films are alcohol ethoxylated surfactants, which are low-toxicity pesticides that spread a thin film on the surface of water that makes it difficult for mosquito larvae, pupae, and emerging adults to attach to the water's surface, causing them to drown (USEPA 2007a). The films also disrupt larval respiration of some other classes of air-breathing aquatic insects. They are used on an assortment of waterbodies including ornamental ponds, pastures, irrigation systems, drainage systems, and drinking water systems (CDPR 2010a).~~

In Section 6.2.8, Cumulative Impacts on page 6-28, the following paragraph was added after the first paragraph

> The incremental effects of the District's use of pesticides with the potential to bioaccumulate in the environment (i.e., methoprene and spinosad for mosquito larvae; etofenprox, and lambda-cyhalothrin for adult mosquitoes/yellow jackets) do not contribute considerably to large-scale bioaccumulation and regional impacts to ecological health. The limited number and use of the adult insect products (etofenprox, and lambda-cyhalothrin) in relation to the area of application is inconsequential and does not create a risk that existing organisms would be subject to continuous exposure or exposure at a frequency and duration that is likely to present a substantial risk of bioaccumulation. Although spinosad and methoprene have been designated as potential bioaccumulators, the environmental conditions on the ground and in water after an application of one of these pesticides by the District generally do not provide the continuous exposure needed for substantial bioaccumulation in nontarget organisms. The impact of District applications of these pesticides that could contribute to the bioaccumulation of these pesticides in nontarget animals and the environment is short-lived with such a small fraction of their overall normal exposure to outside stress as to be unremarkable. The pesticides that have the potential to bioaccumulate are used in such low doses, usually with special application restrictions, and in such prescribed areas as to not substantially impact the regional environment and are not cumulatively considerable.

5.2.8 Chapter 7, Human Health

Revisions are made as indicated to the following sections.

In Section 7.2.5.1, Herbicides on page 7-13, the second paragraph is supplemented with the following additional information after Table 7-4, and a third paragraph is added before Impact HH-4:

> The District may use herbicides to control vegetation in and around mosquito habitats to improve surveillance and reduce suitable breeding habitats. Herbicides are typically classified into the following major categories: pre-emergent herbicides (applied to the soil to prevent seedlings from germinating and emerging); post-emergent herbicides (applied after seedlings have emerged and control actively growing plants via contact damage or systemic impacts); contact herbicides (cause physical injury to the plant upon contact); and systemic herbicides (damage the internal functioning of the plant). Herbicides included in the Program have diverse chemical structures, act through distinct modes of action, and exhibit varying levels of potential toxicity to humans. ~~These~~ Many of the herbicides are typically nonselective and broad-spectrum and function by inhibiting growth but do so in a multitude of ways. Most of the herbicides are moderately persistent in soil and water (for each herbicide's half-life in soil and water, please refer to Appendix B). The following have been shown to exhibit no/low toxicity to humans: imazapyr (USEPA 2006a), triclopyr (USEPA 1998a), and sulfometuron methyl (USEPA 2008). The actual use and human exposure in the field are far less than tested in the laboratory, and much higher volumes (exposure) would be needed to result in toxicity.
>
> Many of the herbicides are typically nonselective and broad-spectrum and generally function by inhibiting growth but do so in a multitude of ways. For example, sulfometuron methyl retards or

stops root and shoot development. Herbicides used against annual broadleaf weeds are generally of the post-emergent variety, such as triclopyr and sulfometuron methyl. In addition, imazapyr is a systematic, nonselective, pre- and post-emergent herbicide used for a broad range of terrestrial and aquatic weeds. Glyphosate represents a commonly used herbicide for the control and elimination of grass weeds and sedges. Most of the herbicides are moderately persistent in soil and water (for each herbicide's half-life in soil and water, refer to Appendix B).

In Section 7.2.5.1.1, Glyphosate on page 7-13, the first paragraph is modified as follows:

Glyphosate is a nonselective, post-emergent, and systemic herbicide that is the active ingredient (as an acid or salt) in Alligare, Aquamaster, Buccaneer, and Roundup© products. It is designed to target the shikimic acid pathway, which is specific to plants and some microorganisms; therefore, glyphosate is thought to have very low toxicity to mammals (USEPA 1993). The District would ~~employ an adequate buffer to water sources~~ strictly adhere to its BMPs and product label requirements if it applies glyphosate.

