

De Anza Natural/ReWild Mission Bay Wetland Restoration Project Roadmap

Introduction

This roadmap document provides a comprehensive guide for advancing the vision of wetland restoration and public access at De Anza Natural. It outlines the technical, regulatory, engagement, and planning steps required to move from conceptual planning through implementation and long-term management. The document is designed to support project planning, regulatory agency coordination, and future fundraising and grant opportunities. The technical progression in the roadmap document is intentionally structured to reduce uncertainty and avoid redesign during permitting and implementation. Technical analyses and stakeholder coordination are sequenced to progressively refine restoration concepts into permit ready and constructable designs. Each milestone builds upon prior data collection and technical findings to support informed decision-making, permitting, and construction planning. This roadmap advances the City's vision for De Anza Natural and builds on the technical work already completed in the 2018 ReWild Mission Bay Feasibility Study, using that study as the starting basis for modeling and cost estimates and refining it as the project design advances.

Project Vision

The De Anza Natural/ReWild Mission Bay project aims to restore degraded wetland habitat and improve water quality within Mission Bay Park while providing equitable public access and educational opportunities. The project must balance ecological restoration goals with community needs, regulatory requirements, climate resiliency, and the Mission Bay Park Master Plan.



Wetland landscape. Photo credit: San Diego Bird Alliance.

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Framework: The Tidal Creek Approach

This roadmap includes a tidal creek metaphor to illustrate project progression through milestones (see Page 3). Like water flowing through a tidal system, the project will move through distinct stages, with various technical studies, regulatory processes, and stakeholder engagement activities flowing in and out at critical junctures. The roadmap progresses from Conceptual Wetland Restoration Planning through Preliminary Engineering (30%), Intermediate Design (65%), Final Design (90-100%), Final Bid Documents and Pre-Construction Planning, and ultimately to Groundbreaking, Construction, and Long-Term Monitoring and Management. Two key factors are highlighted along with the milestones: funding and stakeholder involvement. These factors are critical to maintaining project flow. A financial shortfall or opposition from stakeholders can be a significant obstacle to restoration planning progress.

Planning Background

Mission Bay resource planning began in the 1990s and conservation and restoration of Mission Bay came into greater focus in the mid 2010's with the development of multiple plans and studies. Plans and studies to date:

Mission Bay Natural Resource Management Plan (1990)

Mission Bay Park Master Plan (1994)

City of San Diego Multiple Species Conservation Plan (1997)

Mission Bay Important Bird Area Conservation Plan (2014)

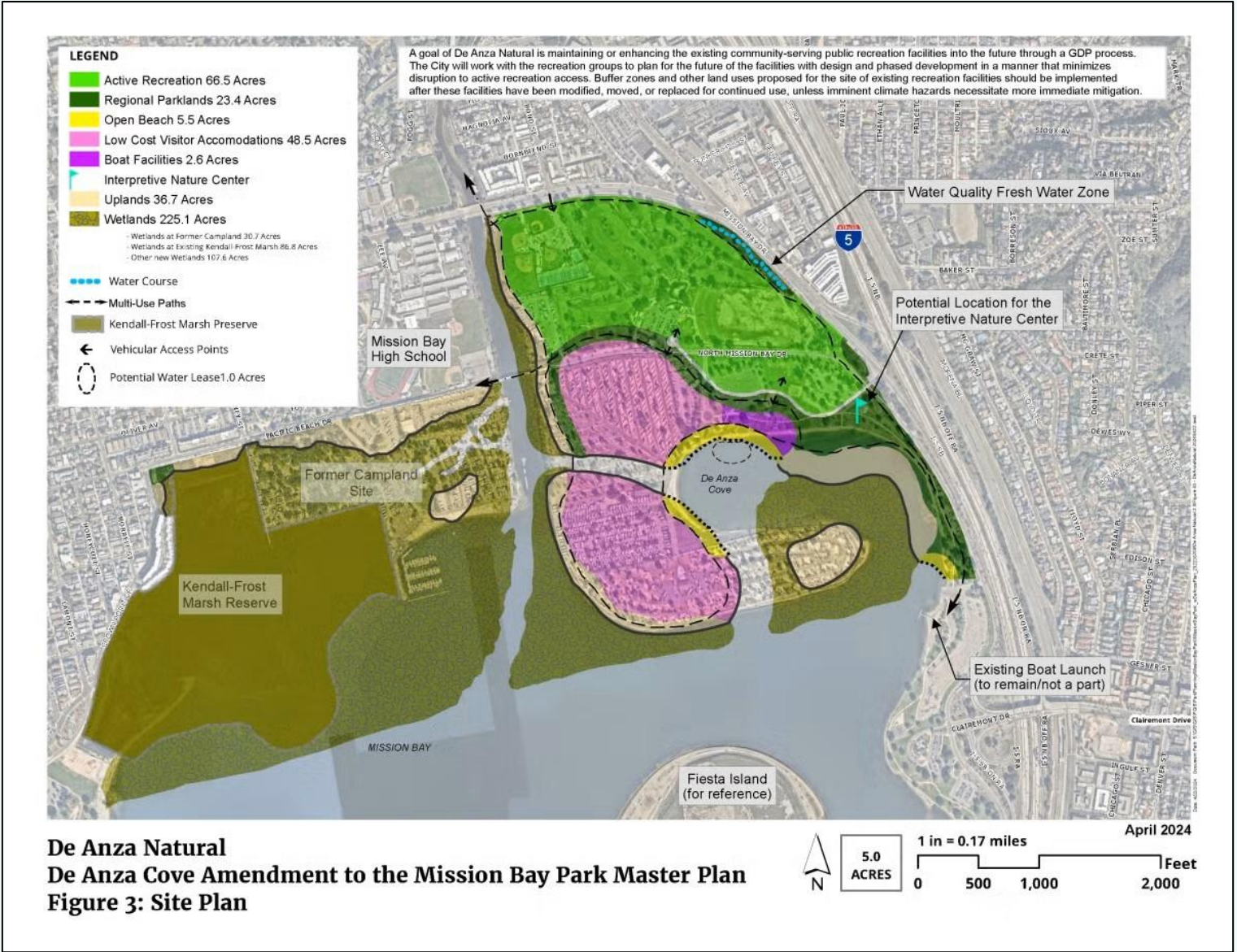
ReWild Mission Bay Feasibility Study (2018)

City of San Diego Climate Action Plan Update (2022)

City of San Diego Mission Bay Dispersion Study (2023)

De Anza Natural Amendment to Mission Bay Park Master Plan (Approved by California Coastal Commission on 8/14/2026)

These plans and studies have been developed with stakeholder involvement and may include information that will be helpful to future planning, design, and permitting efforts. As the project progresses, planners should consider if and how these resources may expedite early milestones. Actions described in the roadmap that may be supported by previous studies and plans are denoted with an owl symbol:



De Anza Natural site plan from the Mission Bay Park Master Plan De Anza Natural Plan (2026).

