

DATE: November 12, 2025

TO: Parks and Recreation Commission

FROM: Raymond Wong, Watershed Manager
Lisa Au, Assistant Public Works Director
Jennifer Ng, Public Works Director

SUBJECT: **Sailing Lake Habitat Island Alternative Analysis, Project 23-44**

RECOMMENDATION

Recommend to approve completion of environmental clearance, permitting, and plans and specifications to restore Sailing Lake Habitat Island, as part of the Shoreline Park Water Control Structures Improvements, Project 23-44, with Restoration Alternative 2 – Repair Eroded Slopes and Expand Island Size, and Barrier Improvement Alternative C – Drilled Wooden Piles.

BACKGROUND

The City of Mountain View owns and operates Shoreline Sailing Lake (Sailing Lake) at Shoreline in Mountain View Regional Park (Shoreline Park). The Sailing Lake is an artificial non-tidal saltwater lake created in the 1980s, covering approximately 45 acres with an average depth of 18 feet. The lake supports multiple recreational uses, including kayaking, sailing, and windsurfing. The Sailing Lake includes an island landform (habitat island) located near the southwestern shore of the lake (Figure 1). Historical photographs suggest that the island area was once a landmass connected to the southern lake shoreline.

The habitat island is identified in the Shoreline Wildlife Management Plan (SWMP) as a non-tidal saltwater lake/island habitat within Shoreline Park. The habitat island serves as an annual nesting site for a variety of species including: black skimmers - an umbrella species studied in the SWMP, Forster's terns, American avocets, black-necked stilts, and some resident waterfowl such as mallards and Canada geese. The habitat island is also used as a roosting site during the nonbreeding season by a variety of resident and migratory waterbirds and gull species. Decreasing the rate of bank erosion and restoring the habitat island is one of the habitat enhancement and restoration opportunities identified in SWMP.

Over the years, the habitat island has experienced significant erosion due to wind and wave actions. A 1991 aerial photograph shows the island surface area was approximately 0.18 acre. A 2023 field survey shows the current island surface area has decreased to approximately 0.11 acre. The erosion has reduced the overall size of the island and its habitat value. The existing

near-vertical side slopes have further impacted nesting success for waterbirds breeding on the island, as chicks that fall into the water are unable to climb back on the island. Nesting activities have also been negatively impacted by frequent disturbance from recreational users on the lake during the breeding season, despite ongoing efforts to reduce human disturbance with additional signage and buoy placement.



Figure 1 – Sailing Lake Habitat Island

In addition to the erosion issues at the habitat island, Shoreline Park has several water control structures that require various repairs and improvements. The Shoreline Park Water Control Structures Improvements, Project 23-44, is an umbrella project created to address ongoing operation and maintenance issues at the habitat island, Sailing Lake, Charleston Slough, and Coast-Casey Pump Station. On May 31, 2023, the City executed a professional services agreement with AECOM to provide design engineering, environmental clearance, and permitting services for the Shoreline Park Water Control Structures Improvements, Project 23-44. As a part of this project, the consultant evaluated and developed alternatives to improve and restore the habitat island.

In September 2025, the consultant completed an Alternatives Analysis Report (Attachment 1) that evaluated alternatives to address the erosion and associated habitat degradation at the habitat Island. The Alternative Analysis Report summarizes proposed alternatives to restore the habitat island to its historic island size of 0.18 acre or greater, enhance benefits for nesting bird species, prevent future erosion, and provide a more robust protection barrier around the island to prevent island access by recreational users. A multi-criteria evaluation was conducted to assess how well each alternative meets the project objectives and to inform the recommendation of an alternative to advance into detailed design.

ALTERNATIVES

The term “restoration” encompasses multiple goals for the Habitat Island. The overarching goal of this project is to restore the island to its historic acreage or greater, in a manner that will minimize future erosion. In addition, there is a more specific restoration goal to enhance bird nesting habitat within both the existing island area and any proposed expansion areas to maximize benefits for the target bird species, including black skimmers, Forster’s terns, American avocets, and black-necked stilts.

This study considered three alternatives to restore the habitat island, and three alternatives to improve the existing barrier around the habitat island. As the barrier options could be used for any of the island restoration alternatives, they are discussed separately at the end with individual option costs.

