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# memorandum

date June 28, 2024  
to Jackie Zipkin, EBDA  
cc Heidi Nutters, SFEP  
from Christie Beeman  
subject First Mile Horizontal Levee 30% design – permitting status

## Background

The First Mile Horizontal Levee project team had several pre-application meetings with the Bay Restoration Regulatory Integration Team (BRRIT) during the 30% design development process.

- BRRIT meeting #1 – October 20, 2021
- BRRIT site visit – November 3, 2022
- BRRIT ‘workshop’ – March 27, 2024
- BRRIT follow-up – June 11, 2024

In addition, BRRIT members attended the project design charette held on January 23, 2024. The BRRIT provided formal comments after the first pre-application meeting in 2021 (Attachment 1), and informal comments after both the 2022 site visit (Attachment 2) and the workshop follow-up meeting on June 11, 2024 (Attachment 3).

In response to BRRIT comments, the project team worked to reduce the footprint of the horizontal levee and minimize impacts to existing aquatic resources in the final 30% design. Still, the 30% design is estimated to result in a net loss of approximately 5.3 acres of jurisdictional wetland and waters habitats relative to current conditions. A portion of the horizontal levee slope is expected to convert to tidal wetland with sea level rise, and the net loss is estimated to be reduced to 1.9 acres by 2080.

Also in response to BRRIT comments, ESA evaluated high tide refugia habitat within Oro Loma marsh to help inform priorities for potential habitat enhancements within Oro Loma marsh. Attachment 3 provides a summary of that evaluation, which concluded that the marsh contains quality high tide refugia habitat under existing conditions.

## Next Steps

- 1) ESA identified several small areas of upland within Oro Loma Marsh that may have potential to be converted to wetland, which would add approximately one acre of wetland creation to the project design.

These and other on-site opportunities for wetland creation to offset project impacts should be explored in future phases of design development.

- 2) Further clarification is needed as to whether permitting agencies will consider future conditions with sea level rise when evaluating whether the First Mile project meets “no net loss” requirements. BRRIT members have expressed interest in seeing an evaluation of future habitat conditions with and without the project that considers both sea level rise and marsh plain accretion to aid in evaluating tradeoffs between impacts to current habitats and potential future benefits with sea level rise.
- 3) Based on initial geotechnical guidance, ESA anticipates that a “traditional” levee may require a similar footprint to the proposed horizontal levee, due to the expected need for a relatively wide stability berm on the marsh side of the levee. Once a complete geotechnical investigation has been performed, it may be informative to evaluate the minimum footprint needed for a flood protection levee and compare it to the proposed horizontal levee footprint and associated impacts to existing wetlands.

## **ATTACHMENT 1**

To: Jackie Zipkin, EBDA First Mile Horizontal Levee Project  
From: Bay Restoration Regulatory Integration Team (BRRIT)  
Subject: October 20, 2021 Pre-Application Meeting

Ms. Zipkin,

Thank you for meeting with the Bay Restoration Regulatory Integration Team (BRRIT) on October 20, 2021 to discuss the East Bay Dischargers Authority's First Mile Horizontal Levee Project (project). The purpose of the meeting was to introduce the project to the BRRIT and discuss the project goals and proposed approach. During the meeting, you explained that the design phase has yet to begin and that currently your focus is gathering guidance from the BRRIT agencies to address unique permitting challenges associated with horizontal levees. You also expressed your intention to incorporate our initial comments into a technical memo to share with the BRRIT's Policy and Management Committee (PMC) that fleshes out specific questions for the PMC and proposes a vision for a collaborative process to address those questions.

Below is a list of general guidance to keep in mind as you work with the BRRIT. Following that are additional agency-specific comments/questions about the presentation you provided. We discussed the importance of remaining in close communication about your project timeline as it develops and scheduling another pre-application meeting, when it makes sense to do so. Please contact Valary Bloom at [Valary\\_bloom@fws.gov](mailto:Valary_bloom@fws.gov) or (916) 217-9859 if you have questions or would like to discuss matters further, as she has been designated as your point of contact.

### General Comments

- 1. BRRIT Process:** The key to successful permitting through the BRRIT is engaging in the [pre-application process](#). Projects are expected to coordinate with the BRRIT early and often during project planning and design so that we can provide early review and input and work to resolve any issues identified prior to the submittal of permit applications. Participating in the pre-application process with the BRRIT is the most important thing projects can do to improve permitting timelines and outcomes. We would like to discuss with you when it makes sense to schedule follow-up meetings. We recommend you reach out to us to schedule follow-up meetings when: 1) major design or planning milestones have been reached, such as your 30% design; 2) major design or project objectives change, and 3) just prior to submitting applications.
- 2. General Draft Reports and Plans:** The goal of the BRRIT's pre-application process is that we gain a thorough understanding of the proposed project before we receive permit applications. Please share with us any draft reports and plans, so we can provide early guidance and feedback. You can share large files with us by uploading to [Box](#).
- 3. Permit Applications:** On our [website](#), under the [Resources and Tools](#) page, lies a [Permit Application Checklist](#) you may find helpful as you prepare your permit application. We strongly recommend you meet with us with draft permit application materials prior to submitting permit applications.

4. **Monitoring and Adaptive Management:** Many agencies will require a Monitoring and Adaptive Management Plan that describes monitoring metrics, methods, duration, and frequency; includes performance criteria to evaluate the project's progress towards meeting goals and objectives; discusses adaptive management that may be implemented if performance criteria are not being met; and includes long-term management and maintenance. If long-term management and maintenance activities will impact species, that information should also be included in your environmental assessment. Please provide us with a copy of the Draft Monitoring and Adaptive Management Plan as soon as it is available.
5. **Geotechnical Studies:** If you anticipate the need for exploratory geotechnical studies that may separately require permitting before your final design is reached and/or permit applications are submitted for the primary project, please be clear about those timelines early on in coordination with the BRRIT.
6. **Pre-application Satisfaction Survey:** The BRRIT has developed a pre-application satisfaction survey to obtain feedback from project proponents on their experience during the pre-application process and how we can improve their experience to better serve the restoration community. Project proponents can take the [survey](#) as often as needed and at any stage during the pre-application process.
7. **Mosquito Abatement:** The BRRIT recommends that you coordinate with the local vector control agency to ensure that the project is designed such that it does not create a mosquito nuisance issue if there are nearby communities that would be affected as such. In particular, please ensure that your design includes a plan for avoiding ponding on the horizontal levee.

**Federal**  
*USACE*

1. **General guidance:**
  - a. This project has been assigned the file number 2021-00391. Please have that number included in materials submitted to the USACE.
  - b. USACE will need a delineation of the aquatic resources on site for the project area. You can choose whether you want us to issue a jurisdictional determination. This project would need both the Section 10 waters and the Section 404 waters delineated. The USACE website provides information on what is needed for the delineation and the different types of JDs that we can issue. See: <https://www.spn.usace.army.mil/Missions/Regulatory/Jurisdiction-Determinations/>
  - c. If the USACE is to be the project Federal Action Agency, we will need sufficient information to initiate section 106 of the National Historic Properties Act consultation with the State Historic Preservation Office for potential impacts to Historic properties. The information we need would include a determination of the Area of Potential Effects (APE, we can discuss this with you), including depth of excavation; a cultural resource inventory report that is less than 2 years old for your project APE and a buffer area of at least ¼ mile; evaluations of eligibility for listing on the National Register of Historic Places for any cultural resources within the project APE; and an assessment of potential effects to any eligible historic properties.
  - d. We will need quantities of the impacts within USACE jurisdictional aquatic resources: the volume of fill placed (temporary and permanent separately), the area of

jurisdictional resources filled; if you are doing any work within Section 10 waters, include the area of work, the excavation and fill quantities too.

