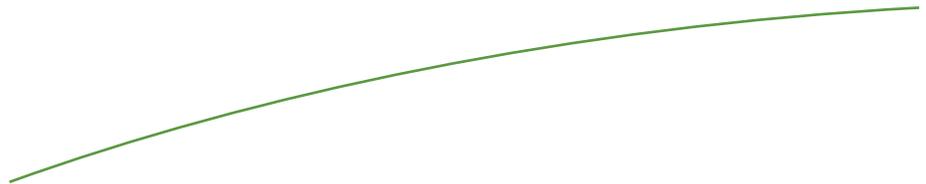




Appendix D.1

BIOLOGICAL RESOURCES REPORT



EXECUTIVE SUMMARY

This report describes existing biological resources within the City of San Diego (City) Master Storm Water System Maintenance Program (Master Program) study area and evaluates the potential impacts to those resources that may occur from long-term maintenance of these storm water facilities. The report also identifies potential mitigation measures to compensate for those impacts. This report is intended to provide information to the U.S. Fish and Wildlife Service (USFWS), U.S. Army Corps of Engineers (Corps), California Department of Fish and Game (CDFG), Regional Water Quality Control Board (RWQCB), California Coastal Commission and City in support of the City's goal of obtaining general permits from those agencies to conduct long-term maintenance activities without the need for separate approvals for each maintenance action.

The purpose of this report is to provide a programmatic analysis of potential biological impacts resulting from implementation of the Master Program. This analysis provides information that will be used by the City and wildlife agencies as part of the permit process for master or regional channel maintenance permits. This report includes a biological reconnaissance and impact analysis for maintenance in the City's storm water facilities proposed under this Program. This report is intended to analyze potential impacts from implementation of the overall program so that the framework for regional permits can be established and evaluated. Under the Program, more specific resource identification, impact analysis and mitigation determinations would occur each year in advance of specific maintenance activities proposed by the City.

The City's Storm Water Division (SWD) of the Transportation and Storm Water Department provides flood control maintenance for numerous storm water facility channels occurring in 7 watersheds in San Diego. Recognizing the need for, and importance of, continuing the periodic inspection, cleaning, and maintenance of storm water facilities in the future, the City has proposed the Master Program. The focus of the Master Program is to identify the long-term maintenance needs for each storm water facility. The program includes specific storm water protocols designed to minimize impacts to sensitive resources.

Eleven wetland/riparian and 7 upland vegetation communities occur within the study area, including proposed access/staging areas. Wetland/riparian vegetation communities include southern riparian forest, southern sycamore riparian woodland, southern willow scrub, mule fat scrub, riparian scrub, freshwater marsh, cismontane alkali marsh, southern coastal salt marsh, coastal brackish marsh, disturbed wetland, and natural flood channel/open water/streambed. Upland vegetation communities include Diegan coastal sage scrub, southern mixed chaparral, non-native grassland, eucalyptus woodland, non-native vegetation/ornamental, disturbed habitat/ruderal, and developed land.

No federally or state listed plant species or Multiple Species Conservation Program (MSCP) narrow endemic species were observed within the study area during biological surveys. The following 4 sensitive plant species were observed during surveys: single-whorl burrobush (*Ambrosia monogyra*), San Diego marsh-elder (*Iva hayesiana*), southwestern spiny rush (*Juncus acutus* ssp. *leopoldii*), and San Diego sunflower (*Viguiera laciniata*).

The federally listed threatened coastal California gnatcatcher (*Polioptila californica californica*) was detected in the study area during biological surveys. The following 3 sensitive animal species also were detected: northern harrier (*Circus cyaneus*), yellow warbler (*Dendroica petechia brewsteri*), and little blue heron (*Egretta caerulea*). Although not detected during the biological surveys, the federally and state listed endangered least Bell's vireo (*Vireo bellii pusillus*) and light-footed clapper rail (*Rallus longirostris levipes*), federally listed endangered southwestern willow flycatcher (*Empidonax traillii extimus*) and San Diego fairy shrimp (*Branchinecta sandiegonensis*), and California species of special concern yellow-breasted chat (*Icteria virens*) also have been documented in or near portions of the Master Program study area.

Approximately 138.40 acres of Corps jurisdictional areas and 136.78 acres of CDFG jurisdictional areas and City wetlands were mapped within the study area.

Up to an estimated 41.62 acres of vegetated wetland habitat, 37.08 acres of unvegetated streambed/natural flood channel, and 4.9 acres of sensitive upland habitat could be impacted upon implementation of the assumed maintenance activities anticipated under the proposed project. The maintenance activities assumed for this report are only an approximation of impacts anticipated by long-term maintenance activities, and precise impacts and mitigation would be established each year by the reporting requirements under the Master Program.

Wetland habitat impacts could include: 4.95 acres of southern riparian forest (including disturbed), 0.09 acre of southern sycamore riparian woodland, 7.49 acres of southern willow scrub (including disturbed), 1.99 acres of mule fat scrub (including disturbed), 0.15 acre of riparian scrub, 17.90 acres of freshwater marsh (including disturbed), 1.57 acres of coastal salt marsh, 0.51 acre of coastal brackish marsh, and 6.97 acres of disturbed wetland. An additional 37.08 acres of unvegetated streambed/natural flood channel could also be affected, although impacts to these unvegetated channels would be temporary impacts that would not require mitigation.

Sensitive upland impacts could include: 2.2 acres of Diegan coastal sage scrub (including disturbed), 0.2 acre of southern mixed chaparral, and 2.5 acres of non-native grassland.

Approximately 14.59 acres of vegetated wetland impacts, 29.23 of unvegetated streambed/natural flood channel impacts, and 0.3 acre of upland impacts may occur within the City's Multi-Habitat Planning Area (MHPA). Approximately 10.62 acres of wetland impacts and 9.19 acres of non-vegetated streambed/natural flood channel impacts may occur within the coastal overlay zone.

Implementation of the proposed project would impact single-whorl burrobush, San Diego marsh-elder, southwestern spiny rush, and San Diego sunflower as well as potentially impacting habitat for coastal California gnatcatcher, least Bell's vireo, yellow warbler, light-footed clapper rail, and little blue heron. Implementation of the proposed project also has potential to impact nesting raptors.

Based on the assumed implementation of the channel maintenance activities, project-related impacts could occur to approximately 29.22 acres of Corps jurisdictional wetlands, 41.62 acres

of CDFG jurisdictional wetlands, and 41.62 acres of City-defined wetlands. Maintenance activities could also take place in approximately 39.51 acres of earthen-bottom Corps non-wetland Waters of the U.S. (WUS), 33.47 acres of concrete-bottom Corps WUS, and 37.08 acres of unvegetated CDFG streambed/City natural flood channel.

Impacts to wetland habitat and/or jurisdictional areas are anticipated to be mitigated through wetland enhancement, restoration, and/or purchase of mitigation credits from an Agency-approved wetland mitigation site or bank. Although not required, the City could choose to mitigate wetland impacts through habitat creation. Impacts to Diegan coastal sage scrub, southern mixed chaparral, and non-native grassland would be mitigated through one or more of the following: preservation of appropriate habitat, payment into the City's Habitat Acquisition Fund, and/or mitigation credits.

Impacts to eucalyptus woodland, non-native vegetation/ornamental, disturbed habitat/ruderal, and developed land would not be considered significant under the City's Biology Guidelines and CEQA Thresholds (2011); therefore, no mitigation is required.

Mitigation for direct impacts to single-whorl burrobush, San Diego marsh-elder, southwestern spiny rush, and San Diego sunflower would not be required. Impacts to coastal California gnatcatcher habitat would be avoided and minimized to the greatest extent practicable, and unavoidable impacts would be mitigated through preservation of habitat. Potential impacts to vireo, clapper rail, gnatcatcher, and nesting raptors would be mitigated by the implementation of avoidance measures during their respective breeding seasons. Impacts to yellow warbler, and little blue heron, and impacts to habitat for these and other sensitive species, would be offset by habitat-based mitigation.

The Master Program includes maintenance protocols that would be followed in order to reduce potential indirect impacts. Indirect project impacts related to habitat insularization, lighting, fugitive dust, and roadkill would be less than significant. Indirect project impacts related to human intrusion would be less than significant with implementation of maintenance protocols that include use of temporary construction fencing. Indirect project-related impacts from noise, water quality, exotic plant species, and animal behavioral changes could be significant. However, implementation of maintenance protocols combined with resource-specific mitigation measures would ensure that the proposed project is in conformance with MSCP Compatible Land Uses and Land Use Adjacency Guidelines and that significant indirect impacts are reduced to below a level of significance.

Although not anticipated, the project has the potential to result in cumulative impacts to listed species not covered by the MSCP. Cumulative impacts to non-covered species under the MSCP would be evaluated at a project-specific level. For most non-covered species, it is assumed that habitat-based preservation within the MHPA would provide adequate mitigation; however, given the wide range of potential species and degrees of impact that may be encountered, case-by-case analysis would be conducted to determine if any non-covered species would be impacted to a level that would be cumulatively significant. In the event that they are determined to be significant, these impacts would be disclosed in subsequent environmental review and mitigated in accordance with the City's Biology Guidelines.

THIS PAGE INTENTIONALLY LEFT BLANK

1.0 INTRODUCTION

The purpose of this report is to provide a programmatic analysis of potential biological impacts resulting from implementation of the Master Program. This analysis provides information that will be used by the City and wildlife agencies as part of the permit process for programmatic or regional channel maintenance permits. This report includes a biological reconnaissance and impact analysis for maintenance within storm water facilities included in the Master Program. This report is intended to analyze potential impacts from implementation of the overall Master Program so that the framework for regional permits can be established and evaluated. Under the Master Program, more specific resource identification, impact analysis and mitigation determinations would occur each year in advance of specific maintenance activities proposed by the City.

1.1 PROJECT BACKGROUND AND DESCRIPTION

The City's SWD provides flood control maintenance for numerous storm water channels occurring in 7 watersheds in San Diego. Recognizing the need for, and importance of, continuing the periodic inspection, cleaning, and maintenance of storm water facilities in the future, the City has proposed the Master Program. The focus of the Master Program is to identify the long-term maintenance needs for facilities included in the Master Program.

Maintenance activities assumed for this report are only an approximation of impacts anticipated by long-term maintenance activities, and precise impacts and mitigation would be established as part of a Substantial Conformance Review (SCR) process which would be conducted annually in accordance with the Master Program. The estimation of impacts to storm water facilities presented in this report should be considered a representation of potential impacts resulting from flood control maintenance activities for the overall Master Program.

A description of the various storm water facilities included in the Master Program and the proposed maintenance activities and estimated width of disturbance for each facility is presented in Appendix A. In general, the channels are divided into natural and man-made. The surface of the channels varies between earth (soft-bottom), cobble, riprap and concrete. In some cases, the channels are completely earthen. In other cases, the surface is covered by a combination of earth, cobble, riprap, and concrete.

1.1.1 Maintenance Activities

Maintenance activities are expected to range from vegetation and debris removal to sediment dredging. The selection of the maintenance method, frequency, and equipment will depend largely on site-specific characteristics of each storm water facility, including size, flow characteristics, surrounding land uses and vegetation, availability of access, and whether the storm water facility is concrete-lined or natural bottom. Where possible, maintenance activities would generally occur during dry months to take advantage of low urban runoff flows within the storm water facility.

Frequency of Maintenance

The frequency of storm water facility maintenance would be based upon routine inspections and past maintenance history. Maintenance frequencies typically occur at 3-year intervals. Facilities that have a known history of flooding and/or accumulation of soil, debris, and vegetation and have the potential to increase the risk to life and property would be placed on a priority maintenance list which would require maintenance annually or bi-annually.

Equipment Selection

Mechanized equipment clearing would be utilized whenever possible to reduce cost. Depending on the conditions associated with each facility, different types of mechanized equipment would be utilized. The decision as to which mechanized equipment to be used would be based upon the density and volume of accumulated material, vegetation growth, the size of the facility, the flow characteristics of the facility, and the need to complete maintenance activities in a timely and efficient manner. The types of mechanized equipment would include, but not be limited to, skid-steers, backhoes, Gradalls, excavators, loaders, dump trucks, and bulldozers. Equipment would range in size from 4 feet wide for the smallest skid-steer to 12.5 feet wide for the largest bulldozer. Smaller equipment such as skid-steers would typically be used for smaller channels. For all equipment clearing activities, the depth of material to be removed would be based upon the design capacity of the facility. Maintenance equipment would utilize access and staging areas designated by the Master Program

Maintenance Methods

Mechanical Maintenance

Mechanical maintenance would utilize equipment often used in excavation (e.g. skid-steers, backhoes, Gradalls, excavators, loaders, dump trucks, and bulldozers) to remove sediment and vegetation from storm water facilities. Mechanized equipment clearing would be used whenever possible to reduce cost. Depending on the conditions associated with each facility, different types of mechanized equipment would be used. The decision as to which mechanized equipment to be used would be based upon the density and volume of accumulated material, vegetation growth, the size of the facility, access, the flow characteristics of the facility, and the need to complete maintenance activities in a timely and efficient manner. Equipment would range in size from 4 feet wide for the smallest skid-steer to 12.5 feet wide for the largest bulldozer. Smaller equipment such as skid-steers would typically be used for smaller channels. For all equipment clearing activities, the depth of material to be removed would be based upon the design capacity of the facility.

Maintenance equipment would utilize access roads which have been identified in the course of preparing the Master Program. These access roads are illustrated on the biological resource maps included Appendix B of this report, as well as Volume 3 of the Program Environmental Impact Report (PEIR).

In most cases, maintenance is expected to occur along the bottom of the facilities and approximately 2 feet up the adjacent banks. Removal of vegetation on the slopes, beyond the lower 2 feet is not expected to occur except when the overall channel width is less than 20 feet. In these narrower channels, removal of vegetation on the sides may be necessary to maximize the ability to transport floodwaters. However, for wider channels, the minimal increase in flood water transport capacity resulting from removing vegetation on the side slopes would be outweighed by the additional cost of maintenance and associated biological mitigation.

The amount of vegetation and sediment removed from the bottom of the storm water facilities would be determined by hydrology and hydraulic studies before any maintenance occurs within a storm water facility. It is anticipated that these studies would specify maintenance that would range from clearing a pilot channel to removing all the vegetation covering the bottom of a facility. Whenever possible, vegetation would be cleared in a manner that allows some vegetation to remain in the facility to provide wildlife habitat and aesthetic value.

Non-mechanical Maintenance

Where equipment access is limited and trucks cannot enter the maintenance area, maintenance would be performed without the use of earthmoving equipment (e.g. using chain saws, mowers and/or weed whips). As a result, non-mechanical maintenance would be limited to removal of above-ground vegetation. If the cut vegetation would not interfere with flood capacity, it would be left within the channel unless it is determined that the cut vegetation is invasive (e.g., giant reed [*Arundo donax*]). In this event, the invasive vegetation would be collected, hauled out by hand, and disposed of in a suitable, pre-approved off-site location. With non-mechanical maintenance, the root systems would remain in place. Above-ground removal would not be used when leaving the roots of invasive plants in place could promote their regrowth and downstream colonization. Determination as to the degree of invasiveness of a plant species would be based on the most current California Invasive Plant Council's (Cal-IPC's) Invasive Plant Inventory.

