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memorandum

date	April 18, 2023
to	Andrew Meyer, San Diego Audubon Society
cc	
from	Annie Roberts, Lizzie Schalo PE and Lindsey Sheehan PE, Environmental Science Associates
subject	Technical Review Memorandum for the De Anza Natural Amendment to the Mission Bay Park Master Plan Draft Program Environmental Impact Report, Sch #2018061024

This memorandum provides a technical review of and comments on the City of San Diego's Draft Program Environmental Impact Report for the De Anza Natural Amendment to the Mission Bay Park Master Plan (PEIR), including a technical analysis of projected habitat change and resiliency with future sea level rise. In particular, this memorandum discusses why the "Wildest" alternative proposed in the ReWild Mission Bay: Wetlands Restoration Feasibility Study Report (2018) and the Wetlands Optimized alternative are environmentally superior alternatives to the proposed project.

1. Land Use Considerations

Both the Wetlands Optimized Alternative and the "Wildest" Alternative better meet the project objectives than the proposed project because they create more wetland habitat and provide equal amounts of active recreation as described further below.

1.1 Project Relation to Entire Mission Bay Park

1.1.1 Wetland Habitat

This project offers a unique opportunity to restore wetland habitat in Mission Bay Park; a land use that cannot be created anywhere except along the coast. The Wetlands Optimized Alternative and the "Wildest" Alternative would better meet project objective 4 (restoring and safeguarding natural habitats) because they would provide 297 acres and 315 acres of expanded marshland and buffer habitat, respectively, compared to the 265 acres of expanded marshland and buffer habitat in the Proposed Project.

Since the project would take place in the Coastal Zone, the project is considered a project of statewide, regional, or areawide significance (see the requirements set forth in Section 15206 Projects of Statewide, Regional or Areawide Significance). By specifically focusing on the diversity of land use in the project area and not Mission Bay as a whole, the PEIR does not consider this plan in the larger context. From the Draft Land Use map

provided in the 2023 Mission Bay Park Master Plan Amendment (**Figure 1**), most of the perimeter of Mission Bay is designated as parkland, active recreation, open beach, or play fields, while a minority is designated as wetland habitat. A large portion of the designated wetland habitat that is included is the San Diego River Floodway, which is disconnected from Mission Bay. Also, note that the San Diego River downstream of W. Mission Bay Bridge is designated as wetland habitat, but is actually mostly "open water". Land use decisions should be based on an assessment of acreages of land use types for the entire Mission Bay Park as well as an analysis and assessment of land use by land use type.

1.1.2 Active Recreation

The current Land Use map underestimates the availability of space for active recreation that already exists in Mission Bay. The PEIR defines active recreation as activities including "land-based active recreational pursuits, including sand volleyball, over-the-line, walking, bicycling, and in-line/roller skating" (pg 2-4). **Figure 2** shows that there are significant areas of Mission Bay that could be considered active recreation and that are not shown on the Land Use map, including playfields, walking/biking paths, and lease area active recreation, including Sea World, Quivira Basin, and Mission Bay Yacht Club. The City of San Diego's website advertises "close to 14 miles of bike paths along Mission Bay."[1] The PEIR also states that "regional parkland supports activities such as picnicking, kiteflying, Frisbee throwing, informal sports, walking, jogging, bicycling, and in-line/roller skating" (pg 2-4). By this definition, all of the regional parkland could be considered active recreation areas. There are also significant portions of Mission Bay that could be considered open water active recreation. The land use map and analysis should include all types of active recreation for the entire park.

[1] https://www.sandiego.gov/park-and-recreation/parks/regional/missionbay/waterland