- e. If the USACE is to be the project Federal Action Agency, we will need enough information to initiate section 7 of the Endangered Species Act (ESA) consultation with both the USFWS and the NMFS. This should include a description of the Action Area, the ESA-listed species that may occur within the Action Area; an assessment of the habitat for ESA-listed species within the project area; the potential effects of the project on ESA-listed species; the proposed conservation measures to avoid/minimize effects to species; your conclusions on the effects to ESA-listed species. The USACE makes the determination, but we rely on the information provided in your application and we then consult with the FWS and/or NMFS for their concurrence and take coverage (if Formal consultation is required). Most of the information that we will need will be clarified by the USFWS & NMFS BRRIT staff members, so I will rely on them to provide specifics of what would be needed for the consultation. We will also need enough information in the Biological Assessment to analyze Essential Fish Habitat (EFH) impacts.
  - f. All areas where the setback marsh would encroach into USACE jurisdiction should be quantified as fill discharge (cubic yards and acreage). We will need to have a justification for the fill placed within the marsh and an analysis of how there would be a net benefit from the project in terms of habitat functions.
2. **Specific information requests:**
- a. Typically, programmatic approaches, like Regional General Permits, are for project activities that have minimal adverse effects. So the types of concerns that the USACE will be considering are whether the fill placed within Waters of the U.S. (WOTUS)- tidal marsh habitat here - would be considered “minimal” effect. We will need more information on the area of existing WOTUS that would be filled, and of that, the area that would be converted to upland. And further, what would be the area of the created treatment wetland?
  - b. Sulphur Creek does not show up on our 408 database.
  - c. When you submit your application materials, please provide a rationale or justification for the placement of fill within WOTUS, if the fill placement could be minimized.
  - d. Please determine whether the EPA will be the project Federal Lead Action Agency, since they are providing funds. If they are, the EPA should take care of the ESA/EFH/NHPA compliance, and documentation of their compliance should be provided to the USACE before we can issue our DA (Department of Army) permit.
  - e. Please provide a map that shows the project and the Oro Loma Marsh (OLM) East and OLM West, for reference.
  - f. Please include Sulphur Creek in the study area for the habitat assessment.
  - g. Please provide more information on what is proposed for Sulphur Creek. Looks like at one end, while the project would widen the channel, it would also place a higher levee within the existing marsh?
  - h. Terms Low Marsh, Mid Marsh and High marsh are all based on elevations relative to tidal datums and not to vegetation, correct? This being the case, please describe the change in plants that you expect to see in the modeled results with project versus without project.

- i. Please explain how this project benefits water quality: specifically, is the benefit to the SF Bay more than to the specific project area? It could be argued that the influx of this freshwater from the treatment marsh may have an adverse effect on water quality as experienced by the local fauna. In particular, several listed species depend on the current more saline conditions that produce habitat dominated by pickleweed (See USFWS comments).
- j. Please review the requirements of the Mitigation Marsh – it may include requirements that the marsh be maintained in perpetuity. Often mitigation sites cannot be filled or impacted by subsequent projects.
- k. What is the restoration component of this project? If you are placing fill within WOTUS, mitigation is typically required for loss of waters – in this case, the fill placed that converts the marsh to upland (levee) would need to be mitigated. If there is a restoration component to this project, we could work with you to include the on-site restoration towards meeting the mitigation requirement. The amount of mitigation needed would be determined as we get more information on the project and work through the mitigation ratio checklist.

#### NMFS

1. **Protected Species and Habitat.** NMFS protected species and habitats that could occur in or near the proposed project include the following:
  - a. **California Central Coast (CCC) Steelhead and Designated Critical Habitat.** Threatened CCC steelhead could be present in the project area and the project is located in designated critical habitat for CCC steelhead. Sulphur Creek is located between San Lorenzo Creek and Alameda Creek, essential populations of CCC steelhead in NMFS Recovery Plan for the species (see National Marine Fisheries Service. 2016. Final Coastal Multispecies Recovery Plan. National Marine Fisheries Service, West Coast Region, Santa Rosa, California.). There are no recovery actions associated with CCC Steelhead in Sulphur Creek.
  - b. **Southern Distinct Population Segment of Green Sturgeon and Designated Critical Habitat.** Multiple life stages of green sturgeon can be present in San Francisco Bay year-round and may forage in the project area (see NMFS Recovery Plan for more information on the species, National Marine Fisheries Service. 2018. Recovery Plan for the Southern Distinct Population Segment of North American Green Sturgeon (*Acipenser medirostris*). National Marine Fisheries Service, Sacramento, CA.).
  - c. **Essential Fish Habitat (EFH).** The project area is located within an area identified as Essential Fish Habitat (EFH) for various life stages of fish species managed under the [Pacific Groundfish Fishery Management Plan](#) (FMP), the [Coastal Pelagic Species FMP](#), and the [Pacific Coast Salmon FMP](#). San Francisco Bay, including the project area, is also designated as an estuary habitat area of particular concern (HAPC) for various federally-managed fish species as defined in the Pacific Salmon and Groundfish FMPs. For more information on HAPCs designated under the Groundfish and Salmon FMPs, please see page 102 of the Groundfish FMP and page 6 of the Salmon FMP Appendix A.
2. **Impacts to Species and Habitats.** NMFS is supportive of sea level rise shoreline adaptation projects in the San Francisco Bay that can potentially enhance tidal and subtidal estuarine habitat and water quality. However, multi-benefit restoration projects may result in adverse

effects to NMFS trust resources. NMFS will be interested in the project actions that would avoid and minimize impacts to protected resources. The applicant should consider project elements listed below.

- a. *Limiting in-water work.* Conducting in-water work at low tide when fish are not present can prevent take of listed species.
  - b. *Timing of in-water work.* If in-water work cannot be avoided, working outside of the primary salmonid migration window (June 15 to November 30) will limit the presence of listed salmonids in the action area. Green sturgeon can be present in the area year-round.
  - c. *Turbidity and Water Quality.* Incorporating project elements or minimization measures that will limit changes to water quality and disturbance to benthic habitat may also be important.
  - d. *EFH.* Adverse impacts to EFH may be unavoidable with in-water work.
  - e. *Hydrology.* The applicant should consider analyses assessing potential changes to hydrology in the action area as a result of the project and potential impacts to fish. Assessing the magnitude, variability, and seasonality of freshwater flow releases and potential impacts to migratory species like salmonids may be of interest to NMFS.
3. **Monitoring and Adaptive Management.** During the presentation, the project team indicated a robust monitoring and adaptive management plan would be implemented along with the pilot project. Monitoring associated with the pilot project would benefit from including an assessment of changes to fish community assemblage (such as abundance and species composition) in the project area as a result of habitat changes to inform adaptive management and future similar projects in the San Francisco Bay. Although the Oro Loma project was able to document benefits to water quality from polishing wastewater, additional support for a project that will not be isolated from the Bay would be helpful in evaluating impacts for future projects. If the project can document better foraging habitat or refugia for fish, or improved aquatic habitat that would greatly benefit future proposed projects. Some considerations when developing monitoring and adaptive management plans:
- a. Monitoring plan should describe methods for assessment of fish species within the area. Ideally those methods would be aligned with similar monitoring efforts in the region (*e.g.* South Bay Salt Ponds Restoration Project fish monitoring efforts).
  - b. Monitoring plan should describe the methods for water quality within the area associated with fish monitoring (*e.g.* monitoring salinity, temperature, dissolved oxygen, pH, nutrients, etc.).
  - c. Unless the project team can demonstrate a reason for a different method, a before, after, control, impact monitoring design is preferred.
  - d. The adaptive management plan should clarify thresholds or triggers associated with monitoring (such as artificial cues for salmonids, low dissolved oxygen, increased numbers of non-natives) that would trigger an action.
  - e. The adaptive management plan should include an array of management actions that will be tested if triggered during monitoring.
  - f. The monitoring and adaptive management plan should also describe the reporting timeframes (*e.g.* annually) and plan for coordination with agencies when adaptive management is needed.



