

**Riverwalk Project
Wetland Restoration Plan
(Project No. 581894)**

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Prepared for:

SD Riverwalk, LLC
4747 Executive Drive, Suite 410
San Diego, CA 92121

Prepared by:

Alden Environmental, Inc.
3245 University Avenue, #1188
San Diego, CA 92104



**Riverwalk Project
Wetland Restoration Plan**

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1.0 INTRODUCTION

This wetland restoration plan (Plan) has been prepared for the Riverwalk Project (Project) in accordance with the requirements of the City of San Diego (City). Specifically, the wetland restoration described herein is required to comply with MHPA Guideline B15 of the MSCP Subarea Plan. Guideline B15 requires restoration of native vegetation along this portion of the San Diego River Corridor as a condition of development proposals. In addition, this Plan identifies habitat creation/enhancement efforts that, along with the B15 enhancement, would contribute to a future wetland habitat mitigation bank on the Riverwalk Project site. Additional approvals, permits, and authorizations will be required for the future mitigation bank establishment. This Plan is not intended to be a component of those future bank approval efforts. All restoration activities are intended to increase and enhance the native habitats along the San Diego River within and adjacent to the Multi-habitat Planning Area (MHPA).

2.0 PROJECT DESCRIPTION AND IMPACTS

2.1 PROJECT LOCATION

The approximately 195.0-acre Project site is located in Mission Valley in the City, on the La Jolla U.S. Geological Survey (USGS) 7.5-minute Quadrangle (Figures 1 and 2). Regional access to the site is provided by Interstate 8 (I-8), located immediately south of the Project site; State Route 163 (SR 163), located approximately one mile east of the Project site; and Interstate 5 (I-5), located less than two miles west of the Project site. Primary vehicle access to the Project would occur at Fashion Valley Road from the east, Hotel Circle North from the south, and Friars Road from the north.

The habitat restoration and enhancement area is located along the existing San Diego River channel, which traverses the Project site in an east-west direction. All restoration activities would occur adjacent to this channel and within the MHPA.

2.2 PROJECT SUMMARY

The Project site is currently developed as the Riverwalk Golf Course with three, 9-hole courses and a clubhouse building. The golf course operates under an existing Conditional Use Permit (CUP No. 94-0563). The Project proposes an amendment to the existing Levi-Cushman Specific Plan to replace the 195-acre Riverwalk property with the Riverwalk Specific Plan and redevelop the existing golf course as a walkable, transit-centric, and modern live-work-play mixed-use neighborhood that features an expansive Regional River Park along the San Diego River.

Additionally, the Project includes modifications to Fashion Valley Road to improve this crossing of the San Diego River in a manner that avoids wetland impacts to the maximum extent possible. The existing culverts would be replaced with a Con/Span arch. The foundation for the arch is buried beneath the roadway, leaving an earthen-bottomed channel. Wetland/riparian habitat impacts from the Fashion Valley Road improvements would require mitigation. That mitigation, which requires habitat creation and enhancement, is addressed in a separate mitigation plan.

The Project also includes a habitat restoration effort along the existing river channel and within the MHPA on site (Figures 3 and 4). This is to comply with Guideline B15 in the City's MSCP Subarea Plan (City 1997) and to create a future wetland mitigation bank.

The restoration would include the removal of invasive, non-native plant species and the planting of native seed and container stock in accordance this Plan when approved by the City. The restoration is intended to increase and enhance the native habitats along the San Diego River, within and adjacent to the MHPA.

3.0 DESCRIPTION OF THE RESTORATION SITE

3.1 LOCATION AND SIZE OF RESTORATION AREA

The restoration effort would be conducted within an approximately 22.43-acre area along the existing river channel, within the limits of the Riverwalk Project (Figures 3 and 4). This area supports, or has the potential to support, wetland/riparian habitats.

3.2 EXISTING FUNCTIONS AND SERVICES

The restoration area is located along the existing San Diego River Channel, which flows through the Riverwalk Golf Course. The channel is incised and supports wetland/riparian habitats. The land adjacent to the north and south of the channel is an existing, developed golf course and does not support sensitive vegetation communities.

3.3 SITE SUITABILITY

The restoration area is considered suitable for the proposed wetland habitat enhancement and creation as a result of the presence of appropriate soils and topography and the presence of existing wetland/riparian features. The adjacent golf course areas are within the historic limits of the San Diego River and support suitable soils, topography, and landscape features for successful expansion (creation) of native wetland/riparian habitat. A hydrological study (Chang Consultants 2019) was conducted for the Project to define the 2-, 5- and 10-year floodplain limits and found that the majority of the restoration area will be inundated during at least a 2-year storm event. Virtually the entire area would be inundated during a 10-year event.

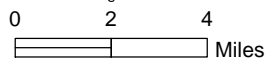
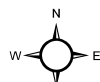
The grading for habitat creation is designed to occur within the Ordinary High Water Mark (OHWM) in the active channel area, adjacent to the low-flow channel. The OHWM defines the lateral extent of waters in ephemeral and intermittent streams in the Arid West. The active channel, a short-term geomorphic feature formed by prevailing stream discharges, is narrower than the bank-full channel and is defined by a break in bank slope that also typically is the edge of permanent vegetation (Lawlor 2004). Typically, riverine restoration would occur within and adjacent to the OHWM, within the active channel. The OHWM is associated with flood events ranging from <1- to the 15.5-year event (U.S. Army Corps of Engineers [Corps] 2011). The grading and hydrological design for the created habitat is well within this standard for the identification of the OHWM and active channel area. The target hydrological conditions would meet the Corps requirements for determination of the OHWM and limits of jurisdictional feature areas.



