3.9 Public Health and Vector Management

This section of the Final EIS/R describes the existing public health and vector management within the Phase 2 project area and analyzes whether implementation of the project would cause a substantial adverse effect on public health and vector management from project implementation. The information presented is based on a review of existing public health and vector management within the area, and other pertinent federal, state and local regulations, presented in the regulatory framework setting section. Using this information as context, an analysis of public health and vector management-related environmental impacts of the project is presented for each alternative. Mitigation measures described in Chapter 2 would be implemented with the project. Therefore, this section only includes additional mitigation measures as needed.

3.9.1 Physical Setting

Methodology

The development of the baseline conditions, significance criteria, and impact analysis in this section is commensurate to and reliant on the analysis conducted in the 2007 South Bay Salt Pond (SBSP) Restoration Project Environmental Impact Statement/Report (2007 EIS/R). The baseline condition specific to the pond clusters is based on the current condition of these areas. This is based on information and data gathered for preparation of this Final EIS/R.

Regional Setting

As stated in the Programmatic EIS/R for the SBSP Restoration Project, there are five species of mosquitoes that are routinely controlled by the mosquito and vector control agencies in the South San Francisco Bay area: the summer salt marsh mosquito (*Aedes dorsalis*), winter salt marsh mosquito (*Aedes squamiger*), Washino's mosquito (*Aedes washinoi*), western encephalitis mosquito (*Culex tarsalis*), and winter marsh mosquito (*Culiseta inornata*).

The ecology of these mosquitoes is summarized in the Programmatic EIS/R. All five of these species can be found in the Refuge, and individuals can disperse distances that are large enough for breeding populations to migrate into the Refuge from other areas or to disperse from the Refuge into other locations. None of these species are specific to the Refuge. Within the SBSP Restoration Project Area, the Alameda County Mosquito Abatement District, Santa Clara Vector Control District, and San Mateo County Mosquito Abatement District are responsible for managing the populations of mosquitoes for their respective communities.

Project Setting

Potential habitats for several mosquito species are found in the Phase 2 pond clusters. These species are described in detail in the Programmatic EIS/R for the SBSP Restoration Project. Table 3.10-1 of the Programmatic EIS/R listed the habitat types in the SBSP Restoration Project and the mosquito species associated with those habitats. A similar table is provided in Table 3.9-1, below. Table 3.9-1 also identifies which ponds in Phase 2 correspond with which habitat under the existing conditions. Refer to Section 3.5.1 in Section 3.5, Biological Resources, for a detailed description of the habitats present in the Phase 2 pond clusters.

Table 3.9-1 Mosquito Species Found in Marsh Habitats in the SBSP Restoration Project Phase 2 Area

HABITATS	MOSQUITO SPECIES	PHASE 2 POND CLUSTER
Open salt pond with vigorous wave action, tidal mudflat, high salinity salt ponds	none	Mountain View Ponds (Ponds A1 and A2W; Charleston Slough); Ravenswood Ponds (S5, R5, R3 and R4).
Fully tidal salt marsh: Higher ground with pools or borrow channels that do not flush	*Aedes squamiger* (winter), *Aedes melanimon* (fall), *Aedes dorsalis* (summer), *Aedes taeniorhynchus* (summer), *Culiseta inornata* (winter)	Island Ponds ; Mountain View Ponds (fringe marsh); Ravenswood Ponds (fringe marsh and Flood Slough)
Muted tidal salt marsh: Pools and channels that do not flush vigorously	*Aedes squamiger* (winter), *Aedes melanimon* (fall), *Aedes dorsalis* (summer), *Aedes taeniorhynchus* (summer), *Culiseta inornata* (winter)	A8 Ponds
Seasonal wetland: Brackish to nearly fresh water pools with vegetated margins	*Aedes squamiger* (winter), *Aedes melanimon* (fall), *Aedes dorsalis* (summer), *Aedes taeniorhynchus* (summer), *Aedes washinoi* (winter fresh water), *Culex tarsalis* (spring, summer), *Culex erythrothorax* (summer in tules), *Culex pipiens* (foul fresh water), *Culiseta incidens* (spring, fall fresh water), *Culiseta inornata* (winter)	None
Vernal pools, upland fresh water marsh	*Aedes washinoi* (winter), *Culex tarsalis* (spring, summer), *Culex erythrothorax* (summer in tules), *Culex pipiens* (foul fresh water), *Culiseta incidens* (spring, fall fresh water), *Culiseta inornata* (winter)	None