Roadmap to Tidal Wetland Restoration Planning



Milestone 1: Conceptual Wetland Restoration Planning

Overview

This stage builds on initial conceptual design and land use planning for De Anza Natural and identifies projects that may tier off from the Programmatic EIR, establishing the technical foundation for restoration planning. The purpose of this phase is to further evaluate, refine, and advance these concepts through baseline technical studies, feasibility-level engineering analyses, and planning to support future design, permitting, and implementation. The site's location directly adjacent to the existing UC San Diego Kendall-Frost Marsh Reserve is a key advantage, providing a natural propagule source and an existing model for tidal connection that improve the likelihood of future restoration success. In addition, improving water quality is a foremost objective for this site and should be carried through design as a measurable performance objective alongside habitat restoration and conservation. The milestones that follow are also intended to provide the technical foundation for the City's future General Development Plan and Wetlands Management Plan.

Tasks & Outcomes

1. Establish baseline understanding of site conditions (e.g., habitat, hydrology, geotechnical, water quality).
2. Initiate agency, stakeholder, and tribal coordination and build partnerships.
3. Engage the community to learn about values and priorities to develop project goals and objectives.
4. Identify feasible project phasing opportunities based on funding availability, existing infrastructure, land use, and other implementation strategy considerations.

5. Refine conceptual restoration alternatives and identify major constraints.
6. Develop conceptual restoration figures, preliminary cost estimates, and pathways to 30% design, including permitting strategies.

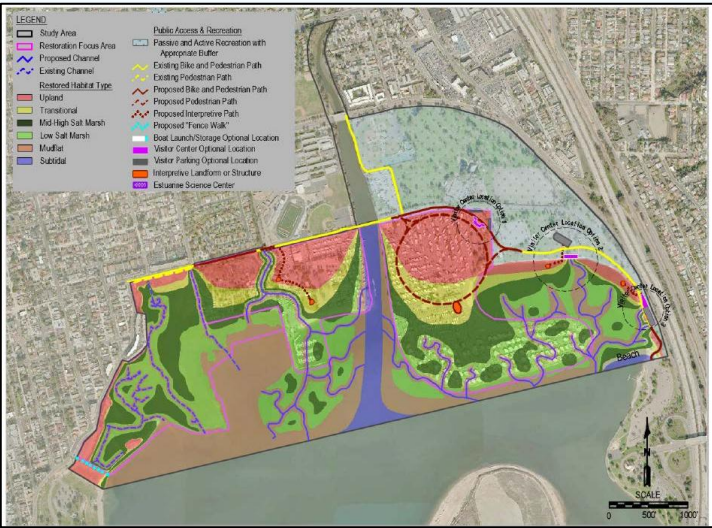
Funding Strategy

Develop initial cost estimate for each phase based on conceptual design, including planning, permitting, and implementation. Identify potential funding sources and start planning for the public grant pathway or compensatory mitigation pathway. Funding plan should include 1) funding through Intermediate Design (65%), including major permit application fees; 2) funding for Final Design (90-100%) through Construction; and 3) funding for post-construction monitoring and maintenance. See Appendix B for potential funding sources. The De Anza Natural Land Use Plan mentions the potential for a mitigation bank in which credits would be earned for wetland restoration to reconcile the costs of the

ANTICIPATED TIMELINE AND COST FOR EACH MILESTONE	
Milestone 1 – Conceptual:	6 - 12 months, \$300,000-500,000
Milestone 2 – 30%:	9 - 15 months, \$500,000-900,000
Milestone 3 – 65%:	12 - 24 months, \$800,000-\$1,500,000
Milestone 4 – Final Design:	6 - 12 months, \$500,000-1,000,000
Milestone 5 – Final Bid Documents and Pre-Construction Planning:	2 - 4 months, \$100,000-\$250,000
Milestone 6 – Construction:	24 - 36 months, \$50,000,000-\$100,000,000
Milestone 7 – Long-Term Monitoring/Management (annually):	Years 1 - 5: \$100,000-250,000; Long-term: \$30,000-\$100,000

project. Since habitat and public access areas are typically designed together, coordinating the funding strategy with the access design early allows the project to pursue this funding source while delivering the public access the plan envisions.

Note: Funding sources may only fund up to a certain milestone, requiring continuous fundraising throughout the planning process.



“Wildest” conceptual design figure from the Feasibility Study.

Agency Coordination

Identify all landowner and easement stakeholders to understand who needs to be in the room for real decisions to be made. Coordinate with responsible parties and potential land managers early (i.e., City of San Diego, UC San Diego and Natural Reserve System, San Diego Bird Alliance, Local Tribes) and obtain buy-in on the Conceptual Design. Coordinate with wildlife agencies (i.e., U.S. Fish and Wildlife Service, California Department of Fish and Wildlife) and the California Coastal Commission. Establish project guardrails to avoid significant roadblocks by crossing jurisdictions (e.g., work in Caltrans roadways). Identify all resource, regulatory and permitting agencies.

Permitting and Environmental Review

Set up early coordination meetings with key agencies. Discuss project scope and regulatory constraints and work collaboratively to identify likely permit pathways, projected timelines, and level of planning and resource documentation required at each step. Likely agencies include:

- City of San Diego (Parks & Recreation, Planning)
- California Coastal Commission
- U.S. Fish & Wildlife Service
- California Department of Fish & Wildlife
- Army Corps of Engineers
- Regional Water Quality Control Board
- National Marine Fisheries Service

After meeting with the agencies, develop a preliminary permitting plan. See planning matrix in Appendix A as a template.

Note: For features near the preserve edge, particularly public access and low-cost visitor accommodations, plan for project-level review of drainage, lighting, and edge effects under the Multi-Habitat Planning Area Land Use Adjacency Guidelines, and a Biological Resources Technical Report per the City's Biology Guidelines.

Technical Studies & Data Collection

At this point it is important to get a general understanding of the site, the historical context, and the resources that may be impacted. The following is a list of assessments, surveys, and studies that should be performed to inform the design. Limit geotechnical work at this stage. More detailed investigations will come later when final locations of structural and hydrological features are identified. Focus on understanding general soil conditions. Consider permits for geotechnical borings in jurisdictional areas. Biological investigations at this point should be cursory to help guide the conceptual plan development.