Habitat Island Restoration Alternatives

Habitat Island Restoration Alternative 0 – Maintain Existing Condition

Alternative 0 includes no improvements to the existing island, leaving the existing near vertical eroded banks and associated risk to wildlife unaddressed. In addition, no improvements would be made to the island’s existing surface features. However, a new barrier system would be constructed to reduce human interaction (recreational users) with the habitat island and its wildlife. The objective of this alternative is to maintain the current level of City operation and maintenance while limiting near-term capital costs.

This alternative does not meet the primary goals of the project to restore the island to its historical size and to minimize future erosion. In addition, it is anticipated that this alternative will result in continued erosion and further reduction in island size over time, which would increasingly limit bird nesting areas. For these reasons, Alternative 0 is not further evaluated in this alternative analysis.

Habitat Island Restoration Alternative 1 – Repair Eroded Slopes

Alternative 1 preserves the existing habitat island shape and surface size of 0.11 acre, while repairing the eroded slopes around its perimeter (Figure 2). While the existing surface topography on the island would largely remain intact, the proposed design includes flattening the island’s side slopes. Gravel erosion protection would also be provided around the island slopes.

A construction duration of two months would likely be required for this alternative, with mobilization starting in early October after the end of the bird nesting season. The contractor would need to lower the lake level and potentially install cofferdams, to create a dry work area

that would accommodate the earthwork at the island.

The planning level Engineer's Opinion of Probable Construction Cost (OPCC) for Alternative 1 is approximately \$1.2 million.