1.1.2 Access and Staging

The Master Program designates specific access routes and staging locations for each of the storm water facilities included in the proposed Master Program. In most cases, access would occur directly from adjacent streets or parking areas due to the urban location of the facilities. In other cases, short dirt or paved driveways would be used to access the facilities from nearby public streets. Access for a few of the channels would require temporary impacts to vegetation communities such as non-native grassland. Staging areas would consist primarily of paved areas or disturbed habitat adjacent to the channels.

Access into the facilities for maintenance would occur in 2 ways. In many cases, concrete or earthen ramps would be used for access into the facility. In other cases, equipment would operate outside the facility along its banks. All access routes would incorporate Best Management Practices (BMPs) during and after maintenance activities. Impacts to upland and wetland habitat would be mitigated in accordance with the Mitigation Monitoring and Reporting Program (MMRP) from the certified PEIR.

1.1.3 Wetland Impact Authorization Process

Maintenance pursuant to the Master Program would be conducted on an annual basis. As a result of biological and weather constraints, it is anticipated that maintenance would primarily occur during the summer and early fall. The overall maintenance process is summarized below and then described in more detail.

The annual maintenance process would begin with the preparation of an Annual Maintenance Needs Assessment by SWD. The needs assessment would identify storm water facilities that require maintenance in the coming year. Once the facilities have been identified, the SWD would undertake a number of individual assessments of each of the storm water facilities. In particular, an Individual Biological Assessment (IBA) will be required prior to the preparation of maintenance plans. Based on the results of these studies, SWD would prepare an Individual Maintenance Plan (IMP) for each maintenance activity.

IBAs will begin with a survey of proposed maintenance areas including the storm water channel, access routes, temporary spoils storage and staging areas. Upon completion of this inspection, the biologist will identify significant biological resources and discuss potential ways to avoid impacts in accordance with the measures identified in the MMRP of the EIR. Once a maintenance plan has been completed, the biologist would determine the potential impact of the proposed maintenance on significant biological resources and define mitigation in accordance with the approved MMRP needed to adequately mitigate for those impacts. The results of this work will be summarized in a written report.

The IBA would include the following components:

- Description of maintenance to be performed including length, width and depth;
- Protocol surveys, as needed;
- Scaled map of the affected storm water facility illustrating pre-maintenance vegetation including wetland boundaries based on evaluation of above-ground indicators of the resources; excavation of soil pits (when deemed necessary by the project biologist), and completion of Corps jurisdictional wetland delineation data forms. Completion of Corps preliminary or approved jurisdictional determination forms are not proposed;
- Location(s) of sensitive species;
- Quantification of impacts to all sensitive biological resources;
- Two digital photos of the affected area;
- Specific maintenance protocols from the Master Program to be implemented as part of the IMP; and
- Identification of any biological monitoring required during maintenance.

The biologist also will work with the hydrology engineer in the preparation of Individual Hydrologic and Hydraulic Assessments (IHHAs) for each maintenance activity. The biologist shall identify significant biological resources which should be retained if the IHHAs conclude that not all of the vegetation within a storm water facility must be removed to maximize the ability of the facility to convey floodwater.

Once the individual assessments have been completed and the IMPs have been prepared, they would be submitted along with the supporting technical studies to the City of San Diego Development Services Department (DSD) for a Substantial Conformance Review (SCR). In the course of the SCR process, DSD would review the certified PEIR for the Master Program to determine whether the activities were included in the Master Program and whether the impacts of the proposed maintenance were assumed in the PEIR impact and mitigation analysis. The DSD would also confirm that mitigation is included pursuant to the requirements of the MMRP associated with the PEIR. If the SCR process concludes that the proposed maintenance activity and associated impacts were adequately analyzed in the PEIR, City staff would make the decision whether or not the proposed maintenance could proceed.

Maintenance which may affect sensitive biological resources shall include the following:

Storm Water Facility and Access Route Field Delineation: Approved access routes would be field marked per the IMP. A qualified biologist would clearly mark both sensitive biological resource areas to be avoided and the limits of resource areas approved for clearing or crossing. The biologist would check for any substantial change in site conditions from those shown on the IMP and have the ability to refine the access routes and maintenance methods whenever possible to avoid or reduce impacts to sensitive biological resources as maintenance progresses in the field.

Sensitive Biological Resource Clearance: Within a minimum of 72 hours of initiating any clearing or grubbing activities, a qualified biologist would conduct any necessary pre-maintenance surveys, including bird nest surveys to provide for compliance with the Migratory Bird Treaty Act (MBTA).

Access Route Clearing (if necessary): Approved access routes would be cleared of brush, low-hanging branches, and obstacles, and limited grading would be conducted as necessary to allow equipment to be transported to the work areas. BMPs would be installed in accordance with the IMP.

Annual Reporting: On an annual basis, a qualified biologist would prepare an annual report which shall include the following components:

- Tabular summary of the acreage of sensitive vegetation lost by the facility that was maintained;
- Scaled map of each affected storm water facility illustrating pre- and post-maintenance vegetation;
- Updated master storm water facility list to reflect the facilities which have been mitigated and, for which, no additional mitigation shall be required;
- Summary of the status of mitigation which has been carried out during the current and previous years to compensate for impacts to upland and wetland vegetation, as well as sensitive species;
- Two digital photographs of each of the areas that were maintained in the current year; and
- Description of any remedial actions and the outcome of their implementation for each affected storm water facility.

1.1.4 Maintenance Protocols

To minimize the impact of storm water maintenance on the environment, the maintenance activities would be performed in accordance with local, state and federal laws governing such activities. In addition, the activities would incorporate the following protocols, as appropriate.

Water Quality

1. Stabilize access roads (or other graded areas) through the use of measures such as permeable protective surfacing (e.g., grasscrete), storm water diversion structures (e.g., brow ditches or berms), or crossing structures (e.g., culverts).
2. During maintenance, use sediment controls within storm water facilities, access paths and staging areas to prevent transport of sediment off-site, including measures such as silt fence, fiber rolls, gravel bags, temporary sediment basins, stabilized maintenance access points (e.g., shaker plates), containment barriers (e.g., silt fence, fiber rolls and/or berms) for material stockpiles, and properly fitted covers for material transport vehicles. Remove temporary erosion control measures upon completion of maintenance.
3. Store BMP materials on-site to provide “standby” capacity adequate to provide complete protection of exposed areas and prevent off-site sediment transport.
4. Provide training for personnel responsible for BMP installation and maintenance.
5. Revegetate temporary access, spoil and staging areas within 30 days of completion of the maintenance. Monitor and maintain revegetated areas for a period of not less than 25 months following planting.
6. Implement sampling and analysis, monitoring and reporting, and post-maintenance management programs per National Pollutant Discharge Elimination System (NPDES) and/or City requirements.
7. Avoid storing materials used during maintenance that are considered hazardous within 50 feet from storm water facilities. Store hazardous materials in accordance with applicable local, state and federal regulations.
8. Store maintenance-related trash in areas at least 50 feet from storm water facilities, and implement regular (at least weekly) removal of trash by a licensed operator for disposal at an approved site.
9. Install a check dam or other comparable mechanism at the downstream end when hydrology and hydraulic studies indicate that maintenance could adversely impact downstream areas. These structures may be removed when vegetation growth has reached a point where the structure is no longer required.

10. Inspect earthen-bottom storm water facilities within 30 days of the first 2-year storm following maintenance. Implement erosion control measures, as appropriate, to remediate substantial erosion which has occurred and minimize future erosion.

Biological Resource Protection

1. Vehicles shall only use routes designated in the Master Program to access storm water facilities.
2. All sensitive biological resources, to remain within or adjacent to the maintenance area, shall be flagged in the field prior to initiation of maintenance activities.
3. Pre-maintenance meetings shall be held onsite prior to maintenance that may occur within or adjacent to sensitive biological resources. At the meeting, a qualified biologist shall point out sensitive biological resources to be avoided during maintenance, and review specific measures which should be implemented to minimize indirect impacts,
4. Physical erosion control measures (e.g., fiber mulch, rice straw, etc.) shall not introduce seed from invasive species.
5. Pre-maintenance surveys shall be conducted if maintenance is proposed to take place during the breeding season of a sensitive animal species. If sensitive animal species covered by the PEIR are identified, then applicable measures from the MMRP shall be implemented under the direction of a qualified biologist to avoid significant direct and/or indirect impacts to identified sensitive animal species. If sensitive animal species are identified that are not covered by the PEIR, additional environmental review under CEQA will be required.
6. Maintenance activities that involve removal of giant reed shall occur through one, or a combination, of the following methods: (1) foliar spray (spraying herbicide on leaves and stems without cutting first) when giant reed occurs in monotypic stands, or (2) cut and paint (cutting stems close to the ground and spraying or painting herbicide on cut stem surface) when giant reed is intermixed with native plants. When sediment supporting giant reed must be removed, the sediment shall be excavated to a depth sufficient to remove the rhizomes, wherever feasible. Following removal of sediment containing rhizomes, loose rhizome material shall be removed from the channel and disposed offsite. After the initial treatment, the area of removal shall be inspected on a quarterly basis for up 2 years, or until no resprouting is observed during an inspection. If resprouting is observed, the cut and paint method shall be applied to all resprouts.
7. If mechanized maintenance activities must occur near active raptor nests, maintenance shall not occur within 300 feet of a Cooper's hawk nest, 900 feet of a northern harrier's nest, or 500 feet of any other raptor's nest until any fledglings have left the nest.

1.2 PROJECT LOCATION

The project study area is situated in San Diego, California (Figure 1) and includes segments scattered along named and unnamed channels (Figures 2a-e). Table 1 provides information on cross-referencing the study area locations shown on Figures 2a-e with numerous smaller-scale vegetation and wetland delineation maps located in Appendix B of this report. All storm water facilities within the jurisdiction of the SWD were included in the original mapping effort and were assigned Map Numbers (Nos). Revisions to the Master Program have resulted in the exclusion of some previously mapped channels such that the map numbering is no longer sequential. Original map numbers were retained for the sake of continuity.

Approximately 98.2 acres of the study area lie within the City's MHPA and 46.7 acres are within the Coastal Overlay Zone (Figure 3). The study area was determined using storm water facility area boundaries provided by the City.

| Map No(s) | Channel Name (map numerical order) | Channel Name (alphabetical order) | Map No(s) |
|------------------|---|--|------------------|
| 1 | Rancho Bernardo Road & Bernardo Center Drive | 11000 Roselle St/11100 Flinkote Ave | 9 |
| 2-3 | Rancho Bernardo | 11044 Via San Marco | 4 |
| 4 | 11044 Via San Marco | 11689 Sorrento Valley Rd | 6 |
| 6 | 11689 Sorrento Valley Rd | 35th St & Martin Avenue | 92 |
| 6a | Industrial Court | 42nd & J Street | 100 |
| 7-8 | Los Peñasquitos Channel | 7969 & 7971 Engineer Rd | 47 |
| 9 | 11000 Roselle St/11100 Flinkote Ave | Alvarado Channel | 59-62 |
| 10 | Dunhill Street & Roselle Street | Alvarado Channel | 64 |
| 11-12 | Soledad Creek Channel | Auburn Creek Channel | 67-70 |
| 18 | Maya Linda & Via Pasar | Auburn Creek Channel | 76-77 |
| 19 | Candida & Via Pasar | Britannia & Bristow | 127 |
| 32-35 | Rose Creek Channel | Camino de la Reina & Camino del Arroyo | 81 |
| 36 | Mission Bay High School | Camino del Arroyo | 52 |
| 37 | Pacific Beach Drive & Olney Street | Camino Maquiladora & Cactus | 125 |
| 40-42 | Chateau Channel | Candida & Via Pasar | 19 |
| 47 | 7969 & 7971 Engineer Rd | Chateau Channel | 40-42 |
| 51 | Red River Drive & Conestoga Drive | Chollas Creek Channel | 71-72 |
| 52 | Camino del Arroyo | Chollas Creek Channel | 78-80 |
| 53 | Cowles Mtn Channel | Chollas Creek Channel | 89 |
| 54 | San Carlos Creek Channel | Chollas Creek Channel | 91 |

Table 1 (cont.)
CROSS-REFERENCE BETWEEN MAP NUMBER AND CHANNEL NAME

| Map No(s) | Channel Name (map numerical order) | Channel Name (alphabetical order) | Map No(s) |
|------------------|---|--|------------------|
| 55a | West Morena Boulevard | Chollas Creek Channel | 93 |
| 55-57 | Tecolote Creek Channel | Cottonwood Channel | 120-121 |
| 58-58a | Murphy Canyon Channel | Cowles Mtn Channel | 53 |
| 59-62 | Alvarado Channel | Delevan Drive | 79a |
| 64 | Alvarado Channel | Dunhill Street & Roselle Street | 10 |
| 65a-c | Fairmont Channel | Encanto Channel | 106-107 |
| 66 | Montezuma Channel | Encanto Channel | 108-111 |
| 67-70 | Auburn Creek Channel | Euclid & Castana | 105 |
| 71-72 | Chollas Creek Channel | Fairmont Channel | 65a-c |
| 76-77 | Auburn Creek Channel | Famosa Boulevard & Valeta Street | 83 |
| 78-80 | Chollas Creek | Imperial Avenue & Gillette Street | 90 |
| 79a | Delevan Dr | Industrial Court | 6a |
| 81 | Camino de la Reina & Camino del Arroyo | Jamacha Channel | 113-115 |
| 82 | Nimitz Channel | La Media & Airway | 124 |
| 83 | Famosa Blvd & Valeta St | Los Peñasquitos Channel | 7-8 |
| 84 | Washington Channel | Maya Linda & Via Pasar | 18 |
| 86 | Pershing Channel | Mission Bay High School | 36 |
| 89 | Chollas Creek Channel | Montezuma Channel | 66 |
| 90 | Imperial Avenue & Gillette Street | Murphy Canyon Channel | 58-58a |
| 91 | Chollas Creek Channel | Nestor Creek Channel | 131-134 |
| 92 | 35th Street & Martin Avenue | Nimitz Channel | 82 |
| 93 | Chollas Creek Channel | Pacific Beach Drive & Olney Street | 37 |
| 94-95 | South Chollas Creek Channel | Parkside Channel | 122 |
| 97-99 | South Chollas Creek Channel | Pershing Channel | 86 |
| 100 | 42nd & J Street | Rancho Bernardo | 2-3 |
| 101 | South Chollas Creek Channel | Rancho Bernardo Road & Bernardo Center Drive | 1 |
| 103-104 | South Chollas Creek Channel | Red River Drive & Conestoga Drive | 51 |
| 105 | Euclid & Castana | Rose Creek Channel | 32-35 |
| 106-107 | Encanto Channel | San Carlos Creek Channel | 54 |
| 108-111 | Encanto Channel | San Diego River | 145-147 |
| 113-115 | Jamacha Channel | Sanyo Channel | 123 |

Table 1 (cont.)
CROSS-REFERENCE BETWEEN MAP NUMBER AND CHANNEL NAME

| Map No(s) | Channel Name (map numerical order) | Channel Name (alphabetical order) | Map No(s) |
|------------------|---|--|------------------|
| 117-119 | Solola Channel | Siempre Viva & Bristow | 126 |
| 120-121 | Cottonwood Channel | Smugglers Gulch Channel | 138-139 |
| 122 | Parkside Channel | Smythe Channel | 129-130 |
| 123 | Sanyo Channel | Soledad Creek Channel | 11-12 |
| 124 | La Media & Airway | Solola Channel | 117-119 |
| 125 | Camino Maquiladora & Cactus | South Chollas Creek Channel | 94-95 |
| 126 | Siempre Viva & Bristow | South Chollas Creek Channel | 97-99 |
| 127 | Britannia & Bristow | South Chollas Creek Channel | 101 |
| 128 | Virginia Channel | South Chollas Creek Channel | 103-104 |
| 129-130 | Smythe Channel | Tecolote Creek Channel | 55-57 |
| 131-134 | Nestor Creek Channel | Tijuana River | 138a-c |
| 136-137 | Tocayo Channel | Tocayo Channel | 136-137 |
| 138a-c | Tijuana River | Virginia Channel | 128 |
| 138-139 | Smugglers Gulch Channel | Washington Channel | 84 |
| 145-147 | San Diego River | West Morena Boulevard | 55a |

1.3 PHYSICAL DESCRIPTION AND LAND USE

The project study area consists of a network of storm water facility channels throughout San Diego. The major channels consist of named creeks, some of which have been channelized and/or lined with concrete and/or riprap along portions of their lengths. Minor channels include unnamed tributaries, which also may include channelized and/or concrete or riprap-lined segments. The storm water facilities are diverse in terms of size, vegetative cover, substrate, hydrology, and environmental setting. The smallest storm water facilities are only a few feet wide, while segments of the largest are over 100 feet wide. Vegetative cover ranges from mature riparian forest to marsh habitat to unvegetated surfaces, with substrates including loams, sands, cobbles, rock and concrete.

