# MITIGATION PLAN
# FOR
# IMPACTS ASSOCIATED
# WITH THE
# DEL MAR SEGMENT
# OF THE COAST TO CREST TRAIL

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April 13, 2007
(Revised-April 2011)

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## 1.0 INTRODUCTION

This report addresses mitigation requirements for impacts associated with the construction and operation of the Del Mar Segment of the Coast to Crest Trail. This plan addresses in detail the impacts of trail construction and the areas proposed to mitigate for those impacts. Wetland habitats impacted have been previously addressed in the Wetland Delineation for the Proposed San Dieguito River Park Coast to Crest Trail, San Diego, California prepared by Tierra Environmental Services (Tierra) and revised July 14, 2005. Upland habitats impacted by the project were previously addressed in a letter dated September 26, 2005 from Tierra to the California Coastal Commission.

There are two main areas of impact that are closely related. These are the trail proper and a series of treatment ponds proposed to treat run-off at an area designated as TP41 at the terminus of San Andres Drive. These are described in detail below.

### 1.1 Del Mar Segment of the Coast to Crest Trail

The San Dieguito River Park Joint Powers Authority (JPA) is proposing to construct a multiple-use trail system extending eastward from near the mouth of the San Dieguito River in the City of Del Mar to Volcan Mountain. The westernmost phase of this Coast to Crest Trail will extend to the east from the San Diego County Fairgrounds to El Camino Real (Figures 1 and 2). For much of this segment, the trail follows historic wetlands associated with the San Dieguito River and San Dieguito Lagoon (Figure 3). The trail segment begins at an unpaved parking lot adjacent to Jimmy Durante Boulevard used by the San Diego County Fairgrounds, parallels the San Dieguito River up to the Interstate 5 (I-5) bridge, crosses under the I-5 bridge, proceeds north and east to San Andres Drive (Figure 3), then continues east to El Camino Real.

Associated with the trail is a proposed complex of water treatment wetlands located at the end of San Andres Drive. Formerly, wastewater from surface run-off was discharged via a storm drain to an area of disturbed seasonal wetlands. Mitigation involves the conversion of this area into treatment wetlands. The treatment wetlands capture run-off and filter it through a system of created wetlands planted and maintained with native wetland plant species.

## 2.0 PROJECT IMPACTS

For the purposes of this plan, the proposed trail has been divided into segments to facilitate presentation of project impacts. These arbitrary divisions include: 1) Jimmy Durante Boulevard to the I-5 bridge; 2) the undercrossing of the I-5 bridge; 3) I-5 undercrossing to proposed treatment wetlands; 4) the treatment wetlands, and 5) from the treatment wetlands to the end of the segment.

Impacts are identified throughout this document as either temporary or permanent. Temporary impacts are defined as areas that are modified during construction but subsequently restored. For this project, permanent impacts are defined as areas converted from native vegetation communities to trail. The project impacts and proposed mitigation measures presented in the

following discussion are illustrated in several figures and summarized in a number of tables. Figure 3, sheet 1 through 6, illustrates the proposed trail alignment relative to the surrounding vegetation types and presents the temporary and permanent wetland impacts of the project features. Figure 4, sheet 1 through 6, illustrates detailed project impacts and includes acreages of proposed impacts and associated mitigation. A summary of proposed permanent and temporary wetland impacts is presented on each sheet. Figures 3 and 4 are referenced throughout the discussion of the project and in Table 1.

Jimmy Durante Boulevard to the I-5 Bridge. This segment of the trail is illustrated in Figures 3 and 4, sheets 1 through 3. No wetland habitat impacts as defined by the California Coastal Commission (CCC) will result from construction of this segment of the trail (Figure 4, sheets 1 through 3). Although the CCC considers the southern overflow parking lot used by the Fairgrounds to be unvegetated wetlands, impacts have been avoided by constructing the trail on a wooden boardwalk and an existing berm (Figures 3 and 4, sheet 1). The boardwalk terminates at a viewing platform. At that point, the trail will be cut into an existing berm in order to form a visual separation of trail users and adjacent wildlife. Thus, no wetland impacts are associated with the trail until it reaches the I-5 bridge. However, approximately 0.19 acre of permanent impact and 0.017 acre of temporary impact to disturbed coastal sage scrub habitat will result from the construction of this segment of the trail (Figure 4, sheet 2).

I-5 Bridge. The proposed undercrossing of I-5 requires bridging two small drainage channels, one on either side of the freeway (Figures 3 and 4, sheet 3). The western drainage is armored with rip-rap on both sides and the bottom. Thus, the western crossing does not impact wetlands as defined by the CCC. Although no wetland plants are associated with the rip-rap on the western side of the bridge, the portion of the channel that occurs within the Ordinary High Water (OHW) mark is considered jurisdictional wetlands by the CCC. However, this channel was previously armored for another project (i.e., protection for the I-5 bridge), therefore no impacts to wetlands are associated with the current project.

The eastern drainage is armored with rip-rap on its western bank (associated with I-5) while the eastern bank of the channel is earthen. Two small areas of salt marsh vegetation occur on both sides of the channel, growing among the rip-rap on the west side and on the earthen bank on the east (Figures 3 and 4, sheet 3). The proposed crossing of the eastern drainage channel will result in 0.008 acre of permanent impacts to CCC-defined wetland (low and high salt marsh) habitat (Figures 3 and 4, sheet 3 and Table 1).

Upland impacts associated with this portion of the trail include 0.001 acre of impact to disturbed coastal sage scrub habitat (Figure 4, sheet 3).

**Table 1. PROJECT IMPACTS AND PROPOSED MITIGATION**

| Proposed Mitigation for Trail and Trail Berms | Acres Impacted | Mitigation Acreage Required | Create High Marsh Along I-5 | Treatment Ponds Ponds | | Boudreau |
|---|---|---|---|---|---|---|
| **Permanent** | | | | | | |
| Low Marsh 4 to 1 | 0.002 | 0.008 | 0.008 | | | |
| High Marsh 4 to 1 | 0.006 | 0.024 | 0.024 | | | |
| Seasonal Salt Marsh (Not Roadbed) 4 to 1 | 0.08 | 0.32 | 0.1395 | | | 0.1805 |
| Seasonal Salt Marsh (Roadbed) 1 to 1 | 0.051 | 0.051 | 0.051 | | | |
| Disturbed FW/Brackish (Not Roadbed) 4 to 1 | 0.36 | 1.44 | 0.3515 | 0.698 | | 0.3905 |
| Disturbed FW/Brackish (Roadbed) 1 to 1 | 0.052 | 0.052 | 0.052 | | | |
| **Temporary** | | | | | | |
| Seasonal Salt Marsh 1 to 1 | 0.183 | 0.183 | 0.183 | | | |
| Disturbed Freshwater/Brackish 1 to 1 | 0.014 | 0.014 | | | | 0.0140 |
| **Proposed Mitigation for Treatment Ponds and Pond Berms** | | | | | | |
| **Ponds 1 & 2** | | | | | | |
| **Permanent** | | | | | | |
| Disturbed Freshwater/Brackish (Pond Berms) 1 to 1 | 0.019 | 0.019 | | | | 0.0190 |
| **Temporary** | | | | | | |
| Seasonal Salt Marsh 1.5 to 1 (Pond 2) | 1.071 | 1.6065 | | 0.143 | | 1.4635 |
| Disturbed Freshwater/Brackish 1.5 to 1 (Pond 1) | 0.178 | 0.267 | | 0.267 | | |
| Disturbed Freshwater/Brackish 1.5 to 1 (Pond 2) | 0.557 | 0.8355 | | 0.557 | | 0.2785 |
| **Ponds 3 & 4** | | | | | | |
| **Permanent** | | | | | | |
| Seasonal salt Marsh (Not in Roadbed) (Pond Berms) 1 to 1 | 0.107 | 0.107 | 0.107 | | | |
| Disturbed FW/Brackish (Not in Roadbed) (Pond Berms) 1 to 1 | 0.39 | 0.39 | | | | 0.3900 |
| **Temporary** | | | | | | |
| Seasonal Salt Marsh 1 to 1 | 0.024 | 0.024 | 0.024 | | | |
| Disturbed Freshwater/Brackish 1 to 1 | 2.049 | 2.049 | | 2.049 | | |
| **TOTAL** | 5.143 | 7.39 | 0.94 | 3.714 | 0 | 2.7360 |