Tidal marshes that lack vigorous tidal flow can provide suitable mosquito breeding habitat. Functional tidal marshes with vigorous tidal flows do not provide high-quality habitat for the most troublesome mosquito species in the Bay Area, and maintenance and restoration of natural tidal flushing in these marshes is effective at limiting mosquito populations while sustaining the natural hydrology of the marsh (San Francisco Bay Joint Venture 2004, as cited in the 2007 EIS/R). Salt marshes at the southern end of San Francisco Bay that do not have vigorous tidal flow produce a single seasonal brood of the winter salt marsh mosquito and multiple broods of the summer salt marsh mosquito each season.

The mosquito and vector control management that occurs within the SBSP Restoration Project Area is consistent with the Refuge Mosquito and Mosquito-Borne Disease Management Policy and the Comprehensive Conservation Plan (CCP), is conducted by the local mosquito abatement districts (MADs), and follows the AMP techniques. The Refuge staff coordinates annually with the MADs to allow the monitoring and, if necessary, control of mosquitoes on the Refuge to minimize public health risks from mosquito-borne diseases. Wetland management BMPs for proactive mosquito control are regularly used. These include, but are not limited to, water management techniques, and maintenance and improvement of water control structures. Refuge staff coordinates with the MADs on timing of irrigations, flood-up schedules, and communication of any problems with unplanned flooding. The goal of the Vector Control portion of the AMP is to maintain or improve current levels of vector management. Through the AMP, mosquito and vector control focuses on monitoring for specific triggers and implementing management actions after a trigger has been signaled. Monitoring protocols have been employed to pinpoint problem areas for vector management. Monitoring parameters include:

- Presence/absence of mosquitoes in former salt ponds
- Number of acres of breeding mosquitoes
- Number of larvae/dip in potential breeding habitat
- Number of acres within the project area treated for mosquitoes
- Costs/level of effort (e.g., hours spent in treatment, amount of material applied, helicopter cost, etc.) to control mosquitoes

If any of the Vector Control AMP management triggers are signaled, AMP management actions are deployed. Management actions are triggered when the following circumstances are discovered as a result of monitoring:

- Detection of breeding mosquitoes in a former salt pond;
- Detectable increase in monitoring parameters (relative to the baseline), particularly in areas with human activity/exposure; and
- Detection of mosquitoes that are known disease vectors and/or are of particular concern (i.e., *Aedes squamiger*, *A. dorsalis*) in the Project Area.

The AMP lists and describes the following vector control management actions and directs implementation of the following activities when necessary:

- Adjust design to enhance drainage or tidal flushing, control vegetation in ponded areas, and/or facilitate access (for control) to marsh ponds
- Increase level of vector control (preferably only as an interim measure while design issues are addressed to reduce mosquito breeding habitat)
- Study relationships of fish abundance and community composition and mosquito larval abundance in marsh features (e.g., ponds and pannes) and managed ponds
- Ensure management actions throughout implementation of the AMP are consistent with Refuge mosquito management policies

In addition to the actions listed in the AMP, the Refuge will continue to work with the mosquito abatement districts to develop designs that minimize the risks of developing breeding habitat and that allow access to the restoration areas for mosquito monitoring and control.

