13 Cumulative Impacts

CEQA Guidelines Section 15130 requires that an EIR discuss a project's potential to result in any significant cumulative impacts. "Cumulative impacts" are defined as "two or more individual effects which, when considered together, are considerable or compound or increase other environmental impacts" (CEQA Guidelines Section 15355). The cumulative impact is the change in the environment that results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time. The EIR must determine whether the project's incremental effect is "cumulatively considerable." The definition of cumulatively considerable is provided in Section 15065(a)(3):

> *"Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.*

According to CEQA Guidelines Section 15130(b),

> *The discussion of cumulative impacts shall reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not provide as great detail as is provided for the project alone. The discussion should be guided by standards of practicality and reasonableness, and should focus on the cumulative impact to which the identified other projects contribute rather than the attributes of other projects which do not contribute to the cumulative impact.*

For a project to have a significant cumulative impact, it must have some incremental impact in the category being studied. Thus, when the District's IMVMP Plan makes no incremental contribution at all to a significant cumulative impact caused by other plans, programs, and projects, i.e., the "no impact" determination for a Program component, it cannot be called cumulatively considerable.

If a project has some potential to contribute to a significant cumulative impact, the CEQA consideration is whether the proposed project's incremental contribution is cumulatively "considerable" (i.e., significant) and, if so, whether the project's incremental contribution can be mitigated to a less-than-significant level. CEQA Guidelines Section 15064 (h)(4) states that the mere existence of significant cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed project's incremental effects are cumulatively considerable.

For purposes of this PEIR, the District's Program would have a significant cumulative effect if:

> *(1) The cumulative effect of related projects (past, current, and probable future projects) without the project are not significant and the project's incremental impact is substantial enough, when added to the cumulative effects, to result in a significant impact; or*
>
> *(2) The cumulative effects of related projects (past, current, and probable future projects) without the project are already significant and the project contributes considerably to the effect. The standards used herein to determine considerability are either that the impact must be substantial or must exceed an established threshold of significance.*

The Guidelines provide that discussion should be "guided by the standards of practicality and reasonableness, and should focus on the cumulative impact to which the identified other projects contribute rather than the attributes of other projects which do not contribute to the cumulative impact" [Guidelines § 15130(b)]. However, the discussion of cumulative impacts "need not provide as great detail

as is provided for the effects attributable to the project alone." [Guidelines § 15130(b).] The analysis should reflect "the severity of impacts and their likelihood of occurrence." [Guidelines § 15130(b).]

Two methods exist for analyzing the cumulative impacts of past, present, and reasonably foreseeable future projects: the “list method” and the “summary of projections method” (CEQA Guidelines Section 15130). Both of these methods are most appropriate to the evaluation of land development or projects involving changes in land use and related activities. For example, the addition of new housing units (future growth) may exceed sewage treatment capacity or public safety desired levels of service with the addition of one or more projects, and the traffic associated with new commercial development may exceed capacity of roadways to handle the new traffic when combined with traffic from other past, present, and future projects.

> The list method requires a discussion of related past, present, and future projects; and in the case of human health, it would require discovering and disclosing impacts to public health from all of these projects. This approach is not practical given the Program’s extent to its Service Area and adjacent counties for a multicounty Program Area, which makes the development of a list of projects most difficult and would then require a human health impact assessment for a very long list and variety of projects potentially creating a physical change in the environment. Most urban development projects would be unlikely to impact human health. Existing general plans and zoning seek to separate sensitive land uses like residences, schools, and nursing homes from other incompatible land uses like garbage transfer facilities/landfills with the potential to have adverse effects on the adjacent land uses. Most development activities with the potential to affect human health (i.e., dry cleaning plants or paint manufacturers) are subject to air and water quality standards to prevent impacts to human health including offsite impacts.

> The summary of projections method relies on projections contained in adopted local, regional, or statewide plans, or related planning documents, that describe or evaluate conditions contributing to the cumulative effect. The issue is whether the project under evaluation is consistent with the forecasts of economic and population growth contained in the planning documents and, therefore, already addressed in the certified EIRs on these plans and projects. Can the agency rely on the cumulative analyses addressed in a prior EIR to say that no further analysis is needed?

The listing of all of the projects occurring in an area is not practical for this evaluation of a vector control Program that could occur over multiple counties in California. The District’s IMVMP Plan does not involve land use development or stimulate growth and would not result in additional housing or commercial/industrial development in a vector control treatment area.

The alternative “summary of projections” method is better suited to the nature of this project. However, this method is also restricted by the limited applicability of the types of regional plans available for analysis. City and county plans contain summaries of growth, but the District’s Program does not induce growth or develop land. Local growth projections do have implications for the determination of whether incremental impacts could be cumulatively considerable. The projections presented in the San Mateo Countywide Transportation Plan 2040 (City/County Association of Governments of San Mateo County 2017) indicate the following population trends for San Mateo County:

> Between 2010 and 2015, the population is estimated to have increased from 718,451 to 745,400, an increase of 26,949 people or 3.75 percent over the 5-year period.

> Between 2015 and 2040, the population is projected to increase to 904,400, an increase of 158,900 people or 21.31 percent over the 25-year period.

However, an online search failed to locate an EIR on these population projections. As a result, the analysis herein considers the implications of growth on the cumulative impacts discussed for various environmental topics as applicable. Because the District’s Service Area (San Mateo County) and the Program Area (including adjacent counties) are large, the impacts are explained in the context of a regional environmental

concern that represents a cumulative baseline for that environmental topic (which is most often a qualitative analysis because project data are not reasonably available). For example, there is no list of projects that could affect aquatic biology, but the factors affecting several fish species are well known from research studies that are used to explain the status of the resource as a result of past, present, and future human activity and other environmental conditions/trends even though specific projects cannot be reasonably identified. The quantitative analysis most relevant to vector control includes consideration of regional trends in pesticide use from available data for 2006 through 2016 (Section 13.4), where appropriate. The San Mateo County General Plan has been updated (since 1986) for some elements and for some unincorporated communities such that there is not a comprehensive, updated countywide general plan EIR on which to rely for a cumulative impact analysis. Therefore, the cumulative analysis herein is guided by reasonably available information that is relevant to a further evaluation of the Program's mostly less-than-significant incremental impacts to identify if any would be cumulatively considerable. In this manner, the incremental effects of the IMVMP Plan, no matter how small or temporary, are evaluated along with other sources of environmental harm resulting from past, present, and future human activities.

It is important to note that the impacts associated with the Proposed Program combine the impacts associated with the Existing Program (which will continue as the No Program Alternative, if selected) and the limited enhancements to existing activities that are proposed for future use as needed. New activities are combined with continuation of current activities to present a collective or comprehensive analysis of potential Program impacts. In the sections below, impacts associated with this comprehensive Proposed Program are discussed in relation to the cumulative context, i.e., impacts associated with other activities and trends in the region.

The following discussion of cumulative impacts is for resources and environmental concerns with less-than-significant or potentially significant impacts (including one significant and unavoidable impact), and the geographic scope of the analysis is the District's Program Area (i.e., Service Area and adjacent counties where service could be provided upon request). The discussion of the cumulative setting (or baseline) is included in the subsections below.

13.1 Land Use and Planning

The Proposed Program would not result in the creation of any permanent structures or barriers that could divide an established community, nor would it result in any permanent land use changes that could conflict with any land use plans, policies, or regulations adopted to avoid or mitigate an environmental effect. All activities conducted under the Proposed Program would be required to obtain any necessary authorizations from the relevant land use authority or property owner and to comply with any applicable laws or policies specific to the area and its resources. Therefore, the Proposed Program would not have the potential to make a considerable contribution to any cumulative impacts related to land use and planning.

Concerning land use regulations and policies in the Program Area, none of the Program components would have impacts (i.e., all determinations of no impact). Nevertheless, the District's Program incorporates the same IPM techniques and principles that have been adopted locally, so the District is subject to similar restrictions by virtue of its own IMVMP Plan. Moreover, the District's chemical use is highly regulated (more so than occurs for agricultural and residential homeowner uses) in order to protect the same environmental features the local land use regulations are aimed at protecting. Rather, the presence of mosquitoes and other stinging/biting insects and rodents has the potential to diminish the quality of urban and rural areas and the local/regional recreational experience; and prevention of this problem and removal of vector problems enhances both existing and future recreational opportunities that could be added due to projected population growth.

None of the Program components would have any potentially significant impacts on the quantity and/or quality of recreational opportunities within the District's Program Area; however, all of the technical components except for Biological Control could have less-than-significant impacts in limited areas, on a

short-term basis. Concerning the quantity and/or quality of recreational opportunities in the Program Area. There are no irreversible or long term impacts to recreational facilities and public land uses which are extensive in the Program Area. The incursions into recreational areas for surveillance and control activities are infrequent and of short duration such that recreationists who could be present would not experience a substantial reduction in the quality of the recreational experience. For example, the Chemical Control Component may limit recreational access and diminish recreational quality of hiking or bird-watching on a short-term basis during some application events, a less-than-significant incremental impact. Due to the isolated and temporary nature of these events and the extensive recreational opportunities on public lands within the Program Area (with no existing significant cumulative impact within the Program Area from other agencies' activities), the small incremental potential impacts on recreational opportunities from five of the Proposed Program technical components when combined are not expected to amount collectively to a significant impact. The collective impact of the District's Proposed Program does not trigger a cumulative impact nor cumulatively contribute considerably to the diminishment of recreational opportunities in the Program Area. No cumulative significant impacts to urban and rural land uses and planning are anticipated when all of the Program's incremental impacts and the impacts of other federal and city and county land use and planning activities in the region are considered together and with projected population growth.

13.2 Biological Resources – Aquatic

Cumulative impacts, as they relate to aquatic resources, includes past, present, and reasonably foreseeable actions that potentially impact aquatic organisms, including fish and nontarget invertebrates. Cumulative impacts can result from individually minor, but collectively significant, projects taking place over a period of time. The determination is whether a proposed project's incremental contribution to a cumulative impact results in a potentially "considerable" (i.e., significant) cumulative impact, and, if so, whether that project's incremental contribution can be mitigated to a less-than-significant level.

The following is a discussion of how the Program's less-than-significant, incremental impacts to aquatic resources could become cumulatively considerable with other impacts in the region. To make this determination, consideration is given to the collective contribution of Program impacts from components considered together with impacts that can exist outside of the Program Area that affect resources within the Program Area as well as impacts just within the Program Area. The issue is whether the Program's incremental contribution to the combined significant cumulative impact is "cumulatively considerable" inside Program Area.

The cumulative impact baseline issues addressed first are regional fisheries trends, loss of shallow-water habitats, loss of wetlands, weed control, and trends in pesticide use (Section 13.2.1). Then the impacts by Program component are evaluated (Section 13.2.2).

13.2.1 Regional Fisheries Trends

13.2.1.1 Pelagic Organism Decline (POD)

POD refers to the recent (2002–present) steep decline of pelagic fishes (i.e., fish that occupy open-water habitats) within the Bay-Delta estuary (Armor et al. 2005; CDWR and CDFG 2007; Sommer 2007; Baxter et al. 2010). This environmental issue has emerged as one of overwhelming concern in the Delta. It is a cumulatively considerable problem based on past and present conditions in the Bay-Delta estuary.

The issues surrounding POD were announced in early 2005 as a possible change in the estuary's ability to support pelagic species and appeared to be a "step-change" from the preceding long-term decline. Four fish species are of primary concern: delta smelt, longfin smelt, young-of-year striped bass, and threadfin shad. From 2002 to 2007, despite moderate hydrologic conditions in the estuary, which would have been expected to result in moderate increases in population sizes, the populations of these species experienced sharp declines. Populations of each of the four species have been at or near all-time record

lows since 2002. The numbers of many pelagic species increased substantially in 2011, but declined again to values near historic lows in 2012, based on the fall mid-water trawl index (CDFW 2013). This change has persisted for a sufficiently long period to conclude that it is the result of something other than the pattern of widely variable population levels observed historically or as part of the long-term decline previously observed.

The factors considered most likely to be responsible for POD are previous abundance of these species; changes in habitat, particularly changes in turbidity and the salinity field in the Delta, invasive weeds and blue green algae blooms, and ammonia and pyrethroid toxicity; predation, particularly from introduced species such as striped bass, largemouth bass, and Mississippi silversides, and entrainment at the Central Valley Project and State Water Project Diversions; food-web effects from invasive clams; and changes in the phytoplankton and zooplankton community (CDWR and CDFG 2007; Sommer 2007; Baxter et al. 2010). These factors result in an existing significant cumulative impact.