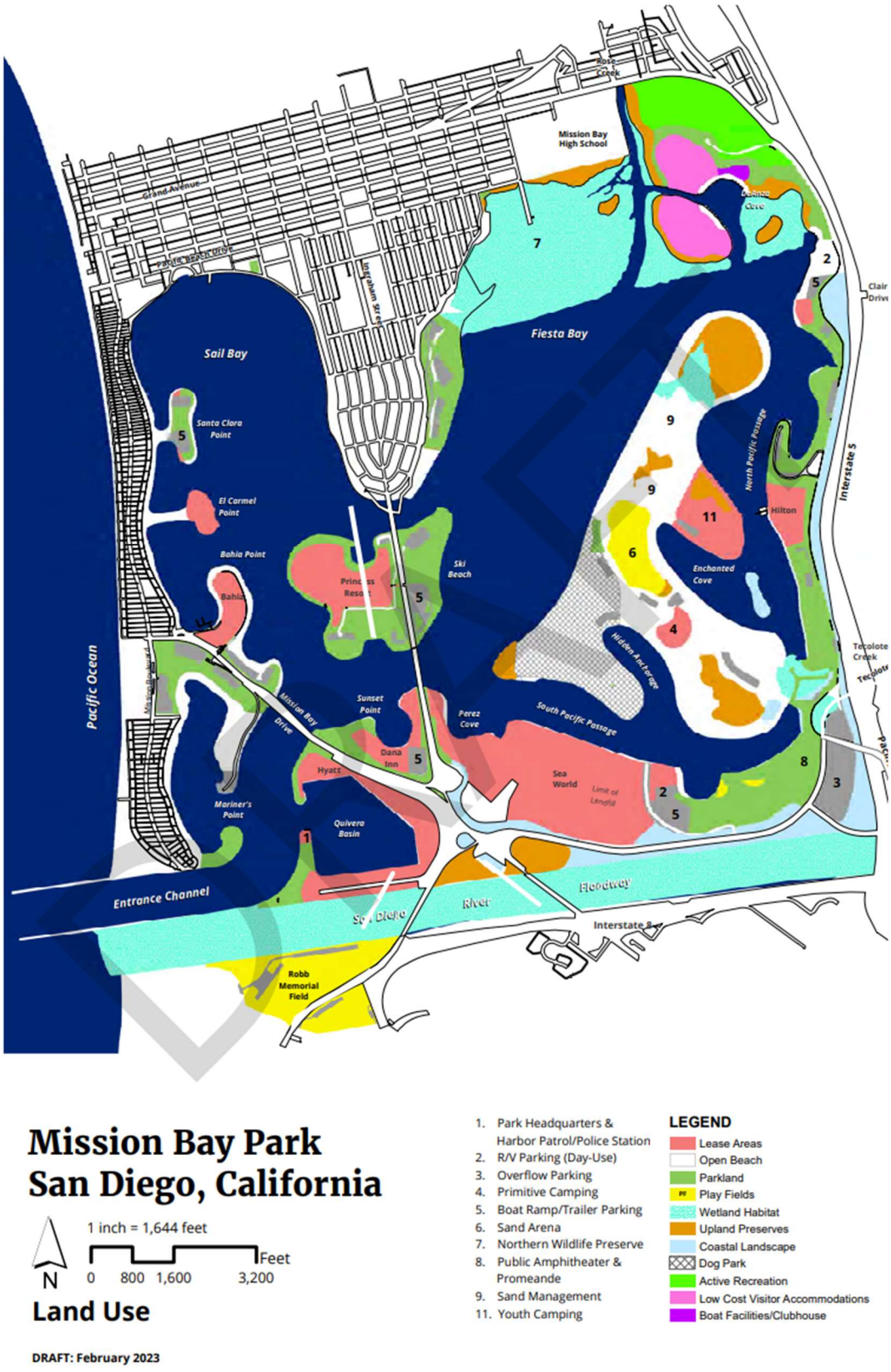


Figure 1. Draft Land Use map from the 2023 Mission Bay Park Master Plan Amendment

Figure 2. Draft Land Use map with additional areas that could be considered Active Recreation

1.2 Wetlands Provide Recreation Opportunities

The City has the opportunity to provide a variety of recreation options beyond what is shown as active recreation in the proposed project. In the area planned as "active recreation" on the site plan, the project proposes to use the space for athletic fields and courts and potentially retain the existing golf course. The planned active recreation options, including the existing golf course, are not coastal-dependent uses as defined and required by the Coastal Act. By prioritizing and increasing habitat restoration in the project area, the area can provide diverse recreational opportunities that are currently not available in the entire Mission Bay Park, including kayaking and birding in or near wetland areas. The PEIR describes the expanded marshland/habitat and upland (dune, sage) and buffer areas as places for recreational opportunities in Section 3.3.1.2, but does not count these areas as active recreation. Limiting the definition of active recreation to land-based activities gives the impression that the creation of habitat will reduce recreation in the project area. However, maximizing the restored habitat within the project area would better meet objective 5 (diversify active and passive recreational uses) by providing significant recreational opportunities, including kayaking and walking paths to observe wildlife, that are coastal-dependent uses currently lacking in Mission Bay Park.

2. Sea Level Rise and Climate Change Considerations

AB 691 requires agencies managing State Tidelands, including the City of San Diego, to proactively plan for sea level rise. As a result, the City prepared a State Lands Sea Level Rise Vulnerability Assessment (ICF 2019). Section 3.4 of the PEIR states that the "PEIR programmatically addresses the environmental impacts of future implementation of the project using realistic, worst-case assumptions and establishes a mitigation strategy that would apply to future improvements." However, the plan set forth by the City in the PEIR does not include a discussion of a long-term resiliency plan that accounts for future projected sea level rise and does not reference the City's Sea Level Rise Vulnerability Assessment.

2.1 Sea Level Rise Resiliency

The project area is vulnerable to future sea level rise. In the City's Sea Level Rise Vulnerability Assessment (ICF 2019), ICF used U.S. Geologic Services (USGS) data to map sea level rise around Mission Bay, as shown in **Figure 3**. A zoomed in version of the USGS data for 6.6 feet of sea level rise with a 100-year storm for the project area is shown in **Figure 4** (CoSMoS v3.0; Barnard et al. 2018). It should be noted that these maps do not show extreme Rose Creek discharge, which will have additional flooding impacts.

In both Section 5.7.3.1 and Appendix I, the PEIR mentions: "With implementation of the Proposed Project, De Anza Cove is expected to experience lowered levels of inundation and velocities by 2100 compared to if the area is left in its current state, as a result of proposed wetland restoration activities, which would increase resilience to sea level rise and coastal flooding." However, the report does not include a sea level rise assessment nor discussion of impacts due to potential adaptation strategies that will be needed to protect developed areas, such as sea walls, revetments, or berms. Without a sea level rise assessment, it is not possible to assess the impacts of the project, even at the program level.