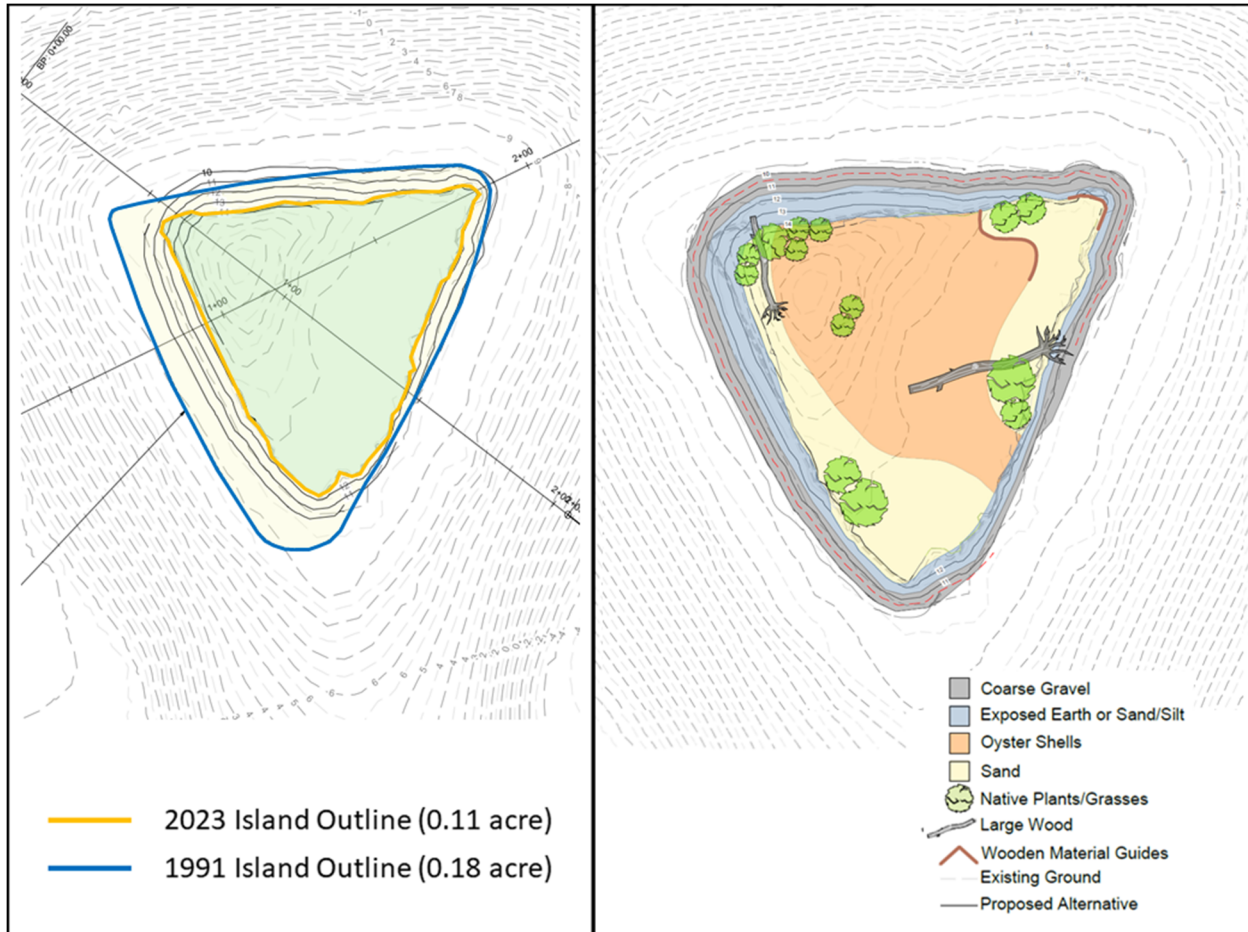


Figure 2 – Habitat Island Restoration Alternative 1

Habitat Island Restoration Alternative 2 – Repair Eroded Slopes and Expand Island Size

Alternative 2 preserves the existing habitat island shape, repairs the eroded slopes around the perimeter, and increases the island size (Figure 3). Alternative 2 meets the goal of restoring the habitat island to its historic size. Because of the additional areas needed to grade a set of gradually sloped banks around the restored island, the island surface area above the lake water level would increase from the existing size of 0.11 acre to the expanded size of up to 0.28 acre, of which 0.18 acre would be flat surface area. While the existing topography on the island surface would largely remain intact, the proposed island side slopes would be flattened. Gravel erosion protection would also be provided around the island slopes.

A construction duration of three to four months would likely be required for this alternative, with mobilization starting in early October after the end of the bird nesting season. Similar to Alternative 1, the contractor would need to lower the lake level and install cofferdams, to create a dry work area that would accommodate the earthwork at the island.

The planning level Engineer's Opinion of Probable Construction Cost (OPCC) for Alternative 2 is approximately \$3.1 million.