In Section 7.2.6.1, Mosquito Larvae Pathogens on page 7-15, the second paragraph is replaced with the following:

~~Because the potential environmental impacts of Bs or Bti application are generally similar to those of chemical pesticide applications, these materials and spinosad are evaluated below under Section 7.2.7, Chemical Control Alternative. The environmental fate and toxicity of these control agents is discussed in Appendix B.~~

All three bacteria are naturally occurring soil organisms, which are commercially produced as mosquito larvicides. Because these forms of biological control are regulated by USEPA and are applied in a similar manner to chemical pesticides, they are evaluated under Section 7.2.7, Chemical Control Alternative, including the discussion of potential impacts. The environmental fate and toxicity of these control agents are described in detail in Appendix B.

In Section 7.2.7.1.1, Bacterial Larvicides (Bs, Bti, and spinosad) on page 7-17, the discussion is modified as follows:

~~These bacterial larvicides as applied are highly mosquito-specific bacteria that usually infect mosquito larvae when they are ingested. These pathogens multiply rapidly in the host, destroying internal organs and consuming nutrients. The pathogen can be spread to other mosquito larvae in some cases when larval tissue disintegrates and the pathogens are released into the water and are ingested by uninfected larvae. Bs and Bti, produce proteins that are toxic to most mosquito larvae, while the fermentation of *S. spinosa* produces spinosysns, which are highly effective mosquito neurotoxicants.~~ Bacterial larvicides such as Bs and Bti are highly selective microbial pesticides for mosquitoes whose protein spores, when ingested, cause destruction of the gut wall leading to paralysis and death. Another bacterium, *Saacharopolyspora spinosa*, produces spinosyns, which are highly effective mosquito neurotoxicants. All three bacteria are naturally occurring soil organisms and are commercially produced as mosquito larvicides. Unlike Bti and *S. spinosa*, Bs is a live bacterium that can reproduce in natural settings for some time following release. Bs and Bti are applied on a variety of ~~crops and~~ standing and moving waterbodies~~, Bti materials the District applies do not contain live organisms, only spores~~. The spores of Bs and Bti can persist in the environment for months, but the endotoxins are readily degraded by UV light and persist only for a few hours to a maximum of a few days. Bacterial spores of Bti are uniquely toxic to nematoceran Diptera (mosquitoes, some midges, blackflies, psychodids, and ceratopogonids) (Lacey and Mulla 1990) and do not exhibit any human toxicity.

Spinosad alters nicotine acetylcholine receptors in insects, causing constant involuntary nervous system impacts ultimately leading to paralysis and death. ~~It is used on various crops, animal husbandry premises, recreation areas, rights-of-way, and local residences.~~ The USEPA has

classified spinosad as a “reduced risk” compound because it is an alternative to more toxic, OP insecticides (CDPR 2002). It exhibits ~~very~~ acute toxicity to target organisms by all exposure routes ~~and~~ but has not been shown to elicit acute or chronic toxicity in humans.

In Section 7.2.7.2, Aliphatic Solvents (Mineral Oil) on page 7-18, the first paragraph under this section is deleted.

~~Monomolecular films are alcohol ethoxylated surfactants (such as BVA-2), which are low-toxicity pesticides that spread a thin film on the surface of water that makes it difficult for mosquito larvae, pupae, and emerging adults to attach to the water's surface, causing them to drown (USEPA 2007a). The films also disrupt larval respiration of some other classes of air-breathing aquatic insects. They are used on an assortment of waterbodies including ornamental ponds, pastures, irrigation systems, drainage systems, and drinking water systems (CDPR 2010a).~~

In Section 7.2.7.1.4, Mosquito Adulticides on page 7-18, the paragraph is removed and replaced with two paragraphs as follows:

~~The District may use pesticides to control adult mosquitoes when no other tools are available and if specific criteria are met, including species composition, population density, proximity to human populations, and/or human disease risk. Adulticide materials are used infrequently and only when necessary to control mosquito populations. The adulticides the District may use to control mosquito and yellow jacket wasps and where they are discussed in detail in Appendix B are listed in Table 7-8.~~

In addition to chemical control of mosquito larvae, the District may use pesticides for control of adult mosquitoes when no other tools are available and if specific criteria are met, including species composition, population density (as measured by landing count or other quantitative method), proximity to human populations, and/or human disease risk. Adulticide materials are used infrequently and only when necessary to control mosquito populations (e.g., those areas with treeholes where access to larval breeding sites is impractical).