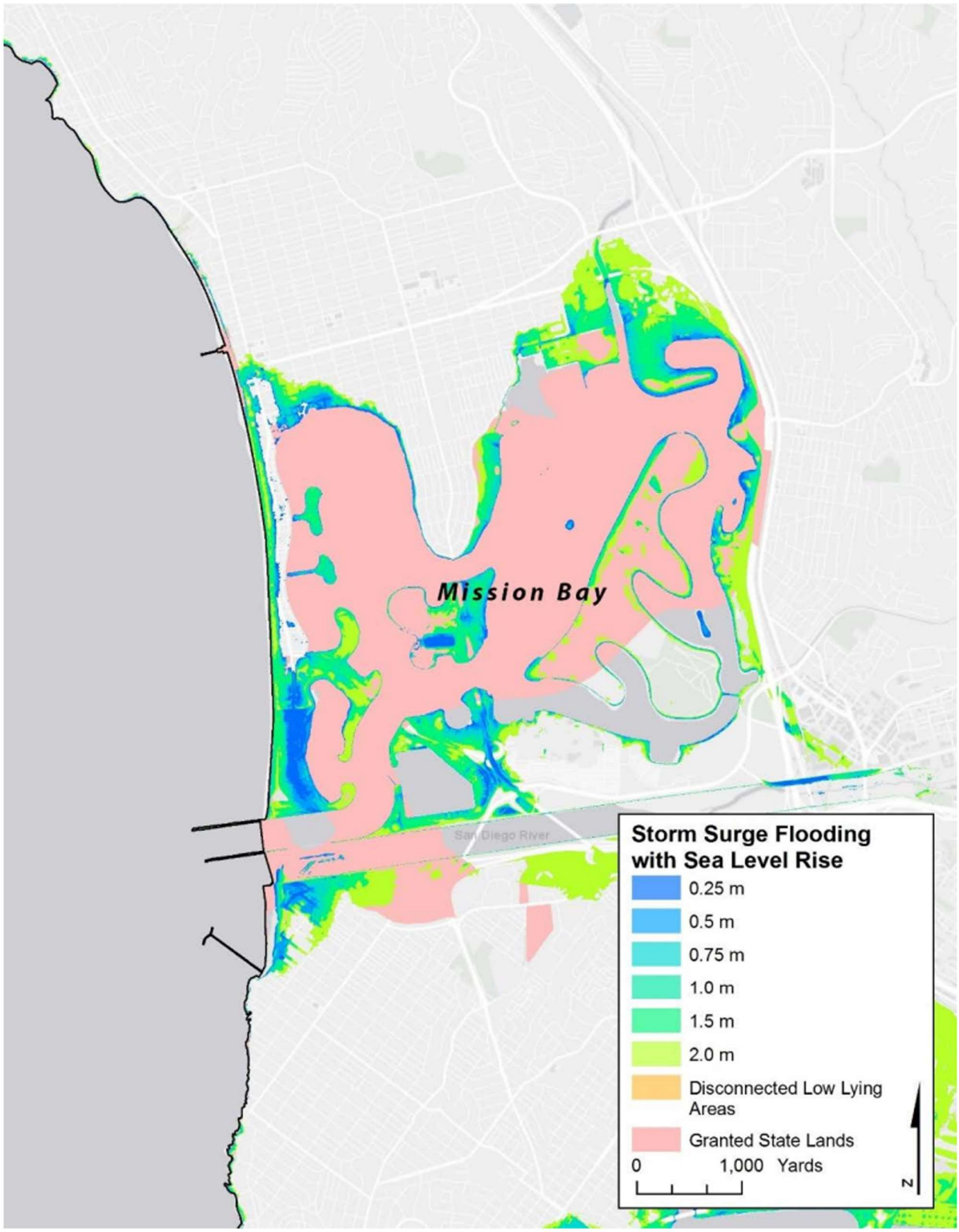


Figure 3. Mission Bay exposure to storm surge and sea level rise.

Figure 4. Projected flood exposure data from the USGS Coastal Storm Modeling System (CoSMoS v3.0; Barnard et al. 2018), accessed via the Our Coast Our Future web platform (Point Blue Conservation Science and USGS 2023).

2.2 SEP Habitat Requirements

According to the Supplemental Environment Project (SEP) required by the RWQCB, the PEIR must fully analyze an expanded restoration alternative that will result in 80 acres of wetland by the year 2100. Without a sea level rise analysis, the PEIR cannot show how the Wetlands Optimized alternative will result in 80 acres of wetland by the year 2100.

ESA developed a habitat evolution model for the Wetlands Optimized alternative (Attachment A) assuming all habitat shown in the figure would start as salt marsh. Assuming 3.6 feet of sea level rise by 2100 would result in only 28 acres of salt marsh remaining at the end of the century, with the majority of the site (124 acres) converting to mudflat. To meet the intention of the SEP, the City may consider reducing the amount of development surrounding the habitat and including more upland habitat that would allow the wetland to move upslope within the planning horizon of this plan, similar to the "Wildest" alternative, which would result in 75 acres of wetland by 2100.

2.3 Cut/fill Balance

The PEIR notes that the preferred alternative would balance cut and fill onsite, but a basic description or grading plan is not provided. Substantial fill will be needed to create the desired wetland acreage, and additional fill may be needed to raise developed areas to make them resilient to sea level rise. In Section 5.2.3.2, the PEIR states that

"future grading and excavation quantities are currently unknown." The PEIR provides a cut/fill estimate of 873,886 cubic yards, but it is unclear to what elevations the wetland and upland habitats would be filled. A cut/fill balance analysis should be included to show the project can create wetland habitat and create resilient development. Alternatively, potential air quality, greenhouse gas emissions, traffic and other impacts associated with bringing in additional fill to the site should be evaluated in the PEIR.

2.4 Greenhouse Gases and Carbon Sequestration

The City of San Diego seeks to achieve a goal of net zero GHG emissions by 2035 (City of San Diego 2022). The City's Climate Action Plan (CAP; 2022) identifies a restoration target of 350 acres of salt marsh land by 2030 to provide resiliency, air quality, and public health benefits, and 700 acres by 2035.