Many of the Interagency Ecological Program studies to evaluate POD's causes have focused on these factors. To date, research has failed to identify a single factor responsible for the decline of all species or even that of a single species (CDWR and CDFG 2007; Sommer 2007; Baxter et al. 2010). POD researchers currently believe that important factors responsible for the decline may be different for each species and that even for a single species these factors may differ between seasons and by hydrologic condition (Wet and Dry years). These factors may operate cumulatively to cause the observed population declines.

The POD Management Team has hypothesized that a number of drivers have combined over time to decrease ecosystem resilience and result in a "regime shift" for the Delta and Suisun Bay region (Baxter et al. 2010). The drivers of the hypothesized regime shift include outflow, salinity, landscape, temperature, turbidity, nutrients, contaminants, and harvest. This hypothesis is currently under investigation.

The District borders on San Francisco Bay, which does not substantially affect San Pablo and Suisun Bays and the Delta. The Physical Control and Vegetation Management components would contribute to landscape habitat modifications, while the Chemical Control Component could potentially contribute to some contaminants (but not substantially as explained in Section 9.2.7) primarily in San Francisco Bay that could be flushed through the Golden Gate Bridge into the Pacific Ocean. The BMPs associated with the implementation of these Program components substantially reduce these potential effects to be less than significant at the Program level. However, the combination of these less-than-significant Program effects with the past, present, and future regional context of impacts from other, non-District sources and factors, would be cumulatively considerable but this is due to the baseline condition. The question then becomes whether the Program's incremental effects contribute in a considerable manner, and they do not for the following reasons:

> The District's Physical Control and Vegetation Management components are limited to small areas of highly modified habitat. These areas are not primary habitat for POD species. Because the areas where these activities occur are very small relative to the overall area of wetlands in the region, these activities are not expected to have any substantive effect on food production for POD species. Therefore, these two components do not contribute substantially to POD.

> The Chemical Control Component includes the use of pyrethroid pesticides, which have been linked to POD. The District uses pyrethroid pesticides as part of an IPM approach, where application of pyrethroids is several levels down in the selection of control measures, so the use of pyrethroids is limited. When pyrethroids are used, the District preferentially uses pyrethroids with limited persistence in the environment. The District applies them over aquatic habitats using only ULV application methods, which results in the minimal effective amounts for adult mosquitoes of these chemicals while not impacting the water (i.e., vector control monitoring has confirmed pyrethrins below toxic levels following spray applications). The District does not apply pyrethroids directly to water and uses the minimal effective amounts of these chemicals. Furthermore, the District applies these chemicals (for

mosquitoes, yellow jackets, and potentially ticks) according to the product labels and District BMPs. Labeled application rates for mosquito control tend to be low (compared to rates used for other insects); thus, the amounts of adulticide materials applied over terrestrial and aquatic habitats is low compared to other pest control uses. Thus, the Chemical Control Component does not contribute substantially to the concentrations of pyrethroids in the aquatic environment or to POD. (See also Section 13.7 and MVCAC 2013/Phillips et al. 2013 monitoring results.) The additional amount of pesticides contributed by this Program (which is not expected to exceed existing levels and which has been on a downward trend from 2006 to 2016, refer to Table 13-1), would not be considered significant given the nature of the existing impacts.

> The Surveillance, Biological Control, and Nonchemical Control Components involve access, monitoring, and control activities with very limited potential to impact POD.

Therefore, all of the Program components have a less-than-significant collective impact and do not contribute considerably to an existing cumulative impact on POD that is caused by other projects and a variety of environmental factors including stream flows. As stated earlier, the District's Program would have a significant cumulative effect if:

> *The cumulative effects of related projects (past, current, and probable future projects) without the project are already significant and the project contributes considerably to the effect. The standards used herein to determine considerability are either that the impact must be substantial or must exceed an established threshold of significance.*

While the effects of related projects without the District's Program are already cumulatively significant for POD and with the Program are significant as well, the District's Proposed Program does not contribute considerably to this effect because the District-specific impacts are not substantial for reasons explained above**.**

13.2.1.2 Salmonid Population Trends

Salmonid population trends were evaluated in a number of 5-year status reviews completed by NOAA Fisheries in 2011 (NOAA Fisheries 2011 a-f). These reviews indicated that most populations of salmonids showed some evidence of decline, although data are very sparse for some distinct population segments (steelhead) or evolutionarily significant units (Chinook and Coho salmon) (also see NOAA 2011g). The declines in the 5-year period of review were largely due in part to poor ocean conditions in 2004 and 2005, which resulted in poor adult returns in 2007 through 2009 and drought (Lindley et al. 2009). However, based on the status reviews for these species, the principal factors resulting in their listing include:

> Loss, degradation, simplification, and fragmentation of habitat caused by a variety of activities including logging, road construction, urban development, mining activities, agriculture, ranching, and recreation

> Reduction or elimination of habitat or blocked access to habitat caused by water storage, withdrawal, conveyance and diversion facilities for agriculture, flood control, and domestic and hydropower purposes

> Point and nonpoint sources of pollution

> Loss of riparian habitats

The Physical Control and Vegetation Management components could conceivably contribute to the first and last factors, while the Chemical Control Component could contribute to the third factor. These vector control activities generally occur over small areas of aquatic habitat and have little impact (if any) on primary salmonid habitat (located primarily outside of San Mateo County). Physical control and vegetation management activities conducted by the District as described in the IMVMP do not occur in habitats that contain salmonids in large part because salmonid habitat is very limited in San Mateo County. The BMPs associated with the implementation of these components substantially reduce these potential incremental effects to be less than significant, and they do not contribute substantially to the total amount of habitat

loss for salmonids in the region. These vector control activities generally occur over small areas, involve a very short duration, and have little impact (if any) on primary salmonid habitat. As noted in Section 4.2.4.1, the National Marine Fisheries Service (NMFS) reviewed the USACE's proposed Regional General Permit 4 for mosquito abatement activities in the five (5) San Francisco Bay Area counties (including San Mateo County) and provided written concurrence on June 3, 2016, that the proposed action is not likely to adversely affect the subject listed species and designated critical habitats. In light of the effects of the past, other current, and probable future projects/activities (affecting river flows and backwater areas), which are contributing to a baseline decline in the salmonid population that is cumulatively considerable from multiple sources and causes across multiple watersheds (primarily north and east of the District's Service Area), the incremental effect on salmonids of the District adopting an updated IMVMP Plan would not be cumulatively considerable.

The Chemical Control Component applies chemicals in aquatic environments at levels that have minimal impacts to fisheries resources or their food supply. BMPs restrict the application of chemicals with higher potential to harm fish from being used in water, and these chemicals are used in very small amounts (ULV method for adult mosquitoes) and with low frequency relative to other sources in the region. The District also preferentially uses chemicals that degrade quickly in the environment, further reducing the risk associated with this component. Thus, the Chemical Control Component does not contribute substantively to chemical loads in salmonid habitats.

The Surveillance, Biological Control, and Other Nonchemical Control Components involve access, monitoring, and control activities with very limited potential to impact salmonids. Therefore, all of the Program components collectively have a less-than-significant (not considerable) cumulative impact on salmonid population trends.

13.2.2 Program Components

The Surveillance Component's maintenance of access routes and the sampling/ monitoring of mosquito and vector populations have less-than-significant impacts on aquatic habitats, native fish or aquatic invertebrates, special status species, or HCPs and NCCPs along with the Biological Control Component's use of mosquitofish in artificial/man-made waterbodies and the trapping associated with the Other Nonchemical Control Component are not cumulatively considerable given their limited disruption to natural habitats. Consequently, the focus of the analysis below is on the Physical Control, Vegetation Management, and Chemical Control Components.

13.2.2.1 Physical Control Component

The deepening and connecting of channels in shallow-water habitats in natural areas (to increase water circulation) under the Physical Control Component would be cumulative with historic and ongoing impacts to these habitats from other land management practices including flood control, urbanization (due to population growth), and channelization. The majority of such activities occurring as part of the action would occur in artificial environments such as drainage ditches, retention ponds, etc. As described in Section 4.2.4.1, shallow-water habitats can be important habitats for young fish and other sensitive aquatic organisms. Floodplains, off-channel pools, backwaters, and wetlands provide high quality habitat for fry and tadpoles that are subject to predation in deeper, connected habitats. However, where fry are present, they would prey on mosquito larvae and, thus, these areas would likely not need treatment. However, conditions in these habitats may change from seasonally or annually, depending on tides, flows, and precipitation patterns, so that a pool that supports fish or amphibians in one year may not have sufficient water to do so in other years.

This Program's Physical Control Component occurs in the context of an environment that is highly modified by human use, for agriculture, urbanization, and flood control. It is estimated that more than 90 percent of wetland and riparian habitats in California have been lost to human development (California Natural Resources Agency 2010). Today, recognition of the importance of wetlands is much greater and

many wetland protection and restoration projects are underway throughout the state, including, but not limited to, the HCP/NCCPs described in Section 4.1.4. Activities affecting wetlands are subject to permitting requirements from a variety of agencies including the USACE, SWRCB or RWQCBs, CDFW, and others. However, wetlands continue to be affected by urban and agricultural development, roadwork, and other activities (California Natural Resources Agency 2010), an existing significant cumulative impact. The District's activities within this context do not contribute substantially to the cumulative effects of other activities within the region in part due to the focus on water circulation (rather than draining or filling) and constraints of required permits. Therefore, the Program would have a less-than-significant (not considerable) cumulative impact on the amount or quality of aquatic habitat.

13.2.2.2 Vegetation Management Component

The vegetation within and around aquatic habitats is an important component of the aquatic ecosystem, as described in Section 4.2.5. As described above, historic development has adversely affected wetland communities, in spite of their ecological importance. While these communities enjoy much more protection now than they have historically, impacts continue to occur because of human development.

The Vegetation Management Component includes measures to remove and maintain vegetation through manual, mechanical, and chemical treatments. Most of this activity would occur in artificial environments, where special-status species would not be impacted, but some activity in natural environments could occur. Similar activities may be undertaken by flood control or water supply agencies, and private and public landowners.

The District performs weed abatement activities in addition to other vector control activities as part of agreements with the Coastal Conservancy (for its ISP) and landowners. These weed abatement activities may involve the use of manual, mechanical, and chemical controls to reduce or eliminate noxious weeds. California Food and Agriculture Code 5261 defines a noxious weed as "any species of plant that is, or is liable to be, troublesome, aggressive, intrusive, detrimental, or destructive to agriculture, silviculture, or important native species, and difficult to control or eradicate, which the Secretary, by regulation, designates to be a noxious weed." At present and under the Existing Program, the District is contracted by the Coastal Conservancy to work on their Invasive Spartina Project but may engage in similar projects in the future.

Numerous entities throughout the Program Area have weed/invasive plant control programs that they implement. These entities include California Department of Transportation and local roads departments, the Midpeninsula Regional Open Space District, local utilities, service districts, government, agricultural operations, and public and private landowners. Information about the coordination of such efforts can be obtained from the CDFA's Noxious Weed Information Project (CDFA 2014). Fourteen federal, state, and county agencies founded the California Interagency Noxious Weed Coordinating Committee in 1995 to coordinate the management of noxious weeds. This group has assembled a variety of tools for those involved in weed control activities. These tools are designed to minimize disruption of native plants and to improve habitat for them. The District's activities are compliant with these tools.

Invasive weeds can disrupt native habitats. They compete with and may displace native plants, which may interfere with ecosystem functions, by altering and reducing the food resources available to primary and secondary consumers. Weed control activities the District performs would be cumulative with those other entities perform. These activities would focus on areas with dense concentrations of weeds and not on individual weed plants distributed broadly in otherwise natural habitats. Thus, weed control activities may affect native plants, as these species may lie within treatment areas, but the effects on individuals of native species are minimized, and the overall effect is likely beneficial, as native species will have less competition in treated areas and, thus, would be expected to be more successful.

Therefore, outside of the San Francisco/Sacramento Bay Delta (which has a serious invasive aquatic weed problem), there is not an existing significant cumulative impact to native habitats from past, present,

and future vegetation management activities of multiple agencies. The District's incremental activities associated with the control of invasive weeds would have no substantial impact on the health of native aquatic habitats and, therefore, would not trigger a cumulative impact nor contribute considerably to a less-than-significant existing cumulative impact.

13.2.2.3 Chemical Control Component

As described in Sections 13.4 (Ecological Health) and 13.5 (Human Health), historic trends in pesticide use vary from county to county based on information available from CDPR. Within the District's Program Area as a whole, pesticide use decreased by approximately 250 tons in 2016 relative to 2006. This reduction may be due in part to strong public pressure to reduce the amount of pesticide used, along with extensive regulatory oversight of and injunctions controlling pesticide use by the USEPA, CDPR, USFWS, NMFS, SWRCB, CDFW, and others. However, the use of pesticides (and herbicides) in or near aquatic ecosystems will continue to be necessary to control vectors of diseases.