Adulticides the District potentially uses include pyrethrins, synthetic pyrethroids, pyrethroid-like compounds, OPs, and synergists. Table 7-8 lists the adulticides the District uses for mosquito abatement. Several of these active ingredients, as well as a few others, are also used for the control of yellow jacket wasps that pose an imminent threat to people, pets or livestock (Table 7-8 and this section). A subset of these active ingredients required further evaluation in Appendix B and further discussion is provided below. A detailed discussion of the environmental fate and toxicity of these pesticides is provided in Appendix B.

5.2.9 Chapter 8, Public Services and Hazard Response

Revisions are made as indicated to the following sections.

In Section 8.2.7, Chemical Control Alternative on page 8-10, the first paragraph is modified as follows:

Chemical control is a Program tool that consists of the application of nonpersistent selective insecticides to directly reduce populations of larval or adult mosquitoes and other invertebrate threats to public health (e.g. yellow jacket wasps). Chemical control is implemented when inspections reveal that mosquitoes or other vector populations are present at levels that trigger the District's criteria for chemical control based on the vector's abundance, density, species composition, proximity to human settlements and recreational areas, water temperature, presence of predators and other factors.

5.2.10 Chapter 9, Water Resources

Revisions are made as indicated to the following sections.

In Section 9.2.7.1.2, Hydrocarbon Esters on page 9-35, the last sentence of the first paragraph is modified as follows:

> Although it may exhibit toxicity to fish and aquatic invertebrates, as well as nontarget insects including moths, butterflies, and beetles, methoprene is considered the least toxic of all larvicide alternatives, especially at concentrations allowed for mosquito control.

5.2.11 Chapter 10, Air Quality

Revisions are made as indicated to the following sections.

In Section 10.1.6.5.5, Nuisance (Odors) on page 10-12, the last paragraph of the section is modified as follows:

> Some of the pesticides used for mosquito control have an unpleasant odor in concentrated form, in particular the Bti liquids (applied as a diluted mixture) and the adulticides pyrethrin and permethrin. ~~When sprayed, once the fog dissipates (about 20 minutes maximum) there is no residual smell.~~ Bti liquids, when diluted with water and sprayed onto water containing breeding mosquitoes, has almost no odor within a few minutes of application. The adulticides pyrethrin and permethrin have no residual smell once the ULV fog dissipates (about 20 minutes maximum). The BVA-2 oil has an odor, although once applied (3 - 5 gallons per acre) there is not much odor. With the exception of BVA-2, these products are typically applied to rural areas such as marshes, rainwater pools, creeks, etc. or during the late evening/nighttime hours and exposure to the public is less likely to occur.

The extra space is removed between “the” and “District” in the paragraphs preceding impact statements AQ-8, AQ-14, AQ-17, AQ-19, AQ-22, and AQ-23.

5.2.12 Chapter 11, Greenhouse Gases and Climate Change

No revisions were made to this chapter.

5.2.13 Chapter 12, Noise

No revisions were made to this chapter.

5.2.14 Chapter 13, Cumulative Impacts

No revisions were made to this chapter.

5.2.15 Chapter 14, Other Required Disclosures

Revisions are made as indicated to the following sections.

In Section 14.1.1, No Program on page 14-1, a sentence is added at the end of the paragraph so it now reads as follows:

> Furthermore, increases in mosquito populations could lead to reductions in local and state revenues for parks, marinas, campgrounds, and other recreational activities and for the businesses that support these activities. There is also the issue of increased costs to individuals, businesses, and governments with respect to health care and additional mosquito management.

In Section 14.2.1, Energy Resources on page 14-2, the extra space between “for” and “the“ in the second sentence is removed.

5.2.16 Chapter 15, Alternatives

Revisions are made as indicated to the following sections.

In Section 15.3, No Program on page 15-3, the third bullet point was revised and additional text was added immediately following the key assumption bullet points so it now reads as follows:

> In the absence of the District's IMMP, the responsibility for mosquito/vector management could fall on CDPH (or some other agency), who ~~CDPH~~ would not provide mosquito/vector control support or "oversight" to local jurisdictions (from Sacramento) given lack of personnel, equipment, or funding. Management at the state level would likely be only reactive rather than proactive.