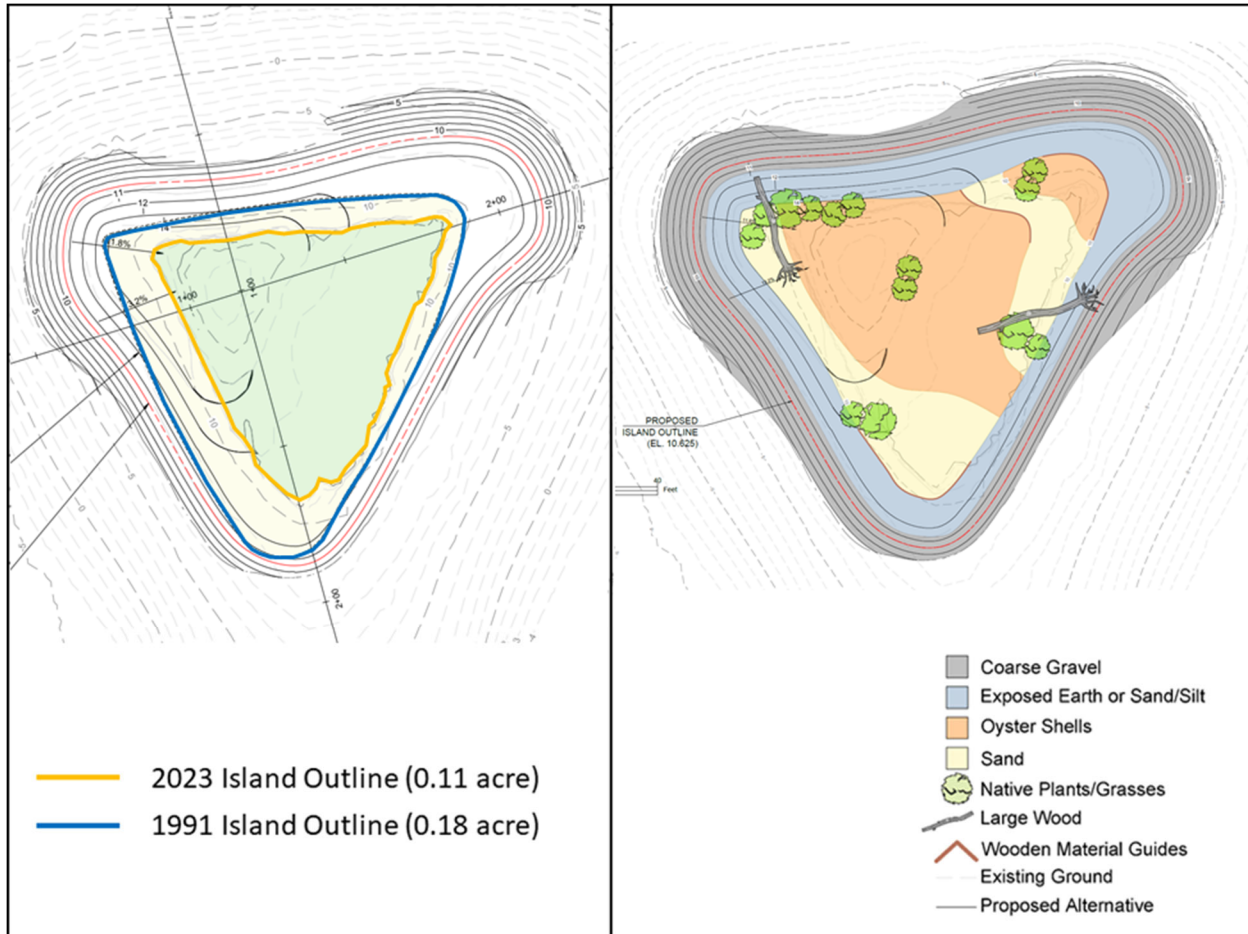


Figure 3 – Habitat Island Restoration Alternative 2

For both Alternatives 1 and 2, the island would also be improved to maximize the habitat quality, by removing invasive vegetation and providing a mixture of new substrate and pockets of native vegetation preferred by the target bird species. The existing wooden frames and guiderails would be removed and re-purposed onsite, and all existing non-native vegetation would be cleared and removed from the site.

In addition, the restoration is proposed to add oyster shells in higher ground areas of the island, sand in mid-elevation areas, and exposed earth or a sand/silt mixture in areas near the water

surface and just above the gravel erosion protection along the island slopes. Existing native vegetation would be preserved to the extent feasible, and additional pockets of pickleweed and alkali heath would be planted.

Wooden frames and guiderails would be used in select areas to prevent movement of the soil, and large wood would be added to provide additional habitat complexity. The anticipated future maintenance needs for Alternative 2 is likely to be slightly greater than Alternative 1, due to the increased shoreline length.

Alternatives 1 and 2 may also temporarily affect the recreational use of the lake, as the lake will be lowered during construction. The total impacts are not known at this time; however, coordination with City staff, the contractor, and the Sailing Lake operator will be needed to prepare for construction and its impact.

Barrier Improvement Alternatives

Barrier Improvement Alternative A – Walsh Marine Buoy System

This alternative includes a Walsh marine buoy system with barrier floats, float collar buoys and chain connectors (Figure 4). The barrier floats are linked together to prevent boaters from entering the vicinity of the island. The international orange color increases visibility and signals caution. The float collar buoys provide additional visibility and instruction to recreation lake users.

Anchors to the lake bottom will be installed at key locations to prevent significant movement of the buoy system. Preliminary data from the supplier suggest that the system is robust enough to resist sinking due to mussel and algae accumulation. However, additional evaluation of its maintenance requirements will be needed during detailed design.

The planning level Engineer's Opinion of Probable Construction Cost (OPCC) of Alternative A is approximately \$110,000.