Contaminants and pesticides have been hypothesized to contribute to declines in fish populations. The District's relative contribution to the loads of such concentrations is not impacting beneficial uses of receiving water including fish, based on monitoring results in a study (MVCAC 2013) discussed in Section 9.1.2.2.10 and in part due to product label restrictions and District BMPs. Furthermore, the District's IPM approach preferentially uses nonchemical components and when using chemical components, uses chemicals that are not persistent in the environment, i.e., break down within 30 to 150 days, and that break down rapidly when using the ULV method such that most are nondetectable in surface waters. For example, for the active ingredient permethrin (proposed for use primarily as an adulticide and also used for yellow jacket control in ground nests and for tick control), studies have shown rapid dissipation/low persistence and no observed aquatic fish and invertebrate toxicity following aerial ULV applications. Based on its potential for endocrine disruption and usage patterns, this product is generally used with careful and strict BMP techniques such as in very small, localized applications directly into the entrance of ground nests, creating little to no risk of runoff of this product into aquatic systems. Permethrin use is restricted to situations when it is absolutely necessary and in ULV applications that are designed to degrade rapidly and, thus, reduce the potential for impacts to nontarget ecological receptors.

The Chemical Control Component has a less-than-significant cumulative impact on pesticide loads in aquatic habitats supporting fish populations because it does not trigger a cumulative impact to fish and their food supply and it does not contribute considerably to declines in fish populations which is not a baseline significant cumulative impact except for fish associated with POD (including salmonids). Therefore, the District's Chemical Control Component has a less-than-significant cumulative impact on aquatic habitats supporting fish populations.

13.3 Biological Resources – Terrestrial

Cumulative impacts, as they relate to terrestrial resources, include past, present, and reasonably foreseeable actions that potentially impact terrestrial mammalian and avian wildlife, herptiles, aquatic organisms, nontarget invertebrates and pollinators, and botanical resources. Cumulative impacts can result from individually minor, but collectively significant, projects taking place over a period of time. The determination is whether a proposed project's incremental contribution to a cumulative impact results in a potentially "considerable" (i.e., significant) cumulative impact, and, if so, whether that project's incremental contribution can be mitigated to a less-than-significant level.

The following is a discussion of how the Program impacts could become cumulatively considerable with other impacts in the region. To make this determination, consideration is given to the combined contribution of Program impacts considered together with impacts that exist within the Program Area. The issue is whether the Program's incremental contribution to an identified significant cumulative baseline impact is "cumulatively considerable."

In summary, only the Program components' less-than-significant and potentially significant impacts have the potential to add an incremental effect to a cumulatively significant impact. In Section 5.2, the Surveillance, Physical Control, Vegetation Management, Chemical Control, and Other Nonchemical Control Components" impacts to terrestrial resources were determined to be less than significant. The Biological Control Component's use of mosquitofish had no impact to terrestrial resources. The key issues for consideration herein are potential effects on beneficial insect pollinators and to nontarget special-status species from chemical applications directed to control of insect and other disease vectors and the potential cumulative impacts associated with Vegetation Management and Chemical Control Components.

Program component impacts to terrestrial resources were identified as "less than significant" (LS) because the likely exposure to terrestrial habitats, to native terrestrial plant or animal populations, or to special-status species was either very short or the application medium (as a fog or liquid) was typically highly dilute (ULV techniques). Additionally, the LS determination was applied because it was indicated that exposure could be considered likely incomplete due to little or no overlap of application areas and typical habitat associated with nontarget special-status or sensitive terrestrial species. Also see Section 13.4, Ecological Health, which provides more detail on chemical use for vector control.

13.3.1 Effects on Pollinators

Some of the currently available insecticides used to control mosquitoes and yellow jackets may also exhibit toxicity to selected beneficial insects. The District employs strict BMPs (along with pesticide label requirements) that are specifically designed to minimize or eliminate the impact of chemical treatments on nontarget insects such as honeybees. For purposes of this revised PEIR, an impact to a nontarget species is considered significant if it reduces the population size, distribution, variability, or recovery potential of the species of concern (see Section 5.2.1.2). Of particular concern recently is a group of insecticides known as neonicotinoids, which target the nervous system of target insects, resulting in paralysis and death (Harmon 2012). Reports implicate this specific group of pesticides as one of the possible contributors to reported decreases in bee colonies, known as colony collapse disorder (CCD). This disorder and the resulting decline in bee populations is an existing significant cumulative impact in the Program Area and vicinity (region). As reported, CCD has been used to correlate some reports of the apparent disappearance of honeybees from hives. A recent in situ study attempted to replicate CCD wherein the authors claimed that the only variable that contributed significantly to hive death was exposure to sublethal levels of imidacloprid (a commonly use neonicotinoid insecticide), although the authors reported mortalities in bees that were fed only contaminated fructose (large doses of the insecticide) (Lu et al. 2012). After this report was published, peer reviews of the article indicated that the methodology was substantially flawed by the use of extremely high levels of pesticides in the tests that are actually already known to be very toxic to bees (400 ppb) when fed directly with no opportunity to obtain alternate, uncontaminated sources of food (fructose).

In addition to the potential impacts of some pesticides on bees and other insect pollinators, it is clear that many other factors can impact bee colonies in their hives. Activities such as housing development and expansion of public projects decrease the number and proximity of orchards, and in many urban or semi-urban areas (including a few municipalities in the District's Service Area, see Appendix F, Comment O-VOL-30), the restrictions on keeping bees can severely limit the number of hives. Other factors affecting bees and insect pollinators include loss of habitat, loss of flowering plants and trees, mite infections, viruses, stress due to movement of the bee colony for agricultural pollination, and predators to the colony. For example, loss of milkweed has been associated with a decline in monarch butterflies. These development, movement, and habitat loss activities, in conjunction with vector control and agricultural production activities, can be considered cumulatively considerable, without precisely accounting for relative impacts to bee colonies. The claims that the problems with bee colonies are purely due to pesticide applications are not supported (see Sections 5.2.7 and 6.2.7).

As an example of the conservative nature of pesticide applications the District practices, the District does not use neonicotinoid insecticides (e.g., imidacloprid and other pesticides recently claimed to be associated with CCD) and is not considering them for future use. As a result, the vector control and maintenance programs the District uses have not been associated with CCD. Insect control activities the District performs would be cumulative with other vector control programs and habitat maintenance activities that other, sometimes nearby, private and/or public groups perform that are within the range of influence of the beehives and pollinators of interest. The Beekeeper's Guild of San Mateo County offers assistance with swarm removal or honeybee colony removal. In general, while it is true that insect abatement activities may affect local pollinators near or adjacent to treatment areas, the careful practice of label application restrictions and District BMPs greatly reduces the potential for significant cumulative impacts to nontarget pollinators.

Claims that the herbicide glyphosate is destroying bee and butterfly populations have not been substantiated. Recently, there have been media reports about the potential for glyphosate to impact bees and bee colonies, possibly leading to Colony Collapse Disorder (CCD). Most of these media reports have been based on suggestions that populations and colonies of bees are declining (from studies by Hopwood et al. 2012) with contrasting reports of bumper crops of honey in some beekeeper journals (Arnason 2015). These reports have been based on extrapolation of the general use of glyphosate to reports of CCD.

Pyrethrin products are only used at night and during predawn hours when bees are not active, and applications are canceled during less than ideal wind and potential drift conditions (Section 2.7, BMPs H-6, H-7, and H-12). Nighttime pollinators that might be present at an application site would not be affected at a population level, because their populations extend beyond the application areas and can replace any lost individuals.

The CCD problem is difficult to assess and quantify, but clearly arises from a variety of factors including drought, climate change, habitat loss, predators, extensive localized pesticide use by agricultural ad residential users, viruses, parasites, etc. These factors are more severe and tend to be permanent and irreversible. Indeed, to the extent that bee colony collapse is on the rise (and this is disputed), the fact that fewer pesticides are being used (both by the District and regionally), tends to suggest that pesticide use (with some exceptions, notably the neonicotinoids) is not the primary cause of this phenomenon. The inclusion of the proposed chemicals for future use to the IMVMP is designed to reduce overall pesticide use by including more targeted and specially formulated chemicals that will work effectively and avoid pest resistance.

The District's analysis shows that the Proposed Program's impacts to pollinators can largely be avoided because the IMVMP uses chemical control as a last resort, uses much lower concentrations of chemicals designed to have temporary effects (typically a matter of days) on target species and protect nontarget species, and will be applied in a manner specifically designed to avoid pollinators. While there may be incidental or indirect impacts to nontarget individuals despite these best efforts, the impact is temporary, localized, and isolated enough to allow for population recovery.

It can be acknowledged that the cumulative effects of land altering projects (past, current, and probable future uses of pesticides, in particular the neonicotinoids) and other environmental factors without the IMVMP (both existing and future activities) on declines in bee populations are already cumulatively significant. Based on the conclusions above (and elsewhere in this PEIR), given the lack of severity or frequency of any impacts, the Program's less-than-significant impacts on bees and other insect pollinators related to mosquito, yellow jacket, and tick abatement activities would not be cumulatively considerable or a significant contribution to the baseline significant cumulative impact of declines in populations of bees and other pollinators.

13.3.2 Vegetation Management

The District performs vegetation management activities in addition to other vector control activities most often as part of agreements with landowners. These vegetation management activities may involve the use of manual, mechanical, and chemical controls to reduce or eliminate noxious weeds. California Food and Agriculture Code 5261 defines a noxious weed as "any species of plant that is, or is liable to be, troublesome, aggressive, intrusive, detrimental, or destructive to agriculture, silviculture, or important native species, and difficult to control or eradicate, which the Secretary, by regulation, designates to be a noxious weed." It excludes plants important to the habitat/food supply needs of other insects (e.g., milkweed which is used by some butterflies).

Numerous entities throughout the Program Area have weed control programs that they implement. These entities include the California Department of Transportation and local roads departments, the Midpeninsula Regional Open Space District, local utilities, service districts, government, agricultural operations, and public and private landowners. Information about the coordination of such efforts can be obtained from the CDFA's Noxious Week Information Project (CDFA 2014). Fourteen federal, state, and county agencies founded the California Interagency Noxious Week Coordinating Committee in 1995 to coordinate the management of noxious vegetation. This group has assembled a variety of tools for those involved in weed control activities.

Invasive vegetation can disrupt native habitats. It competes with and may displace native plants. This tendency may interfere with ecosystem functions, by altering and reducing the food resources available to primary and secondary consumers. Weed control activities the District performs would be cumulative with those other entities perform. Weed control activities may affect native plants, as these species may lie within treatment areas, but the effects on individuals of native species are minimized, and the overall effect is likely beneficial, as native species will have less competition in treated areas and, thus, would be expected to be more successful. Based on this conclusion, the Program's incremental less-than-significant effects relating to weed abatement activities would not, when considered together with other weed abatement activities in the Program Area, be cumulatively considerable or significant.

Herbicides the District uses or may use in the future exhibit low, very low, or practically no toxicity to mammals, birds, and terrestrial invertebrates (bees in particular) and would not pose potentially significant impacts based on laboratory studies (see Table 5-7, Herbicide Toxicity Thresholds to Mammals, Birds, and Bees). For detailed toxicity information, see Appendix B, Section 4.6. In addition to label requirements for use, District BMPs are applied to minimize the impact of herbicide use on nontarget terrestrial plants, including special-status plants. Furthermore, the District takes actions to minimize drift of sprays to nontarget areas by carefully considering weather variables such as wind velocity and direction and chance of precipitation.

The use of herbicides to control undesirable vegetation has been examined relative to the potential to impact amphibians and the use of glyphosate to impact California red-legged frog (CRLF) in particular. The primary causes identified by the USFWS as leading to an adverse impact on the status of the threatened CRLF are loss of habitat and overwhelming predation, invasive species, and competition for foraging items (National Wildlife Federation 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 and adverse effects reported in laboratory studies would not be expected to occur as a result of the District's potential herbicide applications for mosquito or invasive species control in the field, because of the much lower potential exposures and the 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 and technicians based on observations and database investigations. The District concludes that the potential impact of District use of glyphosate under the Program would not contribute considerably to an existing/baseline cumulative impact to CRLF from other activities in the Program Area that lead to loss of habitat and overwhelming predation, invasive species, and competition for foraging items.

The District's ongoing methods of control of vector populations using nonchemical methods and insecticides, and its limited use of herbicides for control of mosquito breeding habitat, are not triggering nor creating a cumulatively considerable impact to nontarget species.