National and international organizations, as well as state and federal agencies, have become increasingly interested in exploring the carbon storage and sequestration capacities of wetlands, especially salt marshes, mangroves, and seagrass beds (see for example Smardon 2019). Peer-reviewed scientific literature has demonstrated the great significance of these ecosystems for both carbon sequestration and storage (Pendleton et al. 2012; Fourqurean et al. 2012). To meet the goals of the CAP, the City should consider maximizing wetland restoration in the project area as salt marsh restoration provides climate benefits. The "Wildest" and Wetlands Optimized alternatives would provide more carbon sequestration benefits compared to the proposed project by providing more wetlands and better meet project objective 3 (mitigate potential sea level rise impacts).

3. Public Access

In Section 8.3.2.3, the PEIR says "the Wetlands Optimized Alternative would not meet project objectives 1 and 6 because, compared to the proposed project, it would not as fully provide equitable access or enhance the public access of De Anza Cove." Currently, the only public access to wetlands in Mission Bay is during Love Your Wetlands Day at Kendall Frost Marsh, which occurs once a year, and during the UC San Diego Natural Reserve System and San Diego Audubon's Wander the Wetlands program, for two hours twice a month. A fence around the site keeps the public out during the rest of the year. While public access to wetlands certainly should be balanced with protection of the habitat, wetlands are a unique coastal landscape that are currently restricted in Mission Bay for almost all San Diegans. Public access to wetlands can include walkways by the shoreline of the wetland, blinds to enhance opportunities to observe wildlife, some boardwalks through the wetlands and a kayak trail for access at higher tides, as described in the "Wildest" Alternative design in the ReWild Mission Bay Restoration Feasibility Study Report (2018). By creating more wetlands, both the Wetlands Optimized Alternative and the "Wildest" Alternative provide greater opportunity for all communities to access this unique habitat and enhance public access in Mission Bay.

Additionally, Section 8.3.2.3 notes that increasing wetlands "would result in a reduction in low-cost visitor guest accommodations and open beach uses." As discussed under the Land Use Considerations section, the project should be considered in the context of Mission Bay as a whole. Mission Bay Park has extensive beach areas for public access; therefore creation of more wetlands rather than public beach areas should be considered a benefit, not a negative. The City should consider adjusting the Wetlands Optimized alternative to increase the low-cost visitor guest accommodations and remove all or portions of the golf course, which is not a coastal dependent use while prioritizing wetlands in order to meet project objectives 1 and 6. Similarly, while the ReWild options do not

include details on the development that could occur in the project area, the "Wildest" alternative provided sufficient space to create a comparable area of low-cost visitor guest accommodations.

4. Impacts to Water Quality

The Mission Bay Master Plan Amendment (2023) states that an important consideration of the project area "should be the extent to which the area can contribute to the Park's water quality." Due to the high importance of water quality to the project, the project should include an additional objective to enhance water quality and water circulation within De Anza Cove.

The PEIR explains that pollutants generated through construction activities will be addressed through a SWPPP and the implementation of construction best management practices (BMPs). Potential long-term pollutants would be addressed through project area and source control BMPs. A SWQMP would be prepared to ensure that runoff is adequately captured and/or treated. However, the PEIR does not include a discussion of the potential impacts to water quality associated with the creation of a channel that connects Rose Creek to De Anza Cove. A water circulation study will be an important next step to size the channel and determine whether the channel will make the water quality in De Anza Cove measurably worse.

5. Impacts to Eelgrass

A significant amount of new wetland habitat shown on the site plan requires the fill of open water in existing eelgrass beds. The PEIR describes the placement of fill to raise elevations for marsh habitat as the creation of new wetland habitat. A more accurate description would be the conversion of habitat from eelgrass to wetland. The PEIR addresses the removal of eelgrass habitat and describes the San Diego Biological Guidelines (SDBG) required mitigation ratio of 2:1, where 1:1 mitigation must occur within Mission Bay. However, the PEIR does not include a description of where and how eelgrass habitat will be mitigated nor an assessment of the potential impacts of such mitigation.

6. Tribal Nation Reconnection Opportunities

The PEIR does not describe how any alternative would or would not meet objective 2 (foster opportunities for members of local Tribal nations to reconnect). In Section 8.3.2.3, the PEIR states that "The Wetlands Optimized Alternative would meet project objective 2 by fostering opportunities for members of local Tribal nations to reconnect to De Anza Cove." However, in Section 8.2.1.2, the PEIR states that the ReWild alternatives "would not foster opportunities for members of local Tribal nations to reconnect to De Anza Cove," but with no explanation of how this conclusion was reached. At the program level, there is still an opportunity to work with tribes to adjust any of the project alternatives to provide opportunities for tribal reconnection. At this point, there is no justification for eliminating the ReWild alternatives based on objective 2.

7. Conclusions

The PEIR should include specific criteria for determining whether an alternative meets a project objective or not. For example, in the PEIR, there is no basis specified for determining whether a project alternative meets or does not meet the project objectives related to land use (objectives 4 and 5) and which project objective takes priority. The PEIR states "the Wetlands Optimized Alternative would not fully implement project objective 5, as active and passive recreational uses would be further reduced" (pg. 8-43). Following this logic, the preferred alternative

would not meet project objective 4 because restoration of habitats would be reduced compared to the Wetland Optimized Alternative and the "Wildest" Alternative. As discussed above, given the larger context of Mission Bay Park, achieving project objective 4 should take precedence over achieving project objective 5.