Jurisdictional wetland delineations and biological resource impact analysis will come later during environmental review and the permitting process. Make sure to have a firm understanding of the project limits before performing these types of studies.

Historical Conditions & Site Characterization

Perform a historical ecology, ethnographic review, and landscape review, including review of aerial imagery and LiDAR (if available), T-Sheets, and historical literature and photos. Focus the ethno review on the pre-history and historical accounts of land use by Kumeyaay. Describe historical habitat types.

Baseline Biological Conditions Report

- Perform avian surveys and document sensitive and special status species
- Perform habitat mapping and describe existing habitat types
- The California Rapid Assessment Method (CRAM) should be performed to achieve an understanding for the existing structural ecological conditions. CRAM will likely be required for permit applications

Baseline Hydrology, Hydraulics, and Geomorphology

- Review of previous studies and available data that may include FEMA studies, Rose Creek watershed hydrology including sediment supply, inputs from Noyes and Olney Street drains, flooding/inundation data and potential coastal hazards
- Install surface and groundwater gages to monitor water/salinity levels and perform water quality baseline sampling
- Perform a preliminary topographic and bathymetric survey
- Develop a preliminary geotechnical and sediment sampling and analysis plan, which should provide:
 - Initial geotechnical/agronomic reconnaissance
 - Sediment quality screening
 - Contamination assessment (i.e., former Campland)

COMMUNITY INPUT MATTERS

This is the first opportunity to learn what the community values. Don't underestimate features people care about, even degraded areas may have strong community attachment. Public access discussions are particularly valuable.



Community event. Photo credit: San Diego Bird Alliance.

Engineering & Design Development

Development of Screening Alternatives

- Develop 10-20 screening alternatives representing different approaches (e.g., water quality-focused, maximum salt marsh, maximum public access) based on project goals and objectives developed with community input. Consider commitments in De Anza Natural (e.g., net loss of active recreation acreage, non-motorized use in De Anza Cove and channels, habitat buffer)
- Present screening alternatives to Advisory Groups for feedback
- Narrow down to three alternatives based on stakeholder input
- Mix and match elements from screening alternatives to create refined concepts
- Screen alternatives for water quality benefit, impacts to existing sensitive habitat, sea level rise resilience, marsh migration, and long-term adaptability
- Do not assume the channels shown in De Anza Natural are the preferred solution; carry alternative hydrologic configurations forward for feasibility testing
- Also consider: net loss of active recreation acreage; retention of low-cost visitor accommodations including RV and tent camping; lighting requirements; continuous public shoreline access; habitat protection and buffers. Locate and design new facilities so they do not preclude future restoration.

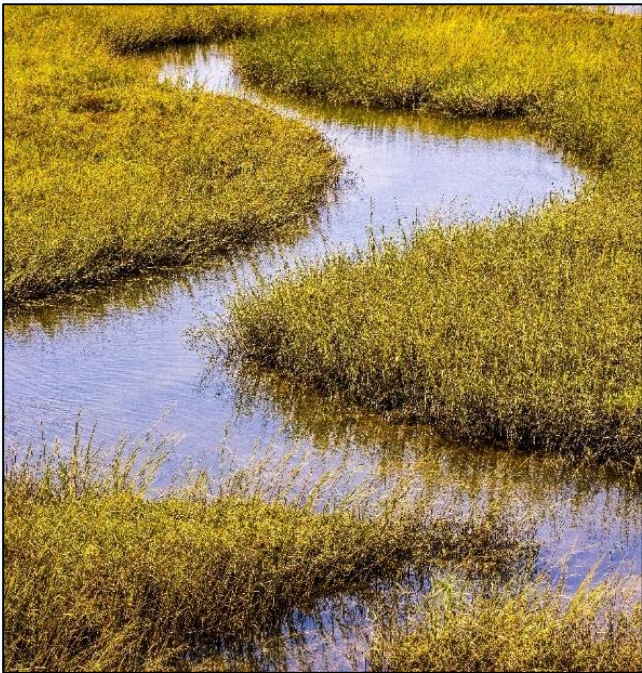
Refinement of Conceptual Alternatives

- Evaluate feasibility and site opportunities and constraints
- Refine conceptual restoration design
 - Habitat type distribution
 - Channel design concepts
- Refine public access and infrastructure design
 - Circulation, trails, bike paths, and overlooks
 - Preliminary water conveyance structure considerations

- Public amenities
- Assess conceptual grading and sediment management
 - Preliminary design cross sections to communicate restoration design approach
 - Sediment management and earthwork considerations

Conceptual Phasing and Planning

- Consider funding availability, constraint removal, or adaptive implementation (avoid overcommitting)
- Consider what aspects of the design should be permitted and pursued concurrently or independently
 - Ex. Should the wetland restoration proceed first funded by State grants, followed by public amenities funded by City Parks?
- Develop an order of magnitude cost estimate for each phase or alternative



Sinuous channel of a reference wetland. Photo credit: Kevin Fistanic.

Stakeholder Engagement

Some stakeholder engagement has already occurred, however, as the design plan progresses, another level of engagement is required. The outreach program should build on itself and mature as project planning progresses. Each milestone will have a more detailed design to share with the public. As the designs become more detailed, it is important to identify new elements to workshop with the public to keep the community engaged and involved.

Public Engagement Plan

Author a public engagement plan that provides a comprehensive understanding for all public outreach that will be performed. This plan should include a step-wise approach to stakeholder engagement, including the level of engagement appropriate for each milestone and clearly identify which elements are open for community input and how that input will inform design decisions. This plan should identify the key groups that require focused direct coordination, along with an approach to continuous general public outreach, including public meetings and workshops. This plan should provide a framework for technical advisory groups that will be met with regularly throughout the planning process.

Advisory Groups

Form a Technical Advisory Committee (TAC) and Tribal Advisory Group (TAG), and plan for additional tribal meetings with groups and individuals, as needed. The TAC should consist of City staff, all key permitting/resource agencies (e.g., State Coastal Conservancy), regional scientific specialists, and key members of the consulting team. The TAG should consist of individuals or representatives from tribal groups that have an ancestral connection to the land. Source funding to compensate TAG members for their time and effort in participation in the TAG and provide refreshments for any in-person advisory group meetings.