13.3.3 Chemical Control Component

The District's chemical control activities involve the application of low concentrations of pesticide active ingredients. Further, the District's practices including avoidance of some habitat types and strict adherence to product labels, which typically require concentrations well below known toxicity values, would result in very short exposures. Program component impacts were identified as "less than significant" because the likely exposure to nontarget species was either very short or the application medium (as a fog or liquid) was typically highly dilute (i.e., ULV techniques). Additionally, the less-than-significant determination was applied because it was indicated that exposure could be considered likely incomplete due to little or no overlap of application areas and typical species habitat.

Although a potential exists for a future application of permethrin (or any other adulticide used by the District), in the vicinity of CRLF habitat, the basic issue in all cases is not what the potential toxicity may be, given that most of those data are developed in studies that purposely provide extreme levels of exposure to the chemical of interest, but whether exposure and the resulting potential for toxicity is realistic under the specific conditions and timing of the proposed vector control application. Typical methods of testing for toxicity in the laboratory are most often not representative of the potential for exposure in the field, or thus of the potential for "real world" impacts. The USEPA designations of toxicity are based, for the most part, on the results of these highly unrealistic laboratory exposures and serve only as guidance for use patterns and labeling in order to address the safety measures needed to minimize chemical exposure to nontarget species such as the CRLF. Also, permethrin use would be limited to targeted treatment of adult insects (adulticiding), either mosquitoes or wasps/ticks. In these scenarios, the potential for the product to actually contact CRLF at levels high enough to result in adverse impacts would require inappropriately broad applications extending beyond the adulticide target locations. Most of the District's chemical treatments are to mosquito larvae and pupae using other highly targeted (rather than broad spectrum) products.

In an attempt to evaluate the perceived plight of the CRLF populations, the USFWS has identified and documented the following nonpesticide confounding factors that can adversely affect the CRLF. The following confounding factors in the interpretation of adverse impacts to CRLF are provided by the California Department of Fish and Game and CDPR (2002):

> In Coastal lagoons, the most significant mortality factor in the pre-hatching stage is water salinity.
  - 100 percent mortality occurs in eggs exposed to salinity levels greater than 4.5 parts per thousand.
  - Larvae die when exposed to salinities greater than 7.0 parts per thousand.

> Predation is an important factor. Bitterns (*Botaurus lentiginosus*) and black-crowned night herons (*Nycticorax nycticorax*) are likely predators of adult frogs. Juvenile frogs, which are more active diurnally, and less wary than adults, may be more susceptible to predation by diurnal predators, such as the great blue heron (*Ardea herodias*) and several species of garter snakes (*Thamnophis* sp.), including the endangered San Francisco garter snake (*Thamnophis sirtalis tetrataenia*).

These confounding factors that impact frog populations make establishing pesticide causality nearly impossible, especially at the potential exposure that could result from the District's use under the Program. This PEIR recognizes that there is an existing/baseline significant cumulative impact to CRLF from past, present, and future activities of agencies and individuals based on several factors including pesticides (hence the regulatory constraints). However, the District's pesticide use does not trigger this cumulative impact nor does it provide a considerable contribution to this existing regional cumulative impact to CRLF for the reasons cited above.

As described in Section 13.4 (Ecological Health), historic trends in pesticide use vary from county to county based on information available from CDPR. Within the District's Program Area as a whole, pesticide use varies by county in 2016 relative to 2006 including reductions of 250 tons. This reduction may be due in part to strong public pressure to reduce the amount of pesticide used, and regulatory oversight of pesticide use by the USEPA, CDPR, USFWS, NMFS, SWRCB, CDFW, and others is extensive. However, the use of pesticides and herbicides will continue to be necessary and could increase with population growth. Many of these chemicals exhibit some environmental persistence. The uses of pesticides under the Chemical Control Component would be cumulative with uses of pesticides by agricultural, industrial, governmental, and residential users, an existing significant cumulative impact. The District's relative contribution to the loads of such concentrations is small compared with other users for the widely used pesticides in part due to BMPs. The District preferentially uses nonchemical components of its IMVMP Plan (consistent with IPM practices) and when using chemical components, uses chemicals that are not persistent in the environment, i.e., breakdown within 30 to 150 days. As such, the District's Chemical Control Component does not contribute substantially to pesticide and herbicide exposures in the terrestrial environment. The Chemical Control Component has a less-than-significant cumulative impact on terrestrial resource exposures to herbicides and pesticides.

13.4 Ecological Health

13.4.1 Introduction

"Cumulative impacts" are defined as "two or more individual effects which, when considered together, are considerable or compound or increase other environmental impacts (CEQA Guidelines, Section 15355). Cumulative impacts, as they relate to ecological health include past, present, and reasonably foreseeable actions that potentially impact aquatic/terrestrial mammalian and avian wildlife, herptiles, aquatic organisms, nontarget invertebrates and pollinators, and botanical resources. Cumulative impacts can result from individually minor, but collectively significant, projects taking place over a period of time. To make a determination of a cumulatively considerable impact, consideration is given to the combined contribution of the Program's collective impacts (mostly less than significant) considered together with impacts that exist outside of the Program from the activities of agencies and individuals. If those impacts, taken all together result in a significant impact, then the Program's incremental contribution to the combined significant cumulative impact is "cumulatively considerable" if it (a) triggers the significant cumulative impact or (b) has a substantial contribution to the existing significant cumulative impact. CEQA Guidelines Section 15064 (h)(4) states that the mere existence of significant cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed project's incremental effects are cumulatively considerable.

The cumulative impact analysis contained herein focuses on the potential for the use of pesticides for mosquito and vector control to contribute to regional pesticide use, which is of concern for its potential impacts to nontarget ecological receptors, some of whom are in decline, an existing/baseline cumulatively significant impact. It includes Table 13-1, Historical Pesticide Use in Pounds of Active Ingredient for the SMCMCD Program Area by County, and Table 13-2, SMCMVCD Pesticide Use within the Service Area: 2006 - 2016. See also Sections 13.2, Aquatic Resources and 13.3, Terrestrial Resources for additional discussion of cumulative impacts. At issue is whether this reported pesticide use is sufficient or whether unreported pesticide use must be estimated to adequately characterize the baseline cumulative condition for pesticide use. This issue is discussed below.

Table 13-1 Historical Pesticide Use in Pounds of Active Ingredient for the SMCMVCD Program Area by County[1]

Active Ingredient	Vector	San Mateo County						Santa Clara County						Santa Cruz County						San Francisco County					
		2006	2008	2010	2012	2014	2016	2006	2008	2010	2012	2014	2016	2006	2008	2010	2012	2014	2016	2006	2008	2010	2012	2014	2016
2,4-D	Herbicide	659	1653	763	1258	1413	1168	1145	931	2446	3273	1015	2981	8.5	28	45	46	148	103	65	114	137	197	160	179
Alcohol Ethoxylated Surfactant	Mosquito																								
Aliphatic Solvents	Mosquito																								
Alkylphenol Ethoxylate	Herbicide-adjuvant	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Allethrins	Mosquito, Yellow Jacket / Wasp							0.5						0.2							0.2			0.01	0.0002
Bacillis sphaericus	Mosquito	2826	3391	453.8	335.31	550.06	535.87	1250.7	120.9	31.8	58.01	50.08	112.43	404	235	149	62.37	106.99	44.82	17.87	200	134.02	409.15	9.9	6.25
Bacillus thuringiensis (israelensis)	Mosquito	392	181.7	351.5	4.75	162.56	218.02	2752	649	500	2005.49	303.45	247.41	99	130	325	285.18	342.84	113.08	1.46	0.01	0.003	1.9	12.84	8.9
Benfluralin (Benefin)	Herbicide	5.9			0.38		0.57	17.3	19.5	14.7	25.24	7.59	14.71	2.3	2.6	1									0.05
Bentazon	Herbicide	19.6	34.4	60.2	0.38		21.34				25.24	7.59	17.52	111	2.2										
Brodifacoum	Rodents	0.02	0.03	0.05	0.05	0.07	0.1	0.1	0.08	0.1	0.09	0.5	0.09	0.03	0.02	0.02	0.01	0.04	0.04	0.03	0.04	0.03	0.02	0.02	0.04
Bromadiolone	Rodents	0.5	0.6	0.6	0.38	0.45	0.57	0.9	1.2	1.1	25.24	0.92	14.71	0.3	0.2	0.1		0.13		0.5	0.45	0.4		2.06	0.05
Chlorophacinone	Rodents	0.1	0.3	0.2	0.2	0.04	0.01	0.6	0.6	0.5	0.6	0.2	0.2	0.01	0.01	0.01	0.01	0.01	0.01	0.02		0.01			
Cholecalciferol	Rodents	0.1	0.2	0.7	0.7	0.6	0.5	0.3	0.2	0.7	0.9	1	0.9	0.03	0.4	0.05	0.06	0.08	0.5			0.1	0.05	0.3	0.6
DCPA (Chlorthal-Dimethyl)	Herbicide	10.5	6					3543.5	3083.23	1548.8	388.66	1151.45	1201.23	240.93	77.54	11.41	154.91	311.72	2.95						
Deltamethrin	Mosquito, Yellow Jacket / Wasp	61.8	57.8	68.5	92.2	3462	3473.3	219	209.2	79.7	123	1467.5	308.3	26	50	5	3.4	167	95.8	44	21	54.1	28.6	501.9	3153.6
Difethialone	Rodents	0.1	0.1	0.1	0.2	0.07	0.1	0.1	0.1	0.4	0.1	0.2	0.2	0.01	0.01	0.01	0.03	0.02	0.03	0.2	0.07	0.1	0.1	0.07	0.2
Diphacinone	Rodents	0.06	0.2	0.2	0.17	0.18	0.24	0.4	0.5	0.6	0.51	0.47	0.64	0.1	0.05	0.03	0.11	0.03	0.1	0.03	0.09	0.07	0.35	0.15	0.17
Dithiopyr	Herbicide	59.8	161.6	84	284.38	224.17	156.2	273	540	318.8	452.33	277.51	645.21	21	94	14	73.97	20.38	57.64	0.79	0.3	2.56	0.41	7.97	4.62
Diuron	Herbicide	677.8	240.3	100.9	257.94	8.81	36	9755	3194	929.4	1645.57	2993.6	2513.24	347	386	120	25.2	85.84	75.03	1.4				9.6	3
Esfenvalerate	Yellow Jacket / Wasp	4.3	8.8	9.1	9.68	4.82	10.3	314.1	231.2	265.2	270.28	485.26	542.49	37	20	20	13	62.89	47.54	1.2	0.6	7.4	6.04	5.84	3.28
Etofenprox	Mosquito, Yellow Jacket / Wasp				0.1	38.4	13.1				3.9	163.8	9				0.1	0.9	0.3				0.1	4.2	1.9
Glyphosate	Herbicide	9832	18317	19919.2	9745.3	8667.9	10329.8	493540	38971	77302.4	40126	43077.7	72964.8	7868	6417	5699.5	5353.9	8434.3	8104	1010.6	1033.7	876.6	1049.5	1088.4	1021
Imazapyr	Herbicide	3362.5	3282.1	2221.6	443.7	3.2	244.8	76	293.4	33.3	17.6	160.5	153.7	11.7	8.4		0.5	0.1	12.7	0.4	0.5		9.4	3.2	3.1
Lambda-cyhalothrin	Mosquito, Yellow Jacket / Wasp	11.1	47.8	8.7	24.3	799	61	132.8	312.5	135.7	297.7	244.1	296.9	97	109	115.9	180.2	237.6	240	16.9	20.4	9.8	17.3	322.1	13.9
Lecithin	Herbicide-adjuvant	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Methoprene	Mosquito	141	176	142.9	57.1	99.4	101.2	604	145	23.4	40.1	24.5	3.3	57	20	5.1	13.7	21.5	19.8	63.6	0.2	0.2	0.1	0.3	58.8
Metolachlor	Herbicide										0.06														
Modified Vegetable Oil	Herbicide-adjuvant	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Naled	Mosquito	236.4	241.7	226.1	6	88.1		1911	1442.2	2168.3	570.4	222.2	451.6	1625	4069	4031.8	875.6	394	594.3		42.4				
Oryzalin	Herbicide	105315	1322.5	436.8	390.9	210.8	311	4598	5502	7797.4	1577.4	3226.5	835.3	329	31	5.7	15.4	58.2	93	24615.8	302.6	0.9	3	3.9	0.6
Pendimethalin	Herbicide	275	424	1366.9	404.2	225.8	61.7	4361	7343.1	7032.8	5154.2	4928.2	4031.8	262	122	63.5	188.8	177.1	437.9	83.1	39.9	236.3	19.9	7.5	5.7
Permethrin	Mosquito, Yellow Jacket / Wasp	1359.4	2633.7	692.9	2852.4	4034.6	467.9	8371.5	19180	20422.1	19700.7	29991	16831.7	698.2	398.1	361	714.8	173.3	1489.9	3250	154.5	117.3	108.8	512.3	70
Phenothrin	Yellow Jacket / Wasp	0.4	0.9	1.1	2.1	2.1	5.2	6	2.7	4.6	4.5	1	17	0.2	0.4	0.1	0.2	1.5	3	1.1	1.6	1.7	3.8	7	9.4
Piperonyl Butoxide	Mosquito	466.8	99.9	218	241.3	507.7	254.2	269.5	612.2	1935.4	1463.6	973.4	522.4	342.8	313.3	1536.5	598.5	1486.1	487.7	176.1	161.2	273.5	148.4	397.1	178.3
Polydimethylsiloxane Fluids	Herbicide-adjuvant	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Potassium Salts (Potash Soap)	All	83.2	698.5	1087.1	3.8	29.4	55.1	274.6	627.4	1888.4	390.3	1055.3	1022.4	1483	3380.8	3122.5	4841.9	3741.2	17700.5	18.4	1.7	3.5	5.3	2.8	1.1
Prallethrin	Mosquito			0.7	0.3	0.2	1.6			3.2	1	1.4	4.1			0.2	0.3	0.5	0.3			0.7	0.4	0.05	1.2
Pyrethrins	Mosquito, Yellow Jacket / Wasp	92.9	28.8	35.6	52.8	114.3	49.8	83.2	112.7	220.9	192.7	307.1	105.3	69	102	274	143.7	289.4	206.2	39.7	53.9	99.7	33.9	83.5	36.6

