Attachment 23

Draft EIR, Chapter IV.I
Public Services

IV. ENVIRONMENTAL IMPACT ANALYSIS
I. PUBLIC SERVICES

1. INTRODUCTION

This section of the Draft EIR evaluates potential impacts to public services that may result from implementation of the Proposed Project. This chapter summarizes public services including emergency services such as fire and police protection, schools, parks, but primarily focuses on the Proposed Project's potential effects on public services related to modifying flood control infrastructure, altering habitat for potential disease vectors (i.e., mosquitoes), and the effects of vacating portions of Liberty Island Road. Descriptions and analyses in this section are based on information provided by Federal regulations (such as Corps guidance on levee construction), State regulations (such as California Code of Regulations Title 23), regulatory plans (such as the Delta Plan and the Central Valley Flood Protection Plan), Proposed Project plans, and various reports and literature. This includes the following technical reports, which were prepared for the Proposed Project and are available upon request from FRPA@water.ca.gov with a subject line of "Lookout Slough Information Request":

- Appendix C – Lookout Slough Tidal Habitat Restoration and Flood Improvement Project 65% Geotechnical Basis of Design Report, Blackburn Consulting, December 2019
- Appendix D – Lookout Slough Tidal Habitat Restoration and Flood Improvement Project 65% Basis of Design Report, Wood Rogers, December 2019

2. ENVIRONMENTAL SETTING

a. Emergency Services – Fire Protection

Fire protection services for the Proposed Project Site and its surroundings are provided by the Dixon Fire Department (Fire Department). The Fire Department serves the 6.7-square-mile City of Dixon and 320 square miles of nearby unincorporated county, with a total service population of approximately 25,000 people. In 2017, the Fire Department responded to roughly 2,500 calls for service, the majority of which (~1,500) were rescue or emergency medical services-related.[1,2] The Fire Department has a goal of arriving on the scene of a call within 7 minutes 90% of the

[1] *City of Dixon, "About the Dixon Fire Department | Dixon, CA - Official Website," accessed October 29, 2019, https://www.cityofdixon.us/300/About-the-Department.*

[2] *Dixon Fire Department, "Dixon Fire Department 2017 Annual Report," 2017, https://www.cityofdixon.us/DocumentCenter/View/9729/2017-Annual-Report?bidId=.*

time. At the time its Strategic Plan was written, the Fire Department had a 90% performance of approximately 18 minutes.[3]

b. Emergency Services – Police Protection

Police services for unincorporated Solano County, including the Proposed Project Site, are offered by the Solano County Sheriff's Department (Sheriff). The Sheriff's Marine Patrol Unit provides police services for approximately 150 miles of Solano County waterways. In 2016, the Marine Patrol Unit responded to 14 search and rescue cases, six boating accidents, 47 vessel assists, and 537 boat inspections, and issued 625 warnings/citations.[4] On dry land, the Sheriff's Patrol bureau serves 900 square miles of unincorporated county.[5]

In addition to the Solano County Sheriff's Marine Patrol Unit, the United States Coast Guard (Coast Guard) provides law enforcement and emergency services for waterways near the Proposed Project Site. The Coast Guard has enforcement authority in federally navigable waters, as well as responsibility for search and rescue, environmental protection, and navigation aid.

c. Schools

School services for the portion of unincorporated Solano County that includes the Proposed Project Site are DH White Elementary School, Riverview Middle School, and Rio Vista High School of the River Delta Unified School District in the City of Rio Vista.[6]

d. Parks

Detailed setting information on parks is provided in Chapter IV.J, Recreation. Throughout the Delta, there are a variety of city and County parks that accommodate many recreational uses, including fishing, birding, hunting, boating, and other regionally popular activities. There are no city or County parks near the Proposed Project Site. The Reserve however, is a CDFW managed conservation area that is open to public recreation and located to the east of the Proposed Project Site across Shag Slough. The Reserve is accessed primarily by boat with pedestrian access via Liberty Island Road and the Shag Slough Bridge.

e. "Other Public Services" – Flood Control

As the Proposed Project would involve modifications to levees, this analysis of "Other Public Services" considers the Proposed Project's potential impacts on public flood control services. Flood control infrastructure such as pumps, weirs, flood walls, and an extensive levee network protect life and property in the Delta, contributing to the social, cultural, and economic health of the surrounding communities. In the Cache Slough Complex, DWR and local maintaining