- g. The monitoring and adaptive management plan should also describe how data can be shared.
4. **Considerations for Horizontal/Ecotone Levees in the San Francisco Bay.** As mentioned above, NMFS supports enhancing shorelines, providing flood protection, habitat transition zones, wave attenuation, improving water quality, and controlling nutrient inputs with horizontal and ecotone levees over traditional grey infrastructure. When considering these projects, there may be implications and potential impacts to NMFS trust resources when implementing these projects. The recent wildlife connectivity [technical update](#) from the Adaptation Atlas did not consider aquatic habitat connectivity and improving connections to the upper watershed. Not the case with Sulphur Creek, but horizontal levees could be proposed in areas that would further disconnect creeks from the Bay, so site specific review would be important when evaluating locations of future projects. Fortunately, the technical update notes an evaluation of connections from the Bay to the upper watersheds is planned for the Adaptation Atlas and may support future project designers interested in evaluating the site-specific appropriateness of constructing horizontal and ecotone levees.

#### USFWS

1. **Section 7 ESA Consultation Needs:**
  - a. This project will likely involve formal consultation between the USACE and USFWS, under section 7 of the ESA for California Ridgways rail (CRR; *Rallus obsoletus obsoletus*) and salt marsh harvest mouse (SMHM; *Reithrodontomys raviventris*). It is not yet clear whether formal section 7 consultation might be appropriate for project effects to western snowy plover (*Charadrius nivosus nivosus*), California least tern (*Sterna antillarum browni*) or California seablite (*Suaeda californica*).
  - b. Please go to [ecos.fws.gov/ipac](https://ecos.fws.gov/ipac) and use our Consultation Package Builder, if you would like assistance building a complete Biological Assessment.
  - c. Though not currently federally listed, there is some possibility that longfin smelt (*Spirinchus thaleichthys*) may be the subject of a proposed or even final listing rule before permit applications are submitted for this project. Though you may be considering the species already from a state listing perspective, it is possible the USACE will decide to enter into formal section 7 consultation with USFWS on this species as well. Therefore, I would encourage you to include an environmental baseline for longfin smelt, as well as measures to avoid and minimize effects to the species and an analysis of effects of the project on the species in your biological assessment. Including this information in your biological assessment now can save time later if you'd otherwise need the USACE to re-initiate consultation should the species become federally listed.
  - d. Many multi-benefit restoration projects have both the likelihood of adverse effects to listed species and the potential for long-term beneficial effects to those same resources. Beneficial effects to species and habitats should be fully described in the biological assessment. However, it is important to understand that the existence of beneficial effects cannot be considered by the federal lead agency making an initial effects determination during section 7 Endangered Species Act consultation.
2. **Brackish Conversion.** We discussed during the pre-application meeting the likelihood of conversion of tidal vegetation to brackish vegetation given the proposed addition of fresh water

into the marsh. Peter Baye suggested the effects of this freshening may occur no more than a maximum of roughly 20-30 feet out from the buried pipeline alignment, along the mid-section of the horizontal levee. Existing tidal vegetation, as you know, is important to the survival of resident CRR and SMHM. Please describe in your biological assessment maximum limits on brackish vegetation establishment that will be allowed and be explicit that, as stated by the project team during the meeting, the treatment plant will reduce the input volume if that threshold is approached. I would also encourage project team exploration of Peter's suggestion that drainage could be improved in areas surrounding the horizontal levee such that the freshening effect of freshwater input is dissipated. We acknowledge that some fish species could benefit from the freshwater inflows that result from the proposed project. We should continue conversations about this ecological tradeoff in the months to come.

**3. Avoidance and Minimization Suggestions**

- a. We recommend you conduct surveys for CRR according to the 2015 *California Clapper Rail Survey Protocol*, (as opposed to the 2017 refuge-developed *Site Specific Protocol for Monitoring Marsh Birds*, which is designed for long-term monitoring and research) prior to each year of construction to determine if CRR are onsite and if so, to guide location of that year's CRR work exclusion buffers.
- b. We suggest that project construction within suitable habitat for CRR be preferably limited to the non-breeding season (Sept 1-Jan 31) or, if it can't, then that it be conducted only outside a 700 foot buffer from CRR calling centers. Also, if heavy equipment is required (during any time of year), we suggest the use of noise reducing modifications to equipment as well as use of portable acoustic barriers/blankets, placed near noise sources.
- c. In addition to having onsite biological monitors, the most effective ways to minimize construction effects to SMHM are to remove vegetation using non-motorized hand tools and to utilize exclusion fencing, where appropriate. As your project advances in design and planning, we should discuss together what other protection measures for listed species would be appropriate to implement. I, along with CDFW and NMFS, can offer up suggestions in this regard.
- d. When constructing the gently sloping ecotones, please consider building a slope that intrudes as little as possible into nearby habitat. If possible, shift the highest point of the levee landward to minimize loss of habitat on the wetland side.
- e. In areas planned for levee removal or lowering, please consider leaving portions in place as high tide refugia for SMHM. Though islands created by making gaps in the southern levee may not provide much protection from predators, marsh mounds created further into the marsh plain near natural slough-side berms may.
- f. As discussed by Water Board below, please note that the Adaptation Atlas recommends construction of a coarse beach along the Oro Loma shoreline. I would encourage you to consider this project element if such a feature could protect an otherwise eroding CRR-occupied marsh.
- g. It sounds like increased public access may be incorporated into this project. I would encourage you to place these alignments as far from CRR occupied tidal channels as possible. I would also encourage prohibiting dog use, considering seasonal closures or

using tall vegetation to screen sensitive species from recreational disturbance, and avoiding installation of structures likely to act as perches for CRR and SMHM predators.

**4. Requests for additional information**

- a. The October 2021 Habitat Assessment is a helpful resource that I appreciate you've provided early in the pre-application phase. The Habitat Assessment explains that Oro Loma marsh supports lower CRR densities than the surrounding marshes to the north and south. Has the project team given consideration as to the reason for the reduced densities? Especially since CRR will likely face habitat loss onsite, it will be important to consider the big picture, in terms of not only where effects to the species can be avoided and minimized but where habitat enhancements (*e.g.*, short or long term predator management, coarse beach to protect the marsh) could be implemented, as an offset. I'm happy to continue this conversation with you into the coming months, together with CDFW.
  - b. Have CRR, SMHM, or other sensitive wildlife been observed taking refuge in the vegetated portion of the horizontal levee at the Oro Loma demonstration project? Please share if you have access to studies conducted to date involving use of these habitat elements.
5. I appreciate your dedication to preserving the unique upland habitat at the southeast portion of the site that is of higher elevation and supports patches of native grassland.

**State**  
*BCDC*

1. **Permitting.** Based upon the scale of this project and the potential impacts, this project would likely be a major project that would need to go before the Commission for a public hearing or vote.
2. **Bay fill for habitat.** The Commission's policies provide that fill in the Bay may be authorized for habitat enhancement, restoration, or sea level rise adaptation of habitat. Such projects must be designed to: a) minimize near-term adverse impacts to and loss of existing Bay habitat and native species; b) provide substantial net benefits for Bay habitats and native species; and c) be scaled appropriately for the project and necessary sea level rise adaptation measures in accordance with the best available science. Please be sure to incorporate these policies into the project as the design progresses and describe how the project would meet these requirements in your application.
3. **Tidal Marsh and Tidal Flat Restoration.** The [San Francisco Bay Plan \(Bay Plan\) policies on Tidal Marshes and Tidal Flats](#) include several policies related to tidal marsh restoration. Among them, Policy No. 5 states that to the extent feasible, habitat projects should be sustained by natural processes; increase habitat connectivity; restore hydrological connections; provide opportunities for endangered species recovery; and provide opportunities for landward migration of Bay habitats. Policy Nos. 6, 7, and 8 include other important design considerations for tidal marsh restoration projects, including related to project monitoring. Similar to the comment above, please be sure to incorporate these important policies into the project as the design progresses, and describe how the project meets these requirements in your application.
4. **Balancing short-term impacts and long-term benefits.** The McAteer-Petris Act states that projects should use the minimum amount of fill necessary to achieve the purpose of the fill, and

that fill should minimize harmful effects to the Bay. BCDC is generally supportive of a more gently sloping, multi-benefit ecotone levee, and recognizes that this would likely require more fill than a traditional levee. Please consider an approach that balances the short-term impacts and long-term benefits of the project and ensures the ecotone does not intrude into existing marsh habitat any more than necessary to achieve the project purpose. For example, you may consider using a 10 to 20:1 slope, rather than a 20 to 40:1 slope, if the former can still achieve the desired outcomes of the ecotone. In addition, as mentioned by the USFWS above, you may consider shifting the high point of the levee inland where feasible to minimize the need for new fill in the Bay.