Active Ingredient	Vector	San Mateo County						Santa Clara County						Santa Cruz County						San Francisco County					
		2006	2008	2010	2012	2014	2016	2006	2008	2010	2012	2014	2016	2006	2008	2010	2012	2014	2016	2006	2008	2010	2012	2014	2016
Resmethrin	Mosquito, Yellow Jacket / Wasp							0.1	0.08	0.03								0.03				0.2		0.01	
Sodium Nitrate	Fumigant	4.7					7.3	4.9	118.9	129	45.7	1.4	26.6				0.2	0.06	0.03						1.1
Spinosad	Mosquito	71	90.7	46.4	36.3	52.2	187.1	758.3	712.8	284.4	1343.4	1794.1	420.6	975	503	351.5	239.7	376.4	465.5	0.4	0.05	0.03	0.4	0.4	0.007
Sulfometuron methyl	Herbicide	30.3	12.8	35.5	42.7	46.5	43.9	150.6	115.4	127.4	84.7	101.7	84.4	27	45	32	41.4	22.7	11.4		0.9	2.2	4.6	3	21
Sulfur	Fumigant	1351	768	1947.7	1453.9	2780.7	4938.4	26812	22684.5	38578	46396.9	45016.3	67746.6	58030	93926	58651	38225.1	83404.8	61287	4.5		4.4			0.8
Temephos	Mosquito																								
Tetramethrin	Yellow Jacket / Wasp	0.03	0.01	0.03	0.02	0.01	0.01	0.03	0.01	0.05	0.06	0.03	0.02	0.01	0.01	0.01	0.05	0.15	4					0.01	0.74
Triclopyr	Herbicide	1580.1	2053.4	2074.2	1248.3	1841.2	1008.3	4581.9	2122.1	14139.6	2411	2795.1	2995.6	657.9	404.9	432.7	677.5	427.9	379.6	298.9	254.5	68.6	180.3	108.9	84.9
	Total	**128930.41**	**35933.84**	**32354.28**	**19250.24**	**25368.34**	**23762.53**	**565807.93**	**109278.7**	**178364.18**	**128116.18**	**141847.65**	**177123.4**	**73830.22**	**110875.9**	**75373.64**	**52775.8**	**100493.7**	**92077.67**	**29712**	**2404.81**	**2031.423**	**2228.82**	**3255.33**	**4869.907**

Source: California Department of Pesticide Regulation, Pesticide Use Reporting database.

Notes:

1. All values are reported in weight (lbs) of Active Ingredient used in a county over the given year, except for herbicide-adjuvants. Amount of Active Ingredient applied is not reported by CDPR for these adjuvant products.
2. Blank Cells: Either no use was reported for that chemical in that county in that year or the reported data were less than 0.005 lb. Because data are usually reported as pounds of product, and the active ingredient needs to be calculated, the CDPR database has apparent problems for some of the chemicals used in quantities greater than the 0.005-pound threshold for reporting the pounds of active ingredient.

Table 13-2 SMCMVCD Pesticide Use within the Service Area: 2006 - 2016

Pesticide Product (units)	Active Ingredient	Amount Used					
		2006	2008	2010	2012	2014	2016
Herbicide dyes and surfactants used for Coastal Conservancy project							
Blazon Blue (gal)	Polymeric colorant		0.74				
Habitat (gal)	Imazapyr	920.81					
Liberate by Coastal Con. (gal)	Lecithin, alcohol ethoxylate			647.39			17.96
Liberate Lpl (gal)	Lecithin, alcohol ethoxylate	462.72	360.23	24.57			
Ll 700 (gal)	Adjuvant	0.50					
Turf Trax Blue (gal)	Polymeric colorant	109.91	53.20	7.19			
Turf Trax by USFWS (gal)	Polymeric colorant			71.39		9.35	
Herbicides used for Coastal Conservancy project							
Polaris by Coastal Con. (gal)	Imazapyr			763.90	95.91	29.17	68.97
Polaris AQ (gal)	Imazapyr		663.66	49.14			
AquaMaster (gal)	Glyphosate	2.50	2.11				
Mosquito Larvicides							
Altosid 2.1 XR (briq)	Methoprene	6,946.00	6,171.50	5,596.00	4709.5	2,997	6,593
Altosid 4.25 Packets (packets)	Methoprene	212.00	149.00	419.00	273	476	28
Altosid 4.25 Pellets (lbs.)	Methoprene	796.33	1,225.49	865.97	416.44	324.52	146.65
Altosid 8.6 briq (briq)	Methoprene	14,910.25	15,382.00	22,835.60	11,944	6,678	2,841
Altosid Liquid Larvicide 20% (gal)	Methoprene	16.71	16.72	14.17	.23	1.15	.023
Altosid Liquid Larvicide 5% (gal)	Methoprene	10.78	9.23	14.89	3.378	2.45	5.67
Altosid XR-G 1.5% (lbs.)	Methoprene	3,525.72	2,726.53	7,952.83	4,410.29	2,857.45	3,271

Pesticide Product (units)	Active Ingredient	Amount Used					
		2006	2008	2010	2012	2014	2016
Metalarv (lbs.)	Methoprene						1.5
BVA 2 (gal)	Mineral oil		588.54	3,880.90	1,831.01	1,644.19	1,145.87
FourStar 45 Bti (briq)	Bti	15.00			10		
FourStar 90 Bti (briq)	Bti						2
FourStar 180 Bti (briq)	Bti						4
FourStar MBG (lbs.)	Bti and Bs					5.38	49.46
FourStar CRG (lbs.)	Bti					48.25	21.96
Golden Bear 1111 (gal)	Mineral oil	5,354.92	2,371.56	34.85			
CoCo Bear (gal)	Mineral oil					8.33	46.03
Natular XRT (briq)	Spinosad					2,377	6,123
Natular G30 (lbs.)	Spinosad				78.77	13.7	78.7
Natular T30 (briq)	Spinosad					3,201	2,298
Natular 2EC (gal)	Spinosad						1.27
Teknar HP-D (gal)	Bti			11.02	19.12	23.31	
Teknar SC (gal)	Bti					21.05	.07
VectoBac 12AS (gal)	Bti	603.20	602.23	378.44	7.06	.006	37.1
VectoMax FG (lbs.)	Bti and Bs					1,778.61	3,269
VectoMax WSP (packet)	Bti and Bs						64
Spheratax SPH 50 G (lbs.)	Bs					3,030.1	2,280.45
VectoLex 7.5 WSP	Bs	136.00	331.00	919.00	14	1,501	40
VectoLex CG (lbs.)	Bs	6,250.50	9,974.77	5,493.31	4,815.86	22.5	
VectoLex WDG (lbs.)	Bs	9.50	14.00	24.50	27.81	16.31	
Mosquito Adulticides							
1% Pyrenone Capsules	Pyrethrins, PBO	15.00		2.00			
25.5% Pyrenone (gal)	Pyrethrins, PBO	214.02	0.12	0.25	8.05	18.8	

Pesticide Product (units)	Active Ingredient	Amount Used					
		2006	2008	2010	2012	2014	2016
Suspend (gal)	Deltamethrin	0.58					
Zenivex (gal)	Etofenprox					136.19	45
Aqua Anvil (gal)	Sumithrin, PBO					1.3	
Rodenticides (used for local city projects)							
Tomcat Ultra Block (briq)	Bromadiolone				12		
Contrac 1oz (briq)	Bromadiolone					98	87
Contrac 8oz (briq)	Bromadiolone					26	309
Fastrac 1oz (briq)	Bromethalin						242
Tomcat 1oz (briq)	Bromethalin						32
Ditrac 1oz (briq)	Diphacinone					45	26
Other Pesticides							
Delta Dust (lbs.)	Deltamethrin	7.55	11.77	7.51	23.39	17.52	23.6
Drione (lbs.)	Pyrethrins, PBO	0.66	0.05	0.03			
Easy Gone Hornet Spray (can)	Tetramethrin, Permethrin, PBO	49.00					
Mosquito dunkets	Bti		184.00				
Ortho Wasp Spray (can)	Tetramethrin, Sumithrin	72.50	3.25	9.75			
Spectracide Pro (can)	Tetramethrin, Permethrin, PBO	23.00	100.50	168.15	74		
(old) Spectracide (can)	2,4-D			1.25			
Spectracide 3 (can)	2,4-D	24.00	19.50	53.50	272.75	237	257
Victor Mint Oil (can)	Peppermint Oil		0.25				
Wasp Freeze (can)	d-trans Allethrin, Phenothrin	17.00	42.00	13.50	5.75	13	1

Source: SMCMVCD Database for generation of Pesticide Use Reports to the San Mateo County Agricultural Commissioner, 2006 – 2016

Note: Values are reported in weight (lbs) of total product.

On February 22, 2018, the Sacramento County Superior Court granted a petition for writ of mandate that invalidated the California Department of Food and Agriculture's ("CDFA") program EIR because, among other things, the EIR failed to adequately describe the baseline existing conditions and analyze cumulative impacts. The court found that while the program EIR properly included reported pesticide use in its baseline calculations, it should have also included "unreported" pesticide use because CDFA had demonstrated that such data existed and it had the ability to acquire such data. Because the unreported pesticide use was not included in the baseline, the court stated that it was impossible to determine the existing conditions, what effects the project might have on those conditions, and what cumulative effects could occur.

This is not an appellate case and, therefore, the District is not required to comply with its holding. Nonetheless, in the interest of fulfilling CEQA's informational purposes, the District searched for data pertaining to unreported use of pesticides in the County (e.g. unreported household use) in June 2018. Despite an exhaustive effort, the District and its consultants were unable to locate any such data. Specifically, the District queried numerous public agencies (including, but not limited to, the San Mateo County Water Pollution Prevention Program, Environmental and Public Health Engineering, California Department of Public Health, California Department of Food and Agriculture, United States Environmental Protection Agency, and the San Mateo County Agriculture Department) and public databases to identify the quantity of pesticide sales and/or use in San Mateo County and the impact of such use on the environment. The unanimous answer from the professionals at the public agencies was that there is no relevant data available on unreported pesticide use.

The District is not required to create data that does not presently exist to satisfy the requirements of CEQA. For this reason, the District's baseline existing conditions rely on the available data and include all reported pesticide use, but do not account for any unreported pesticide use, as such data does not exist, and attempting to quantify or qualitatively characterize such use would be purely speculative. All potential impacts, including cumulative impacts, have been properly analyzed and evaluated based on these existing and reasonably foreseeable future conditions.