Figure 1

Regional Location

RIVERWALK PROJECT
WETLAND RESTORATION PLAN



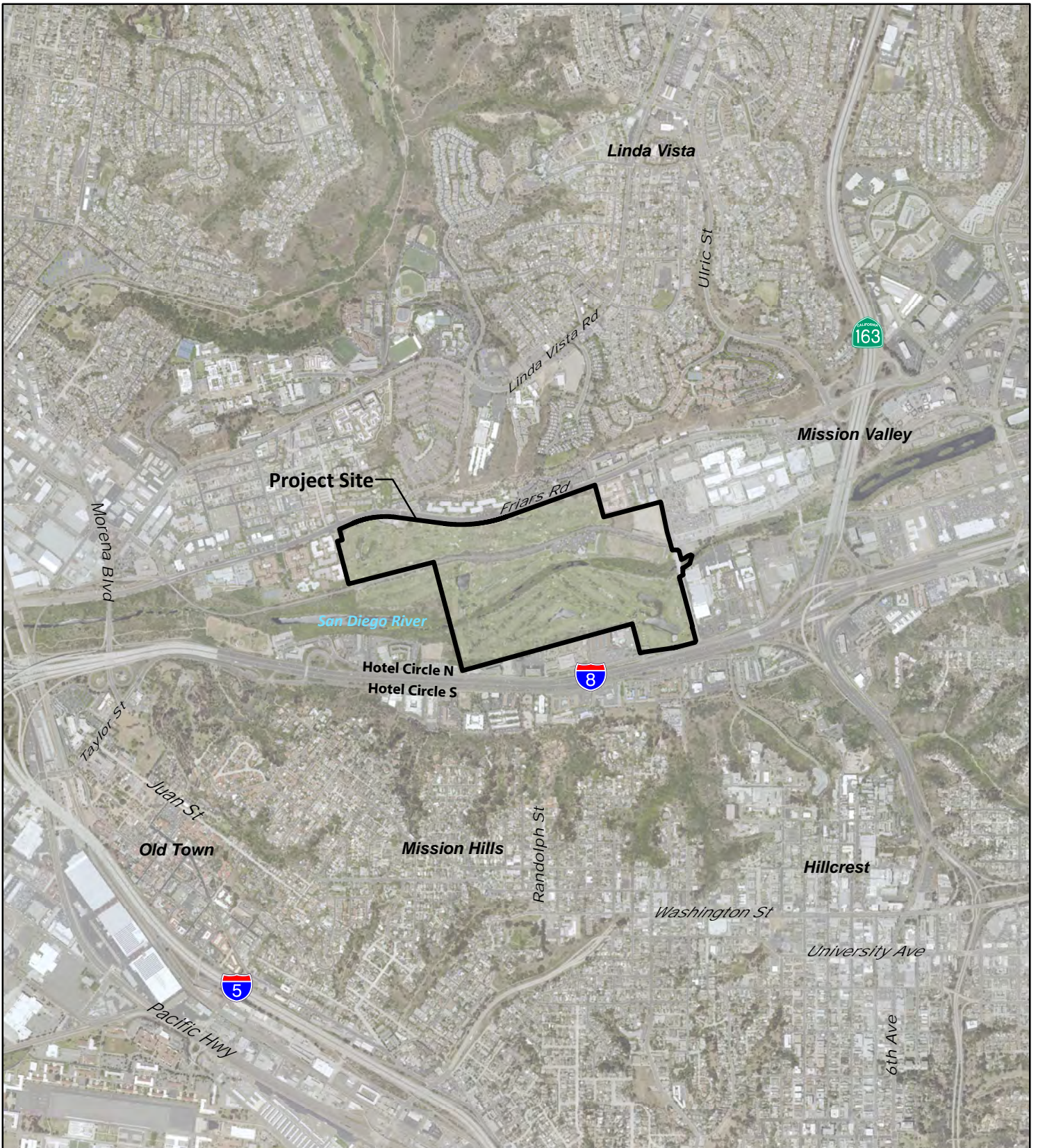
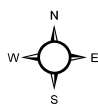