**Proposed Mitigation Locations**

Treatment Ponds: 3.714 acres Freshwater Marsh
Mitigation Along I-5: 0.940 acre High Salt Marsh
Boudreau Restoration: 2.736 acres Tidally-influenced Salt Marsh or Seasonal High Salt Marsh

I-5 to Treatment Wetlands. This segment of the trail is illustrated in Figures 3 and 4, sheets 4 and 5. In this area, the trail follows an existing utilities access road that has been paved with gravel. The roadway is elevated above the level of the surrounding areas for much of its length and does not support hydrophytic vegetation. Some depressions in the road impound water during very wet periods. These depressions have subsequently facilitated the establishment of hydrophytic vegetation and are, thus, considered wetlands by the CCC. These small areas have been included in the impacts presented in Table 1 and are illustrated in Figure 4, sheets 4 and 5.

Impacts for this portion of the trail are presented in tabular form in Figure 4, sheet 4. Construction of the trail will result in temporary impacts to 0.017 acre of CCC-defined wetlands and permanent impacts to 0.043 acre. Upland impacts associated with this portion of the trail include 0.205 acre of permanent impact and 0.023 acre of temporary impact to disturbed coastal sage scrub habitat (Figure 4, sheet 4).

Treatment Wetlands. The treatment wetlands are illustrated in Figures 3 and 4, sheet 5. The primary objective of the treatment wetlands is filtration of sediment, nutrients, heavy metals, oily substances, and invasive plant species collected from the watershed during low hydrologic flows. The secondary objective is to reduce the flow of freshwater into the tidal salt marsh system. The retention capacity, retention time, and habitat diversity have been balanced to provide a treatment wetland that also offers diversity in habitat and points of interest for trail users. The site of the treatment wetlands is comprised of disturbed seasonal wetlands composed of freshwater, brackish and salt marsh species, several of which are non-native (Figures 3 and 4, sheet 5).

The treatment wetlands are designed to handle all non-storm events of urban runoff as well as the 85$^{th}$ percentile storm event as defined by the County of San Diego's Standard Urban Stormwater Mitigation Plan which equates to approximately 0.6 inches of rainfall in a 24-hour period. Larger and more intense storm events would flow over the spillway and rip-rap armored slope (or through a weir and discharge culvert) into an open channel leading towards the San Dieguito Lagoon and River. Even with the treatment wetlands designed to only handle the 85$^{th}$ percentile storm event, 100% of the dry-weather runoff will flow through the treatment wetlands, thus preventing a potentially major source of contaminants and freshwater to the Lagoon.

The treatment wetlands consist of four ponds (Figures 3 and 4, sheet 5 and Figure 5). Their functions are presented below, beginning with pond 1 at the storm drain discharge and proceeding counter-clockwise.

1. Pond 1, located at the storm drain discharge, is the smallest. It has an entry elevation of 10.0' MSL and an exit elevation of 9.5' MSL. The intended function of this pond is to capture propagules of invasive plant species, heavy metals, and sediments as they enter the system. Trash will be removed from this pond on at least an annual basis, with post storm visual assessments being made quarterly by River Park rangers to determine if supplemental removal efforts are warranted. The vegetation in this pond will be managed on an annual basis to ensure proper hydraulic connectivity between ponds 1 and 2. Additionally, this pond will be dredged periodically to remove sediment transported through the watershed before it is transported to the lagoon during large storm events. The frequency of dredging will be contingent upon the

conditions of the pond, including the degree of accumulation of weeds and trash, and the occurrence of unusual storm events. Sediment deposition in Pond 1 will be monitored quarterly in conjunction with monitoring of invasive plant species and trash. Initial dredging frequency is expected to be higher than the long-term frequency due to existing sediment that built up in the lowered reach of the storm drain system caused by the formation of a sill at the outfall prior to the construction of the treatment ponds being transported by storm events into Pond 1. The condition of the pond will be examined by River Park rangers on a quarterly basis and after unusual storm events to ensure proper function.

The system floodwater bypass is located adjacent to this pond and will flow over a weir structure and under the trail bridge through culverts to the southeast to the lagoon. The weir and outfall channel are armored with concrete and rip-rap side-slopes to maintain its form during more intensive storm events.

2. Dry weather flow, smaller than 85$^{th}$ percentile storms, and portions of larger storm events will continue through the system entering the second pond directly to the west at 9.0' MSL. To promote positive flow through the system, the base contour was set at the exit elevation of 8.5 MSL. The design of the low flow channel in this pond is sinuous to maximize bio-filtration during base flow and becomes gradually more direct from entry culvert to exit culvert as flows increase. This pond will remove primarily oils and nutrient loads but will also function as a backup for finer sediments and invasive species. This pond will be managed periodically to remove invasive species as they grow and remove the minimal sediment transported through the watershed. The frequency of management will be contingent upon the conditions of the pond, including the degree of accumulation of weeds and trash, and the occurrence of unusual storm events. The condition of the pond will be examined by River Park rangers on an annual basis and after unusual storm events to ensure proper function. Management of the east and west portions of the pond will be conducted in alternate years to minimize habitat disturbance. If possible, any sediment dredging required will not be conducted in conjunction with the first pond to ensure that only one of these areas is impacted per year. The design also supports habitat refuge during moderate flows by creating small islands.

3. The third pond directly to the south of the second receives flows at an elevation of 8.3 MSL. It has an exit culvert elevation of 8.0 MSL. The design and intent of this pond is to provide for the natural use of these excess waters, prior to them reaching the high salt marsh of the lagoon restoration project. This urban water, regardless of the water quality at the discharge point, will have a negative effect on the salt marsh proposed next to the site. The area will likely convert to a brackish marsh if too much urban runoff accumulates in the newly dredged marsh. The quantity of water reaching the marsh will be diminished by the temporary holding of the water in these ponds. A certain volume will be taken up by the proposed riparian trees and freshwater marsh species. Some of the ponded water will be lost through evaporation and transpiration. Furthermore, because the bottom of the pond is not sealed, a certain amount of water will percolate.

Pond 3 will not be dredged or cleared of vegetation, as greater biomass will result in a greater rate of evapotranspiration. Invasive species will be removed on an at least annual basis.

4. The fourth pond will have an entry elevation of 7.8 MSL and an exit elevation of 7.5 MSL. This pond functions in the same manner as the third pond. This final pond in the system will empty via a culvert to the salt marsh created by Southern California Edison at an elevation of 4.5 MSL. This pond will not require dredging nor will vegetation removal be required. Invasive species will be removed on an at least annual basis.