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[3] *Dixon Fire Department and Citygate Associates, "Development of a Long-Range Strategic Plan for the City of Dixon Fire Department: Final Report, Volume 1 of 2," February 22, 2007, https://www.cityofdixon.us/DocumentCenter/View/277/Volume-1---Dixon-Final-Report?bidId=.*

[4] *Alameda County Sheriff's Office, "Airport and Marine Patrol Police Services," Alameda County Sheriff's Office, accessed July 16, 2018, https://www.alamedacountysheriff.org/les_airport.php.*

[5] *Solano County Sheriff's Office, "Solano County Sheriff's Office 2016 Annual Report," 2016, http://www.solanocounty.com/civicax/filebank/blobdload.aspx?blobid=26719.*

[6] *Solano County, "Solano County - General Plan," November 4, 2008, https://www.solanocounty.com/depts/rm/planning/general_plan.asp.*

agencies, including RDs, are responsible for flood control services, including levee maintenance. The Corps and the Central Valley Flood Protection Board oversee levee maintenance and modification as the primary regulatory authorities with jurisdiction over the region's flood control levees.

Lands within and adjacent to the Proposed Project Site are presently protected by levees maintained by RDs 2098, 2068, 2060, and 2104. Other nearby lands are protected by levees maintained by RDs 146, 501, 536, 1667, 2084, and 2093.

Levees bounding the Proposed Project Site include the Shag Slough Levee (RD 2098 Unit 1, Yolo Bypass West Levee), the Cross Levee and the southern portion of the Cache/Hass Slough Levee (collectively RD 2098 Unit 2, Cross Levee and Cache Slough East Levee), and the northern portion of Cache/Hass Slough Levee (RD 2098 Unit 3, Hass Slough East Levee). The Corps improved existing levees along the eastern, western, and southern boundaries of RD 2098 along Cache (in 1935), Hass (in 1936), and Shag (in 1961) Sloughs as part of the Sacramento River Flood Control Project (SRFCP). Currently these levees are maintained by RD 2098 utilizing maintenance fees collected from private landowners with some supplemental funding coming from County property taxes.[7] RD 2098 presently oversees approximately 10.97 miles of levee, spending approximately $38,000 annually on maintenance.

The Shag Slough Levee was designed and constructed with a crest of approximately six feet above the 1957 design water surface profile while the Cache/Hass Slough Levee was constructed with a crest approximately three feet above the 1957 design water surface profile. Over time the Cache/Hass Slough Levee has consolidated due to poor soil foundation conditions, with portions of the crest of the levee at approximately one foot above the 1957 design water surface profile. The 1957 design profile is based on specified design discharges and adopted concurrent conditions at confluences of streams within the Sacramento River Flood Control Project. In this portion of the Yolo Bypass, the 1957 design profile was scaled from the 1907 and 1909 floods, based on the authorized design flow of 490,000 cubic feet per second. The six-foot freeboard criterion for the Shag Slough Levee was intended to provide a factor of safety for both flood stages and wind-wave run-up in the Yolo Bypass.[8]

The Shag Slough Levee is part of a larger flood control system along the Yolo Bypass. The Yolo Bypass is a 59,000-acre floodway that, as part of the Sacramento River Flood Control Project, provides flood relief for the greater Sacramento Region during heavy rainfall and snowmelt events.[9] The Yolo Bypass' design capacity ranges from 343,000 cubic feet per second to 500,000

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7 *Michael Brandman Associates, "FINAL Municipal Service Review: Solano County Water, Irrigation, Reclamation, and Flood Management Agencies" (Solano County LAFCO, April 13, 2009), http://www.solanolafco.com/Studies/MSR/SpecialDistricts/WaterMSRfinalApril132009.pdf.*

8 *Environmental Science Associates, "Baseline Study Deliverable for Flood Conveyance Optimization: Lookout Slough Tidal Habitat Restoration and Flood Improvement Project" (Sacramento, CA, June 2019).*