5. **Public Access.** The [Bay Plan policies on Public Access](#) require, in part, that maximum feasible public access to and along the waterfront, and on permitted fills, should be provided in and through every new development in the Bay or on the shoreline, except in cases where public access would be inconsistent with the project due to public safety considerations or significant use conflicts, including unavoidable adverse effects on Bay natural resources. In these cases, in lieu access at another location, preferably near the project site, should be provided. The policies also require that public access areas be sited, designed and managed to prevent significant adverse effects on wildlife. As your design progresses, please continue to explore what public access improvements may be feasible at or near the project site, and how impacts from public access on wildlife and habitat may be avoided or minimized, such as by incorporating comments from the USFWS above. As conversations on this topic advance, we will determine and inform you whether any review by the Commission's Design Review Board may be required. We look forward to continuing to work with you on this issue.
6. **Beneficial re-use of dredged sediment.** Please clarify whether the project would include the beneficial re-use of dredged sediments. If so, additional San Francisco Bay Plan policies would apply to the project, including Dredging Policy No. 11.
7. **Pilot Project.** The [Bay Plan policies on Tidal Marshes and Tidal Flats](#) recognize that pilot projects provide an opportunity to research and test new concepts and techniques before implementing experimental projects on a large scale. This project proposes to cover a rather large area of the shoreline and will have associated habitat impacts in existing tidal marsh. We are aware of one or two smaller pilot projects around the Bay that are also planning to test the concept of the horizontal levee for sea level rise adaptation in the Bay. Depending upon the proposed timing for the permitting and implementation of this project, perhaps some of the lessons learned from those pilot projects can inform the design and monitoring of this project. Has there been consideration of doing a smaller project at the project site as a pilot to test this technique and connection to the Bay? We encourage pilot studies to occur prior to the larger scale projects. If a pilot study is not proposed for this area, it would be helpful to have additional information or examples of similar projects and their studies that may help address uncertainties related to marsh impacts from horizontal levee construction and operation.
8. **Habitat Conversion and Mitigation.** There are a number of the Commission's policies that support the use of nature-based shoreline protection, and say that such methods also need to be balanced with the Commission's responsibility to conserve existing Bay habitats and resources.
  - a. **Policy Considerations.** The [Bay Plan policies on Tidal Marshes and Tidal Flats](#) mention that tidal marshes and tidal flats should be conserved to the maximum extent feasible

during projects and that impacts to these habitat areas should be avoided, minimized, and potentially mitigated. These policies also say that where a transition zone does not exist and it is feasible and ecologically appropriate, shoreline projects should be designed to provide a transition zone between tidal and upland habitats. The [Bay Plan's Shoreline Protection policies](#) say that natural and nature-based features for shoreline protection should be used where possible and that the ecosystem benefits, including habitat and water quality improvement, should be considered in determining the amount of fill necessary for the project purpose. Suitability and sustainability of proposed shoreline protection and restoration strategies at the project site should be determined using the best available science on shoreline adaptation and restoration. These policies also say that shoreline protection projects that include natural and nature-based features may be self-mitigating or require less mitigation than projects that do not include any natural or nature-based features.

- b. Project Design Considerations.** This project is likely to result in habitat conversion in the near-term, but would provide transition zone slopes for some habitats as sea levels in the Bay Area rise. As described above, we encourage you to consider the amount of fill necessary to create an ecologically functioning ecotone that achieves the project goals, while also minimizing the impacts on the existing habitats. It is a possibility that this project could be found to be self-mitigating, but it depends upon the actual project impacts and what the habitat benefits would be. If mitigation is necessary, then it is likely that it would be less than is required for traditional shoreline protection projects.
9. **Sea Level Rise Assessment.** For larger shoreline projects like this one, it is necessary to prepare a risk assessment prepared by a qualified engineer and based on the estimated 100-year flood elevation that takes into account the best estimates of future sea level rise and current and planned flood protection for the proposed project. BCDC currently considers the [OPC 2018 Sea Level Rise Guidance](#) as the best available science on sea level rise in the Bay Area. In the assessment, it would be helpful to include analysis of multiple risk aversion scenarios and how the project would evolve over time under each scenario throughout the life of the proposed project. The [Bay Plan Climate Change policies](#) also include additional details on what should be included in the risk assessment.

BCDC's policies require that areas that are identified as vulnerable to flooding that would threaten public safety or public access areas should be designed to be resilient to sea level rise at mid-century, and be adaptable beyond mid-century for the life of the project. Consideration should also be given to how the shoreline protection is integrated with current or planned adjacent shoreline protection measures and how adverse impacts to adjacent areas would be minimized and avoided. In addition, please note that the [Bay Plan Public Access policies](#) require that these areas be sited, designed, managed and maintained to avoid significant adverse impacts from sea level rise and shoreline flooding. If adaptation is necessary in the future to prevent flooding, such actions should be considered now and described with the project. The adaptive capacity for the habitat components of the project should also be considered and included as part of the project.

In addition to the comments above, please consider the following:

- a. When performing the risk assessment and selecting the design alternative, it would be helpful to model multiple risk aversion scenarios for multiple future end points to compare the benefits of the project alternatives to the no-project alternative.
  - b. It was not clear from the presentation whether the sea level rise modelling was for the flood control levee design or the small levee design. Are you selecting between these two designs, or will they be used in different areas of the project? Clarification on this would be helpful.
  - c. It looks like the lower end of the sub-surface treatment layer would be around 10 feet NAVD88 and the top would be at around 12 feet NAVD88. Additional details on how long the sub-surface treatment layer will function and remain viable during occasional flooding from storm events and sea levels rise in the future would be helpful.
10. **Environmental Justice and Social Equity Policies.** Please note that the Bay Plan contains policies on environmental justice and social equity that require that environmental justice and social equity be incorporated into project planning as early as possible. Additionally, these policies require equitable, culturally-relevant community outreach and engagement by project applicants to meaningfully involve potentially impacted communities for major projects, especially in underrepresented and/or identified vulnerable and/or disadvantaged communities. The proposed project area appears to have adjacent areas that have low social vulnerability, but there are pockets of high social vulnerability areas nearby and we encourage consideration of this during the community outreach and engagement for this project. If you have additional questions on these policies or the community outreach and engagement, please let us know.
11. **Engineering Criteria Review Board.** Based upon the scale of this project and the Bay fill associated with it, the project is likely to require review by BCDC's Engineering Criteria Review Board.

**CDFW**

1. Due to the project's proximity to Sulphur Creek, the Bockman Channel, and the Alameda Flood Control Channel, the project may be subject to Fish and Game Code 1600 permitting authority. 1600 Notification is required for any activities that may substantially divert or obstruct the natural flow; change or use material from the bed, channel, or bank including associated riparian or wetland resources; or deposit or dispose of material where it may pass into a river, lake or stream. Consideration should be given to minimize potential impacts to these water bodies.
2. CDFW recommends that the project proponent apply for a 2081(b) Incidental Take Permit if any in-water work is anticipated to occur that could result in the potential take of state-listed species, including state threatened longfin smelt (*Spirinchus thaleichthys*). Take, as defined under Fish and Game Code Section 86, is to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill.
3. State fully protected species may not be taken or possessed at any time except for necessary scientific research, including efforts for recovery (Fish and Game Code §§ 3511 and 4700). Based on the information provided, it appears that the project could have both short-term construction-related impacts to fully protected species, as well as long-term impacts to those species due to habitat conversion associated with freshening of the marsh. It will be important for the project to contribute to the recovery for fully protected species and to clearly demonstrate how the project will be beneficial to these species.