The ponds also function as the last line of defense in a containment scheme. If a major pollutant enters the pond system, it will be somewhat treated and contained within the four ponds, thus delaying its spread to the enhanced and constructed salt marsh wetlands to the south and east. When the pollutant reaches the open lagoon, its toxicity to the natural environment will be minimized and thus less damaging to the marsh than it would have been prior to the construction of the treatment ponds. To be considered successful, the volume of dry weather flow eventually released into the tidal wetlands will be reduced by approximately one-half what it would have been if the treatment ponds were not constructed as measured by the difference of flow entering Pond 1 and that exiting Pond 4. Two improvements have been made to Pond 1 to help improve the system's stormwater management capacity. First, a second culvert between ponds 1 and 2 has been added to increase the volume of storm water that can be conveyed into Pond 2 during larger storm events. Second, a vegetated low berm has been added to the eastern portion of Pond 1 to help deflect storm flows towards the two culverts to Pond 2 and away from the overflow weir to the lagoon. Additionally, a flashboard weir structure will be added to the outfalls of ponds 3 and 4 to provide additional water level management functionality within these ponds to ensure the development and sustainment of wetlands habitats and water quality treatment capacity.

Impacts associated with these ponds and the berms required to construct them total 4.395 acres, 3.879 of which are temporary and 0.516 of which are permanent (Table 1).

Treatment Ponds to End of Segment. From the treatment ponds, the trail continues north and then east to its terminus (Figures 3 and 4, sheet 6). The trail impacts a small area of seasonal wetland along this reach including 0.013 acre of temporary impacts and 0.046 acre of permanent impacts.

Summary of Impacts. Impacts from the Del Mar Segment of the Coast to Crest Trail are associated with construction of the trail (including the portion built on an existing berm), the berms surrounding the treatment ponds, and the treatment ponds. The trail, treatment ponds, and associated berms would result in temporary impacts to approximately 4.076 acres and permanent impacts to approximately 1.067 acres of CCC-defined jurisdictional wetland (Table 1). Proposed project components also would result in impacts to 0.86 acre of disturbed coastal sage scrub habitat**.**

## 3.0 MITIGATION

Proposed mitigation for both permanent and temporary wetland impacts is presented in Table 1. Mitigation for the majority of project wetland impacts is proposed at a 1:1 ratio.

Exceptions include:

- permanent impacts to salt marsh (4:1);
- permanent impacts to seasonal salt marsh and disturbed seasonal wetlands not currently located in the roadbed and associated with the trail and berms (4:1);
- temporary impacts to seasonal salt marsh and disturbed seasonal wetlands impacted by Pond 1 and Pond 2 that must be maintained on a regular basis (1.5:1).

Mitigation for upland impacts is proposed at ratio of 2:1. Proposed mitigation for all wetland impacts, including mitigation ratios and the locations of the proposed mitigation, is summarized in Table 1.

Total project wetland impacts equal 5.143 acres and require 7.39 acres of mitigation. Mitigation will be accomplished through the creation of similar habitat. Of the 7.49 acres needed for mitigation, 0.94 will be accomplished at the mitigation site parallel to I-5, 3.714 acres will be accomplished at the treatment ponds by converting disturbed wetlands into managed wetlands, and 2.736 acres will be accomplished at the Boudreau parcel, located north of El Camino Real adjacent to the San Dieguito River (Table 1).

As described previously, project impacts to upland habitat are comprised of 0.86 acre of disturbed coastal sage scrub (Figures 3 and 4). Coastal sage scrub is considered a Tier II Uncommon Upland Habitat by the City of San Diego (City of San Diego 2002). Thus, proposed project impacts to disturbed coastal sage scrub must be mitigated at appropriate ratios as determined by the guidelines established in the City's Biological Review References (City of San Diego 2002). Mitigation for project-related upland impacts includes revegetation of soils excavated for wetland creation by SCE and disposed of at Disposal Site (DS) 33. These plans are discussed further in Section 3.2.

### 3.1 Mitigation for Wetland Impacts

Mitigation for impacts to wetland habitats will be accomplished at three discrete sites. These include: 1) a narrow strip of ruderal habitat located adjacent to the trail alignment where it parallels I-5; 2) creation of wetland habitat at the treatment ponds; and 3) creation of tidal or seasonal wetlands on the former Boudreau parcel north of El Camino Real adjacent to the San Dieguito River. These sites are presented in greater detail below. The ruderal strip and treatment pond mitigation sites are shown in Figure 6. The location of the tidal marsh restoration on the former Boudreau property is not shown in Figure 6. This mitigation will be included in a larger restoration effort currently being developed by the San Diego Association of Governments (SANDAG). This larger restoration effort is currently in the conceptual stage and refined alternatives have not yet been developed. In the event that SANDAG restoration does not go forward, a back-up mitigation site on the Boudreau parcel will be implemented. At this back-up site, 2.736 acres of seasonal high salt marsh would be restored as mitigation for impacts to similar habitat.

### 3.1.1 Ruderal Habitat Parallel to I-5

As stated previously, approximately 0.94 acres of high/seasonal salt marsh will be created at the mitigation site parallel to I-5. The ruderal strip occurs immediately east of the existing gravel access road that parallels I-5. As described previously, a segment of the proposed trail occurs along this access road. The elevation of this proposed mitigation site is roughly 8-10 feet above NGVD. The site is non-tidal, but retains seasonal moisture from rainfall.

This mitigation site occurs in a portion of the San Dieguito River Valley that was apparently farmed, as the site is flat and supports a substantial area of non-native species that may have invaded once farming activities ceased. Vegetation of this strip is dominated by ripgut brome (*Bromus diandrus*), and shortpod mustard (*Hirschfeldia incana*), with horseweed (*Conyza canadensis*), sow thistle (*Sonchus asper*) and Indian sweet clover (*Melilotus indicus*) subdominants. This vegetation community extends well east of the strip that is proposed for mitigation. However, all vegetation east of this ruderal strip is included in the San Dieguito Lagoon Restoration project that abuts this site**.** As part of that project, the area east of the proposed mitigation site will be converted to tidal wetlands. Thus, conversion of ruderal habitat to high/seasonal marsh as mitigation for the Coast to Crest trail will be an extension of marsh habitat created for the San Dieguito Lagoon Restoration project. The proposed mitigation will consist of the removal of exotic plant species, grading to lower the elevation of the site to approximately + 7 feet NGVD, and planting of high/seasonal marsh plant species.

### 3.1.2 Former Boudreau Property

The primary option for mitigation at the former Boudreau site will include restoration of approximately 2.736 acres of tidally-influenced wetlands as part of an approximately 50-acre restoration currently being developed by SANDAG. As stated previously, this larger restoration effort is in the initial stages and a concept plan has not yet been developed; therefore, there is no graphic representation of this restoration available for this document. The SANDAG Restoration will be subject to review and approval of the California Coastal Commission and will require a Coastal Development Permit in addition to other local, state and federal permits. The current schedule for the SANDAG proposed project anticipates that the project will begin construction in 2014. A Deed Restriction will be placed over the entire SANDAG restoration site if required by the California Coastal Commission. In the event that the SANDAG restoration is withdrawn or terminated or not approved, the JPA will implement the back-up plan shown in Figure 11 and will record a Deed Restriction on the 2.736-acre site

The former Boudreau property referred to in this plan consists of approximately 75.4 acres of former agricultural land located in the San Dieguito River Valley. The parcel is located south of the San Dieguito River and west and north of El Camino Real (Figure 7). The property is essentially flat with some minor exceptions. The majority of the site ranges from 10 to 13 feet above sea level (MSL) and will be graded to approximately 9 feet above MSL if the back-up plan is implemented.

San Diego Gas and Electric (SDG&E) maintains an easement that serves as a transmission corridor across the Boudreau parcel (Figure 7). The exact width of the easement is not known. For the purposes of this plan, the easement is estimated to be approximately 125 feet wide. The easement is not a part of this mitigation plan but may be viewed as a constraint to some forms of restoration.