Although some variation exists in the reported amounts of pesticide use within the District's Program Area counties, use will vary according to particular needs, majority of habitat type, and seasonal vector outbreaks. The public is aware of these pesticide uses and, in general, is pressuring agencies within these counties to use less pesticide product whenever possible. The District uses very strict and thorough BMPs in their pesticide applications for mosquito and vector control and is attempting to reduce total pesticide use where possible consistent with IPM practices. One new pesticide is proposed for use by the District, naled, that is of concern to water quality (see Section 13.7). As a result of the short half-life and potential breakdown product dichlorvos, short-term exposure of aquatic nontarget species to naled and dichlorvos is possible but poses little unwanted toxicity with adequate water exchange. Toxicity is of concern in wetlands with little water exchange/limited current where the invertebrate food supply could be reduced temporarily. These factors and the rapid degradation makes the exposure minimal, and the potential for unwanted effects limited in area and duration. Even with the possibility of some unexpected or unwanted effects, the exposure to nontarget species is so brief as to present little impact to these nontarget populations' sizes, distributions, viability, resilience, or recovery potential. The District's incremental contributions to overall pesticide use within its Program Area do not trigger a cumulatively considerable impact. While overall use of pesticides throughout the Program Area (past, present, and future) may be considered cumulatively significant as represented by declines in some important species, the District's incremental contributions to this impact are temporary and site specific in nature and would not be expected to result in measurable ecological harm due to rigorous observation of regulatory limitations and best management practices. These BMPs are well-established in vector control and have been demonstrated to be sufficiently protective of beneficial uses of receiving waters in typical vector control applications, even in cases when materials have been applied to impaired waterways (Phillips et al. 2013). When conducted as described in the District's IMVMP, the contribution of these pesticide applications to pesticides in the environment are not substantial, so not cumulatively significant. Therefore, the Program's

long-term activities including chemical applications would not contribute considerably to nontarget ecological receptor impacts, i.e., they present little impact to these nontarget populations' sizes, distributions, viability, resilience, or recovery potential. The Program components would not result in significant cumulative impacts to the ecological health of the region.

The Proposed Program does result in the use of pesticides and a potential increase in pesticide use over existing conditions for certain formulations. Local planning agencies, County Agricultural Commissioners, and CDPR do not forecast future pesticide use. However, the cumulative analysis for ecological health concerns can address the question of increases in pesticide use as a result of the Proposed Program as a variation of the "summary of projections method" to address regional cumulative impacts of pesticide use and whether the incremental contributions of the Program's chemical treatment methods contribute to cumulative significant ecological health-related impacts. The estimates of pesticide use in the District's Program Area are not based on population or housing units or employees but rather on past trends in pesticide use from available data on pesticide sales of products, as active ingredients, reported to the CDPR for 2006, 2008, 2010, 2012, 2014, and 2016. The analysis seeks to provide the regional context needed for a reasonable discussion of cumulative impacts. Just as local and regional plans project growth based on past trends, the analysis below relies on past trends to address possible changes in pesticide use and potential cumulative ecological health impacts.

This analysis considers whether potential exists for any incremental contribution of chemical use from the Program, when combined with other reasonably foreseeable uses of the specific pesticides considered in this PEIR (and Appendix B), which would result in impacts that could be considered "cumulatively considerable" to ecological health. The District's activities would involve the application of low concentrations of pesticide and herbicide active ingredients. Further, the District's practices including avoidance of some habitat types and strict adherence to product labels, which typically require concentrations well below known toxicity values, would result in very short exposures. Program component impacts were identified as "less than significant" if the likely exposure to nontarget species was either very short or the application medium (as a fog or liquid) was typically highly dilute (i.e., ULV techniques). Additionally, the less-than-significant determination was applied if it was indicated that exposure could be considered likely incomplete due to little or no overlap of application areas and typical species habitat.

13.4.2 Trends in Pesticide Use 2006–2016

Trends in pesticide use help to determine whether there is an existing cumulatively considerable impact in the region from the uses of pesticides by agricultural, industrial, governmental, and residential users. In general, there is an existing significant cumulative impact from the quantities of materials applied overall with some reductions in use of selected materials. Table 13-1, Historical Pesticide Use in the San Mateo County Mosquito and Vector Control District's Program Area illustrates the changes in relative pesticide use (as pounds per year of active ingredients) for the 46 chemicals by all users (reporting use to the San Mateo County Agricultural Commissioner and others and compiled by CDPR) in the counties represented in the District's Program Area (Service Area plus adjacent counties) which is the focus of this PEIR's Appendix B. The potential cumulative impact of the use of similar pesticides by numerous agencies, organizations, and individuals (including farmers and land managers) in the counties suggests that many potential interactions could lead to cumulative pesticide impacts without definitive determination of the relative volume of each of the sources. However, pesticide use in the Program Area has decreased since 2006. The amount of active ingredients used in the Program Area in 2006 was approximately 798,281 pounds (399 tons), but it decreased substantially to 297,834 pounds (149 tons) in 2016 (CDPR).

Although the reported cumulative pesticide product used has a very wide range for each county in the table, some generalities can be made for each county although the data are limited to 2006 to 2016:

> San Mateo County reported more than 52 tons fewer pesticides used in 2016 than in 2006.

> Santa Clara County reported more than 194 tons fewer pesticide use in 2016 than in 2006.

> San Francisco County reported more than 12 tons fewer pesticide use in 2016 than in 2006.

Although some variation exists in the reported amounts of pesticide use by these counties, use will vary according to their particular needs, majority of habitat type, and seasonal vector outbreaks. The public is aware of these pesticide uses and, in general, is pressuring agencies within these counties to use less pesticide material whenever possible.

The regulatory environment is constraining the use of several pesticides to protect selected species such as the CRLF. Section 6.1.3.1.4 (Stipulated Injunction and Order, Protection of California Red-Legged Frog from Pesticides) explains that on October 20, 2006, the US District Court for the Northern District of California imposed no-use buffer zones around CRLF upland and aquatic habitats for certain pesticides. This injunction and order will remain in effect for each pesticide listed in the injunction until the USEPA goes through formal 7(A)(2) consultation with the USFWS on each of the 66 active ingredients, and the USFWS issues a Biological Opinion including a “not likely to adversely affect” statement for the pesticides. Of the 66 pesticides listed in the original injunction the District currently uses methoprene and permethrin, while naled and esfenvalerate are part of the Proposed Program for vector control. Esfenvalerate may be applied directly to yellow jacket and wasp nests in response to public complaints in the future if District surveillance indicated a public health risk. Methoprene is used for larval mosquito control, and permethrin is currently used for yellow jacket control and may be used in the future for adult mosquito and tick control. Naled is not currently used but may be used for adult mosquito control in the future.

Under the injunction and order, no-use buffer zones of 60 feet for ground applications and 200 feet for aerial applications apply from the edge of the following CRLF habitats as defined by the USFWS and the Center for Biological Diversity: Aquatic Feature, Aquatic Breeding Habitat, Nonbreeding Aquatic Habitat, and Upland Habitat. These habitats are found in 33 counties of California including San Mateo County. As discussed in greater detail in Section 4.1.3.1.6, the US District Court for the Northern District of California issued another Order and Stipulated Injunction in 2010 that covered 11 additional federally listed species, 8 of which occur in San Mateo County or surrounding counties. As a public agency conducting public health vector control, the District is exempt from the limitations placed on pesticide use in both the 2006 and 2010 injunction orders. Although the District is exempt from the use limitations in the stipulated injunction when applying insecticides and herbicides for the purposes of public health mosquito control, several BMPs incorporated into the District’s IMVMP also aim to protect CRLF and CRLF habitat (see Chapter 2, Table 2-8, Categories E and F). The District’s chemical control and vegetation management control components as described in the IMVMP are likely to keep District activities within compliance of the stipulated injunction through self-imposed restrictions except in extreme or unusual circumstances. However, the injunctions may contribute to reductions in pesticide use by other agencies, which further reduces the risk of cumulative impacts.

The District uses very strict and thorough BMPs in its pesticide applications for mosquito and vector control and is attempting to reduce total pesticide use where possible consistent with IPM practices. The District’s annual use of pesticides is reported to the San Mateo County Agricultural Commissioner and provided here in Table 13-2, SMCMVCD Pesticide Use within the Service Area: 2006 - 2013. The amount reported is pounds of total product used by the District, not just the pounds of active ingredient, which has to be calculated for each formulation. Therefore, the amounts in Table 13-2 are not directly comparable to the pounds of active ingredient presented in Table 13-1. Although the units in Table 13-2 vary from Table 13-1 and are reported by product name, comparisons for the most heavily used Bs formulation (VectoLex CG) is 6,250.5 pounds in 2006 and 5,493.3 pounds in 2010, declining to no use in 2016. This weight is for the total product, not just the active ingredient. For the VectoLex CG formulation, the amount of active ingredient Bs would be approximately 469 pounds in 2006 and 412 pounds in 2010. The active ingredient in this example is approximately 7.5 percent of the total product amount. While use of VectoLex CG declined, other products were used heavily in 2014-2016, including Natular XRT (spinosad), VectoMax FG (Bti and Bs), and Spheratax SPH (Bs). Pesticide product use by the District is

affected by population growth, weather conditions (rainfall), and restoration projects in the Service Area. Higher use of larvicides occurs in years of intensive mosquito populations. The year 2014 had heavy WNV activity, and this is reflected in the use of several larvicides and the adulticide Zenivex® (etofenprox). Also, at selected sites a large amount of product may have to be used or is required to abate a significant mosquito/vector problem, e.g., wastewater treatment plant and wetlands with invasive vegetation.

The District's incremental contributions to overall pesticide use within its Program Area do not trigger a cumulatively considerable impact based on the specific analyses of their use practices, targeted insects, and products used with one exception (naled). While the overall use of pesticides throughout the Program Area may be considered cumulatively significant based on the use of a long list of active ingredients and quantities used by all users, and since the District is a major user of a few of these pesticides in some years such as 2014, the question of whether the District's pesticide use could cause a cumulatively significant (substantial) contribution to this impact must be examined. The majority of the current pesticides used by the District are nonpersistent compounds that degrade within a few hours to a few weeks when exposed to sunlight, moisture, and soil, and do not accumulate or produce known long-term impacts. Per the District's IMVMP Plan, the least toxic materials available for effective control are prioritized, and all pesticides are applied at or below USEPA-mandated label rates, incorporating BMPs which studies have shown are effective at protecting aquatic systems (MVCAC 2013). Moreover, the District does not use the ingredients with the greatest potential to harm nontarget invertebrate species (i.e., neonicotinoids) and proposes the conditional use of one organophosphate (naled) but only in very limited circumstances (See Section 2.3). For those chemicals used by the District, label requirements and District BMPs substantially avoid or minimize potential impacts. Therefore, the Program's long-term activities including chemical applications would not contribute considerably to nontarget ecological receptor impacts. The Program components combined and with the additional chemicals under consideration for future use added into the overall Proposed Program collectively would not result in considerable or significant cumulative impacts to the ecological health condition of the region.

13.4.3 Impacts to Selected Nontarget Species

The concerns for cumulative impacts focus on salmonids, beneficial insect pollinators, insect predators, and CRLF. In brief, as described in more detail in Sections 4.2.1.2 and 5.2.1.2, an impact to a nontarget species can be considered significant if it caused relatively high magnitude, persistent, or permanent changes compared with an environmental baseline (which here means rooted in the existing condition). These determinations are based on the best professional judgment of a technical expert, and consider criteria including, but not limited to, the following:

> Substantially reduce the population size, distribution, viability, or recovery potential of a rare, threatened, or endangered species, or species of concern;

> Result in changes in the population size, distribution, viability, or resilience of a native fish, wildlife, or plant species;

13.4.3.1 Pollinators

Section 13.3.1 addresses impacts of pesticide use on bees and other pollinators from herbicides under the Vegetation Management component and insecticides under the Chemical Control Component. It concluded that:

> While it can be acknowledged that the cumulative effects of related projects (past, current, and probable future uses of pesticides, in particular the neonicotinoids) without the IMVMP are already significant and based on the conclusions above (and elsewhere in this PEIR), given the lack of severity or frequency of any impacts, the Program's less-than-significant impacts on insect pollinators related to mosquito, yellow jacket, and tick abatement activities would not be cumulatively considerable or significant.

13.4.3.2 Insect Predators

Because of the selective nature of the vector control chemical products for mosquitoes, any claimed potential adverse impact to insect predators associated with District applications (as nontarget exposures) would be temporary and inconsequential in the impact to those populations of predator species. Even in the event of ancillary exposures, the recovery of such populations occurs rapidly to maintain the general level of individuals in their populations. The relative higher sensitivity of the target vs nontarget (less sensitive predator) species provides an adequate measure of safety to maintain the balance of predator populations. Although some nontarget predator species may be inadvertently exposed to a pesticide, the potential impact to the predator population would likely not be significant or even detectable. Similarly, for the target insects that could be exposed and subsequently carry a "body burden" of the chemical, the concentrations of consumed chemical by the predator species in these scenarios would be below the level of concentration in the food items to result in toxicity to the predator species. In the evaluation of the potential loss of prey species (target species reductions) the number and location of available alternative food items available to the predator species would preclude any significant adverse impacts due to the loss of a single predator food item (Van Bael et al. 2008).