Hydrology varies from permanently flowing creeks to ephemeral streambeds that flow only following rainfall or in response to urban runoff. Some storm water facilities are in highly urbanized settings and present little opportunity for wildlife utilization due to their location and individual characteristics, while others traverse open space areas and/or function as wildlife corridors.

As channels are naturally associated with larger basins, this analysis is based on Hydrologic Units (HUs) as defined in the San Diego Regional Water Quality Control Board (RWQCB) Water Quality Control Plan for the San Diego Basin. The channels that are included in the City's Master Program occur within the following 7 HUs: San Dieguito, Peñasquitos, San Diego, Pueblo San Diego, Sweetwater, Otay, and Tijuana (Figure 4). Summary descriptions of the 7 HUs applicable to the proposed project are provided below.

- San Dieguito HU – The San Dieguito HU is a rectangular-shaped area of approximately 350 square miles associated with the San Dieguito River watershed. Major tributaries and water bodies include Santa Ysabel and Santa Maria creeks and Lakes Sutherland and Hodges. The Rancho Bernardo Channel is the only named channel mapped in this HU addressed by the Master Program.
- Peñasquitos HU – The Peñasquitos HU is a rectangular-shaped area of approximately 170 square miles associated with several smaller storm water facilities including Peñasquitos, Rose Canyon and San Clemente Canyon Creeks. Water bodies within this HU include Los Peñasquitos (Sorrento) Lagoon, Mission Bay and Miramar Reservoir. Segments of named channels in this HU that are addressed by the Master Program include Rose, Los Peñasquitos, Soledad, and Tecolote creeks.
- San Diego HU – The San Diego HU is a long, generally triangular-shaped area of approximately 440 square miles that encompasses the San Diego River watershed. Major water bodies within this area include El Capitan, San Vicente and Murray reservoirs as well as Lakes Jennings and Cuyamaca. Segments of named channels in this HU that are addressed by the Master Program include Alvarado, Fairmont, and Nimitz channels as well as the San Diego River and Murphy Canyon.
- Pueblo San Diego HU – The Pueblo San Diego HU is a small rectangular area encompassing approximately 60 square miles. No major water bodies occur within this HU, with much of the western HU boundary adjacent to San Diego Bay. Channel segments in this HU that are addressed by the Master Program include the Chollas and South Chollas creeks as well as Encanto, Auburn Creek, Jamacha, Cottonwood, Pershing, Solola, and Washington channels.
- Sweetwater HU – The Sweetwater HU is a linear area encompassing approximately 160 square miles associated with the Sweetwater River watershed. Major water bodies within this unit include the Sweetwater and Loveland reservoirs as well as the southern portion of San Diego Bay. The Parkside Channel is the only channel in this HU addressed by the Master Program.

- **Otay HU** – The Otay HU is a club-shaped area of approximately 160 square miles associated with the Otay River and related tributaries including Jamul and Dulzura creeks. Major water bodies within this HU include Upper and Lower Otay reservoirs. Nestor Creek Channel is only storm water facility in this HU addressed in the Master Program.
- **Tijuana HU** – The Tijuana HU is a triangular-shaped area of approximately 470 square miles that encompasses the portions of the Tijuana River watershed north of the international border. Principal drainages include portions of the Tijuana River in the westernmost portion of the HU, as well as Campo and Cottonwood creeks. Major water bodies within this unit include Morena Reservoir, Barrett Lake and the Tijuana Estuary. Segments of named channels in this HU that are addressed by the Master Program include the Sanyo, Tocayo, and Virginia channels, Smuggler’s Gulch, and the Tijuana River.

All of the described HUs and associated drainage courses are ultimately tributary to the Pacific Ocean, with several encompassing coastal lagoons and embayments as noted above.

2.0 METHODS

2.1 LITERATURE REVIEW

Prior to conducting field investigations, HELIX Environmental Planning, Inc. (HELIX) performed a review of existing literature, including previous vegetation mapping completed by Mooney and Associates (Mooney 2004) and Dudek (2006), information compiled as part of the Multiple Species Conservation Program (MSCP; City 1997), critical habitat designations, and sensitive species data from the USFWS, CDFG’s California Natural Diversity Database (CNDDDB 2011), and California Native Plant Society (CNPS 2011).

2.2 BIOLOGICAL SURVEYS

2.2.1 Biological Resources Mapping

HELIX biologists mapped vegetation communities within the project study area during numerous site visits (Table 2). The majority of vegetation communities within the study area were mapped on 1"=150' scale aerials, except for the areas along the San Diego River, which were mapped on 1"=200' scale aerials. Mapping along the Tijuana River is based on mapping conducted by Dudek and Associates in 2006. Storm water facilities were mapped to the boundaries provided to HELIX by the City. The original mapping effort covered approximately 885 acres within the City.

Vegetation communities were mapped in accordance with the City’s Guidelines for Conducting Biological Surveys (2002). The study area was surveyed on foot, with the aid of binoculars when necessary. Access was limited in certain portions of the study area, and in these areas vegetation was mapped using aerial interpretation combined with upstream and/or downstream observations.

Lists of plant and animal species observed/detected within the study area during site visits were recorded and are presented in Appendices C and D, respectively.

| Table 2 SURVEY INFORMATION | | |
|---------------------------------------|------------------------------|---|
| Date | Personnel | Survey Type |
| February 5, 2007 | Stacy Nigro | Jurisdictional delineation (JD), vegetation mapping |
| February 6, 2007 | Stacy Nigro, Sarah Haas | JD, vegetation mapping |
| February 7, 2007 | Stacy Nigro, Jason Kurnow | JD, vegetation mapping |
| February 8, 2007 | Stacy Nigro, Sarah Haas | JD, vegetation mapping |
| February 13, 2007 | Stacy Nigro | JD, vegetation mapping |
| February 14, 2007 | Stacy Nigro, Heather Haney | JD, vegetation mapping |
| February 15, 2007 | Stacy Nigro, Sarah Haas | JD, vegetation mapping |
| February 16, 2007 | Stacy Nigro, Jason Kurnow | JD, vegetation mapping |
| February 20, 2007 | Stacy Nigro, Sarah Haas | JD, vegetation mapping |
| February 21, 2007 | Stacy Nigro, Brian Parker | JD, vegetation mapping |
| February 22, 2007 | Stacy Nigro, Sarah Haas | JD, vegetation mapping |
| February 26, 2007 | Stacy Nigro, Heather Haney | JD, vegetation mapping |
| February 28, 2007 | Stacy Nigro, Heather Haney | JD, vegetation mapping |
| March 1, 2007 | Stacy Nigro, Heather Haney | JD, vegetation mapping |
| March 23, 2007 | Stacy Nigro, Shelby Howard | JD, vegetation mapping |
| April 5, 2007 | Stacy Nigro, Phillip Tran | JD, vegetation mapping |
| April 6, 2007 | Stacy Nigro, Brian Parker | JD, vegetation mapping |
| April 9, 2007 | Stacy Nigro | JD, vegetation mapping |
| January 30, 2008 | Stacy Nigro, Kimberly Davis | JD, vegetation mapping |
| February 1, 2008 | Stacy Nigro, Kathy Pettigrew | JD, vegetation mapping |
| February 7, 2008 | Stacy Nigro, Kathy Pettigrew | JD, vegetation mapping |
| November 20, 2008 | Stacy Nigro | JD, vegetation mapping |
| April 8, 2011 | Stacy Nigro | JD, vegetation mapping |

2.2.2 Jurisdictional Delineation

HELIX biologists conducted program-level jurisdictional delineation fieldwork within the study area on the same dates that vegetation mapping was conducted. Delineations were conducted on foot with the aid of 1"=150' scale aerials and topographic maps, except for the areas along the San Diego River, in which 1"=200' scale aerials and topographic maps were used. Access was limited in certain portions of the study area, and in these areas the delineation was completed via aerial and topographic interpretation combined with upstream and/or downstream observations. All areas with depressions or storm water facility channels were evaluated for the presence of Waters of the U.S. (WUS), including jurisdictional wetlands. Wetland determinations were completed at a program level and soil pits were not excavated. Determinations were based on

species of vegetation present and their wetland affiliations, above-ground hydrology indicators, topography, soil surface substrate, and best professional judgment. Areas were determined to be a federal (Corps) wetland if they presumably satisfied the 3 criteria (vegetation, hydrology, and soils) established for wetland delineations as described in Environmental Laboratory (1987) and the Wetland Delineation Manual: Arid West Region (Arid West Supplement; Corps 2006 and 2008), as applicable. Areas were determined to be non-wetland WUS if there was evidence of regular surface flow (e.g., bed and bank) but the vegetation or soil criterion was not met. Jurisdictional limits for these areas were delineated by the ordinary high water mark (OHWM), which is defined in 33 CFR Section 329.11 as “that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank; shelving; changes in the character of the soil; destruction of terrestrial vegetation; the presence of litter or debris; or other appropriate means that consider the characteristics of the surrounding areas.”

CDFG jurisdictional boundaries were determined based on the presence of riparian vegetation or regular surface flow. Streambeds within CDFG jurisdiction were delineated based on the definition of streambed as “a body of water that flows at least periodically or intermittently through a bed or channel having banks and supporting fish or other aquatic life. This includes watercourses having a surface or subsurface flow that supports riparian vegetation” (Title 14, Section 1.72). Riparian habitat is not defined in Title 14, but the section refers to vegetation and habitat associated with a stream. CDFG jurisdictional habitat includes all riparian shrub or tree canopy that may extend beyond stream banks.

City jurisdictional areas were based on the definition of wetlands pursuant to the Environmentally Sensitive Lands Regulations (ESL) of the Land Development Code and include areas characterized by any of the following conditions: (1) All areas persistently or periodically containing naturally occurring wetland vegetation communities characteristically dominated by hydrophytic vegetation, including but not limited to salt marsh, brackish marsh, freshwater marsh, riparian forest, oak riparian forest, riparian woodlands, riparian scrub, and vernal pools; (2) Areas that have hydric soils or wetland hydrology and lack naturally occurring wetland vegetation communities because human activities have removed the historic wetland vegetation or catastrophic or recurring natural events or processes have acted to preclude the establishment of wetland vegetation as in the case of salt pannes and mudflats; (3) Areas lacking wetland vegetation communities, hydric soils, and wetland hydrology due to non-permitted filling of previously existing wetlands; or (4) Areas mapped as wetlands on Map C-713 as shown in Chapter 13, Article 2, Division 6 (Sensitive Coastal Overlay Zone). City-defined wetlands are the same as CDFG wetlands in all locations within the study area.

2.3 SURVEY LIMITATIONS

Site visits were conducted during daylight hours. No focused plant or animal surveys were conducted. Complete inventories of biological resources present on a site often require numerous focused surveys at different times of day during different seasons. Some species such as annual plants are present in only spring or summer, and nocturnal animals are difficult to detect during the day. Other species may be present in such low numbers that they could be missed. Due to such timing and seasonal variations, survey results are not an absolute list of

all species that the study area may support. Sensitive species with potential to occur are described in Sections 4.2.2 and 4.3.2 of this report.

Vegetation and wetland delineation boundaries were converted to a GIS database to assist in estimating the general magnitude of impacts that could be associated with future channel maintenance activities. Due to the precision possible through GIS, the individual impact estimates in many of the tables that appear in this report infer an accuracy level that is somewhat misleading due to the programmatic estimates of maintenance work to be conducted. Thus, these numbers should be considered approximations and not definitive.

2.4 NOMENCLATURE

Nomenclature used in this report follows the conventions used in the City Biology Guidelines (City 2001) and the MSCP (City 1997). Vegetation community classifications follow Holland (1986); Latin plant names follow Hickman, ed. (1993) while common names follow Hickman or California Native Plant Society ([CNPS] 2011). Sensitive plant status follows CNPS (2011) and CDFG (2011a and b). Animal nomenclature is taken from Heath (2004) for butterflies, Crother (2001) for amphibians and reptiles, American Ornithologists' Union (2010) for birds, and Baker et al. (2003) for mammals. Sensitive animal status follows CDFG (2011c and d).

3.0 RESULTS

3.1 VEGETATION COMMUNITIES

Eleven wetland/riparian and 7 upland vegetation communities occur within the study area, which covers approximately 332.7 acres. Wetland/riparian vegetation communities within the study area include southern riparian forest, southern sycamore riparian woodland, southern willow scrub, mule fat scrub, riparian scrub, freshwater marsh, cismontane alkali marsh, southern coastal salt marsh, coastal brackish marsh, disturbed wetland, and streambed/open water/natural flood channel. Approximately 136.78 acres of wetland/riparian habitat were mapped within the study area (Table 3). Upland vegetation communities observed include Diegan coastal sage scrub, southern mixed chaparral, non-native grassland, eucalyptus woodland, non-native vegetation/ornamental, disturbed habitat/ruderal, and developed land. Approximately 195.9 acres of upland habitat, including developed land, were mapped within the study area (Table 3). Appendix B includes vegetation mapping and jurisdictional delineations at 1"=150' scale for all areas within the Master Program study area. Figure 4 can be used as a key map for Appendix B. This figure depicts each map page location in relation to other map pages and hydrologic unit.