Vector control of the portions of the project area located outside of the Refuge are under the jurisdiction of the applicable MAD. For example, vector control of Charleston Slough, which is part of the Alviso-Mountain View Pond cluster, is implemented by the Santa Clara County Vector Control District. Vector control of Flood Slough, which is part of the Ravenswood Pond cluster, is implemented by the San Mateo County Mosquito Abatement District. These local agencies employ similar methods for vector control at these locations as they employ within the Refuge through implementation of the CCP and AMP.

Mosquito control techniques employed by the MADs and the Refuge emphasize minimization and disruption of suitable habitat, and control of larvae through chemical and biological means, as opposed to spraying of adults. Control techniques most often include source reduction, source prevention, larviciding,

use of predatory fish, and use of bacteria that are toxic to mosquito larvae. The MADs thereby minimize the number and severity of mosquito outbreaks and to address those that do occur. The environmental baseline does not have significant mosquito-control or vector-related public health problems, particularly not within the Phase 2 project areas, which are public spaces and do not have homes or businesses within them.

3.9.2 Regulatory Setting

Mosquito management that occurs within the Refuge is consistent with the Refuge Mosquito and Mosquito-Borne Disease Management Policy (draft October 2007), and management that occurs in the Phase 2 project areas outside of the Refuge boundaries are consistent with the policies of the local MADs. The activities of MADs are governed by Federal and State regulations including the CWA, ESA, Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), California Health and Safety Code, and California Food and Agriculture Code.

The MADs discharge aquatic pesticides and biological control into Waters of the United States pursuant to the NPDES permit program. These permits are occasionally amended or replaced.

The MADs follow specific protocol to avoid affecting endangered species. Within the Refuge, they coordinate with the Refuge staff and follow protocols dictated by the general operations and maintenance of the Refuge and the AMP for Vector Control to avoid effects to sensitive species or their habitat (i.e. nesting birds or endangered species habitat) when conducting vector control activities. Additional procedural processes are necessary, including consultation with wildlife agencies, if an endangered species or designated critical habitat would be adversely affected from vector control activities, which would result in additional measures to be implemented to minimize affects to endangered species or designated critical habitat.

Per FIFRA, any pesticide that is used must be licensed by the EPA Environmental Protection Agency and used in accordance with the specifications and labeled directions. Additionally, MADs can only use pesticides that are registered for use in California. Individuals must be certified by the California Department of Health Services to apply pesticides or work under the direct supervision of somebody that is certified (CDPH 2005).

3.9.3 Environmental Impacts and Mitigation Measures

Overview

The thresholds of significance for potential Phase 2 impacts to public health and vector management follow. The rationale for the potential impacts as they relate to the significance criteria can be found in Section 3.10.3 of the PEIS/R and in summary form below. In tiering from the PEIS/R, the impacts and analysis for Phase 2 matches the style, format, and content contained in the PEIS/R and considers new effects under Phase 2 that had not been specifically considered in the PEIS/R.

Significance Criteria

The threshold of significance is defined in the Programmatic EIS/R as a substantial increase in the need for vector management activities in any of the Phase 2 Project Areas as a result of Phase 2 activities.

As explained in Section 3.1.2, while both CEQ Regulations for Implementing NEPA and the CEQA Guidelines were considered during the impact analysis, impacts identified in this Final EIS/R are

characterized using CEQA terminology. Please refer to Section 3.1.2 for a description of the terminology used to explain the severity of the impacts.

Program-Level Evaluation Summary

The determination was made in the SBSP Restoration Project Programmatic EIS/R that under the implementation of Programmatic Alternative C, there would be a less than significant impact to public health and vector management. The alternative would result in a less than significant increase in mosquito populations and would not result in a substantial increase in the need for vector management activities through the implementation of the AMP.

Project-Level Evaluation

Phase 2 Impact 3.9-1: Potential increase in mosquito populations.