TRIBAL ENGAGEMENT

The City of San Diego is the Lead Agency for CEQA and will lead all required Government-to-Government tribal consultations, however, for this project to be a success there is a need for frequent advising from the tribal community throughout planning and beyond. Working successfully with tribal communities takes the involvement of experienced people who already have local connections and are trusted by tribal community leaders. The existing relationship the SD Bird Alliance has with Renascence puts this planning effort in an ideal position to properly engage with local tribal bands and create a safe place where the planning and design team can gain knowledge about the local culture (e.g., ethnobotany) for incorporation into the project. Forming a Tribal Advisory Group for this project is a worthwhile endeavor and should be pursued as early as possible in the planning process. If done correctly, it can provide invaluable advising throughout the entire project from planning to construction and perpetually into long-term management. Developing a TAG for this project also offers the potential for healing around a collective effort to repair and conserve native land. It is essential that a recurring funding source is identified that can be used to remunerate tribal community members who participate in the TAG meetings as well as to provide refreshments for any in-person meetings. When identifying potential participants in a TAG, a wide net should be cast to ensure that all interested bands and individuals are given the opportunity to participate. While tribal engagement is exclusively for tribal members, the tribal community should be included in all general public engagement as well.

Public Workshops

Host workshops at key points during conceptual design, using a mix of in-person and virtual formats depending on the needs of those being engaged. Perform outreach to the broader community that may not be engaged yet. The initial workshop should present the historical ecology and existing condition findings and offer an interactive activity to learn more about features that people value and to understand their priorities (find the balance between recreation and habitat protection). Follow up workshops can provide examples of trail design alternatives and discuss proposed habitat distributions while providing an interactive activity for the public to provide direct input. At future engagement milestones, the design team can report back to the public what feedback was received and which recommendations were and were not incorporated and why.

Focused Stakeholder Outreach

Engage early with neighbors, businesses, and hyper-local organizations that are likely to have a front row seat to the restoration project. These folks can be a big asset or obstacle to the project, so it's best to engage them early and often to keep relationships positive and to make sure that they know about all of the upcoming workshops and public engagement opportunities.

Host stakeholder meetings with established groups (e.g., Rewild Coalition, Wetlands Working Group) to keep them informed as the design progresses and obtain feedback on Conceptual Design. Depending on the outcome of these focused stakeholder engagement efforts it may prove useful to establish a community member advisory committee.

Equitable Access Planning

Start equitable access planning by getting stakeholder feedback on priorities for access (e.g., trail types, access points, public transit

tie-ins, signage, parking, public amenities and desirable features). The public outreach team should start using available tools to identify communities that have historically faced barriers to accessing Mission Bay and connect with community leaders and organizations to better understand their needs and priorities for accessing and enjoying the area. The public outreach team should also engage with the tribal community on this topic.

Key Opportunities for Collaboration

- Design charrettes
- Tabling at public events (e.g., farmers markets, festivals)
- Mixers, luncheons, and site visits

Key Risks

- Not doing the necessary outreach can lead to disenfranchising local stakeholders, which can lead to letters of opposition or negative public comment during hearings.
- Easement holders and landowners can create major roadblocks to the project timeline or design elements if concerns are not addressed early. Litigation could also be a concern.



Outreach table. Photo credit: San Diego Bird Alliance.

Milestone 2: Preliminary Engineering Design (30%)

Overview

This stage of the planning process advances the selected conceptual design into preliminary engineering drawings. Technical studies intensify, and the design becomes sufficiently detailed to support environmental review and initial permitting discussions. This is where concepts start becoming reality through engineering analysis.

Outcomes

1. Finalize phasing strategy.
2. Produce preliminary engineering design, to inform technical studies and reports needed to support environmental review and initial project permit planning.
3. Engage stakeholders in design and planning to streamline project approval and public buy-in and build support within the tribal community.
4. Develop preliminary engineering 30% designs with enough detail to support funding applications for Final Design and Implementation.
5. Update cost estimates and finalize funding strategy and permitting pathways.

Funding Strategy

- Produce an updated cost estimate with ranges of ±30%
- Identify funding sources for each phase
- Begin grant application preparation



Ridgway's rail in tidal channel surrounded by Pacific cordgrass. Photo credit: Karina Ornelas.

Permitting and Environmental Review

At this point in the permitting process, it is important to make sure the project is tracking along with the pre-application discussions held with agency staff during conceptual design stage. Flag elements that were not previously identified that may require the consultant team to reengage with agency staff.

During this stage, retain a permitting specialist to review and finalize the permitting plan. This plan will include a strategy to pursue a Coastal Development Permit (CDP) and other major permits, navigate the CEQA/NEPA process, and develop and

investigate streamlined approaches to permitting (e.g., Cutting the Green Tape).

Stakeholder Check-in

Have the TAC, TAG, Coalitions, and Working Groups review the 30% design. The TAG should advise on cultural resources and design elements. Host public workshops to share preliminary design and results of studies. Consider presenting refined and attractive graphics with color (not engineering drawings). The landscape architect helps to add visual appeal to 30% designs for these public presentations. During presentations, show how shorelines will be configured and explain where different important features will be located, including key public access elements. Consider highlighting which special status species will be conserved and how the project will benefit them. Include City departmental review coordination during 30% design phase.

Technical Studies & Data Collection

The focus of technical studies during the preliminary engineering stage is on confirming the hydrological functionality of the design. The 30% model is the biggest lift and most expensive. This process involves building the model that will then be tweaked in future iterations of the design. Additional ecological field studies should be limited during this stage, assuming sufficient studies were produced previously.

Site Characterization and Survey

- Perform a detailed survey that includes:
 - Utility/infrastructure and drainage/hydraulic structure mapping
 - Project boundaries and property/parcel limits
- Refine habitat maps to include more a detailed assessment

Hydrology and Hydraulics Report

- Existing conditions 2D hydrodynamic model
 - Build existing model with survey, field data, previous studies/models, and as-builts
 - Flooding, inundation, and geomorphic assessment
 - Preliminary SLR vulnerability modeling
 - Potential habitat response assessment
 - Rose Creek sediment transport analysis
- Proposed conditions 2D hydrodynamic model
 - Evaluate Rose Creek/tidal channel feasibility and alternative configurations
 - Compare alternatives for tidal prism, wetland function, sediment dynamics, habitat impacts, and sea level rise
 - Use results to inform selection of preferred design
- Design performance evaluation
 - Tidal prism and circulation assessment
 - Flooding and inundation assessment
 - Rose Creek sediment transport assessment
 - Channel stability and geomorphic assessment
 - Habitat transition response assessment

Geotechnical Investigation Report

- Implement the geotechnical and soil analysis plan
- Characterize the soil for grading and infrastructure design
- Analyze sediment suitability
- Understand groundwater levels and salinities