**Table 3
EXISTING VEGETATION COMMUNITIES***

| HU | Wetlands† | | | | | | | | | | | Total |
|------------------|--------------|-------------|--------------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|--------------|---------------|
| | SRF | SRW | SWS | MFS | RS | FWM | CAM | CSM | CBM | DW | STM/OW | |
| San Dieguito | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.17 | 0.00 | 0.00 | 0.00 | 0.02 | 0.02 | 0.21 |
| Peñasquitos | 0.00 | 0.00 | 5.05 | 0.80 | 0.00 | 7.23 | 0.00 | 1.66 | 0.53 | 0.19 | 5.43 | 20.89 |
| San Diego | 36.3 | 0.77 | 3.30 | 0.16 | 0.00 | 11.91 | 0.02 | 0.00 | 0.00 | 0.54 | 24.01 | 77.01 |
| Pueblo San Diego | 0.00 | 0.00 | 2.87 | 0.50 | 0.50 | 5.41 | 0.00 | 0.53 | 0.00 | 5.38 | 6.69 | 21.88 |
| Sweetwater | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.03 |
| Otay | 0.00 | 0.00 | 0.30 | 0.00 | 0.00 | 1.94 | 0.00 | 0.00 | 0.00 | 0.07 | 0.00 | 2.31 |
| Tijuana | 0.00 | 0.00 | 4.66 | 1.93 | 0.00 | 1.63 | 0.00 | 0.00 | 0.00 | 2.93 | 3.30 | 14.45 |
| TOTAL | 36.30 | 0.77 | 16.18 | 3.39 | 0.50 | 28.29 | 0.02 | 2.19 | 0.53 | 9.16 | 39.45 | 136.78 |

| HU | Uplands† | | | | | | | Total |
|------------------|------------|------------|-------------|------------|-------------|-------------|--------------|--------------|
| | Tier II | Tier IIIA | Tier IIIB | Tier IV | | | | |
| | DCSS | SMC | NNG | EW | NNV/ ORN | DH/ RUD | DEV | |
| San Dieguito | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 | 0.0 | 5.0 | 5.3 |
| Peñasquitos | 1.1 | 0.5 | 1.9 | 1.7 | 4.7 | 4.8 | 28.0 | 42.7 |
| San Diego | 1.2 | 0.1 | 2.6 | 0.9 | 3.8 | 6.0 | 22.4 | 37.0 |
| Pueblo San Diego | 4.7 | 0.0 | 10.2 | 0.2 | 3.5 | 10.5 | 48.2 | 77.3 |
| Sweetwater | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.3 | 1.3 |
| Otay | 0.0 | 0.0 | 2.2 | 0.0 | 0.5 | 6.6 | 2.4 | 11.7 |
| Tijuana | 0.0 | 0.0 | 2.8 | 0.0 | 1.5 | 8.1 | 8.2 | 20.6 |
| TOTAL | 7.0 | 0.6 | 19.7 | 2.8 | 14.3 | 36.0 | 115.5 | 195.9 |

*Upland habitats are rounded to the nearest 0.1 acre, while wetland habitats are rounded to the nearest 0.01; thus, totals reflect rounding

†Habitat acronyms: CAM=cismontane alkali marsh, CBM=coastal brackish marsh, CSM=coastal salt marsh, DCSS=Diegan coastal sage scrub, DEV=developed land, DH/RUD=disturbed habitat/ruderal, DW=disturbed wetland, EW=eucalyptus woodland, FWM=freshwater marsh, MFS=mule fat scrub, NNG=non-native grassland, NNV/ORN=non-native vegetation/ornamental, RS=riparian scrub, SMC=southern mixed chaparral, SRF=southern riparian forest, SRW=southern sycamore riparian woodland, STM/OW=streambed/open water, SWS=southern willow scrub

3.1.1 Wetland/Riparian Vegetation Communities

Southern Riparian Forest (including disturbed)

Southern riparian forests are composed of winter deciduous trees that require an abundant supply of water at or near the soil surface for most of the year. Species such as willows (*Salix* spp.) and western cottonwood (*Populus fremontii*) form a dense, medium-height canopy. This habitat occurs in wet areas along frequently flooded rivers and creeks, generally with fine alluvial soils. Typical species present in this habitat in the study area include red willow (*Salix laevigata*), western sycamore (*Platanus racemosa*), black willow (*S. gooddingii*), arroyo willow (*S. lasiolepis*), stinging nettle (*Urtica dioica*), pampas grass (*Cortaderia selloana*), and giant reed. Approximately 36.30 acres of this habitat were mapped along Rose and Soledad creeks, Smuggler's Gulch, Murphy Canyon, and the San Diego River.

Southern Sycamore Riparian Woodland (including disturbed)

Southern sycamore riparian woodland is a tall, open, broad-leaved, winter-deciduous streamside woodland dominated by western sycamore (*Platanus racemosa*). These stands of woodlands seldom form closed canopy forests and may appear as trees scattered in a shrubby thicket of sclerophyllous and deciduous species. Species present on site include western sycamore, poison oak (*Toxicodendron diversilobum*), western cottonwood, castor bean (*Ricinus communis*), and ripgut grass (*Bromus diandrus*). Approximately 0.77 acre of southern sycamore riparian woodland was mapped along Alvarado Channel, Murphy Canyon, Soledad Creek, and the San Diego River.

Southern Willow Scrub (including disturbed)

Southern willow scrub consists of dense, broad-leaved, winter-deciduous stands of trees dominated by shrubby willows in association with mule fat (*Baccharis salicifolia*) and with scattered emergent cottonwood and western sycamores. This vegetation community occurs on loose, sandy, or fine gravelly alluvium deposited near stream channels during flood flows. Frequent flooding maintains this early seral community, preventing succession to a riparian woodland or forest (Holland 1986). Typical species occurring in this habitat within the study area include arroyo willow, red willow, black willow, sandbar willow (*Salix exigua*), mule fat, western sycamore, tamarisk (*Tamarix* sp.), Brazilian pepper (*Schinus terebinthifolius*), Mexican fan palm (*Washingtonia robusta*), pampas grass, giant reed, and cattails (*Typha* spp.). Approximately 16.18 acres of this habitat were mapped along Alvarado, Encanto, Fairmont, Auburn Creek, and Solola channels; Chollas, Nestor, Rose, Soledad, Los Peñasquitos, South Chollas, and Tecolote creeks; Murphy Canyon; San Diego and Tijuana rivers; Smuggler's Gulch; and several smaller unnamed drainages.

Mule Fat Scrub (including disturbed)

Mule fat scrub is a depauperate, shrubby, riparian scrub community dominated by mule fat and interspersed with shrubby willows. This vegetation community occurs along intermittent stream channels with a fairly coarse substrate and moderate depth to the water table. Approximately

3.39 acres of mule fat scrub were mapped along Chollas, Los Peñasquitos, Rose, and South Chollas creeks; Encanto, Auburn Creek, and Virginia channels; San Diego and Tijuana rivers; Smuggler's Gulch; and smaller unnamed drainages.

Riparian Scrub (including disturbed)

Riparian scrub is a generic term for several shrub-dominated communities that occur along drainage and/or riparian corridors. Typical species in this habitat within the study area include mule fat, Hooker's evening primrose (*Oenothera elata* ssp. *hookeri*), and San Diego golden-bush (*Isocoma menziesii* var. *menziesii*). Approximately 0.50 acre of riparian scrub was mapped along Chollas Creek, Encanto and Auburn Creek channels, San Diego River, and a smaller unnamed channel.

Freshwater Marsh (including disturbed)

Freshwater marsh is dominated by perennial emergent monocots that reach between 12 and 15 feet. This vegetation type occurs along the coast and in coastal valleys, near river mouths, and around lake and springs margins. Species present in this habitat in the study area include cattails, California bulrush (*Scirpus californicus*), umbrella sedge (*Cyperus involucratus*), tall flatsedge (*C. eragrostis*), watercress (*Rorippa nasturtium-aquaticum*), spike-rush (*Eleocharis* spp.), and rabbitsfoot grass (*Polypogon monspeliensis*). Approximately 28.29 acres were mapped within the Alvarado, Encanto, Auburn Creek, Jamacha, Mission Bay High School, Montezuma, Nimitz, Cottonwood/Nordica, Rancho Bernardo, Sanyo, Smythe, Solola, and Tocayo channels; Chollas, Los Peñasquitos, Nestor, Rose, Murphy Canyon, Soledad, and South Chollas creeks; the San Diego and Tijuana rivers; and various smaller unnamed drainages.

Cismontane Alkali Marsh (including disturbed)

Cismontane alkali marsh is dominated by perennial, emergent, herbaceous monocots. Standing water or saturated soils are present during most or all of the year, and high evaporation and low input of fresh water render these marshes somewhat salty. Characteristic species include yerba mansa (*Anemopsis californica*), sedges (*Carex* spp.), saltgrass (*Distichlis spicata*), beardless wild rye grass (*Leymus triticoides*), and rushes (*Juncus* spp.), among others. Yerba mansa, saltgrass, Mexican rush (*Juncus mexicanus*), bristly ox-tongue (*Picris echioides*), Hooker's evening primrose, and southwestern spiny rush (*Juncus acutus* ssp. *leopoldii*) were the dominant species in this habitat on site. Approximately 0.02 acres of cismontane alkali marsh were mapped in the Alvarado Channel.

Southern Coastal Salt Marsh

Coastal salt marsh is dominated by plants adapted to the higher soil salinity levels and frequent inundation in areas periodically flooded by salt water. Typical plant species include California seablite (*Suaeda californica*), common glasswort/pickleweed (*Salicornia* spp.), and saltgrass. Species present on site included glasswort, alkali-heath (*Frankenia salina*), fleshy jaumea (*Jaumea carnosa*), western marsh-rosemary (*Limonium californicum*), California loosestrife (*Lythrum californicum*), and saltgrass. Approximately 2.19 acres of southern coastal salt marsh were mapped within Chollas and Rose creeks.

Coastal Brackish Marsh

Coastal brackish marsh is dominated by perennial, emergent, herbaceous monocots that are adapted to varying soil salinities due to input from saltwater and freshwater. It is very similar to cismontane alkali marsh, with many of the same species. This habitat typically intergrades with coastal salt marshes toward the ocean and occasionally with freshwater marshes at the mouths of rivers. Species observed in this habitat on site include cattails, southwestern spiny rush, saltgrass, and glasswort. Approximately 0.53 acre of coastal brackish marsh was mapped in Rose Creek near its confluence with Mission Bay.

Disturbed Wetland

Disturbed wetland is typically dominated by exotic wetland species that have likely become established following previous disturbance(s), although it may also contain native species. The habitat composition is highly variable based on the hydrology, soils, and type and frequency of disturbance. Species present within the study area include rabbitsfoot grass, curly dock (*Rumex crispus*), giant reed, bristly ox-tongue, cockle-bur (*Xanthium strumarium*), umbrella sedge, common celery (*Apium graveolens*), Bermuda grass (*Cynodon dactylon*), and poison hemlock (*Conium maculatum*). Approximately 9.16 acres of disturbed wetland were mapped within the Alvarado, Encanto, Auburn Creek, Jamacha, Cottonwood/Nordica, Parkside, Pershing, Rancho Bernardo, Sanyo, Smythe, Solola, Tocayo, Virginia, and Washington channels; Chollas, Los Peñasquitos, Nestor, Soledad, and South Chollas creeks; San Diego River; and several smaller unnamed drainages. Giant reed-dominated disturbed wetland areas include Alvarado, Auburn Creek, Washington, Jamacha, Solola, and Smythe channels and South Chollas Creek. Giant reed is mixed with native habitats along the Los Peñasquitos, Soledad, Chollas, and Nestor creeks; Smuggler's Gulch; and the Tijuana and San Diego rivers.

Streambed/Open Water

Streambed/open water habitat includes unvegetated drainages with a natural bottom (i.e., not concrete-lined) regulated by the Corps as non-wetland WUS and by CDFG as streambed/open water. Areas mapped as open water either support perennial surface flows or were inundated at the time of mapping. Approximately 39.45 acres of streambed and/or open water were mapped within the storm water facilities in the study area. The City regulates these areas as natural flood channels.

3.1.2 Upland Vegetation Communities

Diegan Coastal Sage Scrub (including disturbed; Tier II)

Diegan coastal sage scrub is dominated by low, soft-woody subshrubs on xeric sites characterized by shallow soils. Many of the shrubs are drought-deciduous, an adaptation that allows the habitat to withstand the prolonged drought period in the summer and fall (Holland 1986). Sage scrub species have relatively shallow root systems and open canopies that allow for a substantial seasonal herbaceous (annual plant) component. Typical species on site include California sagebrush (*Artemisia californica*), California buckwheat (*Eriogonum fasciculatum*

ssp. *fasciculatum*), laurel sumac (*Malosma laurina*), black sage (*Salvia mellifera*), California encelia (*Encelia californica*), coyote brush (*Baccharis pilularis*), lemonadeberry (*Rhus integrifolia*), broom baccharis (*Baccharis sarothroides*), and coast prickly-pear (*Opuntia littoralis*). Disturbed Diegan coastal sage scrub contains many of the same shrub species as the undisturbed type but is sparser and has a higher proportion of non-native annual species. Areas dominated by broom baccharis also were classified as disturbed Diegan coastal sage scrub, as these areas were upslope of drainage facilities at elevations corresponding to adjacent upland habitats. Approximately 7.0 acres of Diegan coastal sage scrub were mapped adjacent to Alvarado, Encanto, Fairmont, and Auburn Creek channels; Chollas, Nestor, Rose, Soledad, South Chollas, and Tecolote creeks; Murphy canyon; and the San Diego River.

Southern Mixed Chaparral (including disturbed; Tier IIIA)

Southern mixed chaparral is composed of broad-leaved sclerophyllous shrubs that can reach 6 to 10 feet in height and form dense often nearly impenetrable stands with poorly developed understories. In this mixed chaparral the shrubs are generally tall and deep rooted, with a well developed soil litter layer, high canopy coverage, low light levels within the canopy, and lower soil temperatures (Keeley and Keeley 1988). This vegetation community occurs on dry, rocky, often steep north-facing slopes with little soil. As conditions become more mesic, broad-leaved sclerophyllous shrubs that resprout from underground root crowns become dominant. Species present on site include chamise, toyon (*Heteromeles arbutifolia*), mountain mahogany, and laurel sumac. Approximately 0.6 acre of southern mixed chaparral was mapped along the Alvarado, Chateau, and Solola channels as well as 2 smaller unnamed drainages.

Non-native Grassland (Tier IIIB)

Non-native grassland is a dense to sparse cover of annual grasses, often associated with numerous species of showy-flowered native annual forbs. This association occurs on gradual slopes with deep, fine-textured, usually clay soils. Characteristic species include oats (*Avena* spp.), foxtail chess (*Bromus madritensis* ssp. *rubens*), ripgut grass, ryegrass (*Lolium* sp.), and mustard (*Brassica* spp.). Most of the annual introduced species that comprise the majority of species and biomass within the non-native grassland originated from the Mediterranean region, an area with a long history of agriculture and a climate similar to California. Approximately 19.7 acres of non-native grassland were mapped within or adjacent to the Alvarado, Cowles Mountain, Encanto, Fairmont, Auburn Creek, Jamacha, Mission Bay High School, Montezuma, Nimitz, San Carlos, Smythe, Solola, Tocayo, Virginia, and Washington channels; Chollas, Nestor, Rose, Soledad, South Chollas, and Tecolote creeks; the San Diego River; and several smaller unnamed drainages.

Eucalyptus Woodland (Tier IV)

Eucalyptus woodland is dominated by any of several species of eucalyptus (*Eucalyptus* spp.), all of which are large, non-native trees that produce abundant amounts of leaf and bark litter, the chemical and physical characteristics of which limit the ability of other species to grow in the understory, causing floristic diversity to decrease. Eucalyptus has been planted extensively in San Diego County as wind blocks, as ornamentals, and for hardwood production. If sufficient

moisture is available, eucalyptus trees become naturalized and are able to reproduce and expand their range, which has happened in many riparian areas. Approximately 2.8 acres of eucalyptus woodland were mapped in or adjacent to the Alvarado, Jamacha, Nimitz, Rancho Bernardo, and San Carlos channels; Chollas, Rose, Soledad, and South Chollas creeks; Murphy Canyon; the San Diego River; and several smaller unnamed drainages. Although this habitat is not considered sensitive, it may support nesting raptor species, which are protected by the federal MBTA, under which direct or indirect impacts to an active raptor nest are not allowed.