Table 1 provides a summary of the Proposed Project, Wetlands Optimized Alternative, and "Wildest" Alternative as they relate to the project objectives.

Table 1. Relationship of Proposed Project, Wetlands Optimized Alternative, and ReWild "Wildest" Alternative to Project Objectives

Objective	Proposed Project	Wetlands Optimized Alternative	ReWild "Wildest" Alternative
1. Provide equitable access to De Anza Cove and the coastal landscape for all San Diegans, particularly communities that have historically experienced barriers to access.	• 48.5 ac low-cost visitor guest accommodations	• 27.4 ac of low-cost visitor guest accommodations, which could be expanded to match the proposed project by changing/removing the golf course • Would increase access to wetlands which are currently restricted	• Developed areas were not detailed out in the Feasibility Study, but left space that can be used to match the area of the low-cost visitor guest accommodations in the proposed project • Would increase access to wetlands which are currently restricted
2. Foster opportunities for members of local Tribal nations to reconnect to De Anza Cove.	The PEIR includes no description of how any alternative would or would not meet this objective. At the program level, there is still an opportunity to work with tribes to adjust any of the project alternatives to provide opportunities for tribal reconnection.		
3. Incorporate climate adaptation strategies to increase resilience to climate change and mitigate potential sea level rise impacts.	• 37.4 ac upland habitat and buffer areas for sea level rise transition habitat • 140.5 ac of marsh to provide carbon sequestration benefit	• 46.1 ac upland habitat and buffer areas for sea level rise transition habitat • 250.9 ac of marsh to provide carbon sequestration benefit	• 85.7 ac upland habitat and buffer areas for sea level rise transition habitat • 227 ac of marsh to provide carbon sequestration benefit • Cut/fill fully analyzed and balanced on site, so no soil transportation emissions
4. Embrace responsibility and stewardship of the environment by restoring and safeguarding natural habitats within De Anza Cove.	• 140.5 ac marsh	• 250.9 ac marsh • Allows more access to marsh to encourage public stewardship through exposure	• 227 ac marsh • Allows more access to marsh to encourage public stewardship through exposure
5. Diversify active and passive recreational uses that will serve a range of interests, ages, activity levels, incomes, and cultures both on land and in water.	Maximizing the restored habitat within the project area would provide significant recreational opportunities, including kayaking and walking paths to observe wildlife, that are coastal-dependent uses currently lacking in Mission Bay Park. Most of the perimeter of Mission Bay is designated as parkland, active recreation, open beach or play fields, while a minority is designated as wetland habitat.		
6. Enhance public access and connectivity within De Anza Cove and increase connections to the surrounding communities, including opportunities for multimodal travel.	• Would provide open beach area, which is plentiful in Mission Bay • Would provide tennis center, athletic fields, and a golf course which are not coastal-dependent uses	• Would increase access to wetlands which are currently restricted	• Would increase access to wetlands which are currently restricted • Includes walkways by the shoreline of the wetland, blinds to enhance opportunities to observe wildlife, some boardwalks through the wetlands, and a kayak trail for access at higher tides
Recommended additional objective: **7. Contribute to the improvement of the Park's water quality.**	• 140.5 ac of marsh to provide water quality benefits • Redirecting Rose Creek to De Anza Cove may impact water quality in the cove	• 250.9 ac of marsh to provide water quality benefits • Redirecting Rose Creek to De Anza Cove may impact water quality in the cove	• 227 ac of marsh to provide water quality benefits • Sea level rise modeling shows that tidal marsh acreage persists through 2100, and that wetland benefits to water quality will continue through the century

References

Barnard, P.L., Erikson, L.H., Foxgrover, A.C., Limber, P.W., O'Neill, A.C., and Vitousek, S., 2018, Coastal Storm Modeling System (CoSMoS) for Southern California, v3.0, Phase 2 (ver. 1g, May 2018): U.S. Geological Survey data release, https://doi.org/10.5066/F7T151Q4.

California Coastal Commission (CCC) 2018. Sea-Level Rise Policy Guidance, Updated 2018. November 7, 2018.

California Ocean Protection Council's (OPC) 2018. State of California Sea-Level Rise Guidance, 2018 Update. March 14, 2018.

Cayan et al. 2008; Griggs et al. 2017. Rising Seas in California, An Update on Sea-Level Rise Science. April, 2017.

City of San Diego (2019). State Lands Sea Level Rise Vulnerability Assessment. Available online at: https://www.sandiego.gov/sustainability/resilience. Accessed April 13, 2023.

City of San Diego (2020). Climate Change Vulnerability Assessment. Available online at: https://www.sandiego.gov/sustainability/resilience. Accessed April 13, 2023.

City of San Diego (2022). Climate Action Plan. https://www.sandiego.gov/sites/default/files/san_diegos_2022_climate_action_plan_0.pdf

City of San Diego (2023). De Anza Natural Draft Amendment to the Mission Bay Park Master Plan.

City of San Diego (2023). In the Water. Parks and Recreation. https://www.sandiego.gov/park-and-recreation/parks/regional/missionbay/waterland. Accessed April 6, 2023.

ESA. 2020. Wetland Restoration of Salt Pond 20, Hydrodynamic Modeling Report. Prepared for the San Diego Unified Port District and Great Ecology. March 2020.

Fourqurean, J.W., Duarte, C.M., Kennedy, H., Marba, N., Homer, M., Mateoa M.A., Apostolaki E.T., Kendrick G.A., Krause-Jensen D., McGlathery K.J., and Serrano, O. 2012. Seagrass ecosystems as a globally significant carbon stock. Nature Geoscience 5, 505-509.