Water and Sediment Quality Study

- Rose Creek and De Anza Cove sediment/water quality analysis
- Evaluate water quality response to proposed hydrologic modifications
- Evaluate key water quality indicators affecting wetland health and water-contact recreation
- Sediment contamination and beneficial reuse assessment

Engineering & Design Development

Development of Preliminary Design

- Refinement of restoration design concepts
 - Minimize impacts to existing wetlands, eelgrass, and other functioning sensitive habitat
- Refinement of public access use and features
 - Site the interpretative Nature Center outside of areas subject to future sea level rise
 - Maintain continuous public shoreline access
- Refinement of infrastructure
 - Design utilities and facilities for future relocation, removal, or adaptation
- Design preliminary grading and erosion control and stabilization concepts
- Include Low Impact Development (LID) and on-site stormwater treatment concepts in developed areas
- Develop soil management plan strategy (prioritizing balanced cut and fill on-site)
- Produce habitat type determination and initial planting palette
- Illustrate phasing and sequencing

Equitable Access Planning

The landscape architect should be on the team to advise on trails and concepts, but they should not be making detailed drawings at this point. Ensure that they remain fully informed on all stakeholder feedback regarding equitable access planning during preliminary trail design. Incorporate preliminary tribal access design concepts into the 30% plans.

Development of 30% Design Documents

- 30% plan set (not a full plan set)
- Preliminary quantities/cost estimate
- Preliminary design report
- Outline specifications

Reports Produced

- Preliminary H&H report
- Preliminary Geotech report

Obtain Opinion of Probable Cost with Ranges of $\pm 30\%$



Fish survey using a seine. Photo credit: San Diego Bird Alliance.

Milestone 3: Intermediate Design (65%)

Overview

This stage of design is where the City will commit to a project. Permit-ready documents are produced and demonstrate that the project is constructable. This stage refines the design to a level suitable for permit applications and addresses agency comments on environmental documentation. Technical analyses become more detailed, and construction methodology is developed. Landscape details will be incorporated into the design.

Outcomes

1. Perform additional technical studies to inform 65% engineering designs and environmental review.
2. Continue stakeholder working group coordination and get feedback on public access features.
3. Develop 65% design drawings and specifications that incorporate LID/BMPs, habitat buffers, shielded lighting near habitat, sea level rise adaptation, continuous shoreline access, and relocation/adaptation requirements for vulnerable facilities.
4. Update cost estimates, submit permit applications and apply for funding for final design through implementation.
5. Complete CEQA and produce MMRP. If federal funds are used for the project, NEPA may be required.
6. Develop preliminary construction schedule.

Funding Strategy

- Produce opinion of probable cost that can be used to apply for implementation funding
- Do not overlook the potential costs for project management, construction management, environmental compliance management, administration, engineering support, and any

potential sensitive resource monitoring (e.g., biological, ecological, physical, archeological, tribal, cultural)

- Finalize funding strategy to fund final design and permitting and construction (public grants vs mitigation, see Appendix B)
- Plan for bonds that will be required (e.g., grading bond)

Stakeholder Check-in

Have the TAC, TAG, and Coalitions/Working Groups review the 65% design. The TAG should advise on cultural resource protection, design elements including tribal specific elements, and the plant palette. TAG should advise on cultural protection plan, including potential for impact to known and unknown cultural resources including biological material. Plan for public hearings on permit applications and gather support via public statements and support letters. Have the Mission Bay Park Committee review 65% design and brief City Council, as needed.

Permitting and Environmental Review

At this stage the project will complete CEQA/NEPA and submit the following permit applications:

- Coastal Development Permit (California Coastal Commission)
- Section 404 Clean Water Act Permit and Section 10 River and Harbors Act Permit, or Nationwide Permit (Army Corps of Engineers)
- Clean Water Act Section 401 Water Quality Certification (Regional Water Quality Control Board)
- Lake and Streambed Alteration Agreement (California Department of Fish & Wildlife)
- Incidental Take Permit (California Department of Fish & Wildlife)
- Endangered Species Act consultation (USFWS)
- Essential Fish Habitat consultation (NMFS)

Note: Consider permitting requirements for geotechnical work in jurisdictional areas.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

General Development Plans would be developed over time and provide precise engineering design and construction plans for the recreational elements included in the project. These plans are currently not available; however, their environmental impacts can be estimated at the program level, and a mitigation strategy will be developed that would apply to future improvements. When the General Development Plans are available for all or portions of the project area, the City will evaluate these detailed plans against this PEIR and determine if the analysis and mitigation is adequate or if additional analysis or mitigation is warranted. If, when examining future development actions in the project area, the City finds no new environmental effects could occur or no new mitigation measures would be required other than those analyzed and/or required in this PEIR, the City can approve the activity without additional environmental documentation. If additional analysis is required, it can be streamlined by tiering from this PEIR pursuant to CEQA Guidelines, Sections 15152, 15153, and 15168 (e.g., through preparation of a Mitigated Negative Declaration, Addendum, or Supplemental or Subsequent EIR.

Source: De Anza Natural EIR.

Key Risks

- Coastal Development Permit and federal permits can take 12-24 months. Early and continuous agency coordination is essential to avoid delays.
- Anticipate that one of the project's permits will take a year longer than planned.
- Ensure that the project description is comprehensive.

Monitoring and Adaptative Management Plan

Draft a MAMP that includes monitoring and maintenance activities during the 5-year post construction period and long-term management. Establish measurable performance criteria and adaptive management triggers for water quality, hydrology, habitat, and channel performance. Also include potential adaptive approaches to possible changes in the landscape, such as sea level rise, erosion, and new invasive species. Consider the constraints identified during earlier planning stages. Maintenance frequency should be considered, such as frequent maintenance during Year 1 post-construction, followed by monthly maintenance from Year 2-5 and then as needed thereafter. Plan for alignment with SCWRP's Regional Monitoring Plan to streamline CDP approval. This information could be included in the City’s Wetlands Implementation and Management Plan (WIMP) or build on it.

Technical Studies & Data Collection

During this stage, most major technical studies are completed to inform final design and accompany permit applications. The technical consulting team must be diversified to cover all the disciplines necessary to perform environmental review.