Non-native Vegetation/Ornamental (Tier IV)

Non-native vegetation/ornamental consists of cultivated plants that have naturalized into otherwise native habitat areas or were put in place by humans, usually for the purpose of beautification, windbreaks, or other related purposes. Species observed in this habitat include Peruvian pepper (*Schinus terebinthifolius*), Brazilian pepper, golden wattle (*Acacia longifolia*), myoporum (*Myoporum laetum*), sea-fig (*Carpobrotus chilensis*), hottentot-fig (*Carpobrotus edulis*), oleander (*Nerium oleander*), Canary Island date palm (*Phoenix canariensis*), fountain grass (*Pennisetum setaceum*), and carrotwood (*Cupaniopsis anacardioides*). Approximately 14.3 acres of non-native vegetation/ornamental were mapped along the Alvarado, Encanto, Fairmont, Auburn Creek, Jamacha, Mission Bay High School, Nimitz, Cottonwood/Nordica, Rancho Bernardo, San Carlos, Sanyo, Smythe, and Solola channels; Chollas, Nestor, Rose, Soledad, South Chollas, and Tecolote creeks; Murphy canyon; the San Diego River; Smuggler's Gulch; and several smaller unnamed channels.

Disturbed Habitat/Ruderal (Tier IV)

Disturbed habitat/ruderal areas are devoid of vegetation due to soil disturbance (dirt roads and/or grading) or are dominated by exotic annual forbs without a major grass component. Pursuant to City guidelines for mapping, these areas can be bare ground or dominated by at least 50 percent cover of invasive broad-leaved non-native plant species when vegetated. Plants observed in this community on site include garland daisy (*Chrysanthemum coronarium*), Russian thistle (*Salsola tragus*), castor-bean (*Ricinus communis*), star-thistle (*Centaurea melitensis*), shortpod mustard (*Hirschfeldia incana*), fennel (*Foeniculum vulgare*), horehound (*Marrubium vulgare*), cheeseweed (*Malva parviflora*), and filaree (*Erodium* spp.). Approximately 36.0 acres of disturbed/ruderal habitat were mapped in or adjacent to Alvarado, Cowles Mountain, Encanto, Auburn Creek, Jamacha, San Carlos, Solola, Tocayo, and Virginia channels; Chollas, Los Peñasquitos, Nestor, Rose, Soledad, South Chollas, and Tecolote creeks; Murphy Canyon; the San Diego River; Smuggler's Gulch; and adjacent to several smaller unnamed drainages.

Developed

Developed land is where permanent structures and/or pavement have been placed. Unvegetated, concrete-lined channels and ditches constitute the majority of developed land mapped in the study area, for a total of approximately 115.5 acres. The following channels are entirely concrete-lined: Chateau, Cowles Mountain, Cottonwood/Nordica, Parkside, Pershing, Rancho Bernardo, San Carlos, Sanyo, and Switzer. Both Tecolote Creek and Tocayo Channel are almost

entirely concrete-lined within the mapping area, with a small amount of natural bottom at one or both ends of the mapped extent. The following channels contain sections that are natural bottom and sections that are concrete-lined: Alvarado, Encanto, Auburn Creek, Jamacha, Montezuma, Nimitz, Smythe, Solola, Tocayo, Virginia, and Washington channels; Chollas, Nestor, Rose, Soledad, South Chollas, and Tecolote creeks; and Murphy canyon. Several smaller unnamed drainages are also entirely or partially concrete-lined.

3.2 PLANT SPECIES OBSERVED

A total of 123 plant species were observed within the study area. A list of plant species observed during the site visits is provided in Appendix C.

3.3 ANIMAL SPECIES OBSERVED OR DETECTED

A total of 95 animal species were observed/detected within the study area: 12 butterflies and 3 other invertebrates, 1 amphibian, 3 reptiles, 68 birds, and 8 mammals (Appendix D). All animal species were identified by direct observation or vocalizations, presence of scat and/or tracks, or other sign.

3.4 JURISDICTIONAL AREAS

A program-level jurisdictional delineation was conducted within subject storm water facility channels and sedimentation basins with results categorized by HUs. An estimate of the amount of jurisdictional wetlands within each HU is shown in Tables 3 and 4. Mapping was conducted along segments of several major and minor water areas, including Rose, Los Peñasquitos, Soledad, Chollas, South Chollas, Alvarado, Tecolote, and Nestor creeks; the San Diego and Tijuana rivers; the Jamacha and Encanto channels; Murphy Canyon; and others. Jurisdictional areas within the study area consist of southern riparian forest, southern sycamore riparian woodland, southern willow scrub, mule fat scrub, riparian scrub, freshwater marsh, cismontane alkali marsh, southern coastal salt marsh, coastal brackish marsh, disturbed wetland, and streambed/open water/natural flood channel.

3.4.1 Federal (Corps) Jurisdictional Areas

Areas under Corps jurisdiction total approximately 138.40 acres and consist of approximately 56.39 acres of wetlands and 82.01 acres of non-wetland WUS. Non-wetland WUS were divided into earthen-bottom and concrete-bottom channels, and comprise approximately 43.88 acres and 38.13 acres, respectively. As illustrated in Table 4, the majority of wetland habitat occurs along named channels within the San Diego, Pueblo, and Peñasquitos HUs.

3.4.2 State (CDFG) Jurisdictional Areas

CDFG jurisdictional areas constitute approximately 136.78 acres within the study area, comprising 97.33 acres of vegetated wetland habitat and 39.45 acres of streambed. The approximate acreage of each type of wetlands included in the CDFG's jurisdiction area are as follows: 36.30 acres of southern riparian forest, 0.77 acre of southern sycamore riparian

woodland, 16.18 acres of southern willow scrub, 3.39 acres of mule fat scrub, 0.50 acre of riparian scrub, 28.29 acres of freshwater marsh, 0.02 acre of cismontane alkali marsh, 2.19 acres of coastal salt marsh, 0.53 acre of coastal brackish marsh, 9.16 acres of disturbed wetland, and 39.45 acres of unvegetated streambed (Table 5).

3.4.3 City Wetlands

City wetlands include the same areas as noted above for CDFG jurisdiction. City jurisdictional areas therefore constitute approximately 136.78 acres within the study area, of which 97.33 acres are vegetated with wetland or riparian vegetation and 39.45 acres are unvegetated natural flood channels (Table 5).

Table 4
EXISTING CORPS JURISDICTIONAL AREAS (acre[s])*

| HU† | Wetlands‡ | | | | | | | | | | | Non-wetland WUS | | Total |
|------------------|--------------|-------------|-------------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|--------------|-----------------|--------------|---------------|
| | SRF | SRW | SWS | MFS | RS | FWM | CAM | CSM | CBM | DW | Subtotal | Earthen | Concrete | |
| San Dieguito | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.02 | 1.49 | 1.52 |
| Peñasquitos | 0.00 | 0.00 | 2.40 | 0.09 | 0.00 | 6.14 | 0.00 | 1.66 | 0.31 | 0.05 | 10.65 | 5.29 | 13.39 | 29.33 |
| San Diego | 12.75 | 0.00 | 3.16 | 0.05 | 0.00 | 10.00 | 0.00 | 0.00 | 0.00 | 0.03 | 25.99 | 24.99 | 5.85 | 56.83 |
| Pueblo San Diego | 0.00 | 0.00 | 1.23 | 0.19 | 0.36 | 5.35 | 0.00 | 0.53 | 0.00 | 3.21 | 10.87 | 7.92 | 14.91 | 33.70 |
| Sweetwater | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.28 | 0.28 |
| Otay | 0.00 | 0.00 | 0.16 | 0.00 | 0.00 | 1.71 | 0.00 | 0.00 | 0.00 | 0.04 | 1.91 | 0.00 | 0.57 | 2.48 |
| Tijuana | 0.00 | 0.00 | 2.56 | 0.67 | 0.00 | 1.44 | 0.00 | 0.00 | 0.00 | 2.29 | 6.96 | 5.66 | 1.64 | 14.26 |
| TOTAL | 12.75 | 0.00 | 9.51 | 1.00 | 0.36 | 24.65 | 0.00 | 2.19 | 0.31 | 5.62 | 56.39 | 43.88 | 38.13 | 138.40 |

*Totals reflect rounding

†The HUs correspond to the following Storm Water Facility Maps in Appendix B: San Dieguito HU=Maps 1-3; Peñasquitos HU=Maps 6-46, and 55-57; San Diego HU=Maps 47-54, 58-66, 81-83, and 145-147; Pueblo San Diego HU= Maps 67-80 and 84-121; Sweetwater HU= Map 122; Otay HU= Maps 131-134; Tijuana HU= Maps 123-130 and 136-139

‡Habitat acronyms: CAM=cismontane alkali marsh, CBM=coastal brackish marsh, CSM=coastal salt marsh, DW=disturbed wetland, FWM=freshwater marsh, MFS=mule fat scrub, RS=riparian scrub, SRF=southern riparian forest, SRW=southern sycamore riparian woodland, SWS=southern willow scrub, WUS=Waters of the U.S.

Table 5
EXISTING CDFG AND CITY JURISDICTIONAL AREAS (acre[s])*

| Hydrologic Unit (HU)† | Wetland/Riparian Habitat‡ | | | | | | | | | | | Drainage | Total CDFG /City |
|-----------------------|---------------------------|-------------|--------------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|------------------------|--------------|------------------|
| | SRF | SRW | SWS | MFS | RS | FWM | CAM | CSM | CBM | DW | Wetland/Riparian Total | STM/NFC | |
| San Dieguito | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.17 | 0.00 | 0.00 | 0.00 | 0.02 | 0.19 | 0.02 | 0.21 |
| Peñasquitos | 0.00 | 0.00 | 5.05 | 0.80 | 0.00 | 7.23 | 0.00 | 1.66 | 0.53 | 0.19 | 15.46 | 5.43 | 20.89 |
| San Diego | 36.3 | 0.77 | 3.30 | 0.16 | 0.00 | 11.91 | 0.02 | 0.00 | 0.00 | 0.54 | 53.00 | 24.01 | 77.01 |
| Pueblo San Diego | 0.00 | 0.00 | 2.87 | 0.50 | 0.50 | 5.41 | 0.00 | 0.53 | 0.00 | 5.38 | 15.19 | 6.69 | 21.88 |
| Sweetwater | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.03 | 0.00 | 0.03 |
| Otay | 0.00 | 0.00 | 0.30 | 0.00 | 0.00 | 1.94 | 0.00 | 0.00 | 0.00 | 0.07 | 2.31 | 0.00 | 2.31 |
| Tijuana | 0.00 | 0.00 | 4.66 | 1.93 | 0.00 | 1.63 | 0.00 | 0.00 | 0.00 | 2.93 | 11.15 | 3.30 | 14.45 |
| TOTAL | 36.30 | 0.77 | 16.18 | 3.39 | 0.50 | 28.29 | 0.02 | 2.19 | 0.53 | 9.16 | 97.33 | 39.45 | 136.78 |

*Totals reflect rounding

†The HUs correspond to the following Storm Water Facility Maps in Appendix B: San Dieguito HU=Maps 1-; Peñasquitos HU=Maps 6-46, and 55-57; San Diego HU=Maps 47-54, 58-66, 81-83, and 145-147; Pueblo San Diego HU=Maps 67-80 and 84-121; Sweetwater HU=Map 122; Otay HU=Maps 131-134; Tijuana HU=Maps 123-130 and 136-139

‡Habitat acronyms: CAM=cismontane alkali marsh, CBM=coastal brackish marsh, CSM=coastal salt marsh, DW=disturbed wetland, FWM=freshwater marsh, MFS=mule fat scrub, NFC=City natural flood channel, RS=riparian scrub, SRF=southern riparian forest, SRW=southern sycamore riparian woodland, STM=CDFG streambed (includes open water habitat), SWS=southern willow scrub

4.0 SENSITIVE RESOURCES

4.1 SENSITIVE VEGETATION COMMUNITIES

Sensitive vegetation communities are considered rare within the region or sensitive by CDFG (Holland 1986) or the City (City 2001). These communities, in any form, are considered sensitive because they have been historically depleted, are naturally uncommon, or support sensitive species. The study area supports the following 14 sensitive vegetation communities: southern riparian forest, southern sycamore riparian woodland, southern willow scrub, mule fat scrub, riparian scrub, freshwater marsh, cismontane alkali marsh, southern coastal salt marsh, coastal brackish marsh, disturbed wetland, natural flood channel, Diegan coastal sage scrub, southern mixed chaparral, and non-native grassland.

4.2 SENSITIVE PLANT SPECIES

4.2.1 Sensitive Plants Observed

Sensitive plant species are considered rare, a characteristic that may be based on 3 distributional traits: geographic range, habitat specificity, or population size (Rabinowitz et al. 1986). A species that exhibits a small or restricted geographic range (such as those endemic to the San Diego region) is geographically rare. A species may be more or less abundant but occur only in very specific habitats. Lastly, a species may be widespread but exists naturally in small populations. High-interest plants include those listed by CDFG (2011 c and d), CNPS (2011), and City (2001).

No federally or state listed species or City narrow endemic plants species were observed within the study area; however, the following 4 sensitive plant species were observed and are described below: single-whorl burrobush (*Ambrosia monogyra*), San Diego marsh-elder (*Iva hayesiana*), southwestern spiny rush (*Juncus acutus* ssp. *leopoldii*), and San Diego sunflower (*Viguiera laciniata*).

Single-whorl burrobush (*Ambrosia monogyra*)

Listing: --/--; CNPS List 2.2

Distribution: San Diego County, San Bernardino County, and east to western Texas

Habitat: Sandy washes, chaparral, and desert scrub communities.

Status on site: Observed in ruderal habitat on banks of a minor channel paralleling Delevan Drive west of Chollas Creek (Map No. 79a). CNNDDB reports species in general vicinity of Map Nos. 138-139 (Smuggler's Gulch; CDFG 2011).

San Diego marsh-elder (*Iva hayesiana*)

Listing: --/--; CNPS List 2.2

Distribution: San Diego County; Baja California, Mexico (Baja)

Habitat: Intermittent streambed creeks are preferred habitat for this low-growing, conspicuous shrub. Riparian canopy is typically open; sandy alluvial embankments with cobbles are frequently colonized.

Status on site: Observed in riparian scrub and Diegan coastal sage scrub adjacent to South Chollas Creek and Famosa Slough (Map Nos. 83, 95, 102). Fairly widespread in San Diego County and expected to occur in other study area locations.

Southwestern spiny rush (*Juncus acutus ssp. leopoldii*)

Listing: --/--; CNPS List 4.2

Distribution: Los Angeles, San Bernardino, San Luis Obispo, Ventura, and San Diego counties; Baja

Habitat: Moist, saline, or alkaline soils in coastal salt marshes and riparian marshes

Status on site: Observed in a seep adjacent to Alvarado Channel (Map No. 62), and in marsh habitat in South Chollas Creek (Map Nos. 94-95).