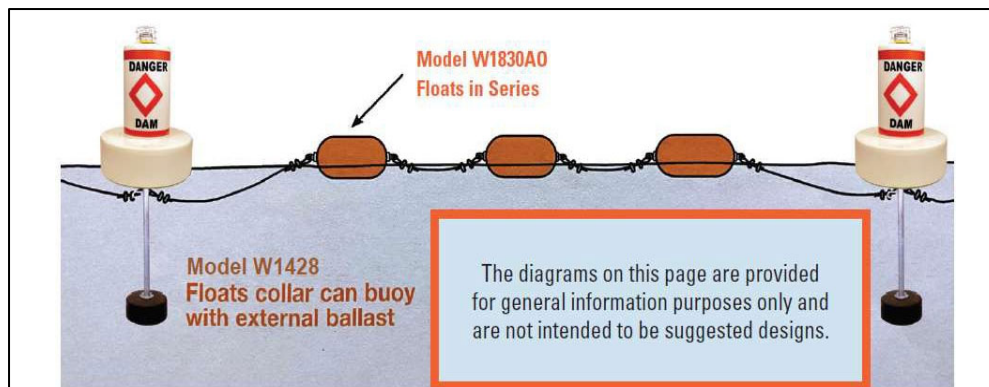


Figure 4 – Barrier Improvement Alternative A

Barrier Improvement Alternative B – Musthane Floating Security Barrier

This alternative includes a Musthane floating security barrier system with large floats and chain connectors. The floating security barriers are larger in size than the Walsh Marine system in Alternative 1, offering better protection against boater entry, as well as easier installation and maintenance. Anchors to the lake bottom will be installed at key locations to prevent significant movement of the buoy system. Preliminary data from the supplier suggest that this product is robust enough to resist sinking due to mussel and algae accumulation. However, additional evaluation of its maintenance requirements will be needed during detailed design.

The planning level Engineer's Opinion of Probable Construction Cost (OPCC) of Alternative B is approximately \$590,000.



Figure 5 – Barrier Improvement Alternative B

Barrier Improvement Alternative C – Drilled Wooden Piles

This alternative includes drilled wooden piles with a rope/buoy system. It could include either single wooden piles, or groups of piles, connected with heavy duty marine rope and a buoy system at the water surface. The wooden piles would be spaced at an appropriate distance to anchor the rope and buoy system in place to restrict boater access.

The planning level Engineer's Opinion of Probable Construction Cost (OPCC) of Alternative C is approximately \$250,000.

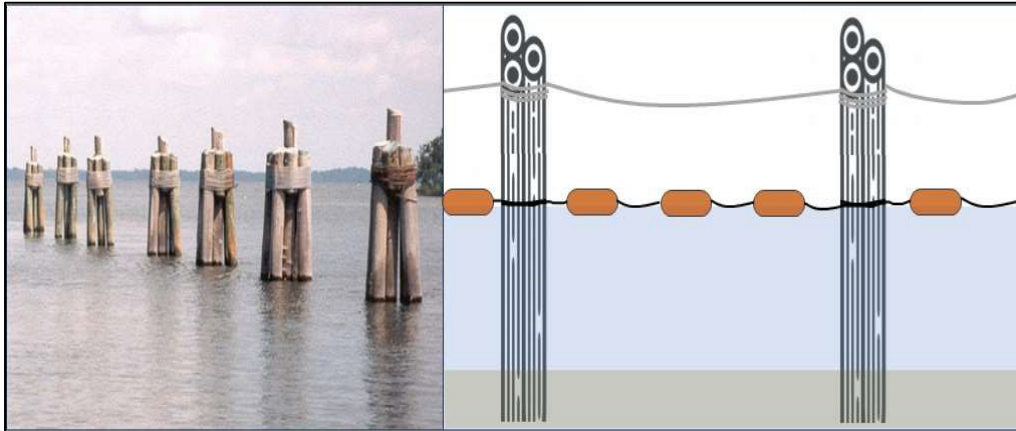


Figure 6 – Barrier Improvement Alternative C

ANALYSIS

Habitat Island Restoration

The project team conducted a multi-criteria evaluation to compare the habitat island alternatives based on the following criteria:

- Engineering: engineering and technical considerations including maintenance, construction duration and construction cost
- Environmental: environmental considerations including benefits for target species
- Regulatory: regulatory constraints or challenges
- Recreation: benefits and impacts associated with public use and recreation activities in the lake.

A simple evaluation framework was developed to score the alternatives based on the evaluation criteria, using a range of scores between 1 and 10. Scores were assigned using qualitative or quantitative methods, depending on the information and data available. Total scores were calculated to support the selection of a staff recommended habitat island alternative.