9 *UC Davis Center for Watershed Sciences, "Yolo Bypass: The Inland Sea of Sacramento," California WaterBlog (blog), February 21, 2017, https://californiawaterblog.com/2017/02/20/yolo-bypass-the-inland-sea-of-sacramento/.*

cubic feet per second.[10] Most of the Proposed Project Site, along with land under the jurisdiction of RD 2068 and 2060 to the north and west are located within the Yolo Bypass' historic 100-year floodplain, but have been isolated from the floodplain by levees.

f. "Other Public Services" – Vector Control

The Solano County Mosquito Abatement District (Abatement District), is an independent special district responsible for mosquito abatement throughout incorporated and unincorporated Solano County, serving a total area of approximately 829 square miles. The Abatement District was originally organized in 1930 under the Mosquito Abatement District Act of 1915 (Health and Safety Code Section 2000-2093). This Act was amended in 2002 and is now referred to as the Mosquito Abatement and Vector Control District Law.

The Mosquito Abatement District aims to control mosquitoes which may bring disease or harassment to humans and/or domestic animals through a variety of natural, physical, and chemical control measures. There are 21 mosquito species known to occur in Solano County, 12 of which are managed by the Abatement District.[11]

Of the 12 mosquito species managed, some are aggressive nuisance biters or can transmit viruses that are harmful to human, wildlife, and domestic animals. The Mosquito Abatement District website highlights six species as aggressive biters that may be detrimental to livestock operations (California salt marsh mosquito [*Ochlerotatus squamiger*], foul water mosquito [*Culex stigmatosoma*], house mosquito [*Culex pipiens* spp.], duck club *Ochlerotatus malanimon*, pale marsh mosquito [*Ochlerotatus dorsalis*], and pasture mosquito [*Aedes nigromaculis*]). All but California salt marsh mosquito are considered vectors of diseases such as West Nile virus and encephalitis.[12]

Despite varying habitat requirements among different mosquito species, all mosquitoes require standing water to reproduce.[13] In general, habitat that has shallow standing water for five or more consecutive days, poor-draining substrates, flat to gently-sloping surfaces, low turbulence, gradually-fluctuating water levels, dense vegetation, and high decomposition rates has favorable breeding conditions for mosquitoes.[14] Conversely, wetland habitat with strong daily tidal fluctuations, open waters, surface turbulence, and habitat for predators inhibit mosquito productivity.

The Proposed Project Site presently contains standing water in Lookout Slough, Sycamore Slough, irrigation and drainage ditches, and managed wetland cells. Lookout and Sycamore

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10 *Yolo County, "Yolo Bypass Drainage and Water Infrastructure Improvement Study," April 2014, https://www.yolocounty.org/home/showdocument?id=23985.*

11 *Solano County Mosquito Abatement District and Cardno, "Integrated Mosquito Management Program Draft Programmatic EIR," April 2014, https://bfae60b9-24e5-4ef9-a27d-bc1adf3140ab.filesusr.com/ugd/251dec_6ee12370c96e4c6690bec83ae854874e.pdf.*

12 *"Solano County Mosquito Abatement District," Solano Co Mosquito, accessed June 10, 2019, https://www.solanomosquito.com/mosquitoes.*

13 *"Solano County Mosquito Abatement District."*

14 *BF Eldridge, "Biology and Control of Mosquitoes. Prepared in Colaboration with Vector-Borne Disease Section, Center for Infectious Diseases, and California Department of Public Health.," 2008.*

Sloughs, and parts of managed wetland cells in the southern portion of the site contain relatively deep waters, limiting their utility as mosquito breeding habitat. Shallow irrigation and drainage ditches and most managed wetland cells within Liberty Farms, on the other hand, provide shallow standing water habitat that may currently provide quality mosquito breeding habitat.

3. REGULATORY FRAMEWORK

The discussion of the regulatory framework below focuses primarily for flood control protection, for which there are numerous regulations. Further regulatory details are contained in Chapter IV.G, Hydrology and Water Quality, Other public services including emergency services are only regulated at the County or city level.

a. Federal Laws and Regulations

i. Title 33, United States Code (USC), Section 408

Title 33 USC Section 408 provides the Secretary of the Army authority to grant permission to alter a Corps civil works project if the proposed alteration does not impair usefulness of the project and is not injurious to the public interest. In its oversight capacity for levee modifications process, the Corps provides guidelines for levee engineering. Among these are Corps' Engineer Manual titled *Engineering and Design – Design and Construction of Levees* and the Corps' Engineering Technical Letter titled *Engineering and Design – Design Guidance for Levee Underseepage*.[15,16]