San Diego sunflower (*Viguiera laciniata*)

Listing: --/--; CNPS List 4.2

Distribution: Known from southern coastal and foothill San Diego County and Baja. Reported localities in San Diego County include San Onofre, Bonsall, Mission Hills, Mission Valley, Spring Valley, La Mesa, and Otay Lake (Beauchamp 1986).

Habitat: Open coastal sage scrub and maritime succulent scrub on a variety of soil types

Status on site: Observed in Diegan coastal sage scrub abutting South Chollas Creek and Encanto Channel on Map Nos. 94, 106, and 107.

4.2.2 Sensitive Plants with Potential to Occur

City narrow endemic plant species not observed during programmatic-level surveys but with potential to occur in the study area are described in Table 6; additional sensitive plant species not observed but with potential to occur are described in Table 7. CNDDDB occurrences of several sensitive plant species occur scattered throughout the City are noted in Tables 6 and 7 when reported in the general vicinity (within an approximate radius of 0.5 to 1.0 mile) of areas mapped for the project.

| Table 6 NARROW ENDEMIC SPECIES WITH POTENTIAL TO OCCUR | | |
|---|---|---|
| SPECIES | STATUS* | POTENTIAL TO OCCUR |
| San Diego thorn-mint (<i>Acanthomintha ilicifolia</i>) | FT**/SE CNPS List 1B.1 MSCP Covered | Low to moderate. Occurs on clay lenses and friable, cracked, clay soils in open areas within grasslands. Project focused around channels that typically do not support appropriate habitat for species. Has been reported in general vicinity of Map Nos. 52, 61-64, and 147 (CDFG 2011). |
| Shaw's agave (<i>Agave shawii</i>) | --/-- CNPS List 2.1 MSCP Covered | Low. Generally occurs in coastal sage scrub and maritime succulent scrub, often on volcanic soils. |

Table 6 (cont.)
NARROW ENDEMIC SPECIES WITH POTENTIAL TO OCCUR

| SPECIES | STATUS* | POTENTIAL TO OCCUR |
|--|---|--|
| San Diego ambrosia (<i>Ambrosia pumila</i>) | FE**/-- CNPS List 1B.1 MSCP Covered | Low to moderate. Primarily restricted to flat or sloping grasslands, often along valley bottoms or areas adjacent to vernal pools as well as creek beds, seasonally dry drainages, and floodplains. Very uncommon. |
| Aphanisma (<i>Aphanisma blitoides</i>) | --/-- CNPS List 1B.2 MSCP Covered | Very low. Occurs on coastal bluffs and beach dunes, little of which occurs within the study area. |
| Coastal dunes milk vetch (<i>Astragalus tener</i> var. <i>titi</i>) | FE/SE CNPS List 1B.1 CA Endemic MSCP Covered | Very low. Occurs in coastal dune communities; no suitable habitat present in the study area. |
| Encinitas baccharis (<i>Baccharis vanessae</i>) | FT/SE CNPS List 1B.1 CA Endemic MSCP Covered | Low. Found in southern maritime chaparral and mature but relatively low-growing southern mixed chaparral. Project focused around channels that do not support appropriate habitat for species (CDFG 2011). |
| Otay tarplant (<i>Deinandra conjugens</i>) | F**T/SE CNPS List 1B.1 | Low to moderate. Found on fractured clay soils in grasslands or lightly vegetated coastal sage scrub. Although not expected, portions of the study area within Otay Mesa may support this species. |
| Short-leaved dudleya (<i>Dudleya brevifolia</i>) | --/SE CNPS List 1B.1 CA Endemic MSCP Covered | Low. Occurs in open areas and sandstone bluffs of chamise chaparral or Torrey pine forest, which are not common in the study area. |
| Variegated dudleya (<i>Dudleya variegata</i>) | --/-- CNPS List 1B.2 MSCP Covered | Low to moderate. Found on cobbly clay soils in very open sage scrub and grassland, and especially among vernal pool communities. Habitat within study area is largely unsuitable to support species. Reported in general vicinity of Map Nos. 61-62 and 126-127 (CDFG 2011). |

**Table 6 (cont.)
NARROW ENDEMIC SPECIES WITH POTENTIAL TO OCCUR**

| SPECIES | STATUS* | POTENTIAL TO OCCUR |
|--|---|--|
| San Diego button-celery (<i>Eryngium aristulatum</i> var. <i>parishii</i>) | FE**/SE CNPS List 1B.1 | Low to moderate. Found in vernal pool communities and vernal moist areas with mima mound topography. Suitable habitat does not occur within study area. Reported in general vicinity of Map Nos. 6-7, 47, 66, 101, 125-128, and 145-146 (CDFG 2011). |
| Prostrate navarretia (<i>Navarretia prostrata</i>) | FT/-- CNPS List 1B.1 CA Endemic MSCP Covered | Very low. Occurs in vernal pool communities, which were not observed within the study area. No CNDDDB records within the Master Program study area. |
| Snake cholla (<i>Opuntia californica</i> var. <i>californica</i>) | --/-- CNPS List 1B.1 MSCP Covered | Moderate. Occurs in Diegan coastal sage scrub on xeric hillsides from Point Loma south to Chula Vista. Species reported in general vicinity of Map Nos. 11-12, 70, and 76-78, (CDFG 2011). |
| California Orcutt's grass (<i>Orcuttia californica</i>) | FE**/SE CNPS List 1B.1 | Low to moderate. Occurs in vernal pool communities, which were not observed within the study area. However, species has been reported in the general vicinity of Map No. 128 (CDFG 2011). |
| San Diego mesa mint (<i>Pogogyne abramsii</i>) | FE**/SE CNPS List 1B.1 CA Endemic | Low. Occurs in vernal pool communities, which were not observed within the study area. Species has been reported in the general vicinity of Map No. 66 (CDFG 2011). |

*Refer to Appendix E for a listing and explanation of status and sensitivity codes

**As of the date of surrender, April 20, 2010, the City has relinquished coverage and does not rely on the City's Federal Incidental Take Permit (ITP) to authorize an incidental take of this vernal pool animal species. Upon completion of a Habitat Conservation Plan (HCP) for vernal pools, the City would enter into an Implementing Agreement in order to obtain species coverage and a Federal ITP for this species.

Table 7
LISTED OR SENSITIVE PLANT SPECIES WITH POTENTIAL TO OCCUR

| SPECIES | STATUS* | POTENTIAL TO OCCUR |
|---|---|--|
| California adolphia (<i>Adolphia californica</i>) | --/-- CNPS List 2.1 | Moderate to high. Most often found in sage scrub but occasionally occurs in peripheral chaparral habitats, particularly on hillsides above creeks. Reported in general vicinity of Map Nos. 4, 51, 59-65, and 76-80 (CDFG 2011). |
| San Diego bur-sage (<i>Ambrosia chenopodifolia</i>) | --/-- CNPS List 2.1 | Low to moderate. Arid, low-growing, fairly open Diegan coastal sage scrub is preferred. Olivenhain cobbly loam is the soil type mapped for San Ysidro population. Reported in general vicinity of Map Nos. 129-130 (CDFG 2011). |
| Del Mar manzanita (<i>Arctostaphylos glandulosa</i> ssp. <i>crassifolia</i>) | FE/-- CNPS List 1B.1 MSCP Covered | Low. Generally found in southern maritime chaparral and Torrey pine forest. Although reported in vicinity of Map Nos. 7-11 (CDFG 2011), not expected to occur within mapped storm water facilities. |
| Otay manzanita (<i>Arctostaphylos otayensis</i>) | --/-- CNPS List 1B.2 MSCP Covered | Very low. Known only from Otay, San Miguel, Jamul, and Guatay mountains in San Diego County. Suitable habitat not present in the study area. |
| San Diego sagewort (<i>Artemisia palmeri</i>) | --/-- CNPS List 4.2 | Moderate to high. Found in moist drainages with sandy soils. SDHNM Plant Atlas has records of this species east of Map 32, as well as in other locations in the City. |
| Dean's vetch (<i>Astragalus deanei</i>) | --/-- CNPS List 1B.1 | Low. Dry hillsides in open coastal sage scrub, chaparral, or southern oak woodland. Rocky sandy loam is soil type mapped for the Tecate population. |
| Coulter's saltbush (<i>Atriplex coulteri</i>) | --/-- CNPS List 1B.2 | Low. Found in coastal bluff scrub, coastal dunes, valley and foothill grasslands, and desert slopes. |
| South coast saltscale (<i>Atriplex pacifica</i>) | --/-- CNPS List 1B.2 | Moderate. Occurs in coastal bluff scrub or sandy, open coastal sage scrub. |
| Davidson's saltscale (<i>Atriplex serenana</i> var. <i>davidsonii</i>) | --/-- CNPS List 1B.2 | Low. Primarily occurs in coastal bluff scrub, although Reiser (2001) suggests it was historically associated with alkaline flats. |
| Golden-spined cactus (<i>Bergerocactus emoryi</i>) | --/-- CNPS List 2.2 | Low. Sandy soils and dry bluffs along coast associated with maritime succulent scrub. Reported in general vicinity of Map Nos. 128-135 (CDFG 2011). |

**Table 7 (cont.)
LISTED OR SENSITIVE PLANT SPECIES WITH POTENTIAL TO OCCUR**

| SPECIES | STATUS* | POTENTIAL TO OCCUR |
|---|---|---|
| Thread-leaved brodiaea (<i>Brodiaea filifolia</i>) | FT/SE CNPS List 1B.1 MSCP Covered | Low. Clay soils in vernal moist grasslands and vernal pool periphery are typical locales. |
| Orcutt's brodiaea (<i>Brodiaea orcuttii</i>) | --/-- CNPS List 1B.1 MSCP Covered | Low to moderate. Occurs in vernal moist grasslands and on the periphery of vernal pools but will occasionally grow on streamside embankments (Reiser 2001). Reported in general vicinity of Map Nos. 51-52 (CDFG 2011). |
| Dunn's mariposa lily (<i>Calochortus dunnii</i>) | --/SR CNPS List 1B.2 MSCP Covered | Low. Dry, stony ridges and firebreaks in chaparral or grassland/chaparral ecotone. Appears to be restricted to gabbroic and metavolcanic soils. |
| Lakeside ceanothus (<i>Ceanothus cyaneus</i>) | --/-- CNPS List 1B.2 MSCP Covered | Very low. Generally found in inland chaparral from Crest up to the Lakeside foothills (Reiser 2001). Suitable habitat does not occur within the study area. |
| Wart-stemmed ceanothus (<i>Ceanothus verrucosus</i>) | --/-- CNPS List 2.2 MSCP Covered | Low. Xeric chamise and mixed chaparrals. Reported in general vicinity of Map Nos. 6-11, 42, 59-66, 70, and 86 (CDFG 2011). However, very little chaparral mapped in actual study area. |
| Southern tarplant (<i>Centromadia parryi</i> ssp. <i>australis</i>) | --/-- CNPS List 1B.1 | Low. Found in valley and foothill grasslands, particularly near alkaline locales. |
| Orcutt's pincushion (<i>Chaenactis glabriuscula</i> var. <i>orcuttiana</i>) | --/-- CNPS List 1B.1 | Low to moderate. Occurs in open Diegan coastal sage scrub, typically in proximity to moist ocean breezes (Reiser 2001). |
| Orcutt's spineflower (<i>Chorizanthe orcuttiana</i>) | FE/SE CNPS List 1B.1 | Low. Found in coastal chamise chaparral openings with loose sandy substrate (Reiser 2001). Very little chaparral mapped within study area. |
| Long-spined spineflower (<i>Chorizanthe polygonoides</i> var. <i>longispina</i>) | --/-- CNPS List 1B.2 | Low. Typically found on clay lenses and on periphery of vernal pools. Reported in general vicinity of Map No. 47 (CDFG 2011). |
| Delicate clarkia (<i>Clarkia delicata</i>) | --/-- CNPS List 1B.2 | Low. Shaded areas or the periphery of oak woodlands and cismontane chaparral. Very little appropriate habitat occurs within the study area. |

**Table 7 (cont.)
LISTED OR SENSITIVE PLANT SPECIES WITH POTENTIAL TO OCCUR**

| SPECIES | STATUS* | POTENTIAL TO OCCUR |
|--|---|--|
| Summer holly (<i>Comarostaphylis diversifolia</i> ssp. <i>diversifolia</i>) | --/-- CNPS List 1B.2 | Low. Mesic north-facing slopes in southern mixed chaparral preferred habitat of this large, showy shrub. Very little chaparral habitat occurs within the study area. Species has been reported in the general vicinity of Map No. 66 (CDFG 2011). |
| Salt marsh bird's beak (<i>Cordylanthus maritimus</i> spp. <i>maritimus</i>) | FE/SE CNPS List 1B.2 MSCP Covered | Low. Salt marshes, particularly slightly raised hummocks. Only 2 native sites definitely extant in San Diego County (Reiser 2001), neither of which is within the study area. |
| Orcutt's birdsbeak (<i>Cordylanthus orcuttianus</i>) | --/-- CNPS List 2.1 MSCP Covered | Moderate to high. Seasonally dry drainages and upland adjacent to riparian habitat preferred habitat. In Tijuana River Valley, grows in a cobbly ecotone with sage scrub upslope and disturbed broom baccharis and southern willow scrub near watercourse. Reported in general vicinity of Map Nos. 126-127 (CDFG 2011). |
| Sea dahlia (<i>Coreopsis maritima</i>) | --/-- CNPS List 2.2 | Very low. Habitat is coastal bluff scrub, which does not occur in the study area. |
| San Diego sand-aster (<i>Corethrogyne filaginifolia</i> var. <i>incana</i>) | --/-- CNPS List 1B.1 | Low. Typically occurs in coastal bluff scrub and coastal chaparral, neither of which occurs within the study area but reported in general vicinity of Map Nos. 138-139 (CDFG 2011). |
| Del Mar Mesa sand-aster (<i>Corethrogyne filaginifolia</i> var. <i>linifolia</i>) | --/-- CNPS List 1B.1 MSCP Covered | Low. Found in sandy and disturbed areas within southern maritime chaparral. Reported within general vicinity of Map Nos. 6-11 (CDFG 2011). |
| Tecate cypress (<i>Cupressus forbesii</i>) | --/-- CNPS List 1B.1 MSCP Covered | None. Closed-cone coniferous forest and southern mixed chaparral, particularly on Otay Mountain. |
| Blochman's dudleya (<i>Dudleya blochmaniae</i> ssp. <i>blochmaniae</i>) | --/-- CNPS List 1B.1 MSCP Covered | Low to moderate. Dry, stony places associated with coastal sage scrub or chaparral near the coast. Reported in general vicinity of Map Nos. 133-134 (CDFG 2011). |