Soils on the site are reported to be Tujunga sand, a coarse-grained, well-drained soil type associated with alluvial fans and flood plains. However, years of tomato farming have altered the soils on-site. Today, those soils appear to be loams augmented with nitrogen fertilizer and, presumably, amendments to reduce soil salinity. In general, the soils of the San Dieguito River Valley are saline as evidenced by surface salt crust and halophytic vegetation that establishes in most areas that are not frequently disturbed. The Boudreau property was, in fact, dominated by pickleweed (*Salicornia virginica*) before being put into agricultural production. Knowledge of these former conditions strongly influenced the restoration plan presented here. Soils within the SDG&E easement were noticeably saline, with salt crust evident on the soil surface in many locations. Plant species typical of high salt marsh were abundant in areas. These included pickleweed, alkali weed (*Cressa truxilliensis*), alkali heath (*Frankenia salina*), and wooly sea blite (*Suaeda taxifolia*).

Several culverts and conduits convey run-off from higher elevations to the east end of the Boudreau property and, eventually, the San Dieguito River. Currently, two of these culverts exude an obvious hydrologic influence on the flat terrain of the site. One culvert that conveys run-off near the intersection of El Camino Real and San Dieguito Road has created a long, narrow wet area near the northwestern boundary of the parcel. The other, a large box culvert draining the Gonzalez Canyon area to the south, has created a similar wet depression near the southern boundary. This wet depressional area will be the approximate location of the back-up mitigation plan for the site.

### 3.1.3 Treatment Ponds

The treatment ponds will provide a wetland area of approximately 3.714 acres. Initially, the ponds were to be planted with freshwater marsh species and the inside of the berms were to be planted with willows, mule-fat (*Baccharis salicifolia*) and other riparian species. The outside of the berms were proposed to be planted with coastal sage scrub species. However, due to natural recruitment by native and non-native species within the ponds and on the berms, these plans were modified. The ponds and inner berms will be allowed to revegetate naturally and the outer berms will be seeded with native salt marsh species and planted with coastal sage scrub container stock. These modified plans are discussed in greater detail in Section 3.3.

The treatment wetlands are located at the end of San Andres Drive (Figures 3 and 4 sheet 5). Formerly, a storm drain terminated at the end of San Andres Drive and run-off from the sub watershed was directed to the area south and west of the outfall. This run-off created a system of disturbed freshwater/brackish marsh and seasonal wetlands. The disturbed freshwater/brackish marsh supported both native wetland species and high densities of invasive non-native plant species. Native species included arroyo willow (*Salix lasiolepis*), southern cattail (*Typha*

*domingensis*), California bulrush (*Scirpus californicus*), pickleweed and alkali heath. Non-natives included pampas grass (*Cortaderia selloana*), myoporum (*Myoporum laetum*), fennel (*Foeniculum vulgare*), and fan palm (*Washingtonia robusta*).

While storm drain discharge created and maintained the disturbed wetlands at this site, the treatment wetlands will result in a net benefit to the functions of the existing wetlands. However, ponds 1 and 2 will require periodic maintenance, therefore mitigation at a ratio higher than 1:1 is required for these temporary impacts to existing disturbed wetlands from the construction and operation of these ponds. Temporary impacts to disturbed freshwater/brackish marsh from construction and operation of ponds 1 and 2 will be mitigated at 1.5:1. Impacts are considered temporary because the resulting ponds will support a similar, yet undisturbed, habitat. Mitigation for temporary impacts to disturbed freshwater/brackish marsh from construction of ponds 3 and 4 will be provided at a 1:1 ratio.

The berms constructed to retain the water within the treatment wetlands are addressed separately in this mitigation plan. These impacts are considered permanent, as freshwater/brackish marsh is replaced by upland habitat. These berms are illustrated in Figure 5 and the impacts associated with their construction are summarized in Table 1. Mitigation for impacts is required at a 1:1 ratio.

The disturbed seasonal wetlands impacted by construction of ponds 3 and 4 is dominated by prickly ox-tongue (*Picris echiodes*), curly dock (*Rumex crispus*), willow weed (*Epilobium* sp.), western ragweed (*Ambrosia psilostachya*), with remnant salt marsh species including common pickleweed, saltgrass (*Distichlis spicata*) and alkali heath. During dry years, this area has no water and begins to succede to upland habitat. During wet years, such as 2005 when this area was surveyed for the project, shallow surface water supports more hydrophytic vegetation. Impacts to seasonal wetlands are summarized in Table 1. Mitigation for temporary impacts to this habitat from the construction of ponds 3 and 4 will be mitigated at a 1:1 ratio. Permanent impacts from construction of the berms also will be mitigated at a 1:1 ratio.

### 3.2 Mitigation for Upland Impacts

Impacts to Tier II Uncommon Upland habitats that occur within the City's Multi-Habitat Planning Area (MHPA) require mitigation at a 1:1 ratio if mitigation also occurs within the MHPA, or at a 2:1 ratio if mitigation occurs outside of the MHPA. Impacts associated with this segment of the trail occur within the MHPA. Mitigation is proposed both inside and outside of the MHPA. Thus, mitigation for impacts to 0.86 acres of disturbed coastal sage scrub will be accomplished at a 2:1 ratio with creation of 1.72 acres of the same habitat to satisfy the mitigation requirements of the City of San Diego. A summary of the impacts to coastal sage scrub habitat is presented in Table 2.

As presented previously, impacts to disturbed coastal sage scrub will be mitigated through revegetation of a 1.72-acre strip of land on DS33 located immediately west of El Camino Real (Figures 6 and 9). Originally, mitigation for impacts to coastal sage scrub was proposed at two locations: along the banks of the treatment ponds and at an upland disposal site used by SCE.

**Table 2. Impacts to Coastal Sage Scrub (by sheet per Figure 4)**

| Sheet | Impact ( Square ft.) |
|---|---|
| 4-1 | 1122 |
| 4-1 | 743 |
| 4-1 | 350 |
| 4-1 | 1143 |
| 4-2 | 723 |
| 4-2 | 2037 |
| 4-2 | 1172 |
| 4-2 | 3457 |
| 4-3 | 23 |
| 4-3 | 110 |
| 4-3 | 782 |
| 4-3 | 140 |
| 4-3 | 150 |
| 4-3 | 160 |
| 4-3 | 1067 |
| 4-3 | 421 |
| 4-4 | 6622 |
| 4-4 | 982 |
| 4-4 | 400 |
| 4-4 | 10244 |
| 4-4 | 2329 |
| 4-4 | 225 |
| 4-4 | 620 |
| 4-4 | 2,170 |
| 4-4 | 44 |
| 4-4 | 58 |
| 4-4 | 91 |
| **Total sq. ft.** | **37,385** |
| **acres** | **0.86** |

After discussions with CCC staff it was determined that the banks of the treatment ponds would be revegetated with high/seasonal salt marsh species and coastal sage scrub species but all coastal sage scrub mitigation would occur at the 1.72-acre area on DS33. The planting palette for this mitigation is presented in Figure 8.

## 3.3 Wetland Mitigation Plan

### 3.3.1 Ruderal Habitat Parallel to I-5

This area will be graded to create seasonal/high salt marsh habitat that will occur at a higher elevation than the upper tidal salt marsh of the San Dieguito Lagoon Restoration being constructed by Southern California Edison. That restoration plan depicts high salt marsh in this area at approximately 5 feet NGVD**.** Approximately 2-3 feet of overburden will be excavated and disposed of at one of the disposal sites identified in the San Dieguito Lagoon restoration plan. This will lower the site to approximately + 7 feet NGVD (Figure 10).