Alviso-Island Ponds

Alternative Island A (No Action). Under Alternative Island A, Ponds A19, A20, and A21 would continue to receive tidal action through their existing levee breaches. These ponds are currently partially covered with marsh vegetation, partially sediment or bare ground, and partially water-filled. The relative amounts of each of these cover types varies with the tide stage, though sediment and marsh vegetation have been increasing since these ponds were breached in 2006. Under Island A, the ponds would continue to transition to tidal marshes and the existing breached levees would naturally degrade. The continual transition of these ponds to tidal marshes would likely result in a slight decrease in potential mosquito breeding habitat because the ponds could be flushed more thoroughly with the tides.

Mosquito and vector management would continue to follow the Vector Control AMP and the general operations and maintenance of the Refuge, as described above, and be in accordance with current USFWS practices. Because no new construction would occur under Alternative Island A, the AMP management actions would be limited to adjusting the level of vector control at the ponds as needed and ensuring AMP activities under AMP categories other than the Vector Control category are consistent with the Refuge mosquito management practices. By design, the established AMP management triggers would lead to the implementation of the AMP management actions early enough to avoid substantial increases in the need for vector management activities. They would also minimize potential increases in mosquito populations. Therefore, impacts under Alternative Island A would be less than significant.

Alternative Island A Level of Significance: Less than Significant

Alternative Island B. The Alviso-Island Ponds would continue to receive tidal action under Alternative Island B. This alternative would result in an increase of tidal flushing for Ponds A19 and A20 (but not A21) and all ponds would continue to transition into tidal marshes. The transition of these ponds to tidal marshes with an increase in tidal action would likely result in a decrease in potential mosquito breeding habitat because the ponds would be flushed more thoroughly with the tides, especially for Ponds A19 and A20 in comparison to Alternative Island A.

As described in more detail above in the analysis for Alternative Island A, mosquito and vector management would continue to follow Vector Control AMP and the general operations and maintenance of the Refuge. Differing from Alternative Island A, for Ponds A19 and A20, AMP management actions could include adjustments in the construction design and implementation to enhance pond drainage or

tidal flushing. This activity would not occur at Pond A21 because no construction is proposed for this pond under this alternative. By design, the implementation of the AMP management actions would occur early enough, due to the established AMP management triggers, to avoid substantial increases in the need for vector management activities while minimizing potential increases in mosquito populations. Therefore, impacts under Alternative Island B would be less than significant.

Alternative Island B Level of Significance: Less than Significant

Alternative Island C. The Alviso-Island Ponds would continue to receive tidal action under Alternative Island C. Compared to Alternative Island A and Alternative Island B, this alternative would result in an increase of tidal flushing for all three ponds and all ponds would likely transition more rapidly into tidal marshes compared to the other alternatives. The proposed breaches and lowering of various levees and creation of pilot channels in Pond A19 would result in an increase in tidal flushing for the Island Ponds. The transition of these ponds to tidal marshes with an increase in tidal action and tidal flushing would result in a general decrease in potential mosquito breeding habitat in comparison to Alternative Island A and Alternative Island B.

Similar to the other alternatives for the Island Ponds and as described in more detail above in the analysis for Alternative Island A, mosquito and vector management would continue to follow the Comprehensive Conservation Plan, the general operations and maintenance of the Refuge, and the AMP for Vector Control. AMP management actions could include adjustments in the construction design and implementation to enhance pond drainage or tidal flushing. Because of the extent of construction at the ponds under this alternative, this alternative would allow for the most opportunity to adjust the design for the most optimized drainage and tidal flushing that would allow for optimal future vector control. By design, the implementation of the AMP management actions would occur early enough, due to the established AMP management triggers, to avoid substantial increases in the need for vector management activities while minimizing potential increases in mosquito populations. Therefore, impacts under Alternative Island C would be less than significant.