Therefore, the collective effect of the Program's less-than-significant impacts on insect predators would not trigger a cumulative impact when combined with other less-than-significant impacts from past, present, and future activities by other agencies and individuals that are not cumulatively considerable.

13.4.3.3 Other Nontarget Species

Section 13.3.3 discusses the impacts of herbicides (especially glyphosate) and adulticides (especially permethrin) on CRLF.

> The use of herbicides to control undesirable vegetation has been examined relative to the potential to impact amphibians and the use of glyphosate to impact CRLF in particular. The primary causes identified by the USFWS as leading to an adverse impact on the status of the threatened CRLF are loss of habitat and overwhelming predation, invasive species, and competition for foraging items (National Wildlife Federation listings). The potential impact of glyphosate on the CRLF is marginal and only applicable in situations of excess exposure to incorrectly treated areas.

> Although a potential exists for the future application of permethrin (or any other adulticide used by the District), in the vicinity of an area of CRLF habitat, the basic issue in all cases is not what the potential toxicity may be, but whether exposure and the resulting potential for toxicity is realistic under the conditions and timing of the proposed vector control application. These confounding factors that impact frog populations make establishing pesticide causality nearly impossible, especially at the potential exposure that could result from the District's use under the Program. The District's current use of permethrin is limited to the direct application into the nests of ground-dwelling yellow jackets, which are not in areas where CRLF occur. Although permethrin is also included as an active ingredient in some potential future use adulticide products, the District uses adulticides only sparingly, and does not conduct such applications in or near potential CRLF habitat without prior consultation with relevant regulatory agencies per BMPs outlined in the District's IMVMP (see BMPs A4, A7, and others)

This PEIR recognizes that there is an existing significant cumulative impact to CRLF from past, present, and future activities of agencies and individuals based on several factors including pesticides (hence the regulatory constraints from the injunctions to reduce impacts), However, the District's pesticide use does not trigger this cumulative impact nor does it provide a considerable contribution to this regional cumulative impact. Although not technically subject to the injunction, the self-imposed limitations placed on District activities in complying with BMPs in the IMVMP result in practices which are expected to conform *de facto* with the terms set forth in the injunction.

13.5 Human Health

Cumulative impacts, as they relate to human health, include past, present, and reasonably foreseeable actions that potentially impact humans. Cumulative impacts can result from individually minor, but collectively significant, projects taking place over a period of time. To make a determination of a cumulatively considerable impact, consideration is given to the combined contribution of Program impacts (mostly less than significant) considered together with impacts that exist outside of the Program from the activities of agencies and individuals. If those impacts, taken all together result in a significant impact, then the Program's incremental contribution to the combined significant cumulative impact is "cumulatively considerable" if it triggers the significant cumulative impact or if it has a substantial contribution to the existing significant cumulative impact.

The Proposed Program does result in the use of heavy equipment under the Physical Control Component that is primarily a less-that-significant impact on air quality which is addressed in Section 13.8. The primary concern is the Proposed Program's pesticides and a potential increase in pesticide use over existing conditions for certain formulations. Local planning agencies, County Agricultural Commissioners, and CDPR do not forecast future pesticide use. However, the cumulative analysis for human health concerns can address the question of increases in pesticide use as a result of the Proposed Program as a variation of the summary of projections method to address regional cumulative impacts of pesticide use and whether the incremental contributions of the Program's chemical treatment methods contribute to cumulative significant human health-related impacts. The estimates of pesticide use in the District's Program Area provided in the preceding analysis in Section 13.4 (see Table 13-1) is not based on population or housing units or employees but rather on past trends in pesticide use from available data on pesticide sales of products, as active ingredients, reported to the CDPR. The analysis seeks to provide the regional context needed for a reasonable discussion of cumulative impacts. Just as local and regional plans project growth based on past trends, the analysis below relies on past trends to address changes in pesticide use and potential cumulative human health impacts.

This analysis considers whether potential exists for any incremental contribution of chemical use from the Program, when combined with other reasonably foreseeable uses of the specific pesticides considered in this PEIR (and Appendix B), which would result in impacts that could be considered "cumulatively considerable" to human health. The District's activities would involve the application of low concentrations of pesticide and herbicide active ingredients. Further, the District's practices including minimization or avoidance of impacts to some habitat types (such as tidal marshes and seasonal wetlands) and strict adherence to product labels, which typically require concentrations well below known toxicity values, would result in very short exposures. Program component impacts were identified as "less than significant" because the likely exposure to humans was either insignificant due to low toxicity and/or very short or the application medium (spray or liquid) was typically highly dilute (ULV techniques). Additionally, the less-than-significant determination was applied because an indication existed that exposure could be considered likely incomplete due to little or no overlap of application areas and procedures outlined in the IMVMP would eliminate or greatly minimize exposure. These highly limited exposures would apply to both present and future populations in the Program Area, but primarily in San Mateo County.

Public comments on the first Draft PEIR (March 2016) focused on the District's use of the herbicide glyphosate and other pesticides including pyrethroids including chemicals that are possible endocrine disruptors. Highlights of findings contained in the human health analysis (Section 7.2) include the following:

> Section 7.2 5.1.1 found that current data indicate that glyphosate is nontoxic to humans, and the endocrine disruption issue in humans has not been demonstrated with human exposure scenarios that are realistic and typical for vector control. Glyphosate products are effective, widely used, generally low risk products for weed control (Gertsberg 2011). Some ancillary reports in the press of sublethal effects on disease resistance, biological diversity, or enzyme activity as a result of ingestion/uptake of glyphosate are interesting but without clear mechanisms that can be related directly to glyphosate

(Gertsberg 2011). The only route of exposure that members of the public would even potentially have to glyphosate would be physical contact with dried product on vegetation well after treatment was completed. Given the remote and generally inaccessible areas in which the District would likely use glyphosate, and the small amount of vegetation that would typically be treated, such contact would be very unlikely and infrequent.

> Section 7.2.7.2 evaluates the pyrethrin and pyrethroid active ingredients, some of which are moderately toxic to humans based on laboratory studies. Concerning studies on pyrethroids and their possible links to human diseases, the common flaw in many demographic studies is that correlation is not always causality. Although hundreds of studies attempt to link diseases to specific external factors, they do not typically provide a defensible correlation to causality. Although most reports of potential pesticide linkages to disease use unrealistically high exposures, the applications resulting from typical District vector control operations using pyrethroid products are at product amounts far below the levels resulting from agricultural applications. The limited exposure of these products to humans based on applications techniques, label requirements, and District BMPs resulted in conclusions that impacts to human health from the use of pyrethrins, pyrethroids, and pyrethroid-like compounds for mosquito, yellow jacket wasp, and tick control would be less than significant.

> Section 7.2.7.2.6 covers PBO, a pesticide synergist that enhances the effectiveness of pesticide active ingredients, such as pyrethrins and pyrethroids, by inhibiting microsomal enzymes and, thus, the breakdown of the other active ingredient(s) (USEPA 2006b). It degrades quickly in soil and water. PBO has a low acute toxicity by oral, inhalation, and dermal routes, but it was included in the final list of chemicals for screening under USEPA's Endocrine Disruptor Screening Program (USEPA 2009a). Subsequent screening by the USEPA found that based on the weight of evidence considerations, no potential interaction with the estrogen, androgen, or thyroid pathways of PBO was found in mammals, and further testing was not recommended (USEPA 2015a). As a synergist, PBO is applied in products by the District using the same guidelines and BMPs as those for pyrethroids and pyrethrins: ULV application with a backpack mister or hand can/duster, and it is not applied during high winds. The synergist PBO was determined to have a less-than-significant impact on human health.

The District's less-than-significant incremental contributions to overall pesticide use within its Program Area do not trigger a cumulatively considerable impact to human health. While the overall use of pesticides throughout the Program Area may be considered cumulatively significant based on the use of a long list of active ingredients and quantities reported by all users, in the absence of an analysis to conclude otherwise and despite instances of reductions in use over the period 2006-2016, the District's incremental contributions to this overall impact are not cumulatively considerable or significant. As discussed in Section 7.1.2.1, the District applies chemical control using techniques designed to protect human health, as described in its IMVMP Plan, which result in treatments using the least amount of product to be effective with minimal repeated applications. Coupled with the use of methods that contain treatments to targeted areas and use of chemicals with short residuals, the result is much lower levels of chemical exposure for a shorter duration of time than what would be capable of causing harm to human health. Therefore, the Program's long-term activities including chemical applications would not contribute considerably to human health impacts. The Program components when combined and with the few changes proposed for future use into the overall Proposed Program collectively would not result in significant cumulative impacts to the human health condition of the region.

13.6 Public Services and Hazard Response

The District's Program would not incrementally increase demand for police, fire, or health-care services, nor would it create a significant hazard (only less-than-significant impact) to the public or the environment through the routine transport, use, or disposal of hazardous materials, through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment, or through the operation of aircraft. In addition, the Program would not expose people or structures to a

significant risk of loss, injury, or death involving wildland fires (only a less-than-significant impact). In short, the Proposed Program does not have substantial incremental impacts on public services, and implementation of any of the Program components (individually or in combination, including future activities) would not result in a considerable contribution to any cumulative public services and hazard response impacts that could result from other projects and population growth in the vicinity of the treatment areas. Because population growth would occur in small increments through 2040, the cumulative baseline condition is that public services can be added as needed, and there is no cumulatively considerable impact due to service deficiencies.

13.7 Water Resources

Less-than-significant impacts to water resources are identified for all Program activities, under the Vegetation Management Component and the Chemical Control Component, with the exception of the use of naled for adult mosquito control. While Table 9-1 lists chemicals of concern for pesticide concentrations in surface water and sediment throughout the Program Area, Table 9-2 lists only one pesticide-impaired surface waterbody and TMDL status in the District's Service Area, lower San Mateo Creek. Because pyrethroids have been implicated in sediment toxicity, the likely cause is the use of common household insecticides containing pyrethroids by members of the public and improper disposal, not vector control activities conducted by the District. Where receiving waters (such Central San Francisco Bay) have been identified as impacted by pesticides, pyrethroids, or sediment toxicity, an existing significant cumulative impact is associated with the combined applications of these pesticides by all users within the watershed. The District's use now or in the future of some of the more toxic and persistent pyrethroids (permethrin and resmethrin) would be unlikely to contribute to impairments of receiving water identified on the CWA 303(d) list (lower San Mateo Creek) as caused by pyrethroids and sediment toxicity primarily because of the District's method of application. Several studies have shown that pyrethrins applied using ULV techniques do not accumulate in water or sediment following repeated applications. These studies also determined that no toxicity is associated when exposure is limited to the amounts used when following ULV protocols for mosquito control from truck-mounted equipment (Lawler et al. 2008; Amweg et al. 2006). Concerning permethrin, when applied in accordance with ULV label instructions, studies have shown rapid dissipation, low persistence, and no observed aquatic fish and invertebrate toxicity following aerial ULV applications (Appendix B). Although one study found higher levels of permethrin on the surface microlayer of the waterbody, corresponding water samples did not contain detected residues, and higher surface microlayer concentrations were not correlated with toxic effects in the waterbody. There is minimal movement of pesticides in sediments or soils into waterbodies that is determined by the binding and half-life characteristics of the chemical used. When applied directly to ground nests of yellow jacket wasps or around residences or parks for tick abatement, the product is used with careful techniques such as controlled applications to very small, localized areas.

Water quality 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 [MVCAC] NPDES Permit Coalition 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 (in larvicides and adulticides) applied by the vector control districts were similar. A few water samples exceeded monitoring triggers.

An associated ecotoxicology study by researchers from the University of California Davis (Phillips et al 2013) on the mosquito and vector control spray applications monitoring results included both pre-application and post-application sampling and a combination of aquatic toxicity tests and chemical analyses. Most of the active ingredient detections in receiving waters and sediments were not attributable

to the mosquito control applications. Most relevant to the Proposed Program are the findings regarding naled, permethrin, pyrethrin, and sediment samples.

> For naled, there were two spray events at a total of two wetland, one agricultural, and six urban monitoring sites resulting in 18 post-application samples. Nine of the post-application samples reported toxicity that can be attributed to the naled breakdown product dichlorvos.

> For permethrin, four spray events at six agricultural, five urban, and one wetland sites resulted in 24 post -application samples. One of two toxic samples that were observed after permethrin applications could be explained by the presence of bifenthrin, which was not applied as part of vector spray pesticide activities.