**Table 7 (cont.)
LISTED OR SENSITIVE PLANT SPECIES WITH POTENTIAL TO OCCUR**

| SPECIES | STATUS* | POTENTIAL TO OCCUR |
|---|---|---|
| Sticky dudleya (<i>Dudleya viscida</i>) | --/-- CNPS List 1B.2 MSCP Covered | Low. Conspicuous succulent perennial primarily on very steep north-facing slopes. Reported in general vicinity of Map Nos. 82-83 (CDFG 2011). |
| Palmer's goldenbush (<i>Ericameria palmeri</i> ssp. <i>palmeri</i>) | --/-- CNPS List 2.2 MSCP Covered | Moderate to high. This sizeable shrub grows along coastal drainages in mesic chaparral sites, or rarely in Diegan coastal sage scrub. Occasionally occurs as a hillside element (usually at higher elevations inland on north-facing slopes). Reported in general vicinity of Map Nos. 65-66 and 76-80 (CDFG 2011). |
| Round-leaved filaree (<i>Erodium macrophyllum</i>) | --/-- CNPS List 1B.1 | Moderate. Clay soils in open areas of grassland or sage scrub in coastal valleys. |
| Coast wallflower (<i>Erysimum ammophilum</i>) | --/-- CNPS List 1B.2 MSCP Covered | Moderate. Coastal dunes and coastal strand. Reported in general vicinity of Map Nos. 6 and 82-83 (CDFG 2011). |
| Cliff spurge (<i>Euphorbia misera</i>) | --/-- CNPS List 2.2 | Very low. Occurs in maritime succulent scrub, which does not occur within the study area. |
| San Diego barrel cactus (<i>Ferocactus viridescens</i>) | --/-- CNPS List 2.1 MSCP Covered | High. Occurs in open coastal sage scrub, often at crown of hillsides or in association with vernal pools. Reported in general vicinity of Map Nos. 12, 70, 76-80, 84, and 101 (CDFG 2011). |
| Palmer's frankenia (<i>Frankenia palmeri</i>) | --/-- CNPS List 2.1 | Low. This low-growing shrub grows on coastal salt marsh periphery, but the only known extant native population in the U.S. is in Chula Vista (Reiser 2001). |
| Mexican flannelbush (<i>Fremontodendron mexicanum</i>) | FE/SR CNPS List 1B.1 | Very low. This large bush occurs in closed-cone coniferous forest and southern mixed chaparral in Otay Mountain habitats. No suitable habitat in the study area. |
| Orcutt's hazardia (<i>Hazardia orcuttii</i>) | --/ST CNPS List 1B.1 | None. Open chaparral with chamise. The only known U.S. site where species occurs is in Encinitas (Reiser 2001) but is primarily found in Baja. |
| Ramona horkelia (<i>Horkelia truncata</i>) | --/-- CNPS List 1B.3 | Low. Limited to gabbro soils occurring in chaparral communities (usually chamise chaparral). |

**Table 7 (cont.)
LISTED OR SENSITIVE PLANT SPECIES WITH POTENTIAL TO OCCUR**

| SPECIES | STATUS* | POTENTIAL TO OCCUR |
|---|---|---|
| Decumbent goldenbush (<i>Isocoma menziesii</i> var. <i>decumbens</i>) | --/-- CNPS List 1B.2 | Low to moderate. Presumed to utilize coastal sage scrub habitat intermixed with grassland and is more partial to clay soils than other closely related varieties. |
| Coulter's goldfields (<i>Lasthenia glabrata</i> ssp. <i>coulteri</i>) | --/-- CNPS List 1B.1 | High. Found in coastal salt marshes and vernal pools (Reiser 2001). Reported in general vicinity of Map Nos. 6-12 (CDFG 2011). |
| Robinson's pepper grass (<i>Lepidium virginicum</i> var. <i>robinsonii</i>) | --/-- CNPS List 1B.2 | Moderate. This annual herb grows in openings in chaparral and sage scrub at the coastal and foothill elevations. Typically observed in relatively dry, exposed locales rather than beneath a shrub canopy or along creeks. Reported in general vicinity of Map Nos. 85 and 101 (CDFG 2011). |
| Gander's pitcher-sage (<i>Lepechinia ganderi</i>) | --/-- CNPS List 1B.3 MSCP Covered | Low. Found in metavolcanic-derived soils in chaparral. |
| Nuttall's lotus (<i>Lotus nuttallianus</i>) | --/-- CNPS List 1B.1 MSCP Covered | High. Occurs in coastal dune communities. Reported near mouth of San Diego River in general vicinity of Map Nos. 55-57, and 82-83 (CDFG 2011). |
| Felt-leaved monardella (<i>Monardella hypoleuca</i> ssp. <i>lanata</i>) | --/-- CNPS List 1B.2 MSCP Covered | Low. Found in chaparral understory, typically beneath mature stands of chamise in xeric situations. |
| Jennifer's monardella (<i>Monardella stoneana</i>) | --/-- CNPS List 1B.2 | Low. Found in canyons around Otay and Tecate mountains. |
| Willow monardella (<i>Monardella linoides</i> ssp. <i>viminea</i>) | FE/SE CNPS List 1B.1 MSCP Covered | Moderate. Occurs in coastal and riparian scrub, especially in sandy washes (Reiser 2001). Reported in general vicinity of Map Nos. 18-19 (CDFG 2011). |

**Table 7 (cont.)
LISTED OR SENSITIVE PLANT SPECIES WITH POTENTIAL TO OCCUR**

| SPECIES | STATUS* | POTENTIAL TO OCCUR |
|--|---|---|
| San Diego goldenstar (<i>Muilla clevelandii</i>) | --/-- CNPS List 1B.1 MSCP Covered | Moderate. Occurs in grasslands, particularly in association with mima mounds and vernal pools. Reported in general vicinity of Map Nos. 53-54, 64-66, 84, and 126-127 (CDFG 2011). |
| Little mousetail (<i>Myosurus minimus</i> ssp. <i>apus</i>) | --/-- CNPS List 3.1 | Very low. Occurs in vernal pool communities, which do not occur within the study area. Species reported in general vicinity of Map Nos. 124-127 (CDFG 2011). |
| Spreading navarretia (<i>Navarretia fossalis</i>) | FT**/-- CNPS List 1B.1 | Low to moderate. Occurs in vernal pool communities, which were not observed within study area. However, reported in general vicinity of Map Nos. 47-50 and 123-127 (CDFG 2011), and species critical habitat overlaps with portions of Map Nos. 124 and 126. |
| Coast woolly-heads (<i>Nemacaulis denudata</i> var. <i>denudata</i>) | --/-- CNPS List 1B.2 | Very low. Typically found in coastal dune communities. No suitable habitat within the study area. |
| Slender woolly-heads (<i>Nemacaulis denudata</i> var. <i>gracilis</i>) | --/-- CNPS List 2.2 | Low. Well-developed dunes whether on desert or rarely along coastal beaches. Reported in general vicinity of Map No. 128 (CDFG 2011). |
| Brand's phacelia (<i>Phacelia stellaris</i>) | --/-- CNPS List 1B.1 | Low to moderate. Occurs in coastal bluff scrub and in sandy coastal sage scrub openings near beach (Reiser 2001). |
| Torrey pine (<i>Pinus torreyana</i> ssp. <i>torreyana</i>) | --/-- CNPS List 1B.2 MSCP Covered | None. Occurs in closed-cone coniferous forest along coast near Del Mar. Would likely have been detected within study area if present. |
| Otay mesa mint (<i>Pogogyne nudiscula</i>) | FE**/SE CNPS List 1B.1 | Low to moderate. Restricted to vernal pools on Otay Mesa and in northern Baja. Reported in general vicinity of Map Nos. 86, 124-127, and 147 (CDFG 2011). |
| Nuttall's scrub oak (<i>Quercus dumosa</i>) | --/-- CNPS List 1B.1 | Low to moderate. Occurs in chaparral or coastal sage scrub with relatively open canopy cover in flat terrain; on north-facing slopes, may grow in dense monotypic stands. Found in sandy or clay loam soils. Species could potentially occur in upland habitat adjacent to some Program facilities. |

**Table 7 (cont.)
LISTED OR SENSITIVE PLANT SPECIES WITH POTENTIAL TO OCCUR**

| SPECIES | STATUS* | POTENTIAL TO OCCUR |
|---|---|---|
| Small-leaved rose (<i>Rosa minutifolia</i>) | --/SE CNPS List 2.1 MSCP Covered | None. No known native U.S. populations remain. Only known U.S. site occurred on periphery of coastal sage scrub in Otay Mesa and was transplanted into biological open space to make way for development. |
| San Miguel savory (<i>Satureja chandleri</i>) | --/-- CNPS List 1B.2 MSCP Covered | Low. Gabbro and metavolcanic soils in interior foothills, chaparral, and oak woodland |
| Rayless ragwort (<i>Senecio aphanactis</i>) | --/-- CNPS List 2.2 | Low. Occurs in open coastal sage scrub, cismontane woodlands, and alkaline flats (Reiser 2001). |
| Bottle liverwort (<i>Sphaerocarpos drewei</i>) | --/-- CNPS List 1B.1 | Low. Occurs under shrubs within coastal sage scrub and chaparral. Reported in general vicinity of Map No. 86 (CDFG 2011). |
| Purple stemodia (<i>Stemodia durantifolia</i>) | --/-- CNPS List 2.1 | High. Small perennial herb typically found in wet sand along minor creeks and seasonal drainages. Reported in general vicinity of Map No. 64 (CDFG 2011). |
| Oil neststraw (<i>Stylocline citroleum</i>) | --/-- CNPS List 1B.1 | Low to moderate. Coastal scrub areas and chenopod scrub in clay soils in vicinity of oilfields. |
| Estuary seablite (<i>Sueda esteroa</i>) | --/-- CNPS List 1B.2 | High. Found on periphery of coastal salt marsh, as soils usually mapped as tidal flats. Reported in general vicinity of Map Nos. 82-83, and 134 (CDFG 2011). |
| Parry's tetraococcus (<i>Tetraococcus dioicus</i>) | --/-- CNPS List 1B.2 MSCP Covered | Low. Gabbro soils in low growing chamise chaparral and sage scrub. Conditions typically quite xeric with only limited annual growth. |

*Refer to Appendix E for a listing and explanation of status and sensitivity codes

**As of the date of surrender, April 20, 2010, the City has relinquished coverage and does not rely on the City's Federal Incidental Take Permit (ITP) to authorize an incidental take of this vernal pool animal species. Upon completion of a Habitat Conservation Plan (HCP) for vernal pools, the City would enter into an Implementing Agreement in order to obtain species coverage and a Federal ITP for this species.

4.3 SENSITIVE ANIMAL SPECIES

4.3.1 Sensitive Animals Observed or Detected

Four sensitive animal species were detected within the study area during HELIX surveys and are described below.

Coastal California gnatcatcher (*Polioptila californica californica*)

Listing: FT/SSC; MSCP Covered

Distribution: Southern Los Angeles, Orange, western Riverside, and San Diego counties south into Baja

Habitat: Coastal sage scrub

Status on site: One individual observed in Diegan coastal sage scrub on Encanto Channel slopes near the post office (Map No. 107). Likely occurs in other areas of appropriate habitat near mapped channels. CNDDDB and/or USFWS records for the species are scattered throughout the City and are found near the following facilities: Murphy Canyon (Map No. 58a), Auburn Creek Channel (Map No. 76), South Chollas Creek (Map No. 101), and Smugglers Gulch (Map No. 139).

Northern harrier (*Circus cyaneus*)

Status: --/SSC; MSCP Covered

Distribution: Throughout San Diego County lowlands but also in foothills, mountains, and desert

Habitat: Open grassland and marsh

Status on site: One individual observed foraging over grassland near Otay region storm water facility (Map No. 126). Few individuals expected to occur on actual site, as most areas are vegetated with trees and shrubs or are developed. Little appropriate habitat occurs along mapped storm water facilities.

Yellow warbler (*Dendroica petechia brewsteri*)

Status: --/SSC

Distribution: Observed throughout much of San Diego County during breeding season with rare sightings in winter

Habitat: Riparian woodland

Status on site: Two individuals heard calling in southern riparian forest along San Diego River (Map No. 147).

Little blue heron (*Egretta caerulea*)

Status: BCC/--

Distribution: San Diego represents northwestern corner of species' range, where it is observed in coastal areas most frequently around Mission Bay. A relatively recent arrival in San Diego County, population is estimated between 10 and 12 individuals (Unitt 2004).

Habitat: Shallow marshes and ponds near coast

Status on site: One individual observed foraging in freshwater marsh habitat in Rose Creek near Mission Bay Drive (Map No. 34). Uncommon in the City and not likely be found in other mapped project locations.

4.3.2 Sensitive Animals with Potential to Occur

Additional sensitive animal species that were not detected during HELIX surveys but have potential to occur within the study area are listed in Table 8.

| Table 8 | | |
|---|------------------------------------|--|
| LISTED OR SENSITIVE ANIMAL SPECIES WITH POTENTIAL TO OCCUR | | |
| SPECIES | LISTING OR SENSITIVITY * | POTENTIAL TO OCCUR |
| INVERTEBRATES | | |
| San Diego fairy shrimp (<i>Branchinecta sandiegonensis</i>) | FE**/-- | Low. Occurs in vernal pools and road basins on the mesas in San Diego County. CNDDDB and/or USFWS records for this species exist on the mesa east of I-15 on Map No. 58a. Appropriate habitat for this species does not occur within the Program facilities. |
| Quino checkerspot butterfly (<i>Euphydryas editha quino</i>) | FE/-- | Very low. Occurs in open sage scrub and chaparral. Requires abundant nectar and primary host plant dwarf plantain (<i>Plantago erecta</i>). Not reported in project study area (CDFG 2011). |
| Hermes copper butterfly (<i>Lycaena hermes</i>) | --/-- | Low to moderate. Found in southern mixed chaparral and coastal sage scrub with mature larval host plant spiny redberry (<i>Rhamnus crocea</i>). |
| Wandering/salt marsh skipper (<i>Panoquina errans</i>) | --/-- | High. Coastal salt marshes along river mouths and other brackish waters. Larval host plant is saltgrass (<i>Distichlis spicata</i>). |
| Riverside fairy shrimp (<i>Streptocephalus woottoni</i>) | FE**/-- | Low. Occurs in vernal pools and road basins on San Diego County mesas. |
| VERTEBRATES | | |
| Reptiles and Amphibians | | |
| Silvery legless lizard (<i>Anniella pulchra pulchra</i>) | --/SSC | Moderate. Occurs in loose soil, particularly in sand dunes or otherwise sandy soil. Generally found in leaf litter, under rocks, logs, or driftwood in oak woodland, chaparral, and desert scrub. |
| Arroyo toad (<i>Bufo californicus</i>) | FE/SSC MSCP Covered | Low. Found on banks with open-canopy riparian forest of willows, cottonwoods, or sycamores. Breeds in shallow slow-moving streams but burrows in adjacent uplands during dry months. No recorded CNDDDB locations in study area, and MSCP list of known locations does not include creeks in study area. |