4. Other species that should be considered for this project include, but are not limited, to:
  - a. California Ridgway's rail (*Rallus obsoletus obsoletus*), federally and state endangered and state fully protected,
  - b. California black rail (*Laterallus jamaicensis coturniculus*), state threatened and state fully protected,
  - c. Salt-marsh harvest mouse (*Reithrodontomys raviventris*), federally and state endangered and state fully protected,
  - d. Longfin smelt (*Spirinichus thaleichthys*), federal candidate and state threatened,
  - e. White-tailed kite (*Elanus leucurus*), state fully protected,
  - f. Steelhead (*Oncorhynchus mykiss*), federally threatened (Central California Coast and Central Valley ESUs),
  - g. Green sturgeon (*Acipenser medirostris*), federally threatened and state species of special concern (southern DPS),
  - h. White sturgeon (*Acipenser transmontanus*), state species of special concern,
  - i. Western pond turtle (*Emys marmorata*), state species of special concern,
  - j. Burrowing owl (*Athene cunicularia*), state species of special concern,
  - k. Saltmarsh common yellowthroat (*Geothlypis trichas sinuosa*), state species of special concern,
  - l. Northern harrier (*Circus hudsonius*),
  - m. Alameda song sparrow (*Melospiza melodia pusillula*), state species of special concern,
  - n. Salt-marsh wandering shrew (*Sorex vagrans halicoetes*),
  - o. Pallid bat (*Antrozous pallidus*), state species of special concern,
  - p. Hoary bat (*Lasiurus cinereus*), state species of special concern
  - q. Monarch butterfly (overwintering) (*Danaus plexippus*), federal candidate; and
  - r. California seablite (*Suaeda californica*); state endangered.
5. Similar to the USFWS's comment above, CDFW recommends you conduct surveys for California Ridgway's rail according to the 2015 *California Clapper Rail Survey Protocol*. Surveys should include calls for California black rail, in addition to adding black rail surveys in the month of April or May. There are a number of ways to accomplish this, and CDFW can provide a suggested methodology of incorporating both species into your surveys.
6. CDFW supports the USFWS's and NMFS's comments regarding suggested avoidance and minimization measures to some special-status species and is happy to work with you to develop additional measures.
7. Based on discussion during the meeting, it appears that the project may consider incorporating public access elements in portions of the project area. CDFW will be happy to work with you in coordination with USFWS and BCDC to discuss strategies to minimize public access-related impacts to special-status species.

#### Water Board

1. In considering the circumstances under which filling of wetlands or waters of the State may be permitted, we need to determine whether the project has avoided and minimized impacts to the maximum extent practicable consistent with the State Water Resources Control Board's *Procedures for the Discharge of Dredged or Fill Materials to Waters of the State* and U.S. EPA's Clean Water Act Section 404(b)(1) *Guidelines for Specification of Disposal Sites for Dredge or Fill*

*Material.* We support the use of nature-based adaptation strategies that provide increased shoreline resilience and consider them to be appropriate minimization measures.

Please provide more detailed information on how the project has been designed to avoid and minimize impacts to waters of the State to the maximum extent practicable, and the constraints in constructing an alternative design with less impacts. For example, our preference is to construct horizontal/ecotone levees as far landward as possible, and during our meeting, we discussed the constraints posed by the Union Pacific Railroad and Alameda County Flood Control District channel located adjacent to the proposed horizontal levee.

2. Although the concept of nature-based adaptation strategies has been around for some time, they have not been implemented in very many restoration projects and we are still learning about their design and implementation. In addition, for many locations in the Bay, we have limited information on whether marshes can keep pace with sea level rise. We support providing as broad an ecotone slope as possible, similar to the slope of a natural transition zone, to provide the most environmental benefit but need to better understand the potential risks/impacts and long-term benefits. To help us evaluate whether the short-term impacts may be offset by the long-term benefits, please provide an analysis of a range of potential outcomes and the short-term vs. long-term risks and benefits for alternative project designs (including a no project alternative).
3. We will need to determine whether the project meets the California Wetland Conservation Policy, the primary goal of which is to ensure no overall net loss and to achieve a long-term net gain in the quantity, quality, and permanence of wetland acreage and functions. Fill placed in waters of the State resulting in the conversion of wetlands to uplands, will not require mitigation if these areas are inundated by 2050 and are converted back to waters of the State again. Please refer to the Ocean Protection Council's guidance and evaluate the medium-high risk aversion scenario to estimate the extent of fill that will be inundated by 2050.
4. We appreciate that project elements include widening Sulphur Creek to increase conveyance capacity and potentially sediment input into the marsh and we encourage you to maximize other potential habitat restoration opportunities at the project site. For example, the Adaptation Atlas suggests that coarse beaches are suitable along much of the shoreline of the San Lorenzo OLU, especially where the marsh scarp is eroding. Other potential restoration opportunities could include constructing internal refugia (e.g., marsh mounds) to provide more ecological uplift in the existing marsh.
5. We recommend that you work closely with the agencies to develop a Monitoring and Adaptive Management Plan that describes the project goals and objectives; project elements that will be monitored; duration, timing, and frequency of monitoring; includes appropriate performance criteria; and identifies adaptive management actions that will be implemented to ensure that project goals and objectives are met. The purpose of monitoring is to verify that the project is functioning as designed, and to verify that the project's impacts to beneficial uses are adequately offset by the environmental benefits.
6. My understanding is that the project is communicating with NPDES staff on their permitting requirements and developing a means for crediting nutrient reductions. Please let me know if I can help to facilitate any future discussions.



**Meeting Participants:**

Jackie Zipkin, East Bay Dischargers Authority  
Caitlin Sweeney, San Francisco Estuary Partnership  
Jeremy Lowe, San Francisco Estuary Institute  
Heidi Nutters, San Francisco Estuary Institute  
Matt Graul, East Bay Regional Parks District  
Becky Tuden, East Bay Regional Parks District  
Christie Beeman, ESA  
Mark Lindley, ESA  
Jill Sunahara, ESA  
Peter Baye, Coastal Ecologist

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Water Board: Agnes Farres, [agnes.farres@waterboards.ca.gov](mailto:agnes.farres@waterboards.ca.gov)

Water Board: James Parrish (NPDES)

## **ATTACHMENT 2**

To: Jackie Zipkin, EBDA First Mile Horizontal Levee Project  
From: Bay Restoration Regulatory Integration Team (BRRIT)  
Subject: November 3, 2022, Pre-Application Meeting/Site Visit

Ms. Zipkin,

Thank you for meeting with the Bay Restoration Regulatory Integration Team (BRRIT) on November 3, 2022, to discuss the First Mile Horizontal Levee Project and conduct a site visit. The purpose of the meeting was to see the site in person, but we met first as a group reviewing recent updates to the project at the EBDA office.

This letter provides responses to questions you raised at the pre-application meeting. There are also additional agency-specific comments/questions toward the end of this letter. Please contact Valary Bloom [valary\\_bloom@fws.gov](mailto:valary_bloom@fws.gov) or (916) 217-9859 if you have questions or would like to discuss further.

### **Project Schedule**

Below is the anticipated project schedule based on the materials submitted. Please keep us updated if and when the anticipated schedule changes. We recommend that you submit permit applications at least 6 months before desired permit issuance to give the agencies sufficient time to review the application, request any additional information that may be needed, and issue permits/authorizations in time to meet your construction schedule.

*Anticipated Permit Application: Mid to late 2024*

*Desired Permit Issuance: Mid to late 2025*

*Desired Construction: Mid 2026*

### **General**

- 1. Permit Applications:** Please review our [Permit Application Checklist](#), available on our [website](#) under the [Resources and Tools](#) page, as you prepare your permit applications. Depending on your project schedule, it may be beneficial to provide draft permit applications to the BRRIT for preliminary review/comment. We strongly recommend you meet with us prior to submitting permit applications.
- 2. Pre-application Satisfaction Survey:** The BRRIT has developed a pre-application satisfaction survey to obtain feedback from project proponents on their experience during the pre-application process and how we can improve their experience to better serve the restoration community. Project proponents can take the [survey](#) as often as needed and at any stage during the pre-application process.