A study of residential pesticide use in California, including the San Francisco Bay Area, was conducted to understand consumer behavior and sources of pesticides in urban waterways (Flint 2003[4]). The UC Statewide IPM Program sponsored a telephone survey and a shelf survey of pesticide products to collect information about outdoor pesticide use, pest control practices, and attitudes of residents in 2002-2003. It includes the following findings (from the Chapter 1 Summary) that are most relevant to the analysis herein:

> Insects were considered by far the greatest outdoor pest problem in all northern California areas. Ants were the most common pest treated by residents themselves or by professional applicators hired by the homeowner.

> More respondents in the Bay Area (40.6 percent) reported no outdoor use of pesticides than in any other area.

> The largest share of the respondents who had applied pesticides in the past 6 months stated that they normally applied pesticides between 1 and 3 times a year. About one third applied pesticides more than 3 times a year, and 3.4 percent of the Bay Area respondents applied pesticides more than 12 times a year.

> Only a minority of residents hire pest control professionals to manage outdoor problems.

- Almost half of respondents in the three northern California watersheds disposed of pesticides improperly. Many of these threw pesticide containers containing pesticides into the trash, but 5-15 percent in each area admitted to pouring mixed pesticides into inside or outside drains or the street gutter.
- Substantial numbers (44-62 percent in all areas) "estimate" rather than follow label directions precisely when measuring and mixing pesticides. About half of the products used by residents were ready-to-use products requiring no mixing or dilution.
- Large home supply stores accounted for 42 to 52 percent of all pesticide sales to residential users in northern California.
- The store shelf survey found that certain active ingredients were very dominant in the market, including 78 different products containing the insecticide permethrin. Another pyrethroid used primarily for indoor pests, tralomethrin, was found in 32 products. Other common active ingredients were the herbicide dicamba (28 products), the insecticide pyrethrin (26 products), and the herbicide glyphosate (25 products).

[4] Flint, M.L. 2003. Residential Pesticide Use in California: A Report of Surveys taken in the Sacramento (Arcade Creek), Stockton (Five-Mile Slough), and San Francisco Bay Areas with Comparisons to the San Diego Creek Watershed of Orange County, California. Prepared for the CDPH. Director, IPM Education and Publications and Extension entomologist, University of California Statewide IPM Program, University of California Davis. March 15.

- Retail shelves contained unregistered pesticides. Pesticides that are no longer registered for use in California were found on shelves of many of the stores surveyed.

~~The District would perform no surveillance, physical control, vegetation management, biological control, or chemical control activities within its Service Area or in adjacent jurisdictions. "Do nothing" means the District would cease to exist and not provide the services funded by local property taxes. It is assumed that CDPH would not be able to provide even limited mosquito management services at the local level.~~ As a result of the No Program assumptions, the vectors of human and animal disease and discomfort would be more numerous than under existing conditions, and proliferate such that outbreaks of disease and illness would occur more frequently. See Appendix E, (Section 4.2) for a more extensive discussion of No Program than presented herein with historical information going back to 1772. In comparison to existing conditions with the current Program fully implemented, the No Program Alternative would have the following environmental impacts:

> **Urban and Rural Land Uses:** No conflicts with local land regulations and no disruption to recreationists from temporary closures of trails or other park features would occur during chemical treatments. However, the increase in mosquitoes would impact the quality of the recreational experience and homeowners due to an increase in discomfort from biting mosquitoes. Biting insects can cause severe allergic reactions in sensitive individuals, leading to hospitalization and even death. Without control of saltmarsh mosquitoes, all land uses could be affected in nearby areas. These impacts are **potentially significant**.

In Section 15.3, No Program on page 15-4, the following revisions were made to the paragraph following the fifth bullet point under Human Health:

CDPH would not be able to replace all of the services the District currently provides or would provide under the Proposed Program. Lack of coordinated surveillance increases risk of emerging diseases or invasive mosquitoes going undetected until already established in an area; it reduces disease risk assessments and outbreak predictions at the local level. Lack of public outreach leads to increased mosquito production on private property and less information being available to people about mosquito-borne disease reduction. Homeowners would resort to use of pesticides available to them, many of which are more toxic than the ones used by the District. This impact on human health is **potentially significant**.