Alternative Island C Level of Significance: Less than Significant

Alviso-Mountain View Ponds

Alternative Mountain View A (No Action). Under Alternative Mountain View A, Ponds A1 and A2W would remain partially managed ponds, and the fringing marsh outside of the ponds and sloughs levees, Permanente Creek, and Mt. View Slough would continue to exist in their current state. Mosquito and vector management would continue to follow the Vector Control AMP and the general operations and maintenance of the Refuge. AMP management actions could include adjustments in the construction design and implementation for activities such as levee maintenance to enhance drainage. For these ponds, the AMP management actions could also include increasing the level of vector control at the ponds and ensuring AMP activities under AMP categories other than the Vector Control category are consistent with the Refuge mosquito management practices. By design, the implementation of the AMP management actions would occur early enough, due to the established AMP management triggers, to avoid substantial increases in the need for vector management activities while minimizing potential increases in mosquito populations. Therefore, impacts under Alternative Mountain View A would be less than significant. Under this alternative, Charleston Slough would continue to be managed and maintained as it currently is by the City of Mountain View and would not be managed under the purview of the AMP.

Alternative Mountain View A Level of Significance: Less than Significant

Alternative Mountain View B. Ponds A1 and A2W would be breached to open them to tidal action under Alternative Mountain View B. This would begin their transition into tidal marshes. Opening these ponds to tidal flows would likely result in an increase in mosquito habitat relative to the existing conditions. As outlined in Table 3.9-1, tidal marshes (once they are established) are suitable habitat for some mosquito species, while the currently large salt ponds with vigorous wind action provide minimal habitat. Thus, there could be an increase the potential habitat for some types of salt marsh mosquito species. Also, constructing new upland areas (e.g., habitat transition zones) that would pool water could likely result in an overall increase in potential mosquito breeding habitat if they are not designed, constructed, and maintained so that water does not pool in them and allow mosquito breeding.

Similar to Alternative Mountain View A, mosquito and vector management would continue to follow general operations and maintenance of the Refuge and the AMP for Vector Control. Upland transition zones, habitat islands, and the raised levee could potentially provide depressions that could fill with water and support mosquitoes, but through the implementation of the AMP, the design of these upland areas would be designed to enhance drainage. Additionally, the upland transition zones and raised levee would be located to allow access for mosquito control. By design, the implementation of the AMP management actions would occur early enough, due to the established AMP management triggers, to avoid substantial increases in the need for vector management activities while minimizing potential increases in mosquito populations. Therefore, impacts under Alternative Mountain View B would be less than significant.

Alternative Mountain View B Level of Significance: Less than Significant

Alternative Mountain View C. Ponds A1 and A2W would be breached to open them to tidal action under Alternative Mountain View C and would begin transition into tidal marshes. The removal of the existing tide gate/water control structure at Charleston Slough would open the slough to tidal flows. The ability for these water bodies to flush with the tide and the construction and maintenance of new upland areas (e.g., habitat transition zones) that would not pool water would likely result in an overall decrease in potential mosquito breeding habitat for the salt marsh mosquito species as outlined in Table 3.9-1. Compared to Alternative Mountain View B, this alternative would result in a more thorough tidal flushing and would result in a greater decrease in potential mosquito breeding habitat in comparison to Alternative Mountain View B.

The AMP and the general operations and maintenance of the Refuge would be implemented in the same manner as described above under Alternative Mountain View B. By design, the implementation of the AMP management actions would occur early enough, due to the established AMP management triggers,) to avoid substantial increases in the need for vector management activities while minimizing potential increases in mosquito populations. Therefore, impacts under Alternative Mountain View C would be less than significant.

Alternative Mountain View C Level of Significance: Less than Significant

Alviso-A8 Ponds

Alternative A8 A (No Action). Under Alternative A8 A, the A8 Ponds would continue to function as muted tidal marsh. Mosquito and vector management would continue to follow the AMP and the general operations and maintenance of the Refuge for Vector Control. AMP management actions could include adjustments in the construction design and implementation for activities such as levee maintenance to enhance drainage. For these ponds, the AMP management actions could also include increasing the level of vector control at the ponds and ensuring AMP activities under AMP categories other than the Vector

Control category are consistent with the Refuge mosquito management practices. By design, the implementation of the AMP management actions would occur early enough, due to the established AMP management triggers, to avoid substantial increases in the need for vector management activities while minimizing potential increases in mosquito populations. Therefore, impacts under Alternative A8 A would be less than significant.