**Weed Eradication.** Weed eradication will be accomplished through an aggressive weed eradication program, termed "grow and kill", which is recommended at all restoration areas prior to planting. This type of program is conducted by clearing and removing existing vegetation from the site, installing the irrigation system (if any), fertilizing, and irrigating to promote weed growth. Irrigation, via water truck or irrigation system, is continued until the weed crop is 1" - 3" high. Irrigation is then discontinued and a broad spectrum, water-safe herbicide applied. This cycle will be repeated at least twice to germinate existing seed banks. Use of the grow and kill technique allows native species, especially those planted from seed, a competitive advantage with weed species, reduces maintenance costs, and increase chances for attainment of success criteria with no damage to the environment.

Short-lived, water-safe herbicides, such as Garland-4 and AquaMaster™, have been used in numerous, similar restoration projects. Garland 4 and AquaMaster are water-safe and are being proposed for a large-scale exotic control program currently being developed for the Tijuana River Valley (Tijuana River Valley Exotic Species Control Program, Southwest Wetlands Interpretive Association, Tierra Environmental Services, 2004). The herbicides proposed at the San Dieguito mitigation sites are the same as those proposed for the exotic species control plan at the Tijuana River Valley. These herbicides have been preliminarily approved by California State Parks, the County of San Diego, and the U.S. Fish and Wildlife Service for lands owned by these agencies within the Tijuana River Valley.

**Planting Plan**. High/seasonal salt marsh creation includes perennial herbaceous species established from container stock (Table 3) as proposed in the San Dieguito River Valley Regional Open Space Park Master Plan (Park Master Plan; 2000). The dominant species include alkali weed (*Cressa truxillensis*), glasswort (*Salicornia subterminalis*), pickleweed (*Salicornia virginica*), woolly sea blite (*Suaeda taxifolia*), alkali weed (*Cressa truxillensis*), alkali heath (*Frankenia salina*), saltgrass (*Distichlis spicata*) and southwestern spiny rush (*Juncus acutus* ssp. *leopoldii*). All species will be planted from container stock grown from seed or cuttings collected within the project site. Spacing and densities are presented in Table 3 and in Figure 9.

Seeds will be collected from donor plants located within the San Dieguito River Valley, where possible. Collection within the San Dieguito Lagoon may require a permit from CDFG.

**Table 3. High/Seasonal Salt Marsh Plant Palette**

| Scientific/Common Name | Size | % Cover | Spacing on Center |
|---|---|---|---|
| *Cressa truxillensis*/alkali weed | 6 "pot | 7.5% | 6 ft. |
| *Distichlis spicata*/salt grass | 6" pot | 7.5% | 2 ft. |
| *Frankenia salina*/lkali heath | 6" pot. | 7.5% | 4 ft. |
| *Juncu acutus ssp. leopoldii*/southwestern spiny rush | 6" pot | 7.5% | 10 ft. |
| *Limonium californicum*/sea lavender | 6" pot. | 7.5% | 4 ft. |
| *Monanthochloe littoralis*/shore grass | 6" pot | 7.5% | 2 ft. |
| *Salicornia virginica*/common pickleweed | 6" pot | 20% | 4 ft. |
| *Suaeda taxifolia* /woolly sea blite | 6" pot | 20% | 6 ft. |
| *Arthrocnemum subterminale* | 6" pot | 15% | 4 ft. |

**Irrigation**. Irrigation will be accomplished through use of a water truck. The water truck will access the mitigation site via the existing utility road or this portion of the trail. The water truck will be used to provide supplemental water to the restoration sites until plantings have become established. It is anticipated that irrigation will be required every two weeks during the plant establishment phase. The use of supplemental irrigation will be phased out gradually depending on the local weather conditions during the establishment period (e.g., after the first two growing seasons).

All plants and seed mixes will be irrigated immediately after planting. The amount of water and duration of irrigation will be determined by the revegetation contractor and approved by the Project Biologist. Each watering episode will allow for deep penetration of the water into the soil. Deep soaking of the soil will promote good root development and will enhance survivorship of seedlings and container stock.

### 3.3.2 Former Boudreau Property

Tidally-influenced salt marsh will be established on the former Boudreau site in conjunction with a larger restoration effort being conducted by SANDAG. Conceptual plans are being developed for that larger restoration project; however, tidally-influenced salt marsh will be established below + 4.5 NGVD. In the event that the SANDAG project does not go forward, a back-up plan is proposed. This back-up plan would establish high/seasonal salt marsh on the former Boudreau site as mitigation for impacts to seasonal wetlands at ponds 3 and 4 and the trail and berms (Table 1). A 2.736-acre parcel located adjacent to El Camino Real within former agricultural lands would be graded and revegetated with high/seasonal salt marsh species (See Figure 11).

Under the back-up plan, high/seasonal salt marsh will be graded to match the elevations of the high/seasonal salt marsh that was disturbed by the ponds, trail and berms, approximately + 9 feet NGVD (Figure 11).

**Weed Eradication**. Because the area proposed for salt marsh restoration on the former Boudreau parcel has been disturbed by the construction of the SCE San Dieguito Lagoon Restoration Project, at least two cycles of grow and kill are recommended prior to planting. Irrigation will be accomplished via the irrigation system discussed below.

**Planting Plan**. The planting plan for the SANDAG restoration project is in the process of development; however, it is anticipated that the approximately 50-acre site will include subtidal, unvegetated intertidal, low salt marsh and mid-high salt marsh habitats with representative plant species for each habitat. In the event that the back-up site must be used, seasonal salt marsh habitat will be established that is comprised of the same species proposed for the mitigation area parallel to I-5 (Table 3 and Figure 8)**.** Once established, high/seasonal salt marsh species are expected to persist at the site regardless of local weather conditions.

**Irrigation**. Irrigation of the proposed mitigation site will not be necessary as tidal influence will provide diurnal inundation of the site. Irrigation of the back-up site will be accomplished through use of a water truck. The water truck will access the mitigation site via the existing utility road. The water truck will be used to provide supplemental water to the restoration site until plantings have become established. It is anticipated that irrigation will be required every two weeks during the plant establishment phase. The use of supplemental irrigation will be phased out gradually depending on the local weather conditions during the establishment period (e.g., after the first two growing seasons).

All plants and seed mixes will be irrigated immediately after planting. The amount of water and duration of irrigation will be determined by the revegetation contractor and approved by the Project Biologist. Each watering episode will allow for deep penetration of the water into the soil. Deep soaking of the soil will promote good root development and will enhance survivorship of seedlings and container stock.

### 3.3.3 Treatment Ponds

The treatment ponds were constructed in fall 2008 and are currently providing the intended water treatment functions. Natural colonization by both native and non-native exotics plant species has occurred, providing an opportunity to revise the planting plan prepared in November 2007. This modified planting plan is submitted for review and approval by the California Coastal Commission pursuant to Special Condition #8 of the San Dieguito Wetland Restoration Project Coastal Development Permit.

#### 3.3.3.1 Site Conditions.

A survey of the treatment ponds was conducted on November 20, 2008 by C. Nordby of Nordby Biological Consulting. Native and non-native exotic plant species were observed during the survey. In general, the bottom of each pond, where water actively flowed, had been colonized by a number of desirable native emergent taxa, including cattail (*Typha* sp.), California bulrush (*Scirpus californica = Schoenoplectus californicus*), prairie bulrush (*Scirpus robustus* =

*Bolboschoenus maritimas* ssp. *paludosus*), and spike sedge (*Eleocharis* sp.), as well as native plant species indicative of saline conditions. These included Pacific pickleweed (*Salicornia virginica = Sarcocornia pacifica*), saltgrass (*Distichlis spicata*), woolly sea blite (*Suaeda taxifolia*), alkali heath (*Frankenia salina*) and alkali weed (*Cressa truxillensis*). The higher areas of each pond were dominated by weedy, native and non-native species, including goldenbush (*Isocoma menziesii*) curly dock (*Rumex crispus*), Bermuda grass (*Cynodon dactylon*), cocklebur (*Xanthium strumarium*), and spearscale (*Atriplex* sp.). In addition, a few willows, including black willow (*Salix gooddingii*) and red willow (*Salix laevigata*) have invaded where the soils are appropriate. Further natural recruitment of willows is anticipated. Because of the relatively high percentage of native species occurring on-site, the revegetation plan, including weed eradication, was modified.