Biological Resources Report

- Perform a jurisdictional delineation (must be as current as possible for California Coastal Commission)
- Produce alliance level vegetation maps
- Perform protocol level special status species surveys
- Perform impact analysis

Cultural Resources Report

- Produce historic resources assessment
- Produce geoarchaeological resources assessment
- Perform a sacred lands file search

- Perform ethnographic review and ethnographic study
- Engage in listening sessions with the tribal community
- Perform SCIC record search that is no more than 1 year old

Hydrology and Hydraulics Report

- Produce final H&H Report that demonstrates that the project fully functions with proper tidal exchange
- Run the 65% design 2D hydrodynamic model after the project team is confident in the configuration
- Evaluate 65% design performance against criteria for tidal exchange, water quality, sediment dynamics, wetland function, habitat impacts, flooding, and sea level rise

Geotechnical Investigation Report

- Complete implementation of geotechnical field investigations as planned
- Produce report detailing the findings of the geotechnical studies that will inform design and ultimately be used to produce a final geotechnical report

Water Quality Study

Refine water quality and sediment analyses to inform environmental review of potential beneficial uses. Study may include:

- Water quality characterization
- Sediment quality
- Contaminant assessment

Engineering & Design Development

Basis of Design Report

- Produce the preliminary engineering report that informs the 65% design. The report will summarize the reasons behind the approach to designing all aspects of the project.

- Document alternatives considered and the basis for selecting the preferred Rose Creek/tidal channel configuration
- Demonstrate that the preferred design provides measurable water quality and habitat benefits while minimizing impacts to existing habitat



Geological boring rig. Photo credit: Eric Zahn.

Habitat & Landscaping Design

- Develop planting plans with plant palettes
- Identify soil amendment requirements
- Produce irrigation system conceptual design

65% Design Plan Set

The 65% design will build significantly on the 30% design. The design will include construction access and staging, demolition plans, erosion control plans, soil boring data, soil management plan, utility information, flood management, roadway and infrastructure design, planting plan and preliminary public access and amenities. Along with the plan set, produce an outline of technical specifications.

Update Opinion of Probable Cost with Ranges of ±30%

Milestone 4: Final Design (90-100%)

Overview

This phase incorporates reality into the design, ensures constructability, and produces construction-ready documents incorporating all regulatory permit conditions and agency requirements. Perform a thorough QA/QC process at this stage prior to producing final bid documents.

Outcomes

1. Produce construction-ready plan set and technical specifications.
2. Finalize all technical reports and plans required by regulatory agencies and local municipalities for permits to be issued.
3. Obtain final permits.
4. Retain the services of a well-qualified construction management team.
5. Game plan an advertisement strategy and start developing advertising documents and a draft contract.

Funding Strategy

- Produce a final cost estimate ($\pm 10\%$ accuracy) with quantities based on final plans and the anticipated bid items
- Updated cost estimates may reveal funding gaps requiring value engineering and/or fundraising

Note: Consider a third-party estimator to verify engineer cost estimates and make sure the project has sufficient funds for soft costs and contingencies.

Stakeholder Communication

- Produce final project renderings to communicate pre and post restoration conditions
- Host final design presentation to TAC and TAG
- Reveal the final design to the general public in virtual and in-person meetings
- Notify the public of anticipated construction timeline
- Coordinate with adjacent property users (e.g., UC San Diego)

Permitting and Environmental Review

Permit Issuance

At this stage, the permitting specialist will manage agency comments, responses, and revisions to applications. Identify permits that cannot be issued until a contractor is selected (e.g., grading permit) versus those that are required prior to advertisement (e.g., CDP). Submit all prior to issuance items for regulatory permits (e.g., Tribal Access Plan). Some agencies may require final design prior to issuance.

Finalize the Monitoring and Adaptive Management Plan

Technical Studies & Data Collection

Hydrology and Hydraulics Report

- Complete final model refinements and H&H analyses
- Confirm the final Rose Creek/tidal channel configuration meets established hydraulic, water quality, sediment, wetland function, and sea level performance criteria
- Finalize the H&H report

Geotechnical Investigation Report

- Produce final geotechnical design report
- Utilize final report to confirm geotechnical design and specifications (e.g., stabilization, dewatering, settlement, compaction)
- Produce a plan for handling contaminated materials (if necessary)

Engineering & Design Development

Basis of Design Report

- Update and finalize basis of design report

Habitat & Landscaping Design

- Finalize planting palette with sizes, quantities, and spacing, final seeding rates
- Produce a soil management and testing plan for subgrade amending and topsoil preparation
- Finalize irrigation design
- Finalize public amenities, including trails, interpretive signage, and tribal access features

Final Design Plan Set

The final design will include all necessary plan sheets for the contractor to build the project, including final public access elements. Along with the plan set, produce final technical specifications that detail how the project should be constructed to meet all requirements, including special environmental considerations and permit conditions (e.g., nesting bird work windows, soil requirements, quality control, cultural resource protection). Perform a thorough QA/QC review across all disciplines, ensure constructability and permit compliance.

Update Opinion of Probable Cost with Ranges of $\pm 10\%$

Milestone 5: Final Bid Documents and Pre-Construction Planning

Overview

During this stage, design is complete, and the project is ready for advertisement, bidding, and contracting.

Outcomes

- 1. Bid documents are finalized and advertised.
- 2. Contractor is selected.
- 3. Contract is negotiated and executed.
- 4. Permits requiring the contractor are issued.
- 5. Plan for a groundbreaking ceremony.

Funding Strategy

Project management team will coordinate with funders about administrative and work planning procedures necessary to make the project funding available for use during construction. Ensure contingency funds are available for unforeseen conditions and to cover change orders.



Belding's savannah sparrow. Photo credit: Kevin Fistanic.

Permit Management

- Acquire grading permit
- Hire an environmental compliance team, including all required construction monitors whose qualifications will likely require review and approval by agencies or other stakeholder groups
- Develop a permit matrix to track compliance
- Submit pre-construction/prior to construction items
- Perform pre-construction surveys and submit results

Construction Planning

- Draft a construction schedule for use in advertisement and initial contractor coordination
- Consider public safety and access management during construction
- Ensure the construction management team reviews the entire bid package, including cost estimates
- Retain the services of the design team members for construction support, including the Engineer of Record, Geologist, Landscape Architect, Restoration Ecologist, and Outreach Specialist
- Retain the services of a labor compliance specialist (if necessary)

Bid Package Development and Contracting

- Finalize bid documents and include all technical reports and permits. TAG may review final bid package
- Ensure desirable contractor qualifications are outlined in the package and reviewed by the TAG. Contractor should demonstrate they have not violated cultural resource protection in previous projects
- Schedule a pre-bid meeting with a site walk

- Account for question and answer phase and produce necessary addendums
- Perform contractor pre-qualification (if applicable), bid evaluation and/or leveling, and contractor selection
- Award contract

Pre-Construction Coordination

Schedule a pre-construction meeting to kick-off planning and coordination. Contractor will obtain additional permits necessary to perform the work and provide pre-construction submittals (e.g., NPDES, SWPPP). Review the construction schedule and identify risks and opportunities. Plan for potential weather delays. Define communication procedures, including RFI and submittal management. Salvage plants from the grading program footprint to supplement plant procurement. Collect special status species propagules (if necessary).