National Oceanic and Atmospheric Administration (NOAA). 2010. 2009-2011 CA Coastal California TopoBathy Merged Project Digital Elevation Model (DEM). Downloaded March 21, 2023.

Pendleton, L., Donato, D.C., Murray, B.C. et al. 2012. Estimating global "blue carbon" emissions from conversion and degradation of vegetated coastal ecosystems. PLoS ONE 7: e43542.

San Diego Audubon Society. 2018. ReWild Mission Bay Wetlands Restoration Feasibility Study Report.

Smardon, R.C. 2019. U.S. Clean Water Act policy vs wetland science – nexus or not? In Wetland Science & Practice 36(1), 15-22.

Attachment A. Sea Level Rise Technical Assessment

To assess whether the Wetlands Optimized alternative would meet the SEP requirement of 80 acres of wetland by 2100, ESA performed a technical analysis of projected habitat change (i.e., habitat evolution) and resiliency with future sea level rise.

Sea Level Rise Projections and State Guidance

Projections of global sea level rise are well-documented and investigated, with recent research projecting sea level rise on the order of 2 to 10 feet by 2100 in California (e.g., Cayan et al. 2008; Griggs et al. 2017). This research has been used to develop a series of policy guidance documents by the State of California that recommend including specific amounts of sea level rise in project planning and design, the most recent being the California Ocean Protection Council's (OPC) State of California Sea Level Rise Guidance (OPC 2018). The OPC (2018) Guidance includes tables of projected relative sea level rise at well-established tide gages located along the coast of California through 2150 for a range of risk aversion scenarios, including low, medium-high, and extreme (e.g., H++). Table 1 shows the projections for San Diego Bay, which is the closest water level gauge to Mission Bay. These projections were developed and summarized with the intention that local planning and design efforts would have a consistent and accepted basis for addressing future sea level rise.

The California Coastal Commission (CCC) updated their Sea Level Rise Policy Guidance in 2018 (CCC 2018). The CCC (2018) Guidance provides a basis for selecting the time horizon and the risk level of the project, which are used to define the appropriate sea level rise amounts. The OPC Guidance identifies three levels of risk to consider when planning for sea level rise (blue boxes in Table 2-2):

- The low risk aversion scenario is appropriate for adaptive, lower consequence decisions (e.g., unpaved coastal trail), but is not adequate to address high impact, low probability events.

- The medium-high risk aversion scenario is appropriate as a precautionary projection that can be used for less adaptive, more vulnerable projects or populations that will experience medium to high consequences as a result of underestimating sea level rise (e.g., coastal housing development).

- The extreme risk aversion scenario is appropriate for high consequence projects with little to no adaptive capacity and which could have considerable public health, public safety, or environmental impacts (e.g., coastal power plant, wastewater treatment plant, etc.).

Table 1. Projected Sea Level Rise (in feet) for San Diego

		Probabilistic Projections (in feet) (based on Kopp et al. 2014)					H++ scenario (Sweet et al. 2017) *Single scenario
		MEDIAN	LIKELY RANGE		1-IN-20 CHANCE	1-IN-200 CHANCE	
		50% probability sea-level rise meets or exceeds...	66% probability sea-level rise is between...		5% probability sea-level rise meets or exceeds...	0.5% probability sea-level rise meets or exceeds...	
				Low Risk Aversion		Medium - High Risk Aversion	Extreme Risk Aversion
High emissions	2030		0.4 -	0.6	0.7	0.9	1.1
	2040	0.7	0.5 -	0.9	1.0	1.3	1.8
	2050	0.9	0.7 -	1.2	1.4	2.0	2.8
Low emissions	2060	1.0	0.7 -	1.3	1.7	2.5	
High emissions	2060	1.2	0.9 -	1.6	1.9	2.7	3.9
Low emissions	2070	1.2	0.9 -	1.6	2.0	3.1	
High emissions	2070	1.5	1.1 -	2.0	2.5	3.6	5.2
Low emissions	2080	1.4	1.0 -	1.9	2.4	3.9	
High emissions	2080	1.9	1.3 -	2.5	3.1	4.6	6.7
Low emissions	2090	1.6	1.0 -	2.2	2.9	4.8	
High emissions	2090	2.2	1.6 -	3.0	3.7	5.7	8.3
Low emissions	2100	1.7	1.1 -	2.5	3.3	5.8	
High emissions	2100	2.6	1.8 -	3.6	4.5	7.0	10.2
Low emissions	2110*	1.9	1.3 -	2.7	3.5	6.4	
High emissions	2110*	2.8	2.0 -	3.7	4.7	7.5	12.0
Low emissions	2120	2.0	1.3 -	3.0	4.1	7.6	
High emissions	2120	3.1	2.3 -	4.3	5.5	8.8	14.3
Low emissions	2130	2.2	1.4 -	3.3	4.6	8.6	
High emissions	2130	3.5	2.6 -	4.9	6.3	10.2	16.6
Low emissions	2140	2.4	1.5 -	3.6	5.1	9.8	
High emissions	2140	3.9	2.8 -	5.4	7.1	11.7	19.2
Low emissions	2150	2.5	1.5 -	3.9	5.7	11.1	
High emissions	2150	4.3	3.0 -	6.1	7.9	13.3	22.0

Wetlands Optimized Alternative Analysis

To assess the potential area of habitat remaining in 2100 in the Wetlands Optimized Alternative, the OPC 2018 low risk aversion scenario (high emissions) was selected. The low risk aversion scenario (3.6 ft of sea level rise by 2100) is likely to occur and is not as extreme as the medium-high scenario.