**Weed Eradication.** Previously, an aggressive pre-planting weed eradication program including two "grow-and-kill" cycles was recommended. Grow-and-kill cycles involve irrigating the newly constructed site to encourage germination and growth of weeds, then applying a water-safe herbicide to the cultivated weeds. Given the natural establishment by both natives and non-natives, this technique is not recommended. Rather, hand weeding of weed species is proposed in order to allow spread of existing native species. Hand weeding will be conducted prior to the planting proposed in this modified plan, and at regular intervals after planting has been implemented. Weed control following planting is discussed below.

**Planting Plan**. The previous planting plan called for establishment of coastal sage scrub species from rose pot container stock on the berms of the treatment ponds and establishment of fresh/brackish marsh and riparian species from container stock and seed in the bottoms of the treatment ponds. Given the natural establishment that has occurred, it is proposed that a combination of coastal sage scrub container stock and high/seasonal salt marsh species be established from seed on the higher areas of the ponds and the berms and riparian species, including willows, be allowed to recruit naturally. The species selected for high/seasonal salt marsh seed include those that have established naturally in the ponds; that exist in the preserved marsh habitat to the south and west of the ponds; and those expected to occur immediately south of ponds 3 and 4 following planting of the San Dieguito Lagoon Restoration by SCE. The proposed seed mix is presented below in Table 4. All seed will be collected from donor plants located within the San Dieguito River Valley, where possible.

**Irrigation**. It is not anticipated that either freshwater marsh or southern willow scrub will require extensive irrigation. However, revegetation of the berms will likely require supplemental irrigation. Supplemental irrigation will be supplied via water truck and pressurized hose. It is anticipated that irrigation will be required every two weeks during the plant establishment phase. The use of supplemental irrigation will be phased out gradually depending on the local weather conditions during the establishment period (e.g., after the first two growing seasons).

**Table 4. Proposed Seed Mix for High/Seasonal Salt Marsh Habitat on Berms and High Pond Areas**

| Scientific/Common Name | %Purity %Germ | Lbs/acre | Total lbs |
|---|---|---|---|
| *Cressa truxillensis*/alkali weed | 10/70 | 2 | 3.38 |
| *Distichlis spicata*/salt grass | 80/80 | 3 | 5.07 |
| *Frankenia salina*/lkali heath | 3/70 | 1.5 | 2.54 |
| *Juncu acutus ssp. leopoldii*/southwestern spiny rush | 90/80 | 2 | 3.38 |
| *Salicornia virginica*/common pickleweed | -/- | 0.5 | 0.85 |
| *Suaeda taxifolia* /wooly sea blite | -/- | 1 | 1.69 |
| *Iva hayesiana*/San Diego marsh elder | 30/50 | 3 | 5.07 |
| **Total lbs per acre** | | 13 lbs | |
| **Total acres-** | | 1.69 | |

## 3.4 Upland Mitigation Plan

### 3.4.1 Coastal Sage Scrub Established on Disposal Site 33 (1.72 Acre)

Soils of the 1.72-acre site on DS33 will be cleared of all weeds and subjected to at least 2 grow and kill cycles as stated above before planting with coastal sage scrub plant species. The 1.72-acre site will be planted with container stock and hydroseeded as presented in Figure 8.

**Planting Plan.** Coastal sage scrub will be created from planted rose pot container stock and hydroseed. Dominant container species include California sagebrush (*Artemisia californica*), coast golden bush (*Isocoma menziesii*) and bladderpod (*Isomeris arborea*). All species will be grown from seed collected within the project area. Spacing and densities are presented in Figure 8. Seeds will be collected from donor plants within the San Dieguito River Valley. Collection within San Dieguito Lagoon may require a permit from CDFG.

**Irrigation.** Irrigation will be accomplished through use of a water truck. The water truck will access the mitigation site via the newly constructed trail. The water truck will be used to provide supplemental water to the restoration site until plantings have become established. It is anticipated that irrigation will be required every two weeks during the plant establishment phase. The use of supplemental irrigation will be phased out gradually depending on the local weather conditions during the establishment period (e.g., after the first two growing seasons).

All container stock will be irrigated immediately after planting. The amount of water and duration of irrigation will be determined by the revegetation contractor and approved by the Project Biologist. Each watering episode will allow for deep penetration of the water into the soil. Deep soaking of the soil will promote good root development and will enhance survivorship of seedlings and container stock.

## 3.5 As-Built Conditions

Within 60 days of completion of site preparation and planting of each mitigation site, a report will be submitted describing the as-built status of the restoration project. The report will include

details on grading, plant installation, and erosion control measures. In addition, topographic maps showing as-built contours of the restoration site, as well as locations of plantings, will be provided. Changes from original plans will be indicated in indelible red ink. Significant changes from the original planting plan will be coordinated with and approved by the appropriate agencies prior to implementation.

### 3.6 Plant Establishment Period

A 90-day plant establishment period will commence immediately following plant installation. One hundred percent survival of planted stock must be demonstrated by the end of the 90-day period. Should any plants die during this period, they will be replaced with healthy plants of the same type. The Project Biologist will inspect the mitigation sites at the end of the plant establishment period to determine compliance. The acceptance of the plants by the Project Biologist signifies the beginning of the maintenance and monitoring period.

### 3.7 Maintenance and Monitoring Plan

To determine if the mitigation sites are functioning as expected, physical and biological monitoring will be conducted in the restored areas. Proposed monitoring tasks are presented below and summarized in Table 5. It should be noted that the maintenance and monitoring requirements presented below apply to all mitigation sites, including the back-up mitigation site on the former Boudreau site. The proposed restoration – the approximately 50-acre SANDAG restoration - will include a separate monitoring and maintenance plan as well as separate success criteria. The party(s) responsible for monitoring and maintenance will be identified as the plan is developed.

Biological monitoring surveys will concentrate initially on qualitative observations to identify potential problems and recommend remedial maintenance actions, where necessary. Remedial actions, described in greater detail below, may be necessary to address factors that could jeopardize attainment of the criteria for success. Ultimately, the biological success of the restoration plan will be evaluated by comparing the final year of monitoring data with project success criteria. Physical monitoring will initially concentrate on identifying sedimentation rate, retention time, and the pollutant removal capacity of the treatment ponds. Adaptive management actions as described below may be necessary to improve the functioning of the treatment ponds.

Biological monitoring is proposed for a five-year period. At that time, if established target values for plant coverage and for areal cover have been achieved, further biological monitoring of the site will not be necessary and the mitigation will be deemed a success.