In Section 15.4.1, Reduced Chemical Control Alternative on page 15-6, the following revisions were made to paragraphs two through five:

One significant and unavoidable impact is the effect of naled on water resources. Since naled would only be used when absolutely necessary to protect public health, there is no reduced chemical option. ~~To reduce this impact the use of naled would have to be eliminated.~~

The Reduced Chemical Alternative Program would eliminate the options under the Chemical Control Alternative of using one or more of the pesticides with the greatest potential to subject people to objectionable odors: lambda-cyhalothrin, pyrethrin, permethrin, resmethrin, deltamethrin, etofenprox~~, naled~~, and Bti liquid for control of mosquitoes and for control of yellow jacket wasps~~and it would eliminate the use of naled~~. ~~The first~~ This option could result in greater use of other, less odorous chemicals and in greater amounts, and ~~both options~~ could have impacts on public health if these other chemical methods are not as effective ~~for the specific treatment area due to mosquito resistance problems~~ (see No Chemical Alternative below). All of these odorous pesticides can be used without significant impacts to public health or to other air quality parameters; but where people are located close to or within a chemical treatment area, the odor could be a problem for some persons even when the application is within product label specifications for wind speed and consistent with District BMPs.

The Reduced Chemical Control Alternative could be implemented consistent with the Program objectives as long as the area affected is not large scale and as long as other, less odorous chemical options are available for use and the ~~mosquito population is not resistant to the remaining chemical options~~ Program effectiveness is maintained. Limiting the choices of materials that can be used to a few chemicals significantly increases the risks of mosquito resistance to the few products that are available for use. Sound IMM involves many tools, with many materials that being used, and using the most effective and least environmentally harmful.

For the other land use, biological, ecological health, human health, public services, air quality, GHGs, and noise environmental resources and issues, the impacts of the Reduced Chemical Control would be "no impact" or "less-than-significant impact," consistent with the environmental impact evaluations provided in Chapters 3 through 12 for the Surveillance, Physical Control, Vegetation Management, and Chemical Control Alternatives. See Table 15-1 for the specific impact statements by resource and issue for all of these alternatives which would be applicable to a Reduced Chemical Control Alternative with the exception of Impact AQ-25 ~~and WR-25~~ which would be less than significant. However, if the less odorous pesticides ~~and the elimination of naled~~ result in a less effective Program ~~due to mosquito resistance issues~~, then the public health impacts ~~from a less effective Program~~ would be a greater incidence of mosquito-borne disease and discomfort to people in the Program Area than under the Proposed Program but not as much as would occur under No Program or the reduced Program with a No Chemical Control Alternative.

In Section 15.4.2, No Chemical Control Alternative on page 15-8, the following revisions were made to the second bullet point under Human Health:

> Second, increased production of mosquitoes would occur on private property adjacent to areas that previously were treated with pesticide (and herbicide) products as well as increased cases of mosquito-borne disease in humans, their pets, and livestock ~~would~~. Additionally, the increase in mosquito-human interactions would result in an increased risk of severe reactions to the bites ~~and stings~~ of mosquitoes~~,~~ in sensitive and immunocompromised individuals.

In Table 15-1 on page 15-10, Summary of Program Alternative Impacts, the following biological resources impact for both aquatic and terrestrial is changed from N (no impact) to LS (less-than-significant impact):

> Movement of native resident or migratory fish or wildlife species for Surveillance, Physical Control, Vegetation Management, and Chemical Control Alternatives (AR-4, AR-10, AR-17, AR-23, AR-29, TR-4, TR-10, TR-16, TR-22, and TR-28).

5.2.17 Chapter 16, List of Preparers

The consulting firm changed names from Cardno ENTRIX to Cardno.

5.2.18 Appendix B, Ecological and Human Health Assessment Report

The changes to this technical report are mostly errata (e.g., LC50 changed to LD50, Table 6.1 to 6-1) and corrections to the reference callouts primarily where there were multiple references for the same author in a year (e.g., USEPA 2008b). Table 6-1 was supplemented with data where previously no data was reported. None of the changes in the technical report change the conclusions reached on toxicity or effect on ecological and human health. Key changes to the text are provided herein.

Section 4.1.4 Prallethrin

On pages 4-16 and 4-17, the following change was made.