Section 408 provides a uniform process for modifications to all types of Corps civil work projects and applies to any action that would build upon, alter, improve, move, occupy, or otherwise affect the project, excepting certain minor actions such as routine operations and maintenance. The Section 408 process typically requires a non-federal project sponsor, an Applicant (if different than the non-federal sponsor), the Corps District 408 coordinator, and a Corps regional integration team. The non-federal sponsor must issue a concurrence and written acknowledgement and acceptance of any new O&M requirements. Where a 404 decision is also required, the 408 and 404 processes should be closely coordinated (see Chapter IV.G, Hydrology and Water Quality, for more on the 404 process).

ii. Title 44, Code of Federal Regulations (CFR), Section 65.10

Title 44 CFR Section 65.10 establishes minimum standards for certified levee design, operation, and maintenance. Procedural guidance issued in 2010 describes the Federal Emergency Management Agency's (FEMA) levee accreditation review process. This "completeness check" is intended to ensure that all requisite data demonstrating compliance with Section 65.10 have been submitted. Factors examined during levee certification include available freeboard, regulatory compliance, operations and maintenance plans, interior drainage, structural design,

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[15] *Department of the Army: U.S. Army Corps of Engineers, "Engineering and Design: Design and Construction of Levees" (Washington D.C., April 30, 2000), https://www.publications.usace.army.mil/Portals/76/Publications/EngineerManuals/EM_1110-2-1913.pdf.*

[16] *Department of the Army: U.S. Army Corps of Engineers, "Engineering and Design: Design Guidance for Levee Underseepage" (Washington D.C., May 1, 2005), https://www.mvn.usace.army.mil/Portals/56/docs/engineering/HurrGuide/ETL_1110-2-569_%20DESIGN_GUIDANCE_FOR_LEVEE_UNDERSEEPAGE_May_2005.pdf.*

inspection reports, and a with and without levee analysis. These checks are performed in three steps that are intended to be carried out sequentially. To be certified, a levee must have a minimum of three feet of freeboard, with an additional one-half foot above the minimum at the upstream end of the levee – tapering to no less than the minimum at the downstream end, and an additional one foot above the minimum within 100 feet of either side of the levee.

b. State Laws and Regulations

i. 2007 California Flood Legislation

In 2007, the California Legislature passed six bills adding to and amending state flood management and land use laws, including Senate Bill (SB) 5 and 17 and Assembly Bill (AB) 5, 70, 156, and 162. These bills added to or amended sections in the California Government Code, Health and Safety Code, Public Resource Code (PRC), and Water Code, which have since been updated as recently as 2012. These bills collectively outline a comprehensive approach to flood management as part of the land use planning process. As part of this legislation, SB 5 added language to the Government Code Section 65007(h) requiring cities and counties within the Sacramento-San Joaquin Valley outside of urban settings to make a finding on compliance with the FEMA standard of flood protection before approving, among other things, a discretionary permit or entitlement of any property development or use that is located in a flood hazard zone.

ii. California Code of Regulations, Title 23

Title 23 California Code of Regulations, Section 120 provides levee construction requirements within the jurisdiction of the CVFPB. Section 120 is incorporated by reference and builds upon the Corps' Design and Construction of Levees Manual (EM 1110-2-1913), supplementing Corps requirements with additional standards. Among these requirements are additional analyses for settlement and seepage, freeboard requirements to account for excessive wave action, and granting the CVFPB a permanent easement across the property occupied by the proposed flood control works.

c. Regional Regulations and Plans

i. Delta Plan – Delta Stewardship Council (Council)

Chapter Seven of the Delta Plan contains policies relevant to public services such as flood facilities. Risk Reduction Policy 1 requires prioritization of State investments in Delta levees and risk reduction, including investments in flood risk management such as levee operation, maintenance, and improvements. Risk Reduction Policy 4 states that no encroachment may be allowed or constructed in the Yolo Bypass Floodplain unless it can be demonstrated that the encroachment would not have a significant adverse impact on floodplain values and functions.

ii. Central Valley Flood Protection Plan (Flood Protection Plan)