## Questions submitted to BRRIT:

### 1. Can upland habitat being created on the levee be used to offset impacts to existing habitats?

**Response:** The proposed project will result in impacts to aquatic habitat (such as wetlands) and effects to species. Our responses below address the question of whether upland habitat created on the levee can be used to offset (1) impacts to aquatic habitat, and (2) effects to species.

#### Impacts to Aquatic Habitat

**USACE/Water Board/BCDC:** Unavoidable impacts to aquatic habitat can typically be offset with either enhancement, restoration, or creation of aquatic habitat. However, we understand that transitional upland habitat created on the levee is an important part of a complete tidal wetland system and can be viewed as landscape buffer enhancements. The landscape buffer enhancement could be part of the project's mitigation proposal, but cannot entirely offset impacts to aquatic habitat. We will need to discuss compensatory mitigation requirements for all unavoidable impacts to aquatic habitat.

#### Effects to Species

**USFWS:** Effects to species through loss of existing habitats could potentially be partly offset by in-kind habitat created on the ecotone. In-kind mitigation is generally when one provides habitat that serves the same function as the habitat lost. In general, any habitat established on the ecotone that serves the same function for the species as the lost habitat may contribute to mitigation acreage. The first step is for you to describe and quantify which Ridgway's rail and salt marsh harvest mouse habitat functions would be lost after placement of fill in tidal marsh to construct the proposed ecotone. In reality, there could only be creation of high tide refugial habitat on an ecotone. With regard to the Ridgway's rail, I suspect that rail foraging, nesting and high tide refugial habitat would be lost during construction of the ecotone. Salt marsh harvest mice appear to generally forage where they nest, so the replacement of that functional habitat becomes a little simpler.

However, there will need to be a careful analysis into at what timescale the created habitats would start being used. Areas at the toe of the slope may be used as soon as vegetation establishes but higher on the slope, perhaps it will take longer, as sea levels rise. Therefore, there will doubtless be this temporal loss of habitat, in addition to the permanent loss of habitat, underscoring the need for onsite or offsite mitigation in-kind.

Upland acres converted to marsh habitat after the widening of portions of Sulfur Creek may count toward mitigation acreage if they provide the lost habitat function for that particular species. The project team should consider whether creation of marsh mounds along the portion of Sulfur Creek proposed for widening could be a useful strategy by which to provide functional habitat ahead of ecotone construction. One idea is to retain portions of the existing berm/levee as high tide refugia. If there are other appropriate areas within the project area not currently providing habitat, those areas could potentially be used to create marsh mounds as well. The main idea is to get some useful vertical vegetative structure in place for rails and other species in or near the project site before the marsh is impacted by construction.

Also, please consider that created habitat on the ecotone is only useful if species have not disappeared from the landscape in the intervening years or decades before vegetation establishes

or sea levels rise enough to put the habitat at a useable proximity. This underscores the importance of doing advanced offsets by providing useful habitat on the ground ahead of the impact.

**CDFW:** CDFW agrees with the points described above by USFWS with regard to assessing the gains/losses of the types of habitat functions for California black rail, California Ridgway's rail, and salt-marsh harvest mouse. If it is appropriate to pursue a Restoration Management Permit (RMP) under CDFW's Cutting the Green Tape Program for fully protected species take coverage, you will need to be able to 1) avoid and minimize impacts to species to the maximum degree feasible, and 2) demonstrate that the project as a whole contributes to efforts to recover the species. Through the RMP process, as impacts to species habitat become more clearly defined, and the gains/losses of habitat types are identified and quantified, it will become easier to determine whether habitat created on the levee will sufficiently offset impacts to existing habitat, and whether there would be a need to consider providing additional elements to the project, such as the marsh mounds suggested above by USFWS.

**NMFS:** NMFS supports the recommendations of the agencies above. NMFS considers impacts on the overall habitat function for species listed in the Endangered Species Act and the Magnuson-Stevens Fishery Conservation and Management Act. For this project, both designated critical habitat and essential fish habitat would be impacted. More information about the project and understanding the mitigation proposal would inform our answer to this question, but in general, NMFS would encourage the project to think about mitigation that would account for temporal loss of habitat until the upland habitat is functional in 30 to 50 years.

**2. How do the agencies view the trade-off between building a bigger levee now vs. adding on later?—A larger project now has a greater near-term impact but would provide flood protection and upland habitat for a longer period as sea level rises, and therefore minimize the need to go back into the area to make further modifications—A smaller project has a smaller near-term impact, but another project will be needed down the line, leading to additional disturbance**

**Response:** It is difficult to answer this question without more detailed information on the effects of the various scenarios, particularly since the figures provided appear to show more than two scenarios. Based on the information provided in your presentation, the two scenarios in question (i.e. large project vs. small project) propose the same levee base footprint within existing tidal marsh (bayside footprint of levee) and consequently, appear to result in similar impacts to aquatic habitat and similar effects to species. If so, then the trade-offs the agencies would consider between the two scenarios include resilience to sea level rise, additional impacts from filling the stormwater channel for the larger project, impacts on views to the Bay, and effects to species from construction-related disturbance. Please confirm if we are understanding this correctly and explain why the same levee base footprint within existing tidal marsh is proposed for either scenario.

For either scenario, the project proponents will need to provide an alternatives analysis consistent with the Clean Water Act Section 404(b)(1) *Guidelines for Specification of Disposal Sites for Dredge or Fill Material* (Guidelines) demonstrating that the proposed project is the least environmentally damaging practicable alternative (LEDPA). Both scenarios will require (1) implementation of similar avoidance and minimization measures, and (2) similar amount of mitigation for any unavoidable impacts.

The USACE would analyze the project based on its effects to current aquatic habitats, and not necessarily consider future scenarios in our analysis (for example, projected sea level rise based on models).

From BCDC's perspective, in addition to impacts on species and habitat, it will be important to compare and analyze the relative sea level rise resilience of each alternative, as well as the impacts on views to the Bay (including wetlands) from adjacent areas, such as the community park, housing areas, and the adjacent golf course. Building a large levee will likely negatively impact views to the Bay from these areas, but this should be analyzed and described in further detail. If the lower levee option would meet the project goals, provide resilience to future sea level rise for several decades, and have lesser impacts on views to the Bay, it may be appropriate to start with the lower levee and build the levee higher in the future if needed, when more updated sea level rise information is available.

**3. Several BRRIT agency comments in response to our initial meeting speak to demonstrating net benefit. What condition are we comparing net benefit to? –Current condition doesn't seem relevant in the face of SLR–No project -> inundation–Traditional levee or sea wall**

**Response:** We understand that the current conditions at the site are expected to change over time with sea level rise, even if no project action is taken. When analyzing and describing the net benefits of the proposed project, it would be helpful to compare different scenarios as you imply in your question—e.g., a no-project scenario, versus a traditional levee or seawall, versus the proposed project—in order to demonstrate that the proposed alternative would have the greatest net benefit over time when accounting for expected sea level rise. From the perspective of CDFW, USFWS, and NMFS specifically, it will be necessary to analyze the effects to species from permanent and temporal loss of habitat (based on current conditions), but they will also consider the expected future conditions with and without a project, including any long-term benefits to species and habitat expected from the proposed project.

The USACE considers the current conditions at the site when analyzing the project effects. The USACE can consider an analysis that includes the current vulnerability of the site to inundation or erosion. However, the USACE would not compare the net loss or increase in functions under alternative future scenarios; the USACE would expect the 404(b)(1) alternatives analysis to address the current conditions versus the post-construction condition. In that analysis, the project purpose becomes very important, and should include resilience to sea level rise, with a justification for the need.

**4. How can recent agency guidance and tools be utilized on this project?**

**Response:**

**Water Board**

Based on the information provided by the Project team so far, the EBDA Project meets the eligibility requirements for enrolling for coverage under the Statewide Restoration General Order (SRGO). And since your team is coordinating with the BRRIT through our pre-application process, the Project has met the pre-application meeting requirement.