Figure 2

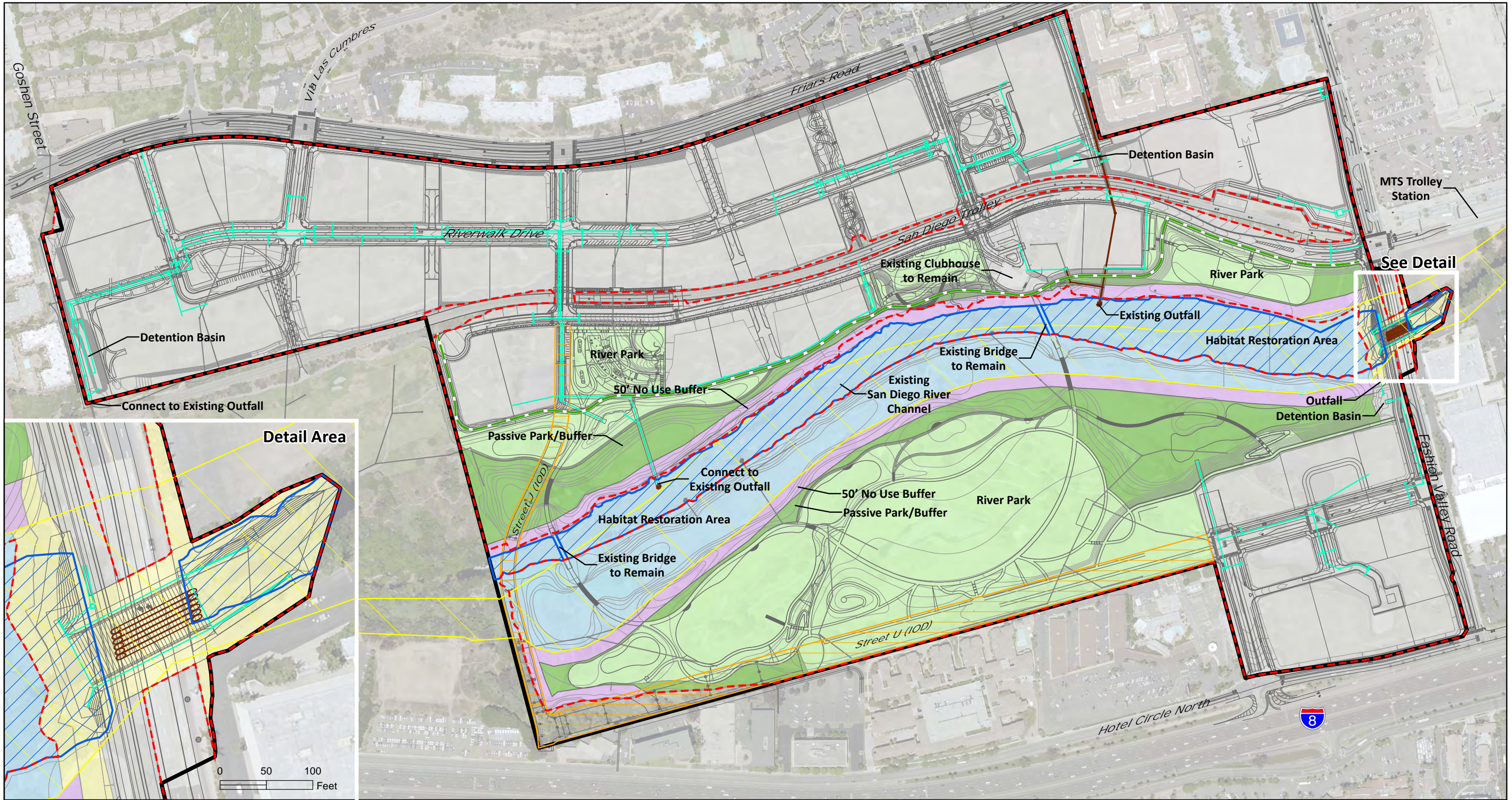
Project Location

RIVERWALK PROJECT
WETLAND RESTORATION PLAN



0 1,000 2,000
Feet





- Project Site
- MHPA
- San Diego River Trail
- City Roadway IOD
- Project Impacts
- Existing Storm Drain
- Proposed Storm Drain
- Existing San Diego River Channel
- Riverwalk Project Development
- Fashion Valley Road Improvements
- River Park - Active Park
- River Park - Passive Park
- 50' No Use Buffer
- Wetland Habitat Restoration

Figure 3

Development Plan

RIVERWALK PROJECT
WETLAND RESTORATION PLAN

WETLAND SEED MIX ¹	
SPECIES	POUNDS/ACRE
Yerba mansa (<i>Anemopsis californica</i>)	3
Spiny rush (<i>Juncus acutus</i>)	4
Pale spikerush (<i>Eleocharis macrostachya</i>)	4
Mugwort (<i>Artemisia douglasiana</i>)	4
Saltmarsh fleabane (<i>Pluchea odorata</i>)	3
Creeping wild rye (<i>Leymus triticoides</i>)	5
San Diego sagewort (<i>Artemisia palmeri</i>)	4
Mulefat (<i>Baccharis salicifolia</i>)	4
Tarragon (<i>Artemisia dracunculus</i>)	6
Western ragweed (<i>Ambrosia psilostachya</i>)	6
California deergrass (<i>Muhlenbergia rigens</i>)	4
Red willow (<i>Salix laevigata</i>)	3
Arroyo willow (<i>Salix lasiolepis</i>)	3
Elderberry (<i>Sambucus nigra</i>)	3
TOTAL	62

¹ Applied within re-establishment area and as needed in enhancement area

WETLAND CONTAINER STOCK ¹	
SPECIES	NUMBER PER ACRE ²
Yerba mansa (<i>Anemopsis californica</i>)	200
Spiny rush (<i>Juncus acutus</i>)	200
Mexican rush (<i>Juncus mexicanus</i>)	200
San Diego marsh elder (<i>Iva hayesiana</i>)	200
Freemont's cottonwood (<i>Populus fremontii</i>)	100
Creeping wild rye (<i>Leymus triticoides</i>)	50
Fuchsia-flowered gooseberry (<i>Ribes speciosum</i>)	100
Mulefat (<i>Baccharis salicifolia</i>)	200
California deergrass (<i>Muhlenbergia rigens</i>)	50
Black willow (<i>Salix exigua</i>)	100
Arroyo willow (<i>Salix lasiolepis</i>)	100
Elderberry (<i>Sambucus nigra</i>)	100
TOTAL	1,600

¹ Applied within wetland re-establishment area

² All container stock is 1 gallon in size

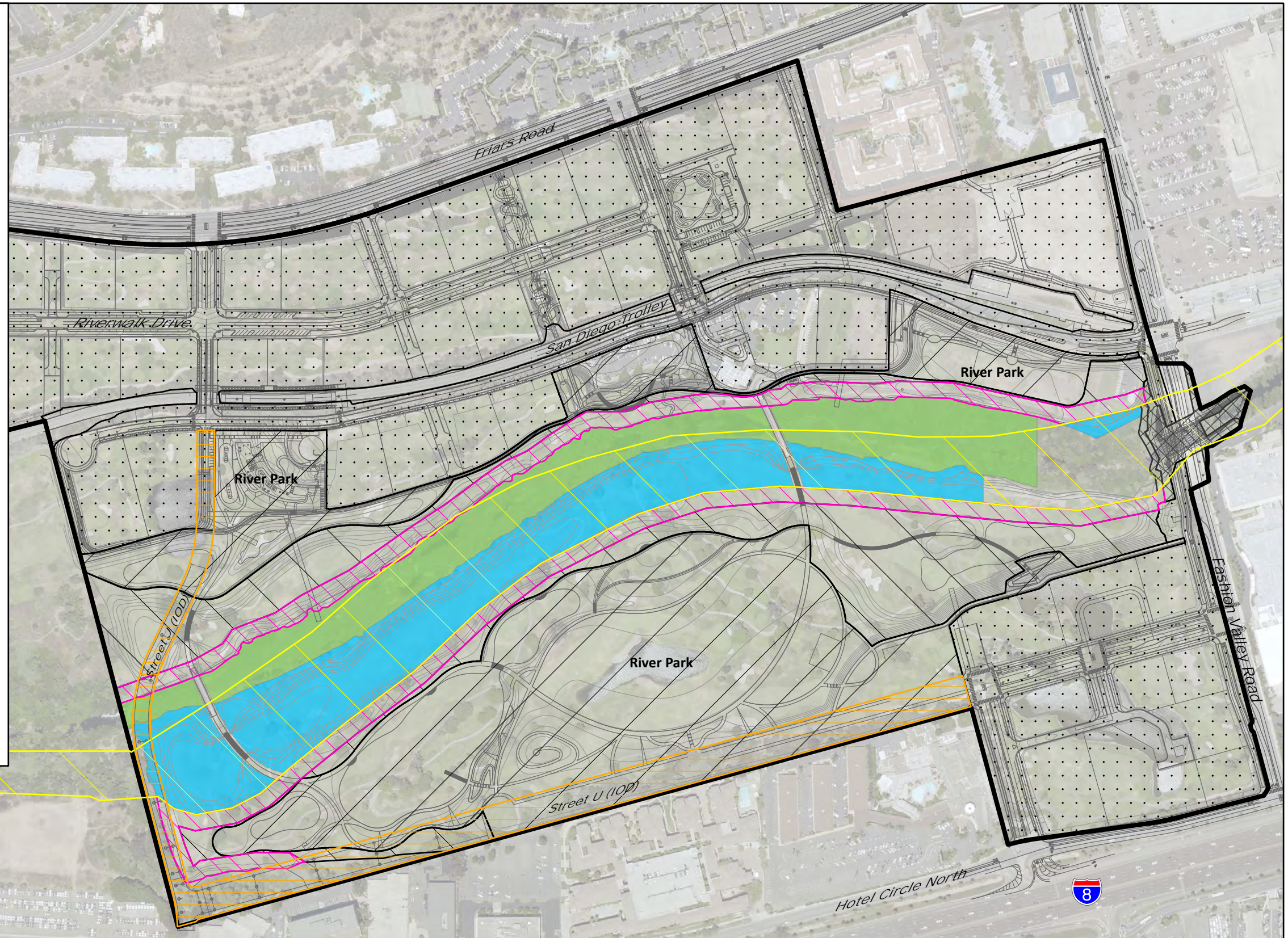
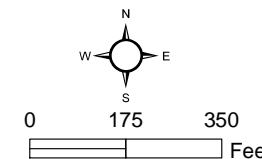