The Central Valley Flood Protection Plan provides guidance on flood risk management in the Central Valley. The CVFPB adopted the Flood Protection Plan in 2012 and updated it in 2017. The plan outlines strategies to prioritize investments in flood management, promote multi-benefit projects, and integrate and improve ecosystem functions associated with flood risk reduction projects.

iii. Lower Sacramento River/Delta North Regional Flood Management Plan (Regional Flood Management Plan)

The Regional Flood Management Plan was developed in response to the 2012 Central Valley Flood Protection Plan by a working group of North Delta counties, flood agencies, citizens groups, local maintaining agencies, and other interested stakeholders. The Regional Flood Management Plan develops a long-term vision for integrated flood management in the North Delta Region and identifies priority flood control projects.

d. Local Regulations

The following have been considered in the analysis of potential impacts and identification of mitigation, as appropriate.

i. Solano County General Plan

Public Health and Safety Element of the Solano County General Plan contains the following policies related to public services such as flood protection:

> HS.P-6: Work with federal, state, and local agencies to improve flood control and drainage throughout the county.
>
> HS.P-8: Work with responsible parties to ensure dams, levees, and canals throughout the county are properly maintained and/or improved.

ii. Solano County Code

Section 7 of the Solano County Code addresses emergency services by establishing an Office of Emergency Services and assigning it powers and responsibilities. The Office of Emergency Services is a division of the Solano County Sheriff's Office. In the event of an emergency, the director of the Office of Emergency Services has the authority to issue rules and regulations related to the protection of life and property affected by the emergency and to require emergency services of any County officer or employee. The incident commander is responsible for developing and maintaining the County's emergency plan.

4. ENVIRONMENTAL IMPACTS

a. Thresholds of Significance

In accordance with CEQA Guidelines Appendix G, the Proposed Project would have a significant environmental impact if it would:

> a). Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, to maintain acceptable service ratios, response times or other performance objectives for any of the following public services:
>
> i. Fire Protection;
> ii. Police Protection;
> iii. Schools;

iv. Parks; or
v. Other public facilities.

Fire and police protection are discussed concurrently below due to the similar range of Proposed Project elements with potential to affect either type of public services. Due to the nature of the Proposed Project and based on comments received during the EIR scoping process, “other public services” are analyzed in the context of flood control and vector control.

b. Methodology

To be considered a significant environment impact on public services, a project’s effects on service ratios, response times, and other performance objectives must necessitate the construction or expansion of new governmental facilities, the construction or expansion of which may result in a significant environmental impact. Reduction in response time, increase in service ratio, and other adverse effects on performance objectives do not themselves constitute significant environmental impacts. Accordingly, this analysis first considers applicable performance metrics for public services and whether the Proposed Project may directly or indirectly cause an adverse effect on these metrics. This analysis next considers whether any potential effects on service metrics would be sufficiently adverse to necessitate new or physically altered governmental facilities, the construction of which could cause significant environmental impacts.

c. Project Impacts and Mitigation Measures

i.-ii. Adverse physical impacts associated with provision of new or physically altered fire or police protection facilities, the construction of which could cause significant environmental impacts

Towards the beginning of the construction period, vegetation would be removed throughout the Proposed Project Site. Some riparian trees would remain in place, but non-native grassland and other vegetation with potential to serve as fuel for a fire would generally be removed. The Proposed Project Site would remain unvegetated throughout construction. After construction is completed and levees are breached, tidal marsh vegetation is anticipated to naturally colonize the site. Because the Proposed Project Site would be stripped of vegetation in the short-term and colonized by less flammable vegetation than what is currently present in the long-term, fire risk would decline.

Construction activity would temporarily increase demand for emergency medical response by introducing workers using heavy equipment to the site. Construction would increase activity on the site on a daily basis for approximately two years. As further described in the Impacts Found to be Less Than Significant Chapter (IV.A) of this DEIR, ecosystem and levee maintenance activities would generate relatively few vehicle trips at a relatively low frequency (approximately once per month, and once per 90 days, respectively).

Construction work crews of approximately 26 persons, as stated in the Impacts Found to be Less Than Significant Chapter (IV.A), are relatively small in comparison to the overall service population of the Dixon Fire Department (25,000-person service population). Furthermore, the most recently available data indicate the Fire Department’s 90% response rate is approximately 157% above its goal response rate, likely due to the rural, sprawling nature of the area served.