Please note that the SRGO specifies that Projects must describe project design steps taken to avoid and minimize impacts to waters of the State to the maximum extent practicable and eligible projects may only be authorized under the SRGO if it (1) meets the definition of a restoration project in the Order; (2) adopts and implements all appropriate General Protection Measures and CEQA mitigation measures identified in the Order and associated attachments to protect water quality and beneficial uses; (3) meets all approving Water Board requirements for project information and reporting; and (4) is designed to protect water quality and beneficial uses in accordance with regional or statewide water quality control plans.

Through the BRRIT's pre-application process, the Water Board can provide project-specific feedback and guidance on how to meet the eligibility requirements of the SRGO. In general, the information the Water Board needs to receive to authorize a proposed project under the SRGO is not substantively different from the information requested when we issue individual 401 certification.

### **USFWS**

Based on the information provided, it does not appear that the Biological and Conference Opinion on the Statewide Programmatic Restoration Effort (Restoration PBO) is applicable to this project. The PBO requires very low effect level to FESA-listed species (here the Ridgway's rail, salt marsh harvest mouse and possibly longfin smelt) and no net loss of habitat, which does not appear to be the case for this project (see response under question 1 above). In addition, central to use of the Restoration PBO are the avoidance and minimization measure (AMM) commitments. So far, there has not yet been an organized list of AMMs described for this project. An individual biological opinion is anticipated for this project.

### **CDFW**

CDFW's Restoration Management Permit (RMP), which consolidates "take" authorizations that voluntary habitat restoration projects may need to obtain into a single streamlined permit, may possibly be appropriate for this project. As you progress in your project designs, I can facilitate coordination with CDFW's Cutting the Green Tape Program staff, where you will have an opportunity to informally meet with them to introduce your project. Through that initial informal meeting, they will be able to determine whether this project is a good fit for an RMP, and further explain that permitting process. Please be aware that state species of special concern and common species are not included for coverage under the RMP at this time and would continue to be addressed via measures in a 1600 Lake and Streambed Alteration Agreement or a Scientific Collecting Permit (if applicable to your project).

Please see [this link](#) on the SFBRA website for helpful resources and tools as you continue project planning and eventually prepare application materials.

## **5. What types of regional monitoring or scientific studies would give the agencies greater confidence in permitting projects, so that each individual project doesn't have to do expensive monitoring and studies?**

Regional monitoring has the potential to improve the monitoring enterprise in San Francisco Bay. Natural resource management agencies may benefit from data collected across multiple temporal and spatial scales to track long-term ecological trends, adaptively manage, and inform decision-

making within the landscape. Regional monitoring may also provide important information to demonstrate effectiveness of novel, nature-based solutions intended to provide multiple benefits to humans and species. There are opportunities for regional monitoring programs, such as the Wetland Regional Monitoring Program ([WRMP](#), *in development*), to benefit project proponents by collecting baseline data, providing guidance on standard operating procedures for monitoring, and/or providing a repository for long-term data.

However, regional monitoring efforts will not eliminate the need for individual project monitoring, particularly for large, innovative, and complex projects such as EBDA's First Mile Project. Projects will continue to conduct construction monitoring to demonstrate that the project effectively implemented appropriate BMPs, and post-construction monitoring to demonstrate the project is meeting restoration goals. Monitoring project performance is especially important to demonstrate that (1) project impacts were adequately offset by the project's environmental benefits, and (2) the project is functioning as designed (e.g. geomorphic monitoring of levee function and stability). This monitoring can only be done at the project level, with specific monitoring for performance standards in order to determine success.

### **Agency Specific Comments**

#### **Federal**

##### *USACE*

1. Habitat impacts should be provided in acres and indicate whether result is conversion of one wetland type to another, or loss of wetland for more than 2 years.
2. Please provide details on the Port of Oakland mitigation area. Who is the responsible party? How will this project impact it? Is there any sort of conservation easement/ deed restriction placed on it?
3. How will the Phase I levee at the Solar Field impact the proposed horizontal levee along Bockman Canal?
4. Has the OLSD had discussions with the ACFCD concerning any potential impacts of this project on the ACFCD? Will any easement or approval from the ACFCD be required for the proposed work?
5. In the preparation of application materials, consider than anything out there in the marsh and along the existing levees that was constructed may be considered a cultural resource and will need to be evaluated for NRHP eligibility (including the levees, the RR track, those linear islands in the marsh, etc.). For any areas that require excavation, consider the depth of excavation and whether there is potential for archaeological discoveries. Would this project require archaeological testing? If no, then provide rationale.

#### **State**

##### **BCDC**

1. BCDC will be reaching out separately to discuss public access as it relates to the proposed project.



## **ATTACHMENT 3**

**BRRIT Comments on 6/11/24 First Mile Pre-application Meeting**  
**(Primary focus on wetland offsets)**

Combined comments:

- 1) It sounds like there is considerable uncertainty about future ownership and management of the horizontal levee project site. Can you provide more detail on the status of ongoing discussions, particularly about management of the site? As you know, at least some of your permits and authorizations will require commitments about maintenance and management so it will be important to identify soon who is responsible.
- 2) The complexity of projects, such as First Mile, that involve utilities and railroads is included as a challenge on the PMC's Permit and Policy Improvement List. It is unfortunate that UPRR has been unresponsive to EBDA's attempts at coordination, as the wisest approach would be working together early to restore the area at a larger landscape level before sea level rise results in interruptions to service. As you know, this coordination is time sensitive, and will become exceedingly difficult and implementation of restoration more challenging and expensive once the First Mile project is already constructed. Would it be helpful to EBDA if a member of the PMC assisted you in your efforts to engage UPRR in discussions? If so, we'd be happy to facilitate that.
- 3) We appreciate that you've determined that about one acre is available for wetland creation within the eastern half of Oro Loma marsh along the creek and by lowering islands and remnant berms no longer necessary for powerline maintenance. Can you be more specific about what areas you've identified? Is it all the beige areas on slide 13 or a subset? Also, is there a particular reason that opportunities to do the same within the *western* half of Oro Loma marsh have not been investigated? There seem to be at least a few islands that could theoretically be lowered there as well but perhaps the challenge is access. Or perhaps it's because lands there are owned by EBRPD, however, most of the eastern half of Oro Loma marsh (where you propose offsets) appear to be owned by EBRPD as well. Are there additional opportunities along the Creek that can be considered to provide more habitat connectivity?

Agency-specific comments:

**Water Board**

1. We agree that using nature-based adaptation strategies is preferable to grey infrastructure (*e.g.*, conventional levee) and is an appropriate avoidance and minimization measure. As such, the project team does not need to spend additional time and resources on an in-depth alternatives analysis comparing the proposed project to a no-project alternative and a conventional levee alternative. However, the project should provide sufficient information to demonstrate that the proposed project is designed to avoid and minimize impacts to waters of the State to the maximum extent practicable.
2. My understanding is that the treatment zone and areas downslope of the treatment zone will be considered waters of the State. If so, I would expect that fill placed to construct the horizontal levee would have more limited permanent impacts to waters of the State compared to the impact estimates presented at our meeting. I would like to confirm how the project is

calculating permanent impacts to waters of the State to ensure that impacts are not overestimated. Please let me know when we can schedule a brief call to go over the project's impact calculations.

3. As we discussed, the proposed project needs to meet the California Wetlands Conservation Policy (No Net Loss Policy). Based on the information provided, the project has several options to consider, such as additional avoidance and minimization to reduce the project's permanent impacts to waters of the State, or onsite opportunities for additional compensatory mitigation. We suggest consulting with Peter Baye if the project is considering mitigation opportunities within the natural transition zone onsite. Since the natural transition zone is primarily dominated by nonnative vegetation and is characterized as providing only moderate quality refugia habitat, there may be opportunities to enhance this habitat while providing compensatory mitigation. Also, if the project chooses to implement restoration at Frank's East, wetland acreage created that is not used to offset this project's impacts can be used to offset future impacts to waters of the State within the Hayward Regional Shoreline Adaptation Master Plan area.