Groundbreaking

- Plan and host a groundbreaking ceremony
- Public notification of updated construction timeline on websites and other media
- Coordinate w/ adjacent property users (e.g., UC San Diego)



Groundbreaking celebration with ceremonial shovels. Photo Credit: Heather Altman

Milestone 6: Construction

Overview

This stage encompasses construction activities and environmental monitoring during implementation of the wetland restoration project.

Outcomes

1. Funding source budgets are properly managed.
2. Environmental compliance is enforced.
3. Weekly construction meetings are held between the contractor, the construction management team, and owner.
4. Design team provides construction support to ensure consistency with project plans and specifications.
5. Construction updates are disseminated to stakeholders.
6. Project is constructed.

Mobilization

- Contractor sets up staging areas and haul routes, implements security features, lays down equipment, and establishes construction trailer and temporary services
- Perform initial work area surveying to establish project work limit boundaries
- Delineate Environmental Sensitive Areas and install protective fencing
- Install BMPs
- Onsite pre-construction meetings (if necessary)

Construction Activities

- Site clearing and grubbing, demolition
- Grading, excavation, stockpiling and hauling

- Channel and shoreline construction
- Structure installation (e.g., bridges, culverts)
- Erosion control, including required stormwater, water quality, and erosion control BMPs
- Soil management including testing, topsoil sourcing, and amending
- Plant procurement and vegetation planting
- Installation of trails, public amenities, interpretive signage and tribal access features
- Maintain required public access or approved temporary access during construction



Coyote near construction equipment. Photo Credit: Jayne Romero

Environmental Compliance

- Workers Environmental Awareness Training (if required)
- Biological monitoring during construction
- Nesting bird surveys as required by permits
- Water quality monitoring
- Dust control and air quality management
- Noise monitoring and mitigation
- Cultural resources monitoring and resource protection including mitigation, curation, etc. (MMRP)

- Agency coordination and compliance report

Construction Management

- Regular site inspections
- RFI, Submittal, and Change Order management
- Schedule tracking and updates
- Weekly construction meetings

Stakeholder Engagement

- Public communication and access management
- Provide project progress updates via media such as newsletters, eblasts, and public meetings
- Manage neighbor relations

Project Closeout

- Punch list completion
- Final inspections
- As-built documentation
- Warranty and establishment period initiation
- Transition to long-term management
- Provide regulatory agencies with necessary post-construction notifications and documents
- Close out permits that do not have a post-construction monitoring phase



Great blue heron foraging in pickleweed. Photo Credit: Kevin Fistanic.

Milestone 7: Long-Term Monitoring and Management

Overview

Following construction, the project enters a long-term management phase focused on monitoring, maintenance, adaptive management, and stewardship to ensure restoration success.

Outcomes

1. Implementation of the Monitoring and Adaptive Management Plan (MAMP).
2. Produce and implement a Cultural Resources Management Plan.
3. Post-construction monitoring completed and performance standards met.
4. Maintenance contractor identified and hired.
5. Stewardship Program developed and implemented.

Monitoring Programs

The MAMP will be implemented and updated as necessary to evolve with changing site conditions and management needs. The following programs include potential monitoring categories and metrics for tracking long-term success. Post-construction plans should be implemented and required reporting timelines should be followed. Frequency of monitoring will be outlined in the MAMP. For 5-years post construction, monitoring results will be used to track success against performance criteria. Results are likely to be reported in an annual report to update regulatory agencies on project performance.

Monitoring should follow the parameters set out for De Anza Natural's Wetlands Management Plan, which specifically calls



Site assessment. Photo credit: San Diego Bird Alliance.

for water-quality testing (petroleum products and other toxins) at the point of water entrance, within the treatment marsh, and in Mission Bay; wildlife and invertebrate use; vegetation composition and health (particularly Spartina); and usage statistics in public-access areas. If a mitigation bank is established, annual "bank accounting" reports are also required to the Coastal Commission, CDFW, Regional Water Quality Control Board, U.S. Fish and Wildlife Service, and the U.S. Army Corps of Engineers.

Biological Monitoring

- Vegetation establishment and survival
- Habitat mapping
- Avian presence and functional use
- Rare plants and sensitive species presence and abundance
- Macrofaunal invertebrates and fish community surveys
- Invasive species tracking
- Wetland extent and condition (e.g., CRAM)

Physical Monitoring

- Channel morphology and stability
- Sediment deposition/erosion patterns
- Tidal circulation and water levels
- Shoreline changes
- Topographic and bathymetric surveys
- Agronomic testing

Water and Sediment Quality Monitoring

- Salinity, temperature, dissolved oxygen
- Nutrient, heavy metals, and other chemistry levels
- Bacterial indicators and other pollutants affecting swimming and water-contact recreation
- Contamination monitoring



Volunteers removing non-native plants. Photo credit: Kevin Fistanic.

Maintenance Activities

Identify and onboard a maintenance contractor that is familiar with maintaining natural habitats and responsible for the following:

- Vegetation maintenance (weeding, replanting)
- Irrigation system operation (if applicable)
- Trail and infrastructure repairs
- Erosion control measures

Cultural Resources Management

Work with the TAG and tribal community to develop a Cultural Resources Management Plan that includes the care of material found during construction and biological resources access and harvesting plan.

Adaptation Measures

Utilize the MAMP to implement adaptation measures to address changing site conditions and unforeseen circumstances. Examples are provided below.