Biological monitoring of all mitigation sites will be conducted monthly during the 90-day plant establishment period, quarterly for the remainder of Year 1 and all of Year 2, semi-annually for Years 3-4 and annually for Year 5. Early biological monitoring surveys will focus on qualitative observations. Once vegetation has become established and the canopy has developed (approximately 2 years), quantitative assessment of attainment of success criteria will commence (see 3.9 Monitoring Methods). Final monitoring for biological success shall take place after at

**Table 5. Summary of Monitoring and Maintenance of Treatment Wetlands Functions and Mitigation Areas**

| Task | Frequency | Trigger | Responsible Party | Action |
|---|---|---|---|---|
| Monitor Treatment Wetland Function and Water Quality | Oct, Nov, Feb, and Mar year 1; Qurterly years 2-; Semi-annually years 4-5. | Major rainfall events | JPA/consultant | Modify flows with flashboard weirs |
| Monitor Sedimentation Pond 1 | Quarterly | 75% capacity as measured at graduated stake | JPA | Removal |
| Monitor Sedimentation Pond 2 | Quarterly | Ability to maintain water flow | JPA | Removal |
| Monitor Trash All Ponds | Quarterly | Trash accumulation | JPA | Removal |
| Monitor Invasive Plant Species Ponds 1 and 2 | Quarterly | Ability to maintain flow | JPA | Removal |
| Monitor All Mitigation Sites (Ponds 3 and 4, CSS site; Boudreau, Ruderal strip) | Monthly for 90-days; quarterly rest of year 1; Semi-annually years 2-4, Annually year 5 | 10% total cover by invasive species | JPA/Consultant | Remedial actions first 90-days; Remove invasives monthly year 1; Remove invasives semi-annually years 2-4; Remove invasives annually year 5. |
| Maintain all Mitigation Sites (Ponds 3 and 4; CSS site; Boudreau; Ruderal strip). | Monthly year 1; quarterly years 2-3 Semi-annually years 4-5 or until succeess critera are met. | Success criteria | JPA/Contractor | Modify irrigation treatment; Replant/reseed as necessary. |

least 3 years with no remediation or maintenance activities other than weeding or after 5 years, whichever is longer. If the final report indicates that the restoration project has been biologically unsuccessful, in part or whole, based on the approved success criteria, then the JPA shall submit within 90 days a revised or supplemental restoration program to compensate for those portions of the restoration program that did not meet the approved success criteria. The revised restoration program shall be processed as an amendment to the coastal development permit unless the Executive Director of the Coastal Commission determines that no permit amendment is required.

Physical monitoring is also proposed for a five year period. The first year of monitoring will be coordinated with the monthly water quality monitoring being conducted under a separate grant agreement focusing on dry weather flow reductions and pollutant removal effectiveness of the treatment wetlands. Based on post construction field observations ponds 1 and 2 of the treatment wetlands appear to be adequate to absorb the dry weather flows produced by the watershed, thus eliminating the need for sampling the discharge from the treatment wetlands. Based on these observations, it is recommended that the monthly sampling be adjusted to use the October, November, February and March sampling to capture first flush storm events instead. Additionally, a dye test is recommended during sampling of one of the storm events as well to establish retention time within each of the four ponds.

During years 2 and 3 monitoring will be conducted on a quarterly basis with two additional samplings occurring during storm events. The first being an early season storm (Oct-Nov) preferably the first storm to cause sufficient runoff to completely fill the four ponds (>0.1" or larger) to assess the ongoing effectiveness of first flush pollutant and flow reductions and the second a late season storm (Feb-Mar) to determine the sustained pollutant and flow reduction capacity of the wetlands.

During years 4 and 5 monitoring will be conducted semi-annually with one event occurring prior to the first rain event in the late summer (Aug-Sep) and the other in the late spring (Apr-May). Additionally, the two storm sampling events from years 2 and 3 will be continued. Field observations from the late summer will identify any pre wet season maintenance activities and the late spring observations will identify any post wet season maintenance activities.

### 3.8 Maintenance During Monitoring Period

Maintenance activities are proposed for a period of five years. The maintenance contractor will be responsible for maintaining the plants and planting sites in good condition and maintaining the irrigation system. Maintenance inspections will be conducted concurrently with biological monitoring of the site. Thus, maintenance inspections will be conducted monthly for the first three months after planting, and quarterly for the remainder of Year 1 and all of Year 2. Subsequent inspections will be conducted on a semi-annual basis.

Specific maintenance activities will be determined by observations made during the scheduled site visits described above. Plant replacement, replanting (hydroseeding), repairs to the irrigation system, erosion control and other remedial actions to correct problems or damage resulting from

natural causes, vandalism or other factors that may jeopardize the successful completion of the project will be performed promptly, generally within two weeks of identification of the problem.

**Replacement Planting**. Planted material that fails to become established during the maintenance period as a result of disease, vandalism, or other natural causes, will be replaced with similar plant species. Should the hydroseeded areas of the treatment wetlands fail to germinate or persist, the planting plan will be reevaluated in terms of species composition and site conditions. Using this adaptive management approach, the species composition of the hydroseed mix may be changed according to further natural establishment by native species. For example, should the high/seasonal salt marsh species fail to germinate and establish, but natural recruitment of coastal sage scrub species is documented, replanting with a hydroseed mix that contains coastal sage scrub species will be implemented. However, this is not anticipated. Should hydroseeded species fail to become established from lack of viable seed, the site will be reseeded with a similar plant palette containing new seed and supplemented with 1-gallon container stock. Supplemental planting will occur as required, based on the results of site monitoring. Replacement vegetation will be installed between October 1 and March 31.

**Weed Abatement**. Observations made during maintenance and monitoring visits will identify any need for non-native plant control. Measures to control weedy species will be implemented promptly. Some exotic species may invade the restoration site and become a problem before the native species can become established. Species that cause problems in southern California riparian systems include salt cedar (*Tamarix* sp.), pampas grass (*Cortaderia selloana*), giant reed (*Arundo donax*), castor bean (*Ricinus communis*), tree tobacco (*Nicotiana glauca*), and bristly ox tongue (*Picris echioides*). All weedy species will be removed from the restoration site frequently so that they do not compete with the establishment of the native plantings. Removal of exotic species will take place monthly during Year 1 and as needed thereafter as determined by the Project Biologist. At a minimum, weed abatement will be conducted during each maintenance visit; monthly for Year 1, and quarterly for the first two years following the plant establishment period. Subsequent weeding will be conducted on a semi-annual basis, or as determined by the Project Biologist. The exotic species will be removed by hand wherever possible. In the case of large, monotypic areas of weeds, limited use of herbicide may be allowed, pending approval of the JPA.

**Vegetation Management.** Observations made during maintenance and monitoring visits determine when vegetation management is required. Management will consist of biomass removal and selective thinning of native species. For example *Typha* sp. and *Scirpus* sp. will be managed by removing all vegetative mass to within approximately 1 foot of the ground surface, where as *Salix* sp. will be managed by selective pruning of branches to promote an upright growth habit to sustain hydraulic flow capacity. Other native species shall be managed based on direction by the Project Biologist.

Vegetation within pond 1 will be managed annually to ensure proper hydraulic functioning of the treatment wetlands.

Vegetation within 25 feet of the outfall from the culverts between ponds 1 and 2, and within 10 feet of the outfall between ponds 2 and 3 shall be managed annually prior to October 15th. Every other year the vegetation within the eastern or western half of pond 2 shall be managed based on direction from the Project Biologist.

**Water-level Management.** The water-level in ponds 3 and 4 will be actively managed during the wet season to ensure adequate inundation frequency, depths, and durations are met to sustain wetland plants within the bottom of each pond. To accomplish this, flash boards will be installed within the added weirs in ponds 3 and 4 to force a deeper ponding depth and longer retention time during storm events. Initially, flash boards should be added to both ponds 3 and 4. If storms frequency and intensity are inadequate to fully pond both ponds, then the flash boards should be removed from pond 3 to force ponding within pond 4. The number and height of the flash boards can be varied as an adaptive management strategy to alter the wetland plant communities being sustained over time. As targeted communities are established, a more fixed seasonal management schedule for the flashboards can be developed for their long-term use by the Park Rangers.