Table 1 summarizes the full evaluation scoring for the habitat island alternatives. Habitat island Alternative 2, Repair Eroded Slopes and Expand Island Size, meets one of the primary objectives of the project by restoring and exceeding the historic size of the habitat island. In addition, Alternative 2 provides a high level of benefits for wildlife, minimizing regulatory risks and potential impacts to recreation, and limits construction costs and duration.

Based on this multi-criteria evaluation, staff recommends Alternative 2 to restore the habitat island.

Category/Criteria	Alternative 1	Alternative 2
	Score 0-10	Score 0-10
Engineering		
Equal to or greater than historic size	0	10
Long-term maintenance	7	6
Construction duration	8	7
Construction cost	8	6
Environmental		
Acreage for habitat	2	8
Shoreline length	2	5
Slope variability	2	4
Benefits to multiple species	3	6
Regulatory		
Fill volume into the lake water body	10	8
Temporary impacts	8	8
Recreation		
Aesthetic value	4	5
Impact to view corridor	8	8
Impact to navigation/recreation	6	6
Ability to restrict public access	8	8
Total Score - Overall	76	95
Total Score - Rank	2	1

Table 1 – Habitat Island Evaluation Results (Alternative Evaluation Report Table 6-6)

Barrier Improvement

The evaluation and recommendation for the barrier improvement alternatives are independent of the habitat island alternatives. The barrier improvement alternatives evaluation considered cost, aesthetics, maintenance, and effectiveness as selection criteria. Each alternative was scored for each criterion with scores ranging from 0 to 5, with 5 being the most positive or beneficial.

The lowest cost alternative was Alternative A, and the highest cost alternative was Alternative B. In terms of aesthetics, Alternative C, featuring the traditional drilled wooden pile design, was considered the most aesthetically pleasing. In contrast, the large black buoys used in Alternative B were viewed as the least visually appealing.

Alternative B is expected to require the least maintenance, due to its robust buoy design, which limits biofouling and reduces the risk of sinking. Alternative A is likely requiring the most effort due to potential biofouling and the risk of damage from boats. Alternative C is expected to have the lowest risk of buoy sinking due to the piles support.

Regarding effectiveness, Alternative B would be the most effective at deterring boaters from approaching the habitat island, while Alternative A would be the least effective, as smaller boats could potentially float over the lower-profile buoys.

Table 2 summarizes the scores for each barrier alternative across all evaluation criteria, along with the total scores and rankings. The highest-ranking barrier improvement alternative is Alternative C, which includes drilled wooden piles connected by a rope and buoy system.

Alt. No.	Alternative Name	Cost	Aesthetics	Maintenance	Effectiveness	Total	Rank
A	Walsh Marine Buoy System	5	3	2	2	12	2
B	Musthan Floating Securing Barrier System	1	1	4	5	11	3
C	Drilled Wooden Piles w/ Buoy System	4	4	3	4	15	1

Table 2 – Barrier Improvement Evaluation Results (Alternative Evaluation Report Table 6-5)

NEXT STEPS

Staff will present a recommendation for the habitat island restoration and barrier improvement alternative to the Board of Directors for the Shoreline Regional Park Community for consideration and approval in early 2026. Afterwards, staff will begin work on environmental clearance, regulatory permitting applications, and project design.

FISCAL IMPACTS

Sailing Lake Habitat Island restoration, under the Shoreline Park Water Control Structures Improvements, Project 23-44, is funded with \$5,050,000 from the Shoreline Regional Park Community Fund. The current funding supports engineering design, environmental regulatory permitting, and the construction of multiple water control structure improvements at Shoreline Park. The current funding also supports engineering design and environmental regulatory permitting for the habitat island restoration. However, it does not include the construction costs for the habitat island restoration, and additional funding will be requested depending on the final alternative.

CONCLUSION

Staff recommends Habitat Island Restoration Alternative 2 – Repair Eroded Slopes and Expand Island Size, and Barrier Improvement Alternative C – Drilled Wooden Piles, for the project. The total planning level Engineer’s Opinion of Probable Construction Cost (OPCC) for both components is approximately \$3.35 million.

Staff requests the Parks and Recreation Commission to comment on the alternative analysis for the habitat island restoration and barrier improvement.

PUBLIC NOTICING – Agenda Posting.

Attachment: 1. Shoreline at Mountain View Lake Habitat Island, Alternative Analysis Report. AECOM. September 2025.

cc: PWD, CSD