Sea Level Rise

- Monitor sea level rise, inundation, erosion, and habitat migration
- Preserve and facilitate space for marsh migration and habitat transitions
- Relocate, remove, or adapt vulnerable public amenities, utilities, and visitor-serving facilities as hazards increase
- Adapt public access as needed while avoiding impacts to wetlands and sensitive habitat
- Prioritize nature-based shoreline adaptation and managed retreat where feasible
- Coordinate with regional sea level rise planning

Sedimentation and Water Quality Impacts from Rose Creek

- Monitor channel, sediment, circulation, and water quality performance
- Remove excess sediment or adjust channel maintenance as needed to maintain preferred hydrology and water quality function
- Adjust LID/BMPs, runoff treatment, trash capture, or other measures if water quality objectives are not met

Habitat Enhancement for Special Status Species

- Ridgway’s rail nesting platforms
- Endangered species outplanting

Vector Control and Invasive Species Management

- Coordinate with local agencies
- Report new invasive species and develop action plans

Alterations to Public Use

- Temporary trail closures for sensitive species protection
- Restrict or modify canoeing/kayaking and other public uses if monitoring identifies adverse impacts to plant communities and wildlife

Stewardship Coordination

Develop a Stewardship Program. Identify key stakeholders that would like to be involved in the long-term management and maintenance of the site. Find roles that complement each other and fit the skillset of each group. The program should be cohesive and serve the needs of the public and the landscape. It could include elements like public tours, environmental education field trips, habitat restoration days, community-based research, nature photography classes and bird walks. Potential partners include:

- City of San Diego (primary land manager)
- UC San Diego Natural Reserve System
- Local colleges and research institutions
- Tribal community partners
- Local non-profits and community groups



Salt marsh bird's beak. Photo credit: Kevin Fistanic.

Appendix A: Permitting Pathway Matrix

Agency	Permit or Approval	Estimated Timeline (months)	Estimated Cost	Key Requirements to Prepare Application	Constraints and Risks	Opportunities for Early Collaboration/Streamlining
California Coastal Commission	Coastal Development Permit (Coastal Act)	12 - 18	\$50,000 - \$100,000	Consistency with State Regulations. public access, habitat protection, long term planning, mitigation	Requires 100% plans for final approval. Unpredictable requirements for project analysis and plan development. Requires a public hearing for approval. Requires numerous submittals for issuance. Expect at least one incomplete application letter.	Wetland Recovery Project Pre-Application meeting. Include CCC in TAC meetings and other working groups if possible. Alignment between the MAMP and Regional Monitoring Plan.
U.S. Army Corps of Engineers	Section 404 Permit (Clean Water Act) and Section 10 Permits (Rivers and Harbors Act)	12 - 24	\$10,000 - \$30,000	Consistency with Federal Regulations related to filling or dredging of aquatic resources. Wetland impacts, alternatives analysis, mitigation	Consulations with other federal agencies are likely to be required. Agencies may take a long time to review applications. Applicant responses must be provided in a timely manner or risk being deprioritized.	These two permits can be potentially combined through the Nationwide 27 permit.
Regional Water Quality Control Board	Section 401 Water Quality Certification	6 - 12	\$10,000 - \$20,000	Water quality standards compliance, discharge and fill/dredge of State aquatic resources	Depending on the project, may require constant water quality monitoring throughout construction.	Waterboard Statewide General Restoration Order
California Dept. of Fish & Wildlife	Lake Streambed Alteration Agreement (1602)	12 - 24	\$20,000 - \$75,000	Alteration to rivers, streams, lakes, and other aquatic resources, habitat protection	CDFW jurisdiction can be hard to define. Application fees cannot be predicted and are calculated based on the estimated cost of different project activities.	Restoration Management Permit

Agency	Permit or Approval	Estimated Timeline (months)	Estimated Cost	Key Requirements	Constraints and Risks	Opportunities for Early Collaboration/Streamlining
California Dept. of Fish & Wildlife	Incidental Take Permit (California Endangered Species Act)	3 - 6	\$5,000 - \$10,000	Incidental take authorization for CESA listed species	Challenging to predict the number of individuals that may require coverage for take.	Restoration Management Permit
U.S. Fish & Wildlife Service	Section 7 Endangered Species Act Consultation	3 - 6	\$5,000 - \$10,000	Programmatic Biological Opinion, incidental take authorization for FESA listed species	Challenging to predict the number of individuals that may require coverage for take.	Keep agency staff involved from the beginning.
National Marine Fisheries Service	Essential Fish Habitat Consultation	3 - 6	\$5,000 - \$10,000	Protection against impacts to fish habitat	May require specialized fish surveys.	Keep agency staff involved from the beginning.
City of San Diego	Grading Permit	3 - 6	Potential for surety bond of 1-10% of grading costs	Grading plans, erosion control	Requires 100% plans for final approval. Post a performance bond.	
City of San Diego	Mission Bay Park Committee Approval	Ongoing		Consistency with Mission Bay Park Master Plan		
City of San Diego	City Council Approval	Variable		Major project milestones, funding allocation		

Appendix B: Potential Funding Opportunities

- Federal Grant Opportunities
 - National Coastal Wetlands Conservation Grant (USFWS), a minimum 25% match is required
 - North American Wetlands Conservation Act Grant (USFWS), 1-to-1 non-federal match
 - Five Star and Urban Waters Restoration Grant (NFWF), projects are required to meet or exceed a 1:0.75 match ratio to be competitive
 - National Coastal Resilience Fund (NFWF), matching funds not required
 - America's Ecosystem Restoration Initiative (NFWF), matching funds not required
 - Wetland Program Development Grant (EPA), 25% non-federal matching funds required
 - NOAA Restoration Center, matching funds not required
 - Pacific Marine and Estuarine Fish Habitat Partnership (USFWS, National Fish Habitat Partnership), 1:1 non-federal financial match preferred
- State Grants Opportunities
 - California Coastal Conservancy (various grant programs), some grants require matching funds
 - Ocean Protection Council, matching funds are encouraged but not required
 - Senate Bill 1 Sea Level Rise Adaptation Grant Program
 - Wildlife Conservation Board, generally does not require matching funds
 - Habitat Enhancement and Restoration
 - California Fish and Wildlife
 - Environmental Enhancement Fund (OSPR), matching funds not required
 - Proposition 1 Watershed Restoration Grant Program, matching funds not required
 - State Wildlife Grant (SWG) Program, minimum of 35% of the total project cost in non-federal matching funds or in-kind services
 - Endangered Species Conservation and Recovery Grant Program, minimum of 25% of the total project cost in non-federal matching funds or in-kind services
- Local Grant Opportunities
 - Philanthropic
 - City capital improvement program coordination
 - Mission Bay Park Improvement Fund allocation discussions
- Compensatory Mitigation Opportunities:

Permittee responsible mitigation is a potential funding source that could be pursued if outside projects have impacts that require tidal wetland mitigation. While this could be a viable option, the mitigation requirements may not align exactly with the goals and objectives of the De Anza Natural Plan which could skew the focus towards less preferred habitat distributions and handcuff the project with additional performance standards. Mitigation banking or in-lieu fee programs are other compensatory mitigation approaches that could also provide funding; however, these are lengthy processes that can take over 10 years, require intensive resource agency involvement, and have little precedence in the Coastal Zone.