**Sediment Removal.** Observations made during maintenance and monitoring visits will identify when sediment accumulation within pond 1 has exceeded the pre-determined volume to trigger maintenance dredging, which was originally thought to be every 2-3 years. However, significant volumes of sediment have been deposited into pond 1 since construction was completed in 2008 after each significant rainfall event which has required more frequent maintenance and removal than anticipated in the long-term. It is believed that the vast majority of this sediment was being stored in the lower reaches of the storm drain system because it was trapped by a sill that had formed at the outfall. The volume of sediment trapped in the storm drain system is unknown, as such the pond was over excavated in fall 2010 and a marked aluminum stake added to document the volume of sediment. The exceedance of the pre-determined sediment volume, based on the burial or near burial of the maintenance indicator on the aluminum stake, will trigger the need to schedule maintenance dredging of pond 1. Once approximately 75% of the capacity of this pond is filled with sediment, as indicated by the graduated aluminum stake, maintenance dredging will be conducted (Table 5).

Sediment removal in pond 2 will occur when the capacity of the low flow channel is compromised. This is not expected to occur more frequently than once every 5 years.

**Vandalism**. The restoration area will be protected and maintained from vandalism and breakage of the irrigation system through installation of an appropriate access barrier. Posted signs designating the area as a restoration site may deter casual vandalism.

Maintenance and monitoring of the restoration site will continue until the objectives of the restoration plan are met. Success of the plantings also will be assessed at 2, 3, 4, and 5 years after installation. Plantings within the restoration area must achieve the specified goals of plant survival and coverage, as described below.

## 3.9 Monitoring Methods

Monitoring will be conducted by the designated Project Biologist. The Project Biologist shall possess a minimum of a bachelor's degree in biology, botany, ecology or a closely related field. In addition, the Project Biologist shall demonstrate expertise in southern California wetland and upland systems including recognition of the dominant annual and perennial plant species of wetland habitats and the ecological requirements of those species. The Project Biologist shall have a minimum of four years experience in the implementation of southern California wetland and upland revegetation projects.

Initial monitoring will begin following the 90-day plant establishment period. The as-built plantings will be compared to the original planting plan with any deviation from the plan mapped and noted. Any significant deviations will be inspected by a restoration specialist and, if necessary, additional plantings made to conform to the plan. The map of the site will identify planting methods, species, densities, and spacing of plants. Final inspection will be conducted by the Project Biologist. The monitoring period will start when the 90-day plant establishment period is accepted by the Project Biologist.

Both qualitative and quantitative data will be collected during monitoring surveys. Qualitative monitoring will be conducted during the first two years of the project until vegetation matures and plant cover increases. Qualitative monitoring will include photographs of each monitoring transect from fixed locations, notes on general site conditions and plant health, assessment of germination and canopy development of the hydro-seeded areas, identification of potential problems and remediation recommendations. Quantitative data will include assessment of plant development and percent cover of all planted species along permanently established transects. Quantitative monitoring along permanent transects will be initiated at the beginning of Year 3 and continue until success criteria are achieved.

Plant development and percent cover will be assessed using the point-intercept method with sampling units located along each transect in a random or spatially stratified random manner. Each species intercepted by the vertical line will be recorded. To calculate percent cover, the number of points that intercept live plant material will be summed and divided by the total number of possible intercepts. Multiple hits of plant material at a single point from overlap of two or more species are counted as one intercept. In addition, all species occurring within a 5-m wide belt transect will be identified and recorded. Final monitoring for success will be conducted with sufficient replication to provide 90% power at an alpha of 0.10 to detect an absolute difference in ground cover of 10%.

Monitoring transects will be established at each restoration site. Each transect will be 25 meters long. Thus, point intercept data will be collected at 51, 0.5-meter locations along each transect (25 meters plus the zero starting point). A typical data sheet used to record these data is presented in Appendix A. The number and location of proposed monitoring transects for the area of ruderal habitat along I-5 to be converted to high/seasonal salt marsh is presented in Figure 12. Six, 25-m transects are proposed that will yield 306 point intercept data points. Figure 13 presents the location and number of proposed monitoring transects for the treatment

wetlands. Twelve 25-m transects are proposed for the treatment wetlands, two each in ponds 2-4. These will provide 612 point intercept data points. Additional transects may be required at each restoration site in order to meet the statistical requirements presented above. There are no transects proposed for Pond 1 as it is anticipated that this pond will be continually disturbed by trash and debris.

The number and location of proposed monitoring transects for the back-up Boudreau restoration site is presented in Figure 14. Ten, 25-m long transects are proposed that will provide 520 point intercept data points.

Six 25-m long transects will be established at the 1.72 acre coastal sage scrub mitigation site (Figure 15), yielding 306 point intercept data points. In addition to percent cover, the number of coastal sage scrub species occurring within a 5-m wide belt transect located along each of the four point intercept transects will be determined.

Permanent photo-documentation stations will also be established within each habitat type to visually document the vegetation changes and community development. Representative photographs shall be taken during each assessment. Photographs will be taken at each end of each transect and will serve to illustrate gross changes in canopy development.

### 3.10 Monitoring Reports

The data described above will be presented in annual reports submitted to the JPA and appropriate agencies at the end of each monitoring year. Annual reports will discuss the progress of the restoration site and will prescribe corrective measures that may facilitate the attainment of restoration success as defined by the established performance goals, presented below. A review of the project by the resource agencies will occur within 45 days of receiving the report and remedial measures will be recommended, if necessary.

### 3.11 Success Criteria for Wetland Mitigation

Success of planted wetland areas will be based on species abundance, diversity and exotic species. Success will be determined using absolute criteria. In order to demonstrate success, total ground cover by native species appropriate to seasonal salt marsh shall be at least 85%. *Salicornia virginica* shall comprise at least 30% relative cover. At least one more native species appropriate to seasonal salt marsh shall comprise at least 15% relative cover and at least 3 more native species appropriate to seasonal salt marsh shall comprise at least 5% relative cover. There shall be zero cover of invasive species and other non-native species shall have less than 10% absolute cover.

### 3.12 Success Criteria for Upland Mitigation

Success of planted upland areas (CSS) will be based on species abundance, diversity and exotic species. Success will be determined using absolute criteria. In order to demonstrate success, total ground cover by native species appropriate to coastal sage scrub in coastal San Diego

County shall be at least 80%. Native shrubs or subshrubs shall provide at least 65% cover of which no more than 15% shall be provided by *Baccharis pilularis*. At least three species of shrubs or subshrubs appropriate to local coastal sage scrub shall each provide a minimum of 5% cover. There shall be zero cover of invasive species and other non-native species shall have less than 10% cover.

### 3.13 Notification of Completion

Once the Project Biologist determines that the success criteria have been met, a report summarizing the revegetation project will be prepared and submitted to the JPA, the California Coastal Commission, and the resource agencies. Upon acceptance of the revegetation site by these agencies, long term management will become the responsibility of the property owner, the San Dieguito River Park JPA.

## 4.0 LITERATURE CITED

City of San Diego. 2002. Biological Review References.

Site/Transect #: Date: Surveyors:

| Trans | Point Intercept | Ground Cover | GC by sp. | Notes |
|---|---|---|---|---|
| 0 | | | | |
| 0.5 | | | | |
| 1 | | | | |
| 1.5 | | | | |
| 2 | | | | |
| 2.5 | | | | |
| 3 | | | | |
| 3.5 | | | | |
| 4 | | | | |
| 4.5 | | | | |
| 5 | | | | |
| 5.5 | | | | |
| 6 | | | | |
| 6.5 | | | | |
| 7 | | | | |
| 7.5 | | | | |
| 8 | | | | |
| 8.5 | | | | |
| 9 | | | | |
| 9.5 | | | | |
| 10 | | | | |
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