Prallethrin has low to moderate acute toxicity via the oral, dermal, and inhalation routes (Category II, III and IV). It is a moderate eye irritant (Category III), not a dermal sensitizer, and is

nonirritating to skin. The oral LDC50 was found to be 460 to 640 mg/kg to rats, the dermal LDC50 was found to be greater than 5000 mg/kg, and the inhalation LC50 (rats nose exposure) was found to be 855 mg/m3 for males and 658 mg/m3 for females. 288 to 333 mg/m3 (USEPA 2003a) (Table 6.1). (USEPA 2003a)

Section 4.1.5 Deltamethrin

On page 4-18, Table 4-4, the half-life for aerobic metabolism (soil) degradation is changed from 22-25 days to 25-33 days.

Section 4.1.10 Permethrin

On page 4-26, under 4.1.10.3 Ecological Toxicity, the paragraph is revised.

Permethrin can be toxic to wildlife at high doses and it should not be applied or allowed to drift to crops or weeds where active foraging takes place (USEPA 2006d). However, in controlled toxicity tests with rats as mammalian surrogatesmammals permethrin is considered to have low mammalian toxicity (Cantalamessa, 1993Nowak et al. 2000). Permethrin has low toxicity to dogs (Richardson 1999), gerbils, guinea pigs, hamsters, mice and rats (Cantalamessa 1993, Sutton et al. 2007); however, dermal exposure in cats of 100 mg/kg of permethrin (equivalent to 1 mL of a 45 percent PSO in a 4.5 kg cat) has resulted in life-threatening effects (Hansen 2006).

Section 4.2.1 Naled

On page 4-33, under 4.2.1.2 Human Toxicity, the paragraph is revised.

Naled is rapidly absorbed by all routes (oral, inhalation, and intraperitoneal) and distributes to all tissues in the rat, chicken, goat, and cow. The oral LDC50 for naled technical grade active ingredient is 81 to 336 mg/kg in rats or mice, the dermal LDC50 is 354-to 800 mg/kg in rats or rabbits, and the nose exposure inhalation LC50 is as low as 0.19 3.1 to 156 mg/L in ratsor mice. (CDPR 1999) (Table 6.1).

Section 4.3.4 Methoprene

On page 4-47, the first paragraph under 4.2.4.4 Summary of toxicity and Potential Effects, is modified.

Methoprene readily degrades in soil and water by a variety of processes. It may exhibit toxicity to fish and aquatic invertebrates, as well as non-target insects including moths, butterflies, and beetles, but these concentrations are much higher than would be experienced in the application scenarios currently in use.

Section 4.3.6 Aliphatic Solvents (Mineral Oils and Aliphatic Petroleum Hydrocarbons)

Specially-derived aliphatic solvents (e.g., mineral oils and aliphatic petroleum hydrocarbons such as GB-1111 and BVA-2) are used to form a coating on top of water to drown larvae, pupae, and emerging adult mosquitoes. These products of petroleum distillation processes have been used for many years nationwide to kill aphids on crops and orchard trees, and to control mosquitoes (USEPA 2007d). They are applied to a wide variety of crops, trees and ornamental plants; to swamps, marshes and intermittently flooded areas. These compounds are also used as an adjuvant for pesticides to increase efficacy and/or application efficiency. These compounds, with appropriate BMPs are applied by mosquito abatement districts (CDPR 2010a). Dormant oils are widely used in the Central Valley on tree crops.

CocoBear Mosquito Larvicide Oil is a plant based oil (also see Section 4.7.3). This product consists mostly of a modified coconut oil (75 percent or more by volume) combined with 10 percent by volume mineral oil and a very small amount of nonionic surfactant and other proprietary ingredients. This material can be used in various waterbodies such as ditches, stagnant pools, swamps, marshes, temporary rainwater pools and intermittently flooded areas, ponds, catch basins and manmade containers for the management of immature mosquitoes.

On page 4-49, under 4.3.6.4 Summary of Toxicity and Potential Effects, the paragraph is revised.

> Aliphatic solvents have very low water solubility and high sorption to organic matter. They are practically nontoxic to most non-target organisms and rapidly break down in the environment, reducing their impact on susceptible non-targets so that, using BMP application practices, these products should not result in unwanted adverse effects. These products are used for both mosquito control and as adjuvents to some pesticides to increase or improve efficacy and/or application efficiency. Golden bear and Cocoa bear oils are pesticides used in controlling mosquito larval populations and are used to suppress mosquito related problems, including suppression of potential West Nile virus. Some white mineral oil based compounds are nontoxic food products and used in numerous cosmetic products. No general direct toxicity has been reported. When added to other compounds as a surfactant, the toxicity of the primary chemical is the issue but not the oil product. A recent development is the use of plant based food grade oils such as coconut oil that is combined with a small amount of mineral oil (e.g. CoCoBear Oil) CoCoBear has no reported significant toxicity to any receptors likely to be exposed during or after use as a larvicide. Acute oral toxicity to rats is >5000 mg/kg, acute dermal toxicity to rats is > 5050 mg/kg, and acute inhalation toxicity to rats is > 2.16 mg/L (Clarke 2014).