Figure 4

Wetland Restoration

RIVERWALK PROJECT
WETLAND RESTORATION PLAN

¹ Includes temporary impact area during construction. Temporary impacts associated with the Fashion Valley Road improvements will be restored to native wetland habitat, in concurrence with the re-establishment measures identified in this plan.



The goal in the habitat creation area within the new OHWM limits (restoration boundary) is to create a variable streambed adjacent to the existing low flow channel that would be ephemeral in nature but may also become intermittent depending upon rainfall, groundwater levels, and overflow conditions from the existing low flow channel. The proposed storm event inundation conditions (2-year event) are consistent with this goal.

A broad range of riparian scrub species that are appropriate for wetland/riparian habitat adjacent to the low-flow channel in the active channel area have been selected for the habitat creation effort. The range of species goes from true hydrophytes to transitional wetland/upland species. The intent is to provide a mosaic of wetland/riparian habitats that are best suited to the final conditions in the habitat creation area. The species selected also are prevalent upstream and downstream from the Project site, along the San Diego River. Overall, the vegetative goal is for a diverse riparian scrub community that is well adapted to variable water flow and rainfall conditions. This community also is adapted to the intermittent seasonal rainfall events, interspersed with relatively dry periods, that are characteristic of coastal San Diego County.

Additionally, the new surface elevation would be within approximately 4 to 8 feet of the existing groundwater level, based on the available soils data collected previously on the site. One goal for the restoration effort is to ensure that the grading does not go deep enough to breach the groundwater level as this could create a perennial surface ponded situation (i.e., the MTS site downstream and FSDRIP upstream), as opposed to a natural seasonal surface stream flow condition. The species identified for the habitat creation are relatively shallow-rooted (2 to 6 feet) and typically do not depend upon groundwater for their survival. The deeper-rooted species may reach down to the groundwater level, but typically they will stop in the capillary fringe area above the groundwater layer. The wetland vegetation in the habitat creation area may use groundwater in dry years with little rainfall; however, the intent of the effort is to not create habitat that is dependent upon groundwater for its long-term persistence.

More specifically, the area of proposed wetland habitat creation is in alignment with the previous San Diego River channel (pre-MTS project) on site and is of a similar width as that of the wetland habitat located just off site and downstream. As such, the habitat creation is within the limits of the larger San Diego River system and would not result in an attempt to convert historic upland habitat to wetland habitat.

Finally, the above approach is in line with other projects approved by the regulatory agencies in the region. An example is the off-site wetland habitat mitigation effort for the Merge 56 Development Project. That effort is in the final approval stages with the Corps and Regional Water Quality Control Board, would occur in McGonigle Creek, and has much the same approach and characteristics as the proposed Riverwalk Project effort.

4.0 RESTORATION DESIGN

To meet MSCP B15 requirement, this Plan recommends measures to expand existing wetland/riparian features within and adjacent to the existing San Diego River channel. The restoration includes 9.92 acres of wetland habitat enhancement and 12.51 acres of wetland habitat creation (Figure 4). It is anticipated that the functions and services of the enhanced and created habitats within the restoration area would be increased.

4.1 WETLAND ENHANCEMENT

The river channel within the restoration area supports southern cottonwood-willow riparian forest, southern willow scrub, coastal and valley freshwater marsh, emergent wetland, and open water, much of which has been affected by, for example, non-native plant species and trash. The Project would preserve and enhance these habitat areas, many of which are in a disturbed condition. The existing channel would stay in place, and no grading would occur within its limits. Enhancement activities would include removing weeds, trash, cement, and other materials that have been dumped within and adjacent to the stream over time. Native seed also will be installed within the enhancement areas, as necessary, to help ensure improved habitat function.

4.2 WETLAND CREATION

In addition to enhancing the preserved wetlands, an additional 12.51 acres of wetland habitat area will be created by expanding the width of the existing channel. Expansion of the channel will involve removal of all of the golf course facilities including greens, holes, sand traps, etc. Once the facilities have been removed, the creation area will be graded to create an expanded channel area that is at an elevation within 2 to 4 feet of the existing river channel bottom. This grading will occur adjacent to the existing channel but will not breach the channel or encroach upon any of the existing wetland habitat. The habitat goal is to create a mosaic of site appropriate wetland/riparian-associated habitats through the installation of a broad species mix. The habitats to become established are anticipated to range from freshwater marsh adjacent to existing channel that experience steady water flows to riparian scrub and forest habitats along the periphery of the wetland creation area.

4.3 TARGET FUNCTIONS AND SERVICES

The goals of this restoration effort are to enhance existing wetland habitat and create wetland habitats that would increase the habitat quantity and quality along the San Diego River. With the completed restoration, it is expected that functions and services (water filtration, sensitive wildlife and plant habitat, etc.) would be improved and increased by the end of the restoration effort. This realization of target functions and values would be documented by conducting quantitative and qualitative analyses throughout the monitoring period. This effort would meet the City's B15 requirement and enable wetland habitat mitigation bank to be created.