Alternative A8 A Level of Significance: Less than Significant

Alternative A8 B. The Alviso-A8 Ponds would remain muted tidal marsh under Alternative A8 B. The habitat transition zones would be designed, constructed, and managed to not allow for the development of depressions or pools in which water would collect and in which mosquitoes could breed.

Similar to Alternative A8 A, mosquito and vector management would continue to follow the AMP and the general operations and maintenance of the Refuge, and the AMP for Vector Control. The continual implementation of the AMP would dictate that the proposed upland transition zones and alteration of the pond bottoms would be designed to enhance drainage. Additionally, the habitat transition zones would be located to allow access for mosquito control. By design, the implementation of the AMP management actions would occur early enough, due to the established AMP management triggers and would avoid substantial increases in the need for vector management activities while minimizing potential increases in mosquito populations. Therefore, impacts under Alternative A8 B would be less than significant.

Alternative A8 B Level of Significance: Less than Significant

Ravenswood Ponds

Alternative Ravenswood A (No Action). Under Alternative Ravenswood A, the Ravenswood Ponds would continue to exist in their current state as seasonal ponds that receive rainfall and some runoff in the winter. Mosquito and vector management would continue to follow the AMP and the general operations and maintenance of the Refuge for vector control. AMP management actions could include adjustments in the construction design and implementation for activities such as levee maintenance to enhance drainage. For these ponds, the AMP management actions could also include increasing the level of vector control at the ponds and ensuring AMP activities under AMP categories other than the Vector Control category are consistent with the Refuge mosquito management practices. By design, the implementation of the AMP management actions would occur early enough, due to the established AMP management triggers, to avoid substantial increases in the need for vector management activities while minimizing potential increases in mosquito populations. Therefore, impacts under Alternative Ravenswood A would be less than significant.

Alternative Ravenswood A Level of Significance: Less than Significant

Alternative Ravenswood B. The change in function of several ponds in the Ravenswood Ponds under this alternative would result in a decrease in potential mosquito breeding habitat in the pond cluster. However, the addition of habitat transition zones could provide an increase in potential breeding habitat if not designed, constructed, and maintained to avoid creating areas where water could pool.

The opening of Pond R4 to tidal action would begin transition of this pond to tidal marsh, and alteration of the pond bottom would allow tidal flushing of the pond. As the salinity of Pond R4 decreases and full tidal flushing occurs, the pond would likely transition to become new mosquito breeding habitat for salt marsh mosquito species as outlined in Table 3.9-1. The proposed habitat transition zones would be

designed, constructed, and maintained to not allow the development of depressions or pools in which water would collect and in which mosquitoes could breed.

The change in management of Ponds R5 and S5 from high salinity seasonal ponds to managed pond habitat would result in deeper water in the ponds. Vegetation management could be necessary on the created island. The change in water management in these ponds would likely result in no measureable changes in the amount of potential breeding habitat.

Potential mosquito breeding habitat would not change for Pond R3 or any of the adjacent sloughs that are part of the Ravenswood Ponds. However, the addition of a water control structure to Pond R3 could enable better active management of water levels and salinity in Pond R3, which could potentially limit the availability of breeding habitat in the pond. The use of a water control structure or tide gate between Flood Slough and Ponds R5and S5 would not change the mosquito habitat in Flood Slough because the slough would continue to function as a tidal marsh, and Ponds R5 and S5 would be managed to avoid increasing habitat.