Section 4.6.2 Glyphosate

On pages 4-63 and 4-64, under 4.6.2.3 Human Toxicity, the following paragraph is revised.

> A one-year feeding study resulted in no chronic effects in beagle dogs at daily doses of 500 mg/kg (USEPA 1993). There is currently no published scientific evidence indicating that glyphosate is carcinogenic or mutagenic unless workers are exposed to extended, unrealistic industrial uses (USEPA 1993, Gertsberg 2011). Experimental evidence has shown that neither glyphosate nor its major breakdown product (aminomethylphosphonic acid [AMPA]) bioaccumulates in any animal tissue (Williams et al. 2000). Glyphosate is poorly biotransformed in rats and is excreted mostly unchanged in the feces and urine (Williams et al. 2000).

On page 4-64, under 4.6.2.5 Summary of Toxicity and Potential Effects, the following material is added to the second paragraph.

> Using BMP approaches, applications of glyphosate can be used safely when an adequate buffer to water sources is maintained. Although there has been some recent concerns expressed about possible sub-lethal effects of glyphosate products, it is virtually nontoxic to mammals and practically nontoxic to birds, fish, and invertebrates. Glyphosate has been identified as a candidate by USEPA for evaluation as a potential endocrine disruptor (USEPA 2009a). Based on these issues, it is likely that USEPA will provide an updated review of its potential risks in 2015, but until then, glyphosate products are effective, generally safe, products used for weed control. Concerns about endocrine disruption by glyphosate are not verified, and this chemical is only one of the dozens of chemicals USEPA is suggesting may have an EDC role. No significant indication of this mode of action has been reported at this time. Some reports of sublethal effects on disease resistance, biological diversity, enzyme activity, and increased use of genetically engineered foods are interesting but without clear mechanisms that can be related directly to glyphosate (Gertsberg 2011).

Chapter 5 Evaluations of Active Ingredients

> On page 5-2, the following table is added.

Table 5-2 Chemicals Employed for Larval Mosquito Abatement

Chemical Classification	Active Ingredient	Appendix B
Organophosphate	Temephos	Section 4.2.2

Bacterial larvicide	Bs	Section 4.3.1
Bacterial larvicide	Bti	Section 4.3.2
Bacterial larvicide	Spinosad	Section 4.3.3
Hydrocarbon ester	Methoprene	Section 4.3.4
Adjuvants/Surfactants	Alkypheneol Ethoxylate (APE)	Section 4.7.1
	Aliphatic Solvent (Mineral Oil)	Section 4.7.2
	Plant oil mix	Section 4.7.3
	Lecithin	Section 4.7.4

Chapter 6 Toxicity Summary: All Active Ingredients

On page 6-1, the following paragraph is added to explain the values in Table 6-1. Table 6-1 has been revised to include additional values. The additional values do not change the conclusions in the text of Appendix B (or in the text of the PEIR).

> Most of the chemical active ingredients listed in Table 6-1 below, and in the narrative sections, have undergone several levels of testing to determine potential toxicity to humans, wildlife and vegetation. The intended and expected use of each chemical and its likely target and non-target receptors are usually included in the tests. While each listed chemical has had numerous toxicity values generated for a multitude of animal and plant species and human receptors, it would not be feasible to include all the possible data published for all species/receptors in Table 6-1. The values in this table have been included to represent a realistic set of potential species that might be affected by exposure to typical applications used for vector control by the Districts. Numerous additional toxicity data are available in a multitude of publications, particularly the several compendia produced by the USEPA, the European Union, Canada and the many state and national environmental regulatory agencies. (Chapter 7 References of this document includes a list of many of those additional sources.) As in all determinations of the potential toxic effects of a chemical, the key is the exposure to the chemical, regardless of the potential hazard (toxicity) demonstrated in laboratory tests.

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