Due to the small number of workers which would potentially require emergency services and the fact that response times are already above target, no new Dixon Fire Department facilities would be needed to serve worker emergency medical needs while maintaining acceptable service ratios.

Beyond construction and maintenance workers, the Proposed Project would not directly or indirectly expand human presence in a manner which would create demand for fire or police services. The Proposed Project Site would be placed under a conservation easement and future facilities which may induce population growth would not be permitted. No new utilities or roads would be constructed which could indirectly induce population growth—although, some modifications to existing infrastructure would occur, including vacation of a portion of Liberty Island Road.

A portion of the terminus of Liberty Island Road would be removed from public use. This includes the north-south section along Shag Slough and the east-west section that is just north of the Project Site. The only effect of removing this road is that the pedestrian access to the Reserve will be eliminated and maintenance access to the bridge will be limited to waterborne vehicles. Pedestrian access to the Reserve is via the structurally deficient Shag Slough Bridge, which cannot support emergency vehicles. However, fire and police protection for the Reserve is also currently provided by boat access from entities with emergency marine services such as the Solano County Sherriff Marine Patrol Division or the Coast Guard.

Demand for fire and police within the Proposed Project Site would be reduced due to discontinuation of farm activities and duck hunting at the Proposed Project Site. The Reserve would continue to provide recreational opportunity, which would be accessible via boat. For recreationalists who continue to use the Reserve, emergency services would need to be provided by entities with marine capabilities, such as those discussed above. As those entities already provide marine emergency services and use of the Reserve is not anticipated to increase, no increased demand would result.

The Proposed Project would not substantially increase need for police or fire service and no new or physically altered facilities would be needed. Therefore, impacts of the Proposed Project would not exceed the applicable threshold of significance related to adverse physical impacts associated with provision of new or physically altered fire or police protection facilities and the Proposed Project would have **no impact** with regard to this threshold.

iii. Adverse physical impacts associated with provision of new or physically altered schools, the construction of which could cause significant environmental impacts

In unincorporated Solano County, most children attend the public school that is geographically nearest to them. For the Proposed Project Site, all such schools are located in Rio Vista and are part of the River Delta Unified School District. None of these schools would experience an increase in demand due to the Proposed Project, as the Proposed Project would not be growth-inducing. No new infrastructure, housing, or places of employment which may induce population growth would be constructed. Modifications to existing electrical, flood control, and transportation infrastructure would occur; none of which would expand service to new areas. As such, there would be no need for new or physically altered schools. Therefore, impacts of the Proposed Project would not exceed the applicable threshold of significance related to adverse physical

impacts associated with provision of new or physically altered schools and the Proposed Project would have **no impact** with regard to this threshold.

iv. Adverse physical impacts associated with provision of new or physically altered parks, the construction of which could cause significant environmental impacts

There are no public city or County parks in the immediate vicinity of the Proposed Project Site. The nearest public park is Sandy Beach Park in Rio Vista, about 10 miles south. Considering that the Proposed Project Site would not increase the population of Solano County, there would be no need for the construction of new park facilities. Although there are no parks present near the site, the Reserve provides recreational opportunity on conservation lands adjacent to the Proposed Project Site. Potential impacts to recreation, including effects on shoreline fishing on the western side of the Reserve, are discussed in further detail in Chapter IV.J, Recreation. Therefore, impacts of the Proposed Project would not exceed the applicable threshold of significance related to adverse physical impacts associated with provision of new or physically altered parks and the Proposed Project would have **no impact** with regard to this threshold.

v. Adverse physical impacts associated with provision of other new or physically altered public service facilities related to flood control, the construction of which could cause significant environmental impacts

These results are discussed in further detail in Chapter IV.G, Hydrology and Water Quality**.**

vi. Adverse physical impacts associated with provision of other new or physically altered public service facilities related to vector control, the construction of which could cause significant environmental impacts

Some mosquito species known to occur in Solano County can transmit diseases such as West Nile Virus, Western equine encephalitis, Saint Louis encephalitis, dog heartworm, and malaria that are harmful to humans, wildlife, and domestic animals. Additionally, some mosquito species in Solano County are aggressive biters of humans and livestock that may pose a nuisance, especially in large numbers. In total, there are 21 species of mosquito known to exist in Solano County, 12 of which are managed by the Mosquito Abatement District, of which six are known to be aggressive biters and are considered disease vectors.[17] Mosquito species managed by Solano County, their potential to transmit diseases or create a nuisance, and their preferred habitat types are summarized in Table IV-I-1 below. Changes in mosquito productivity resulting from alterations to breeding habitat availability have the potential to increase demand for mosquito control programs from the Abatement District, which could have physical, adverse effects on the environment through expanded use of chemical, biological, or other mosquito control methods.