5.0 IMPLEMENTATION PLAN

The on-site habitat enhancement and creation will consist of several components, including:

- Initial site preparation
- Enhancement of preserved wetland areas
- Creation of additional wetland/riparian areas habitats

5.1 RATIONALE FOR EXPECTING IMPLEMENTATION SUCCESS

The site selected for the restoration effort currently supports wetland habitat along the existing San Diego River channel and within the historic San Diego River limits. This Plan would enhance and expand the limits of wetland/riparian area and would improve habitat quality and functions. The hydrological analyses (Change Consultants 2019) concluded that the site would be inundated regularly, the built condition would be above groundwater (maintain surface flow condition), the soils are suitable for the proposed vegetation, and the habitat creation area currently supports golf course. Given the above, suitable parameters for successful implementation occur on the site. Refer to Section 3.3 of this Plan for additional site suitability information.

5.2 RESPONSIBLE PARTIES

5.2.1 Project Proponent

SD Riverwalk, LLC (or the owner at the time of implementation) will be responsible for financing the installation, maintenance, and monitoring of the restoration measures.

5.2.2 Restoration Specialist

Overall supervision of the installation, maintenance, and monitoring of this mitigation program will be the responsibility of a restoration specialist with a minimum of 5 years of habitat restoration experience. The restoration specialist will educate all participants with regard to program goals and directly oversee all aspects of the project. In addition, the specialist will collect pre-condition biological information (photographic documentation), conduct all monitoring data collection, annual assessments, and prepare all required reports. If necessary, the restoration specialist will provide the project proponent and contractor with a brief report, including a written list of items in need of attention following each monitoring visit. The contractor will be responsible for carrying out all required measures in a timely manner. The restoration specialist will notify the contractor and responsible party if any requested remediation is not addressed. A checklist with the main tasks and responsibilities is included in Table 1.

**Table 1
RESTORATION PLAN CHECKLIST**

Construction Phase	Task	Applicable Parties				
		Project Proponent	Grading Contractor	Installation Contractor	Maintenance Contractor	Restoration Specialist
Pre-construction	Order seed and container stock			X		
	Attend pre-construction meeting	X	X	X		X
	Document pre-impact conditions					X
	Identify site limits and staging area					X
Installation	Delineate boundaries			X		X
	Remove existing facilities		X			X
	Grade creation area		X			X
	Install container stock and seed			X		X
	Install irrigation system			X		X
	Prepare/submit as-built report					X
Five-year Maintenance & Monitoring Period	Conduct maintenance monitoring and annual monitoring					X
	Maintain site for remainder of 5 years (or fewer than 5 years if success criteria are met sooner)				X	X

5.2.3 Installation/Maintenance Contractor

The installation and maintenance contractor(s) will have habitat restoration experience and will, under the direction of the restoration specialist, be responsible for completion of grading, pre-planting weed control, planting, seeding, and maintenance. The restoration specialist will educate the contractor(s) on the installation and maintenance of native plant species.

After the installation is complete, maintenance personnel will initiate the maintenance program under the direction of the restoration specialist. Maintenance crews will service the entire enhancement area regularly following installation. Service will include but not be limited to weed control, trash removal, watering, fence repair, dead plant replacement, and re-seeding. All activities conducted will be seasonally appropriate and approved by the restoration specialist. The maintenance crew will meet the restoration specialist at the site when requested and will perform all checklist items in a timely manner as directed by the restoration specialist. The restoration specialist will ensure that maintenance personnel are capable of discerning between native plant species and non-native weed species.

5.3 CONTRACTOR EDUCATION

Prior to the commencement of site activities, the contractor(s) will review all aspects of this Plan including permit requirements, site protection, maintenance inspections, landscape procedures, and monitoring. The restoration specialist will make the Contractor and all other contractors, subcontractors and the project supervisors aware of any agency permits and authorizations associated with the project. Copies of project permits will be kept on site at all times during periods of active work and must be presented to any agency personnel upon demand.

5.4 IMPLEMENTATION SCHEDULE

Implementation of the restoration would commence in conjunction with the grading for the Riverwalk Project. The grading and initial site preparation will be a component of the River Park component of the Riverwalk Project and shown on the final grading plans for that project. Installation of the habitat (seeding, planting, irrigation, etc.) and the 120-day plant establishment period will begin once all restoration area grading activities are complete. Habitat enhancement and creation activities are anticipated to take between 8 and 12 weeks to complete.

Installation activities would avoid the nesting seasons of the least Bell's vireo and light-footed Ridgway's rail (March 15 through September 15) and southwestern willow flycatcher (May 1 through September 1) should any of those species be present, and potentially affected, as determined during a protocol, pre-activity survey.

5.5 SITE PREPARATION

As described above, the initial site preparation will involve removal of the golf course facilities and grading of the areas adjacent to the river channel to achieve the target elevations for wetland restoration. Once the restoration area grading is complete, the site will be de-compacted to increase soil permeability and the potential for establishment of native habitats. Weeds, refuse, debris, and deleterious soil will be removed and disposed of in a licensed landfill.

5.6 FENCING

Prior to and during implementation (grading/planting) of the restoration effort, a temporary orange construction fence will restrict access to the creation/enhancement areas. Three-strand, barbless wire fences will be installed along the boundary of the restoration area, preventing OHV and pedestrian use of the preserve area. Steel signs will be attached to the fences that will provide notice, in both English and Spanish, that the area is an ecological preserve and that trespassing is prohibited. These wire fences will remain in place during the maintenance and monitoring period. Once the restoration effort is established and successful, the fences will be removed.

Permanent barriers will consist of boulders or deterrent vegetation, as well peeler log fencing that will be installed as part of the Riverwalk Project. These barriers will be located along the edge of the 50-foot no use buffer to deter entrance into the MHPA and wetland restoration area. Installation of these permanent barriers is not a component of this Plan.

5.7 WETLAND HABITAT

The target habitat within the wetland creation area has been designed to allow for a mosaic of wetland associated species to become established as determined by specific conditions. To this end, an overall wetland seed mix has been prepared that includes native wetland species that occur within wetland riparian scrub/forest habitats (mule fat scrub, southern willow scrub, freshwater marsh, etc.).

5.7.1 Wetland Seed Mix

Wetland seeding will take place within the entire creation area and as needed in the enhancement area (Figure 4). The wetland seed mix is presented in Table 2 and shown on Figure 4. The seed will be sourced from as close to the site as possible and includes plant species traditionally used by Native American tribes. The source and proof (tags) for all seed will be provided.