### **BCDC**

BCDC is supportive of nature-based solutions for flood protection, and we also need to balance this with our statutory requirement that projects use the minimum amount of fill necessary to achieve the project purpose. Our San Francisco Bay Plan policies state that fill for habitat projects should be designed to: (a) minimize near term adverse impacts to and loss of existing Bay habitat and native species; (b) provide substantial net benefits for Bay habitats and native species; and (c) be scaled appropriately for the project and necessary sea level rise adaptation measures in accordance with the best available science.

To ensure the project is compliant with these policies, please explore whether there may be alternative horizontal levee designs, such as slightly steeper slopes than what is currently proposed, that could result in lesser impacts to existing tidal marsh while still providing the intended project benefits, including flood protection, tertiary water treatment, and transitional ecotone area. Please present an analysis of the expected tradeoffs (i.e. impacts and benefits for habitat, water quality, and flood protection) of the proposed project as compared to any feasible horizontal levee alternatives that may have lesser immediate impacts, both in the near term and with expected future sea level rise over the expected life of the project.

### **NMFS**

If additional mitigation is needed, the project team could also consider converting more uplands to wetlands at the Bay's edge by constructing protective natural beach features to protect the shoreline. Nature-based features, like covering rip rap with sand and gravel, will improve habitat connectivity, tidal exchange, marsh decomposition processes, and food web productivity, and may provide a more biologically functional and sustainable solution to the shoreline edge by implementing nature-based restoration techniques to restore ecological processes. The current rip rapped shoreline, will need to be repaired and replaced indefinitely with increasingly more riprap to protect the shoreline as wave action increases, sea levels rise, and increased overtopping, erosion, and outflanking occurs behind the riprap.

## **ATTACHMENT 4**



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# memorandum

date June 18, 2024

to Jackie Zipkin, EBDA and Heidi Nutters, SFEP

cc Stephanie Bishop and Christie Beeman, ESA

from Leonard Liu, ESA

subject High Tide Refugia Habitat Assessment, Oro Loma Marsh - First Mile Horizontal Levee Project

## Project Background

The First Mile Horizontal Levee Project (Project) is located along the east shoreline of San Francisco Bay, in the City of Hayward, Alameda County, California. The goal of the Project is to expand the concept behind the Oro Loma Horizontal Levee Demonstration Project to full scale along approximately one mile of shoreline south of the treatment plant in an area known as Oro Loma Marsh. The study area for this high tide refugia habitat assessment is the eastern half of Oro Loma Marsh, which is part of the Hayward Regional Shoreline, between Sulphur Creek, San Francisco Bay, the Union Pacific Railroad (UPRR), and Bockman Channel. The Project footprint includes the North, East and South perimeters of Oro Loma Marsh, adjacent to Bockman Canal, the Union Pacific Railroad and Sulphur Creek.

Oro Loma Marsh was agricultural land that was restored in 1997 by the East Bay Regional Park District. The study area is predominantly tidal salt marsh with pickleweed (*Salicornia pacifica*), saltgrass (*Distichlis spicata*), fleshy jaumea (*Jaumea carnosa*), and alkali heath (*Frankenia salina*), non-native fat-hen (*Atriplex prostrata*), and marsh gumplant (*Grindelia stricta* var. *angustifolia*). Cordgrass (*Spartina* spp.) is present at lower elevations, and some of the cordgrass may be invasive hybrid *Spartina*. Other habitats include freshwater wetlands, native grasslands, and uplands dominated by non-native grasses and herbs.

The East Bay Dischargers Authority (EBDA) has identified the following project objectives for the Project, in order of priority:

- Implement a full-scale demonstration of the horizontal levee concept,
- reduce current and future flood risk for a portion of the HASPA planning area,

- create and expand upland transition zones and enhance habitat resilience for special status and native wetland-dependent species,
- provide public access to the Hayward Regional Shoreline that is resilient to sea level rise, and
- improve water quality in San Francisco Bay.

In a meeting on March 27, 2024, the Bay Regional Restoration Integration Team (BRRIT) recommended the Project complete a high tide refugia habitat assessment to be able to see potential Project-related refugia habitat impacts and opportunities for enhancements to refugia habitat.

## Methods

To assess existing marsh-upland transition zone areas and in-marsh refugial habitat at Oro Loma Marsh, ESA used elevation data derived from Hayward early summer 2020 Light Detection and Ranging (LiDAR) dataset to find elevations above high tide line (7.79 feet NAVD88) in Oro Loma Marsh. The high tide line was determined from a temporary water level gauge set by ESA in the northeast area of the marsh in spring 2021.

ESA restoration ecologist Stephanie Bishop and wildlife biologists Leonard Liu and Traci Ikegami visited Oro Loma Marsh on May 9, 2024 and ground-truthed marsh-upland transition zone locations. ESA also mapped, measured, and photographed patches of marsh gumplant (*Grindelia stricta*) and other vegetative refugia within the marsh. Measurements included dominant species, average height, percent cover, relative density, and species richness.

ESA then reviewed imagery in Google Earth and found that the mapped marsh gumplant patches in Oro Loma Marsh were a good match to satellite imagery dated July 8, 2022. Using the refugial data from the 2024 site visit to assist in identifying additional in-marsh refugial habitat, ESA mapped patches of habitat larger than 3 square meters in Google Earth. ESA considered patches of gumplant or other refugia within 1 meter of each other to be contiguous. ESA then combined the Google Earth dataset with the LiDAR and site visit datasets in ArcGIS.

Finally, ESA characterized the quality of each patch of marsh-upland transition zone and in-marsh refugial habitat as low, medium, or high. Reviewing studies by Point Blue Conservation Science and H.T. Harvey and Associates, patch characteristics that are most beneficial to tidal marsh wildlife include in-marsh dense vegetation at least 30 cm from the ground, tall plants above 50 cm tall, transition zones over 25 m wide, less than 250 feet from suitable habitat, grasses and diverse plants can be beneficial. Quality assignments were based foremost on patch size, with most in-marsh patches above 50 square meters in size assigned to high quality and all patches below 15 square meters assigned to low quality. ESA examined each patch in the satellite imagery, and site visit data when available, and judged whether they had more positive correlations for high quality refugia (proximity to channels and other refugia, vegetation density and height, presence of more than one native

species) or more negative correlations (ruderal upland vegetation, connections to upland areas, distant from channels). Tall non-native vegetation was downgraded due to its tendency to die back for over 6 months of the year and only contributing cover in spring and early summer.

## Results

ESA mapped 22.3 acres of high quality refugia, 8.8 acres of medium quality refugia, and 28.7 acres of low quality refugia (**Figure 1**). Most of the high quality refugia is located within marsh areas along channels from the levee breach at Sulphur Creek into the interior of Oro Loma East. ESA also mapped several large tracts of medium quality transition zone refugia at the northwest and southeast corners of the study area. Several lower elevation areas in the study area, notably in the northeast corner, western edge, and southernmost channel, lack large patches of refugia.

## Discussion

Overall, Oro Loma Marsh East contains a good distribution of high tide refugia within the marsh and a large amount of high quality refugia habitat (Figure 1). The amount of refugia habitat has appeared to increase over the last few years. Imagery from 2020 does not show the same extent of gumplant in some locations as 2022 imagery, and the site visit in 2024 also found additional gumplant in areas where it is not evident in the 2022 imagery. The dynamic nature of vegetation and particularly gumplant distribution are possibly related to rainfall variability and drought.

The area exhibits a natural transitional ecotone within the southeast corner that then extends to the northeast across the UPRR through the golf course. A key finding in a previous site assessment was that the southeast corner currently supports upland vegetation including substantial patches of native grasslands that historically established on natural upland-marsh ecotones along the perimeter of existing tidal marshes (Baye, 2021). Therefore, the site contains high quality existing ecotone transition within the southeast corner and a large amount of high quality in-marsh refugia.

## **References**

Baye, P. 2021. Memorandum - Oro Loma Marsh: Summary of Significant Field Observations from April 2, 2021, for the Oro Loma Next Mile Horizontal Levee Feasibility Study.



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SOURCE: ESA; ESRI Service Layers; LiDAR (City of Hayward, 2020)

First Mile Horizontal Levee

**Figure 1**  
High Tide Refugia