> Concerning pyrethrin, there were three spray events at six urban sites and six wetland sites, resulting in 24 post-application samples. Water toxicity was not observed in any of the samples collected as part of the two events at wetland sites. At the event covering the urban sites, two toxic samples observed after the application of pyrethrin could have been caused by PBO synergizing ambient concentrations of pyrethroids in the urban setting, but the concentrations of pyrethrins were well below toxic levels.

> Sediment toxicity results did not provide significant additional information during the first year of the study, but sediment chemical analysis demonstrated that sumithrin concentrations increased over multiple applications at individual sites, although concentrations were still below toxic levels. During the second year, four sediments had significantly higher post application toxicity, but the toxicity of these samples was not related to spray application.

In addition to the use of naled, which was identified to cause a potentially significant and unavoidable impact to water quality, the District's use of some of the more toxic and persistent pyrethroids (permethrin and resmethrin) could potentially contribute to impairments of receiving water identified on the CWA 303(d) list as caused by pyrethroids and sediment toxicity, specifically lower San Mateo Creek. Where receiving waters have been designated as impaired for pesticides used under the District's IMVMP Plan, a baseline cumulatively considerable impact results from all upstream uses of these pesticides or the receiving waters would not be designated as impaired. The issue is whether the District's use of these potential "impairment chemicals" or others is contributing in less-than-significant or significant amounts to an existing cumulatively considerable impact in the Program Area. This incremental impact from the pyrethroids used for vector control on lower San Mateo Creek is not cumulatively considerable given application methods and study results described above and ongoing mitigation in the Service Area described below. However, the future use of naled could result in a cumulatively considerable incremental impact to the pesticide-impaired waterbody of lower San Mateo Creek due to the significant detection of the breakdown product dichlorvos reported above (Phillips et al. 2013). No additional impacts were identified in association with the chemical and nonchemical Program components, and no additional cumulative impacts are anticipated to occur (i.e., the District's less-than-significant impacts are not triggering a new cumulative impact). Monitoring of water quality for the District's NPDES permit has shown little impact from vector control spray applications.

Concerning mitigation for the baseline cumulatively considerable impact to receiving waters and the cumulatively considerable addition from the District, the following mitigation is underway in San Mateo County (SMCWPPP 2017):

> "In compliance with MRP Provision C.9, Permittees are implementing pesticide toxicity control programs that focus on source control and pollution prevention measures. The control measures include the implementation of integrated pest management (IPM) policies/ordinances, public education and outreach programs, pesticide disposal programs, the adoption of formal State pesticide registration procedures, and sustainable landscaping requirements for new and redevelopment projects. Through these efforts, it is estimated that the amount of pyrethroids observed in urban stormwater runoff will

decrease by 80-90% over time, and in turn significantly reduce the magnitude and extent of toxicity in local creeks." (p. 20)

13.8 Air Quality

In developing thresholds of significance, BAAQMD considered the emission levels for which a project's individual emissions would be cumulatively considerable. Therefore, if a project would result in an increase in emissions at or above applicable mass thresholds, then it would be deemed to have a cumulatively considerable impact. Conversely, if a project would not exceed the significance thresholds, then its emissions would not be cumulatively considerable. (BAAQMD 2017)

Impacts to regional ambient air quality by all Program components combined (both existing activities and with additional heavy equipment use in the future) would be less than significant for criteria pollutant emissions. The majority of air districts in California, including BAAQMD and MBUAPCD, assume that if project-level emissions do not exceed significance thresholds, and no closely related project exists, then a project would not have a cumulatively considerable impact on air quality. In most of the areas the District is likely to target for Program activities, related projects would be similar programs other Districts conduct in their respective jurisdictions (e.g., California Department of Transportation and local roads departments, the Midpeninsula Regional Open Space District, local utilities, service districts, government, agricultural operations, and public and private landowners), and CDFA's special campaigns to control specific threats such as gypsy moths, light brown apple moths, Asian citrus psyllid, and Mediterranean fruit flies. These projects would not occur at the same times (days) and same locations. All of the Program component emissions (separately and combined for the District's entire Program) would be below the significance thresholds for criteria pollutant emissions. The incremental impacts on air quality from the Program components are not individually significant nor are they cumulatively considerable. Therefore, cumulative impacts to regional air quality are less than significant.

The VOC emissions resulting from the volatilization of the products during applications of pesticides and herbicides are relatively inconsequential when compared to the sources from vehicles and mechanical equipment used during the application. The VOCs associated with pesticide use are a small fraction of the total emissions the District produces. Concerning the cumulative impact of the District's pesticide use when combined with pesticide use by agriculture, the CDPR restricts use of many agricultural pesticide products that are high in VOCs to comply with the CAA. Statewide use of agricultural pesticides on commercial crops account for approximately 2 percent of all VOCs produced in the state, while the VOC emissions of pesticides and herbicides the District typically uses for vector control are minimal to insignificant. State restrictions include some high-VOC products containing abamectin, chlorpyrifos (not used extensively), gibberellins, or oxyfluorfen (used primarily on some Central California crops), and this concern should not impact District use of other pesticides for vector control (i.e., these restricted products are not considered as part of the Existing Program or the Proposed Program). (CDPR 2014)

13.9 Greenhouse Gases and Climate Change

Scientific consensus concurs that global climate change will increase the frequency of heat extremes, heat waves, and heavy precipitation events. Currently accepted models predict that continued GHG emissions at or above current rates will induce more extreme climate changes during the 21st century than were observed during the 20th century, a baseline cumulatively considerable impact. A warming of about 0.2°C per decade is projected. Even if the concentrations of all GHGs and aerosols are kept constant at year 2000 levels, a further warming of about 0.1°C per decade would be expected. A faster temperature increase will lead to more dramatic, and more unpredictable, localized climate extremes. Other likely direct effects of global warming include an increase in the areas affected by drought, an increase in tropical cyclone activity and higher sea level, and the continued recession of polar ice caps. Already some identifiable signs exist that global warming is taking place. In addition to substantial ice loss in the Arctic, the top 7 warmest years since the 1890s have been after 1997. (IPCC 2007)

The overall global climate change will be comprised of social and economic losses. These negative effects will likely be disproportionately shouldered by the poor who do not have the resources to adapt to a change in climate. Some of the main ecosystem changes anticipated are that biodiversity of terrestrial and freshwater ecosystems could be reduced and that the ranges of infectious diseases would likely increase.

Cumulative impacts were assessed in a qualitative manner by determining if the Program components (both existing and future activities), in conjunction with other projects (activities by numerous agencies and land managers and projected population growth for San Mateo County) throughout the Program Area, would have the potential to contribute to a long-term cumulative impact on climate change. Given that GHG emissions and climate change are global issues, a statewide framework or cumulative approach for consideration of environmental impacts may be most appropriate. Virtually every project in California, as well as those outside the state, would have GHG emissions.

All Program components would generate some GHG emissions individually but would not conflict with current plans, policies, and regulations. No potentially significant impact would occur as a result of any of the Program components (individually or when combined for the entire Program), and no mitigation is required for GHGs and climate change. The components would generate GHG emissions and incrementally contribute to climate change, but this contribution is not considerable.

When all Program emissions are viewed in combination with global emission levels that are contributing to the existing cumulative impact on global climate change, the incremental contribution of these Program emissions would not be cumulatively considerable because they occur intermittently on a very small scale (i.e., not stationary sources) and are well below the presumptive, albeit unofficial, 1,100 MT CO_2e per year GHG emissions threshold for nonstationary sources suggested by the BAAQCD (as described in Section 11.1.7.3.1). Therefore, all Program components (either individually or in combination) would not have a cumulatively considerable impact on global climate change.

13.10 Noise

Program activities would result in temporary, sporadic noise impacts from equipment use (existing and proposed), and any given surveillance or treatment area would be affected only for a brief period. Cumulative impacts would result from the implementation of Program activities in combination with those of other reasonably foreseeable projects and actions occurring at the same time and in the same place. The likelihood of this happening and resulting in noise levels that would exceed thresholds or cause a substantial temporary increase in noise levels is remote even with projected population growth; moreover, noise impacts from the Program would be temporary, lasting only a brief period of time at any given location, after which time the noise would cease. Thus, the potential for cumulative impacts is low, and any impacts that could occur would be of short duration and less than significant. The incremental noise impacts from any of the Program components, individually or in combination for the entire Program, would not be cumulatively considerable and would not trigger cumulative noise impacts in a given area.

13.11 Summary of Cumulative Impacts

None of the Program components would have incremental impacts that would be cumulatively considerable, with the exception of the potential future application of naled at lower San Mateo Creek. Furthermore, when the components are combined into the overall Proposed Program, the collective incremental impacts would not be cumulatively considerable except for the use of the organophosphate naled due to its breakdown product dichlorvos and its potential impact on water quality. The conclusions on cumulative impacts by resource or environmental topic are summarized as follows:

> Land Use and Planning: No cumulative significant impacts to urban and rural land uses or planning are anticipated when all of the Program's incremental impacts and the impacts of other activities in the region are considered together. The majority of District activities have no impact at all on land use and

planning. The incremental impacts from surveillance and control activities are site-specific, of short duration and temporary and are not considerable.

> Biological Resources- Aquatic: All of the Program components have a less-than-significant or "not considerable" cumulative impact on POD. POD is an existing regional cumulatively significant impact resulting from past, present, and future activities in the Delta and San Francisco Bay involving previous abundance of these species; changes in habitat, particularly changes in turbidity and the salinity field in the Delta, invasive weeds and blue green algae blooms, and ammonia and pyrethroid toxicity; predation, particularly from introduced species such as striped bass, largemouth bass, and Mississippi silversides, and entrainment at the Central Valley Project and State Water Project Diversions; food-web effects from invasive clams; and changes in the phytoplankton and zooplankton community. All of the Program components (both existing and future activities) collectively have a less-than-significant cumulative impact on salmonid population trends which are a baseline cumulative impact in the region and vicinity. The Program would have a less-than-significant cumulative impact on the amount or quality of aquatic habitat from the Physical Control Component. The District's incremental activities associated with the control of invasive weeds under the Vegetation Management Component would not be cumulatively considerable.

> Biological Resources-Terrestrial: The District's Proposed Program does not contribute substantially to pesticide and herbicide exposures in the terrestrial environment. The Chemical Control and Vegetation Management Components have a less-than-significant cumulative impact on terrestrial resources of concern (such as pollinators and CRLF) exposures to herbicides and pesticides even though there is a baseline cumulatively considerable impact within the region. The Program's incremental less-than-significant effects relating to weed abatement activities would not, when executed in compliance with the District BMPs, considered with other weed abatement activities in the Program Area, be cumulatively considerable or significant.

> Ecological Health: While the overall use of pesticides throughout the Program Area may be considered cumulatively significant for some nontarget ecological receptors including honeybees, and CRLF, the District's incremental contributions to this impact, using sound IPM methods as described in the District's IMVMP, are not cumulatively significant. Therefore, the Program's long-term activities including chemical applications would not contribute considerably to ecological health impacts.

> Human Health: While the overall use of pesticides throughout the Program Area may be considered cumulatively significant despite trends showing reductions in use, the District's incremental contributions to this impact, largely consisting of short-term, temporary, and indirect exposures of low-toxicity EPA-registered materials, are not cumulatively significant. Therefore, the Program's long-term activities including chemical applications would not contribute considerably to human health impacts.

> Public Services and Hazard Response: The Proposed Program does not have incremental impacts on public services, and implementation of any of the Program components (individually or in combination, existing and future activities) would not result in a significant contribution to any cumulative public services and hazard response impacts that could result from other projects or population growth in the vicinity of the treatment areas.

> Water Resources: Where receiving waters have been designated as impaired for pesticides used under the District's IMVMP, a cumulatively considerable impact results from all uses of these pesticides or the receiving waters (specifically lower San Mateo Creek) would not be designated as impaired. The District's use of these "impairment chemicals" and others is contributing in less-than-significant amounts to an existing cumulatively considerable impact in the Program Area, and these incremental impacts are not cumulatively considerable except for the use of naled which is cumulatively considerable due to its breakdown product dichlorvos (found in some post-treatment samples from vector control monitoring).

> Air Quality: All of the Program component emissions (separately and combined for the District's entire Program) would be below the significance thresholds for criteria pollutant emissions. The incremental impacts on air quality from the Program components are not individually significant nor are they cumulatively considerable.

> Climate Change: When all Program emissions (all components combined) are viewed in combination with global emission levels that are contributing to the existing cumulative impact on global climate change, the incremental contribution of these Program emissions would not be cumulatively considerable because they occur intermittently (i.e., not stationary sources), and fall well below the presumptive BAAQD threshold for nonstationary sources.

> Noise: Any impacts that could occur would be of short duration and less than significant. The incremental noise impacts from any of the Program components individually and when combined would not be cumulatively considerable and would not trigger cumulative noise impacts.