Zones of general topographic suitability for various tidal and tidally-adjacent habitat types can be defined based on the elevation of the area relative to tidal datums (i.e., as a surrogate for the frequency of tidal inundation). Based on an assessment conducted in South San Diego Bay (ESA 2020), salt marsh habitat typically exists between 2.9 to 6.9 ft NAVD. Below 2.9 ft NAVD, the inundation frequency would be too great to maintain marsh vegetation species, and mudflat or subtidal habitat would occur. Above 6.9 ft NAVD, the habit would transition to upland habitat. As sea levels rise, habitat elevation bands rise with it. By 2100, with 3.6 ft of sea level rise, salt marsh habitat is expected to occur between 6.5 and 10.5 ft NAVD.

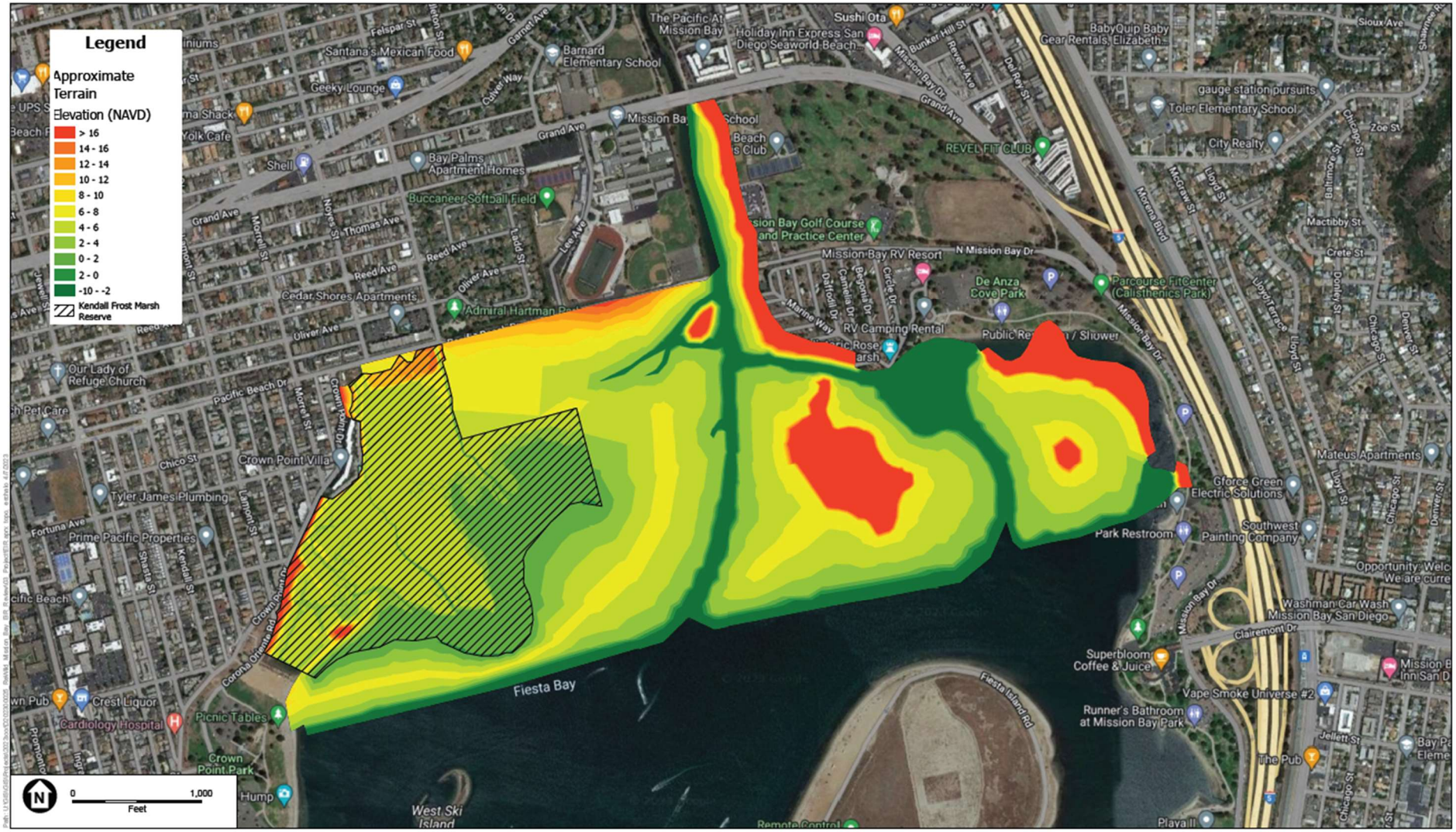
Marsh habitat acreages for 2100 were estimated for the Wetlands Optimized Alternative using the wetlands and uplands areas in PEIR Figure 8-1. ESA developed an approximate terrain by assuming an elevation of 2.9 ft NAVD (lowest saltmarsh elevation discussed above) at the edge of the proposed wetland, an elevation of 6.9 ft NAVD at the inland wetland boundary, and a maximum of 3:1 slope. Varying terrain was assumed in some areas to provide a range of marsh elevations in wetland areas including a high marsh ridge line in the proposed wetland adjacent to Kendall-Frost Marsh, a high marsh ridgeline along the southwest point of the proposed marsh island, and a mid-marsh dip between the two upland areas east of De Anza Cove. The approximate terrain is shown in Figure 1. As mentioned previously, the terrain is entirely assumed based on the wetland extent provided by the PEIR. The PEIR does not provide information about habitat distribution or topography within the wetland area.