Table 2 WETLAND SEED MIX¹	
SPECIES	POUNDS/ACRE
Yerba mansa (<i>Anemopsis californica</i>)	3
Spiny rush (<i>Juncus acutus</i>)	4
Pale spikerush (<i>Eleocharis macrostachya</i>)	4
Mugwort (<i>Artemisia douglasiana</i>) ²	4
Saltmarsh fleabane (<i>Pluchea odorata</i>)	3
Creeping wild rye (<i>Leymus triticoides</i>)	5
San Diego sagewort (<i>Artemisia palmeri</i>)	4
Mulefat (<i>Baccharis salicifolia</i>) ²	4
Tarragon (<i>Artemisia dracunculus</i>)	6
Western ragweed (<i>Ambrosia psilostachya</i>) ²	6
Purple needlegrass (<i>Stipa pulchra</i>)	6
California deergrass (<i>Muhlenbergia rigens</i>) ²	4
Red willow (<i>Salix laevigata</i>) ²	3
Arroyo willow (<i>Salix lasiolepis</i>) ²	3
Elderberry (<i>Sambucus nigra</i>) ²	3
TOTAL	62

¹Applied within creation area and as needed in enhancement area

²Plant species traditionally used by Native American tribes

A hydroseed slurry will be evenly applied in two stages such that an even, homogeneous distribution is made in each area. The first stage will include the seed, a small amount of fiber mulch, and dye. This application will help ensure that maximum seed/soil contact is made. A second layer will be applied immediately following the first. The second layer will include additional fiber mulch, dye, and a tackifier. The tackifier will serve to help bind seed and soil until germination. Hydroseed specifications are presented in Table 3.

Table 3 HYDROSEED APPLICATION SPECIFICATIONS		
Material	First Application	Second Application
Seed	As called for per site	N/A
Long fiber wood mulch	500 lbs/acre	1,000 lbs/acre
Dye	As necessary	As necessary
Tackifier	N/A	90 lbs/acre
Water	Sufficient to maintain slurry	Sufficient to maintain slurry

Hand seeding may be conducted in focused areas to help ensure targeted application of seed. Areas not treated with the hydroseed slurry will be hand seeded following hydroseeding to make sure all areas are seeded. These areas will be determined at the time of seeding and will include areas where hydroseeding may not be possible, where existing native plants may be negatively affected by the hydroseed slurry, or where it is thought that certain species may be appropriate in small areas. Seed of different species will only be mixed when they are to be applied to the same location.

Individual species may be seeded separately as directed by the restoration specialist. Hand broadcasters will be used to help ensure a consistent application of seed. An inert carrier (sand, sawdust) may also be mixed with the seed to help maintain consistency. Seeding will not be conducted during windy conditions. Seed will be raked into soil after application to help increase seed/soil contact.

5.7.2 Wetland Container Stock

In addition to seed, native container stock will be planted in the wetland creation area (Table 4). The container stock will be sourced from as close to the site as possible and includes plant species traditionally used by Native American tribes. If container stock is unavailable from the project vicinity, the restoration specialist may substitute species as necessary. The source and proof for all plant material will be provided. All container stock will be inspected and approved by the restoration specialist prior to being installed. Specifically, the restoration specialist will ensure that:

- The correct number, size, and species ordered are delivered;
- Plants are healthy and showing no sign of disease;
- Roots fill the containers, but are not root bound;
- There is no breakage of plants;
- Plants show no evidence of pests;
- Plants are in a state suitable for out-planting.

The restoration specialist will reject any plants not meeting these requirements.

Table 4	
WETLAND CONTAINER STOCK¹	
SPECIES	NUMBER PER ACRE²
Yerba mansa (<i>Anemopsis californica</i>)	200
Spiny rush (<i>Juncus acutus</i>)	200
Mexican rush (<i>Juncus mexicanus</i>)	200
San Diego marsh elder (<i>Iva hayesiana</i>)	200
Freemont’s cottonwood (<i>Populus fremontii</i>) ³	100
Creeping wild rye (<i>Leymus triticoides</i>)	50
Fuchsia-flowered gooseberry (<i>Ribes speciosum</i>)	100
Mulefat (<i>Baccharis salicifolia</i>) ³	200
California deergrass (<i>Muhlenbergia rigens</i>) ³	50
Black willow (<i>Salix exigua</i>) ³	100
Arroyo willow (<i>Salix lasiolepis</i>) ³	100
Elderberry (<i>Sambucus nigra</i>) ³	100
TOTAL	1,600

¹Applied within wetland creation area

²All container stock is 1 gallon in size

³Plant species traditionally used by Native American tribes

The installation contractor will be responsible for planting all container stock within 4 days following delivery. Container stock staged on site will be placed in a protected area and watered regularly prior to planting. Container stock will be planted in such a way as to mimic a natural species distribution. The restoration specialist will specify the locations for all planting. Plants will be placed in natural groupings with appropriate spacing for the given species/target habitat type. Holes for each plant will be dug twice as deep and twice as wide as the container size. The hole will then be refilled to the halfway point, slightly compacted, and filled with water. Once all the water has soaked into the soil, the container stock will be planted such that the container plant soil level is slightly above ground level. Loose soil will be used to fill in the areas around the root ball and help ensure that there are no air spaces. Remaining soil will be used to create a watering basin around the plant.

5.7.3 Material Salvage

The seed and container stock identified above is intended to be implemented without using any native plant/soil material salvaged from the adjacent development project. If salvaged upland soil/plant material is made available to the restoration effort during the installation phase it will be incorporated to the extent practicable.

5.8 IRRIGATION

A temporary, above ground irrigation system will be installed within the habitat creation area. The system will provide head-to-head coverage to ensure adequate irrigation of both the installed seed mix and container stock species. The system will include timers and ground moisture sensors to help prevent over watering. The timers will be set to emulate a normal rainfall year in the event that actual rainfall does not reach normal levels.

5.9 WILDLIFE HABITAT ENHANCEMENT

As an aid to wildlife establishment within the restoration area, shelter for small animal species will be created. The first type of shelter involves placement of 20 half-inch thick plywood boards, measuring 2 x 4 feet. These boards will provide shade, cover, and nesting locations for species including mice, lizards, snakes, and numerous invertebrate species (e.g., insects, spiders, etc.). The boards also provide an opportunity to monitor the wildlife usage of the site. During regularly scheduled monitoring visits, the restoration specialist will be able to lift each board and note the species present. There are no specific monitoring requirements or performance standards for the boards. The boards are intended to be left in place and allowed to break down naturally.