[17] *"Solano County Mosquito Abatement District."*

Table IV-I-1. Managed Mosquito Species of Solano County

Common Name	Disease Vector	Nuisance Biter	Preferred Breeding Habitat
California salt marsh (*Ochelrotatus squamiger*)		X	Salt and brackish marshes following high tides, rains.
Cool weather (*Culiseta incidens*)			Variety of standing water sources, including creeks, brackish water.
Encephalitis (*Culex tarsalis*)	X		Clear standing water, including marshes. Occasionally found in vegetation on stream margin.
Foul water (*Culex stimatosoma*)	X	X	Standing, polluted water, such as sewage, drainage.
House (*Culex pipiens pipiens & Culex pipiens quinqefasciatus*	X		Standing, somewhat polluted water, such as sewage, drainage.
Duck club *Ochlerotatus melanimon*	X	X	Irrigated pasture, duck clubs, alfalfa fields.
Pale marsh (*Ochlerotatus dorsalis*)	X	X	Salt marshes, brackish waters.
Pasture (*Aedes nigromaculis*)		X	Irrigated pasture, drainage ditches, alfalfa fields.
Western tree hole (*Ochlerotatus sierrensis*)		X	Tree rot holes
Winter (*Culiseta inornata*)			Wide range of standing water, prefers sunlit areas. Examples include duck clubs, irrigation ditches, brackish marshes.

Source: Solano County Mosquito Abatement District. "Mosquitoes." Solano Co Mosquito, 2017. https://www.solanomosquito.com/mosquitoes.

**The genus names Ochlerotatus and Aedes are used interchangeably for certain species on the referenced webpage. Ochlerotatus is used preferentially throughout this document.*

Currently, pastureland subject to periodic flood irrigation covers 38% of the Proposed Project Site, primarily on the Bowlsbey Property. Due to prolonged periods of flooding, the presence of emergent vegetation, and absence of predaceous fish, irrigated pastures pose challenges to mosquito control agencies due to high levels of mosquito productivity.[18] Similarly, an additional

[18] *BF Eldridge, "Biology and Control of Mosquitoes. Prepared in Collaboration with Vector-Borne Disease Section, Center for Infectious Diseases, and California Department of Public Health."*

31% of the Proposed Project Site, at the Liberty Farms Tract is actively flooded and drained on an annual basis, creating breeding grounds for mosquitoes.

Overall, the Proposed Project would result in a decrease in suitable mosquito breeding habitat relative to current conditions through the creation of open water channels subject to tidal circulation, increase in water surface turbidity, and creation of more favorable habitat for predators (such as fish). Studies have demonstrated that restoring tidal connectivity through the removal of barriers and creation of channels that increase open water circulation can significantly reduce mosquito populations.[19] By removing irrigated pastures and periodically flooded but stagnant duck habitat, the Proposed Project is expected to reduce local mosquito populations. The Proposed Project's negative effect on breeding mosquitoes would be further pronounced due to the Proposed Project Site's elevation profile.

As there would be less suitable mosquito breeding habitat present under the post-project conditions, there would be no need for new, expanded, or relocated governmental facilities for the purpose of maintaining mosquito control performance standards. Therefore, impacts of the Proposed Project would not exceed the applicable threshold of significance related to adverse physical impacts associated with provision of new or physical altered facilities related to vector control and the Proposed Project would have **no impact** with regard to this threshold.

5. LEVEL OF SIGNIFICANCE AFTER MITIGATION

The Proposed Project would have ***less-than-significant impacts*** on Public Services. No mitigation is required.

[19] *BF Eldridge, "Biology and Control of Mosquitoes. Prepared in Collaboration with Vector-Borne Disease Section, Center for Infectious Diseases, and California Department of Public Health."*