Similar to Alternative Ravenswood A, mosquito and vector management would continue to follow the general operations and maintenance of the Refuge and the AMP for Vector Control. Implementation of the AMP would result in the design of upland areas, including upland transition zones, habitat islands, and levees to have enhanced drainage and have minimal locations for new mosquito breeding habitat. Additionally, the upland transition zones and raised levee would be located to allow access for mosquito control. By design, the implementation of the AMP management actions would occur early enough, due to the established AMP management triggers, to avoid substantial increases in the need for vector management activities while minimizing potential increases in mosquito populations. Therefore, impacts under Alternative Ravenswood B would be less than significant.

Alternative Ravenswood B Level of Significance: Less than Significant

Alternative Ravenswood C. The change in function of several ponds in the Ravenswood Pond Cluster under this alternative would result in a decrease in potential mosquito breeding habitat in the pond cluster. However, the addition of habitat transition zones could provide an increase in potential breeding habitat if not designed, constructed, and maintained to avoid creating areas where water could pool. The effects to mosquito breeding habitat and vector control under this alternative would be very similar as described under Alternative Ravenswood B.

Over time at Pond R3, the salinity of water in the pond could be reduced and pooled water in the pond could become new mosquito breeding habitat for salt marsh mosquito species; however, the active management of water levels in Pond R3 would allow for control of the water in the pond and could potentially limit the availability of breeding habitat in the pond. At Pond R4, tidal flushing would likely be more thorough under this alternative because of the additional levee breach, which would further reduce potential mosquito breeding habitat compared to Alternative Ravenswood B.

The general operations and maintenance of the Refuge and the AMP would be implemented in the same manner as described above under Alternative Ravenswood B. By design, the implementation of the AMP management actions would occur early enough, due to the established AMP management triggers to avoid substantial increases in the need for vector management activities while minimizing potential increases in mosquito populations. Therefore, impacts under Alternative Ravenswood C would be less than significant.

Alternative Ravenswood C Level of Significance: Less than Significant

Alternative Ravenswood D. The change in function of several ponds in the Ravenswood Ponds under this alternative would result in a decrease in potential mosquito breeding habitat in the pond cluster. However, the addition of habitat transition zones could provide an increase in potential breeding habitat if not designed, constructed, and maintained to avoid creating areas where water could pool. The effects to mosquito breeding habitat and vector control under this alternative would be very similar as described under Alternative Ravenswood B and Alternative Ravenswood C except for Pond R4. Compared to the other action alternatives, tidal flushing would be less in Pond R4 because there would only be a single point (levee breach) for tidal activity to regularly enter and exit the pond. This would result in less tidal exchange in the pond, and, compared to other alternatives, there would be a greater potential for mosquito breeding habitat to develop.

The general operations and maintenance of the Refuge and the AMP would be implemented in the same manner as described above under Alternative Ravenswood B. By design, the implementation of the AMP management actions would occur early enough, due to the established AMP management triggers, to avoid substantial increases in the need for vector management activities while minimizing potential increases in mosquito populations. Therefore, impacts under Alternative Ravenswood D would be less than significant.

Alternative Ravenswood D Level of Significance: Less than Significant

Impact Summary

Phase 2 impacts and levels of significance are summarized in Table 3.9-2. The levels of significance are those remaining after implementation of program-level mitigation measures, project-level design features and the Adaptive Management Plan and other Refuge management documents and practices. The Public Health and Vector Management analysis required no project-level mitigation measures in order to reduce the impacts to a level that was less than significant.

Table 3.9-2 Phase 2 Summary of Impacts – Public Health and Vector Management

IMPACT	ALTERNATIVE											
	ISLAND			MOUNTAIN VIEW			A8		RAVENSWOOD			
	A	B	C	A	B	C	A	B	A	B	C	D
Phase 2 Impact 3.9-1: Potential increase in mosquito populations.	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Notes: Alternative A at each pond cluster is the No Action (No Project Alternative under CEQA). LTS = Less than Significant												