Additionally, shrub and brush material available on site will be collected by hand and stacked into low brush piles to provide additional cover for small animals. Each pile will be approximately 4 to 6 feet in diameter and 2 to 3 feet in height, provided sufficient material is available. This can be especially beneficial during the initial stages of the effort when there will be no cover available for small animals to utilize. The brush piles will be distributed throughout the restoration area. The final number and size of piles will depend upon the amount of material available on site. There are no specific monitoring requirements or performance standards for the brush piles.

5.10 AS-BUILT CONDITIONS

The revegetation specialist shall prepare and submit a map using showing the as-built conditions of the restoration area within 6 weeks of completion of site preparation and planting. Areas of grading, seeding, and planting shall be shown on the map.

6.0 MAINTENANCE PLAN

6.1 HABITAT MAINTENANCE ACTIVITIES

A 5-year maintenance program is proposed to help ensure the successful establishment and persistence of the enhanced and created habitat. The length of the maintenance program may be shortened if the mitigation program is deemed successful before 5 years have elapsed. The maintenance program will involve removal of trash, weed control, fence and signage repair/replacement, and any remedial measures deemed necessary for restoration program success (e.g., re-seeding and recontouring).

Maintenance activities would avoid the nesting seasons of the least Bell's vireo and light-footed Ridgway's rail (March 15 through September 15) and southwestern willow flycatcher (May 1 through September 1) should any of those species be present, and potentially affected, as determined during a protocol, pre-activity survey.

6.1.1 Trash Removal

The maintenance contractor will remove any trash encountered within the restoration area during every maintenance event and dispose of it in a legally acceptable fashion.

6.1.2 Weed Control

Particular maintenance emphasis will be placed on pro-active weed control within the restoration area. All weed species observed during restoration activities will be considered invasive and targeted for removal. All workers conducting weed removal activities will be educated to distinguish between native and non-native species, with special attention paid to rare and endangered plant species.

Weeds will be removed by hand or with small machinery (e.g., line trimmers) whenever possible, but focused herbicide application may be used if needed and requested by the restoration specialist. Herbicides will only be applied by workers licensed to use those chemicals. Additionally, herbicide will not be used during wet or windy conditions.

Weeds will be removed from the restoration area and disposed of in a legal manner. All weeds will be removed prior to reaching 12 inches in height or before developing seed. Leaf and branch drop of native species should be left in place and not removed from the site.

6.2 HABITAT MAINTENANCE SCHEDULE

Regular maintenance, trash removal, and weed control of the restoration area will be conducted during the first 5 years following implementation of the mitigation program or until the restoration program is deemed successful. Maintenance personnel will visit the site at least monthly for the 5-year maintenance and monitoring period. Additional visits will be conducted as directed by the restoration specialist during the rainy season (generally December through May) each year to keep weeds under control.

7.0 PERFORMANCE STANDARDS

The following sections provide performance standards to determine the successful completion of the 5-year maintenance and monitoring program, which could be less than 5 years in length if success criteria are met before 5 years have elapsed. Attainment of these standards indicates the restoration area is progressing toward the habitat functions and services specified for this Plan. Methods used to measure these performance standards are described in the following text. If the restored areas fail to meet the Year 5 standards after the full monitoring term, a specific set of remedial measures will be developed, implemented, and the monitoring and maintenance period would be extended until all Year 5 standards are met or as otherwise provided in this Plan. If the site does not meet Year 5 standards, the monitoring and maintenance period would be extended a full year until all are met. Only when the entire restoration site has attained the Year 5 standards will the entire site be signed off.

7.1 SPECIES SURVIVORSHIP/CONTAINER STOCK

During each annual monitoring event, survivorship of the container stock will be measured, and there will be no less than 80 percent survival of the initial container plants installed for each monitoring and maintenance year unless their function has been replaced by natural recruitment.

7.2 NATIVE SPECIES RICHNESS

Species richness (i.e., the number of species in the area assessed) success criteria have been established to determine the success of the restoration effort. Species richness will be measured by visual assessment in Years 1 and 2, and by quantitative transect data in Years 3, 4, and 5. No specific richness criteria are established for Years 1 or 2, but annual success criteria for species richness in Years 3, 4, and 5 are provided in Table 5. Corrective measures will be implemented in areas not meeting the species richness goals in any given year.

Year 3	Year 4	Year 5
10	12	12

¹Richness is the number of species in an area assessed. These are pre-determined, non-relative values.

7.3 NATIVE SPECIES COVER

Native species percent cover success criteria have also been established to determine success of the restoration effort. Species cover will be measured by visual assessment in Years 1 and 2, and by quantitative transect data in Years 3, 4, and 5. No specific cover criteria are established for Years 1 or 2, but annual success criteria for species richness in Years 3, 4, and 5 are provided in Table 6. Corrective measures will be implemented in areas not meeting the species richness goals in any given year.

Table 6		
NATIVE SPECIES COVER SUCCESS CRITERIA¹		
Year 3	Year 4	Year 5
40	60	70

¹Pre-determined, non-relative values

7.4 WEED COVER

General and target weed cover success criteria have been established for the restoration effort. Given the size of the area and the extent of the weed seed bank, 100 percent weed eradication for all weed species is not a realistic goal (some species are highly invasive, and others are easier to eradicate). Therefore, species in Table 7 are zero tolerance species and will be controlled at 100 percent on a yearly basis. Other non-native species are more ubiquitous and can never be completely eliminated and will, therefore, be managed to a level of 10 percent or less. If the weed cover success criteria are not met in any given year, then remedial measures will be conducted.

Table 7		
ZERO TOLERANCE WEED SPECIES		
Latin name	Common name	Cal-IPC Rating¹
<i>Atriplex semibaccata</i>	Australian saltbush	M
<i>Carpobrotus</i> spp.	ice plant, hottentot fig	H/M
<i>Cynodon dactylon</i>	Bermuda grass	M
<i>Euphorbia lathyris</i>	gopher plant	N/A
<i>Foeniculum vulgare</i>	fennel	H
<i>Hordeum</i> spp.	barley	M
<i>Nicotiana glauca</i>	tree tobacco	M
<i>Ricinus communis</i>	castor bean	L
<i>Salsola tragus</i>	Russian thistle	L
<i>Silybum marianum</i>	milk thistle	L
<i>Sorghum halepense</i>	Johnson grass	N/A
<i>Xanthium strumarium</i>	cocklebur	N/A

¹H= High invasiveness, M= Moderate invasiveness, L= Low invasiveness N/A= Not listed.