Table 2 shows the results of the analysis. Total wetland area in 2100 (including mudflat, but not including Kendall-Frost Marsh) is estimated to be approximately 152 acres. In 2100, mudflat comprises a majority of the total wetlands area at 124 acres while low, mid, and high marsh combined comprise only 28 acres (Figure 2). Because the current plan is estimated to result in mostly mudflat habitat compared to salt marsh habitat, more of the upland and future marsh area should be set as undeveloped and graded at a very shallow slope. This would allow for the salt marsh habitat (low, mid, and high marsh) to have more room to move upslope as sea levels rise and increase the likelihood of this important habitat remaining through 2100.

TABLE 2

HABITAT ACREAGES WITH SEA-LEVEL RISE

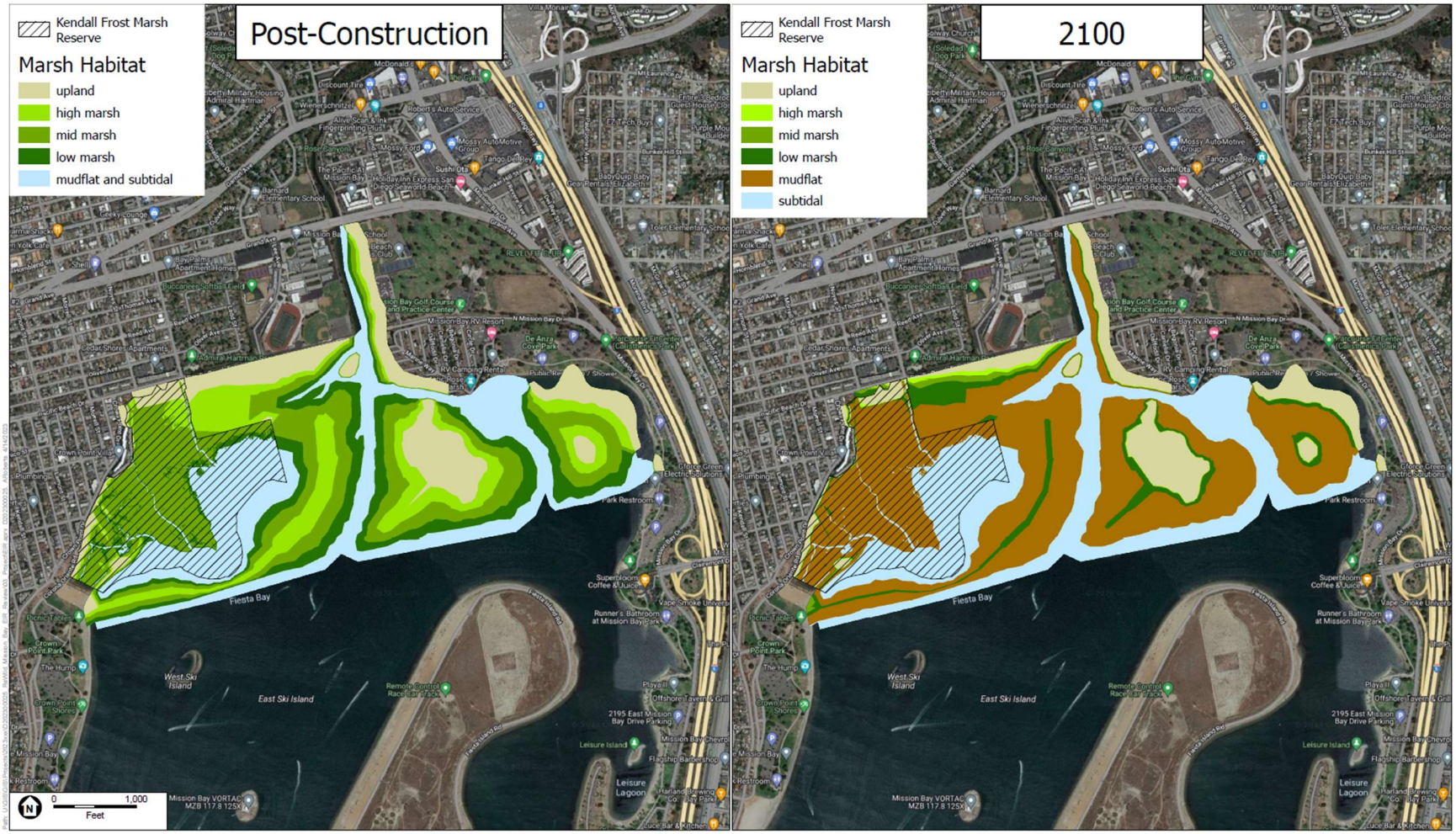
Habitat	Elevation Band (feet NAVD)	Post-Construction (acres)	With 3.6 ft of Sea Level Rise in 2100 (acres)
Upland	> 6.9	49	37
High Marsh	5.7 to 6.9	48	3
Mid Marsh	4.1 to 5.7	60	5
Low Marsh	2.9 to 4.1	46	20
Mudflat	-0.4 to 2.0	0	124
Subtidal	< -0.4	67	81



SOURCE: ESA, 2023

ReWild Mission Bay EIR Review

Figure 1
Wetlands Optimized Alternative Approximate Terrain



SOURCE: ESA, 2023

ReWild Mission Bay EIR Review

Figure 2
Wetlands Optimized Alternative Marsh Habitats
Post-Construction (Left) and 2100 (Right)

ESA