8.0 MONITORING PLAN

8.1 INSTALLATION MONITORING

The restoration specialist will be on site daily during the 120-day plant establishment period to direct all habitat restoration activities including site preparation, weed control, seeding, planting, and watering. Upon completion, the restoration specialist will prepare an as-built map and letter to confirm that the 5-year maintenance and monitoring period may begin.

8.2 MAINTENANCE MONITORING

The restoration specialist will conduct regular maintenance monitoring visits during the 5-year maintenance period. Visits will be conducted monthly in Year 1, every other month in Years 2 to 3, and quarterly in Years 4 to 5. Additional visits may be required as conditions warrant. During each visit, the restoration specialist will assess the condition of the site and identify remedial measures as necessary. A brief monitoring memo will be prepared and submitted to the City's Monitoring and Coordination (MMC) Section and Maintenance Contractor following each maintenance monitoring visit.

8.3 ANNUAL MONITORING

Annual monitoring visits will be conducted by the restoration specialist in the fall during the 5-year maintenance period. During each annual monitoring, the success of the restoration effort will be evaluated, and species richness and cover data will be collected. In Years 1 and 2, species richness and cover will be determined by visual assessment. In Years 3 through 5, quantitative transect data will be collected within the restoration area.

Quantitative transect data will be collected using the point intercept line transect sampling methods described in the California Native Plant Society's Field Sampling Protocol (Sawyer and Keeler-Wolf 1995). Four 50-meter (m) long sampling transects will be established in Year 3 within the creation area. The ends of each transect will be marked with a re-bar stake and recorded with a Global Positioning System (GPS) unit.

Species cover will be determined by dividing each transect into 50 half-meter intervals. A point will be projected into the vegetation at each interval, and any species intercepted by the point will be recorded. Species also will be divided into herb (0 to 60 centimeters [cm]), shrub (60 cm to 3 m), and tree (greater than 3 m) layers. Percent cover will be measured by dividing the number of hits by the number of possible hits. Total native and non-native cover values will be determined separately.

Native species richness (the number of species) will be calculated by counting all of the species encountered within a 5-m wide belt transect along each transect (2.5 m on each side). All plants observed will be categorized by origin (native/non-native) and height layer.

Photographs will be taken each year from the same photograph points used prior to initiation of site preparation. The photographs will help track project progress over time and will be included in the annual report each year.

8.4 ANNUAL REPORTS

As part of the monitoring program, annual reports will be prepared and submitted to the City's MMC Section and Wildlife Agencies (as applicable per resource agency permitting) by the restoration specialist that evaluate the success of the restoration effort to date, along with any recommendations for future work that may be deemed necessary. Each annual monitoring report will include data collected throughout the year in addition to the annual monitoring visit. To detect the overall trend of the restoration, the annual monitoring report will contain comparisons of the monitoring data for all of the years that data were collected.

8.5 REMEDIAL MEASURES/ADAPTIVE MANAGEMENT

If the restoration is not progressing as desired, corrective measures may be implemented. Corrective measures may include, but are not limited to, additional planting or seeding, altered maintenance effort, and increased watering regime.

8.6 MONITORING SCHEDULE

As described above, monthly inspections of the restoration and maintenance effort would be performed during Year 1, every other month during Years 2 and 3, and quarterly for the remainder of the 5-year maintenance and monitoring period. The first annual botanical monitoring event will occur in the first winter following installation. Reports will be prepared and submitted to the City's MMC Section and Wildlife Agencies within 3 months of each annual monitoring visit.

9.0 COMPLETION OF PROGRAM

9.1 NOTIFICATION OF COMPLETION

The permittee shall notify the City and Wildlife Agencies upon the restoration achieving the Year 5 performance standards through the submittal of the final monitoring report.

9.2 CITY CONFIRMATION

After receipt of the final monitoring report, the City and Wildlife Agencies may inspect the restoration to determine if the enhancement and creation have been conducted in accordance with this Plan.

10.0 CONTINGENCY MEASURES

10.1 INITIATING PROCEDURES

An integral part of a successful mitigation program is the ability to detect problems with it early in the process, determine the cause of the problem, and attempt to modify the program to accommodate emerging issues or situations. Minor problems, such as trash, vandalism, isolated instances of plant mortality, or small-scale weed or pest infestations will be rectified as they are discovered during routine site monitoring and would not warrant the implementation of contingency measures.

If a performance standard is not met for all or any portion of the mitigation in any given year, or if the final performance standards are not met, the restoration specialist will prepare an analysis of the cause(s) of failure, and if determined necessary by the participating agencies, propose remedial measures for approval. These measures may include supplemental site grading, manipulation, planting, changes to the plant palettes, adjustment of the management of the site or a re-evaluation of species composition or other design changes. Additionally, the mitigation site is located within a dynamic riverine system that is subject to seasonal changes based on rainfall patterns and flood conditions. Assessments of target habitats will take into consideration riverine functionality in addition to specific success criteria and adaptive measures implemented to help ensure a functioning riverine system.

Should the mitigation fail as a result of a natural disaster such as an earthquake or flood, the project proponent will still be held responsible for any measures that are required to re-establish the mitigation. The project proponent is responsible to have the site meet performance standards in order to receive sign-off, regardless of the problems encountered.

The project proponent shall be responsible for all costs associated with any remedial measures.

10.2 RESPONSIBLE PARTIES

The project proponent shall be the responsible party required to implement remedial measures.

11.0 REFERENCES

- Chang Consultants. 2019. Preliminary Drainage Report for Riverwalk-Vesting Tentative Map No. 2046680. July 16.
- Lawlor, S.M. 2004. Determination of Channel-Morphology Characteristics, Bank-full Discharge, and Various Design-Peak Discharges in Western Montana. Scientific Investigations Report 2004-5263. U.S. Department of the Interior. U.S. Geological Survey in cooperation with the Montana Department of Transportation and the U.S. Department of Agriculture-Forest Service. Reston, Virginia.
- U.S. Army Corps of Engineers. 2011. Ordinary High Flows and the Stage-Discharge Relationship in the Arid West Region. Curtis, K. E., Lichvar, R.W., & Dixon, L.E. Washington, DC: U.S. Army Engineer Research and Development Center.