Table 8 (cont.)
LISTED OR SENSITIVE ANIMAL SPECIES WITH POTENTIAL TO OCCUR

| SPECIES | LISTING OR SENSITIVITY * | POTENTIAL TO OCCUR |
|--|-----------------------------|---|
| VERTEBRATES (cont.) | | |
| Reptiles and Amphibians (cont.) | | |
| Orange-throated whiptail (<i>Cnemidophorus hyperythrus</i>) | --/SSC MSCP Covered | High. Found in coastal sage scrub, chaparral, riparian woodland, and adjacent disturbed areas. Prefers matrix of open shady areas with abundant termites (<i>Reticulitermes</i> sp.). |
| Red-diamond rattlesnake (<i>Crotalus exsul</i>) | --/SSC | Moderate. Found in chaparral, coastal sage scrub, and along creek banks, particularly among rock outcrops or debris piles with burrowing rodents for prey. Suitable habitat occurs within study area. |
| Coronado skink (<i>Eumeces skiltonianus interparietalis</i>) | --/SSC | Moderate. Found in grasslands, sage scrub, open chaparral, oak woodland, and coniferous forests, usually under rocks, leaf litter, logs, debris, or in shallow burrows it digs. |
| San Diego horned lizard (<i>Phrynosoma coronatum</i> ssp. <i>blainvillei</i>) | --/SSC MSCP Covered | High. Found in coastal sage scrub, open chaparral, oak woodlands, and coniferous forests with sufficient basking sites, adequate scrub cover, and loose soil. Requires harvester ants (<i>Pogonomyrmex</i> sp.) but generally excluded from areas invaded by Argentine ants (<i>Linepithema humile</i>). |
| Coast patch-nosed snake (<i>Salvadora hexalepis virgulte</i>) | --/SSC | Moderate. Primarily in chaparral but also inhabits coastal sage scrub and grassland mixed with scrub. |
| Western spadefoot (<i>Spea hammondi</i>) | --/SSC | Moderate. Occurs in open coastal sage scrub, chaparral, grassland, and along sandy or gravelly washes, floodplains, alluvial fans, or playas. Requires temporary pools for breeding and friable soils for burrowing. |
| Two-striped garter snake (<i>Thamnophis hammondi</i>) | --/SSC | High. Occurs along permanent and intermittent streams bordered by dense riparian vegetation but also associated with vernal pools or stock ponds. |
| Birds | | |
| Cooper's hawk (<i>Accipiter cooperi</i>) | --/SSC MSCP Covered | High. Found in oak groves, mature riparian woodlands, and eucalyptus stands or other mature forests. Widespread species expected to occur in several locations within project where trees are present. |

Table 8 (cont.)
LISTED OR SENSITIVE ANIMAL SPECIES WITH POTENTIAL TO OCCUR

| SPECIES | LISTING OR SENSITIVITY * | POTENTIAL TO OCCUR |
|---|-----------------------------|--|
| VERTEBRATES (cont.) | | |
| Birds (cont.) | | |
| Tricolored blackbird (<i>Agelaius tricolor</i>) | --/SSC MSCP Covered | Low to moderate. Marsh habitat near grasslands, pastures, and agricultural fields |
| Southern California rufous-crowned sparrow (<i>Aimophila ruficeps canescens</i>) | --/SSC MSCP Covered | Moderate. Occurs in coastal sage scrub, chaparral, and shrubby grasslands. |
| Bell's sage sparrow (<i>Amphispiza belli belli</i>) | --/SSC | Low. Chaparral and sage scrub with modest leaf-litter on ground. Largely eliminated from most coastal areas of San Diego County (Unitt 2004). |
| Golden eagle (<i>Aquila chrysaetos</i>) | --/SSC MSCP Covered | Low. Nesting occurs on cliff ledges or in trees on steep slopes, with foraging occurring primarily in grassland and sage scrub. Not usually observed near development. |
| Burrowing owl (<i>Athene cunicularia</i>) | --/SSC MSCP Covered | Low. Grasslands and open scrub habitats restricted to Otay Mesa and North Island. Majority of study area too urbanized to support species. |
| Coastal cactus wren (<i>Campylorhynchus brunneicapillus sandiegensis</i>) | --/SSC MSCP Covered | Moderate. Occurs in coastal sage scrub and chaparral where there are large thickets of cactus in which they nest. |
| Western snowy plover (<i>Charadrius alexandrinus nivosus</i>) | FT/SSC MSCP Covered | Low. Found on beaches, dunes, and salt flats. Very little appropriate habitat within study area. |
| Western yellow-billed cuckoo (<i>Coccyzus americanus occidentalis</i>) | --/SE | Low to moderate. A rare and sporadic summer visitor to San Diego County found only in extensive stands of mature riparian woodland. |

Table 8 (cont.)
LISTED OR SENSITIVE ANIMAL SPECIES WITH POTENTIAL TO OCCUR

| SPECIES | LISTING OR SENSITIVITY * | POTENTIAL TO OCCUR |
|---|-----------------------------|--|
| VERTEBRATES (cont.) | | |
| Birds (cont.) | | |
| Southwestern willow flycatcher (<i>Empidonax traillii extimus</i>) | FE/-- MSCP Covered | Low to moderate throughout most Program facilities, high along San Diego River. Uses mature riparian woodland for nesting. Breeding restricted to modest small colonies in San Diego County along Santa Margarita and San Luis Rey rivers, Whelan and Guajome lakes, Couser Canyon, and Pala (Unitt 2004). UFSWS records from 2009 document this species in riparian forest along the San Diego River (Map No. 147). |
| California horned lark (<i>Eremophila alpestris actia</i>) | --/SSC | Low. Occurs in open fields, grasslands, disturbed areas, and open sage scrub. Open habitat uncommon in study area. |
| Prairie falcon (<i>Falco mexicanus</i>) | --/SSC | Low. Nests on cliff or bluff ledges or occasionally in old hawk or raven nests; forages in grassland or desert habitats. All known nesting locations are at least 23 miles from the coast (Unitt 2004); therefore, study area likely outside species' range. |
| Yellow-breasted chat (<i>Icteria virens</i>) | --/SSC | High. Habitat is shrubby willows and riparian woodland. Likely to occur along willow-dominated storm water facilities within the City, particularly within the MHPA. Species has been documented along the Tijuana River in the vicinity of Map No. 138a (Dudek 2006). |
| Least bittern (<i>Ixobrychis exilis</i>) | --/SSC | Moderate. Found in marshes and other wetland habitat. |
| California black rail (<i>Laterallus jamaicensis coturniculus</i>) | --/ST | Very low. Found in wetland habitats; presumed extirpated from San Diego County. |
| Osprey (<i>Pandion heliaetus</i>) | --/SSC | Low. Coasts and inland lakes with open water and a supply of fish. |
| Belding's savannah sparrow (<i>Passerculus sandwichensis beldingi</i>) | --/SE MSCP Covered | Moderate. Restricted to coastal salt marshes dominated by pickleweed. |

**Table 8 (cont.)
LISTED OR SENSITIVE ANIMAL SPECIES WITH POTENTIAL TO OCCUR**

| SPECIES | LISTING OR SENSITIVITY * | POTENTIAL TO OCCUR |
|---|-----------------------------|---|
| VERTEBRATES (cont.) | | |
| Birds (cont.) | | |
| Light-footed clapper rail (<i>Rallus longirostris levipes</i>) | FE/SE | High along San Diego River near coast and in southern reaches of Rose Creek and in Los Peñasquitos Channel; low elsewhere. Found in coastal salt marshes, especially those dominated by cordgrass (<i>Spartina</i> sp.), but also known to use brackish and freshwater sites. USFWS has records of this species using the Los Peñasquitos Channel just east of I-5 (Map No. 8) in 2004 and 2006. |
| Western bluebird (<i>Sialia mexicana</i>) | --/-- MSCP Covered | High. Scattered distribution in central and western portions of San Diego County. Has been observed in ruderal habitat near riparian forest along San Diego River and is likely to occur in portions of the study area. |
| California least tern (<i>Sternula antillarum browni</i>) | FE/SE MSCP Covered | Very low. Coastal areas adjacent to the ocean. No suitable habitat within study area. |
| Least Bell's vireo (<i>Vireo bellii pusillus</i>) | FE/SE MSCP Covered | High. Occurs in mature riparian forest and woodland, as well as riparian scrub. CNDDDB and/or USFWS records include areas along or near the San Diego River, Smuggler's Gulch, Tijuana River, Los Peñasquitos Creek, and Soledad Creek (Map Nos. 7-9, 11, 138a-c, 138-139). Species critical habitat occurs in Smuggler's Gulch/Tijuana River vicinity. |
| Mammals | | |
| Pallid bat (<i>Antrozous pallidus</i>) | --/SSC | Moderate. Deserts and canyons. Daytime roosts in buildings, crevices; less often in caves, mines, hollow trees, and other shelters. |
| Dulzura pocket mouse (<i>Chaetodipus californicus femoralis</i>) | --/SSC | Low. Typically found in chaparral, especially where it intergrades with grasslands. |

Table 8 (cont.)
LISTED OR SENSITIVE ANIMAL SPECIES WITH POTENTIAL TO OCCUR

| SPECIES | LISTING OR SENSITIVITY * | POTENTIAL TO OCCUR |
|--|-----------------------------|---|
| VERTEBRATES (cont.) | | |
| Mammals (cont.) | | |
| Northwestern San Diego pocket mouse (<i>Chaetodipus fallax fallax</i>) | --/SSC | Moderate. Occurs in open coastal sage scrub, particularly in open, weedy areas with sandy substrates. |
| Mexican long-tongued bat (<i>Choeronycteris mexicana</i>) | --/SSC | High. Occurs in scrublands and forests, especially canyons with riparian vegetation. Roosts in mines, caves, and buildings. Sporadically reported through much of San Diego County (CDFG 2011). |
| Spotted bat (<i>Euderma maculatum</i>) | --/SSC | Low. Mountainous regions with ponderosa pines. Roosts primarily in rocky cliff crevices and canyons. |
| Western mastiff bat (<i>Eumops perotis californicus</i>) | --/SSC | Moderate. Chaparral and coast live oaks. Also occurs in arid, rocky areas, cliffs, and canyons. |
| Silver-haired bat (<i>Lasionycteris noctivagans</i>) | --/SSC | Moderate. Prefers forested areas adjacent to ponds and streams. Roosts under loose bark and in tree hollows and buildings. |
| Hoary bat (<i>Lasiurus cinereus</i>) | --/SSC | Moderate. Evergreen forests and wooded areas. |
| San Diego black-tailed jackrabbit (<i>Lepus californicus bennettii</i>) | --/SSC | Moderate. Occurs primarily in open sage scrub, chaparral, grasslands, croplands, and disturbed habitat with at least some shrub cover present. |
| San Diego desert woodrat (<i>Neotoma lepida intermedia</i>) | --/SSC | Moderate. Occurs in open chaparral and coastal sage scrub, often building large, stick nests in rock outcrops or around clumps of cactus or yucca. |
| Pocketed free-tailed bat (<i>Nyctinomops femorosaccus</i>) | --/SSC | Low. Occurs in arid scrublands, including chaparral; roosts in crevices in cliff faces. |
| Big free-tailed bat (<i>Nyctinomops macrotus</i>) | --/SSC | Low. Occurs in rocky scrublands and woodlands, and roosts in rocky cliff faces. Reported sporadically in variety of San Diego County locations (CDFG 2011). |

| Table 8 (cont.) | | |
|---|------------------------------------|--|
| LISTED OR SENSITIVE ANIMAL SPECIES WITH POTENTIAL TO OCCUR | | |
| SPECIES | LISTING OR SENSITIVITY * | POTENTIAL TO OCCUR |
| VERTEBRATES (cont.) | | |
| Mammals (cont.) | | |
| Pacific pocket mouse (<i>Perognathus longimembris pacificus</i>) | FE/SSC | Low. Fine-grained, sandy or gravelly substrates in coastal strand, coastal dunes, river alluvium, and coastal sage scrub growing on marine terraces. |
| American badger (<i>Taxidea taxus</i>) | --/SSC MSCP Covered | Low. Occurs in open plains and prairies, farmland, and sometimes edges of woods. |

*Refer to Appendix E for a listing and explanation of status and sensitivity codes

**As of the date of surrender, April 20, 2010, the City has relinquished coverage and does not rely on the City's Federal Incidental Take Permit (ITP) to authorize an incidental take of this vernal pool animal species. Upon completion of a Habitat Conservation Plan (HCP) for vernal pools, the City would enter into an Implementing Agreement in order to obtain species coverage and a Federal ITP for this species.

5.0 REGIONAL AND REGULATORY CONTEXT

5.1 MULTIPLE SPECIES CONSERVATION PROGRAM (MSCP)

The City's MSCP Subarea Plan has been prepared to meet the requirements of the California Natural Communities Conservation Planning (NCCP) Act of 1992. The Subarea Plan is consistent with the NCCP and describes how the evaluation of proposed development projects relative to the City's portion of the MSCP Preserve (the Multi-Habitat Planning Area [MHPA]) will be implemented. The Plan was adopted in 1997, allowing the City to issue take permits at the local level. Approximately 56,831 acres of habitat are designated as the City's portion of the MHPA, of which approximately 90 percent is to be preserved and the remaining 10 percent may be developed (City 1997).

The MSCP (City 1997) identifies an MHPA that is intended to link all core biological areas into a regional wildlife preserve. Because the project area encompasses several natural creeks and associated wetland/riparian corridors, many of these storm water facilities lie within the MHPA. As illustrated in Figure 3, approximately 100.4 acres of the project study area are within the MHPA, including portions of the following named channels: San Diego River, Los Peñasquitos Creek, Soledad Creek, Rose Creek, Alvarado Creek, Chollas Creek, South Chollas Creek, Smuggler's Gulch, and the Tijuana River. Hydrologic units supporting habitat within the MHPA for the project area include Peñasquitos, Pueblo San Diego, San Diego, and Tijuana.

The proposed project is evaluated for consistency with applicable MSCP policies and guidelines in Section 6.1.7.

5.1.1 General Planning Policies and Guidelines

The MSCP establishes specific guidelines that limit activities that occur within the MHPA. In general, activities occurring within the MHPA must conform to these guidelines and, wherever feasible, should be located in the least sensitive areas. Because flood control channel maintenance is an allowed use within the MHPA, an MHPA boundary adjustment would not be required for the proposed project.

Because of their importance and difficulty finding alternate locations, public infrastructure projects are given special consideration by the MSCP. This is especially true for storm water structures because they must be located within drainage areas that typically are associated with core biological resource areas. MSCP Section 1.4.2 outlines planning policies and design guidelines for various potential usages. The following policies listed under Flood Control in Section 1.4.2 would apply to the proposed project:

- Flood control should generally be limited to existing agreements with Resource Agencies unless demonstrated to be needed based on a cost-benefit analysis and pursuant to the compensation plan. Floodplains within the MHPA, and upstream from the MHPA, if feasible, should remain in a natural condition and configuration in order to allow for the ecological, geological, hydrological, and other natural processes to remain or be restored.
- No berming, channelization, or man-made constraints or barriers to creek, tributary, or river flows should be allowed in any floodplain within the MHPA unless reviewed by all appropriate agencies and adequately mitigated. Review must include impacts to upstream and downstream habitats, flood flow volumes, velocities and configurations, water availability, and changes to water table level.
- No riprap, concrete, or other unnatural material shall be used to stabilize river, creek, tributary, and channel banks within the MHPA. River, stream, and channel banks shall be natural and stabilized where necessary with willows and other appropriate native plantings. Rock gabions may be used to dissipate flows and should incorporate design features to ensure wildlife movement.

Several of the facilities will utilize access roads as well as staging and stockpiling areas within the MHPA and would be subject to the Roads and Utilities - Construction and Maintenance Policies found in Section 1.4.2 of the City's MSCP subarea plan. Applicable policies from this section include:

- Temporary construction areas and roads, staging areas, or permanent access roads must not disturb existing habitats unless determined to be unavoidable. All such activities must occur on existing agricultural lands or other disturbed areas rather than in habitat. If temporary habitat disturbance is unavoidable, then restoration of and/or mitigation for the disturbed areas after project completion will be required.

- Construction and maintenance activities in wildlife corridors must avoid significant disruption of corridor usage. Environmental documents and Mitigation Monitoring and Reporting Programs (MMRPs) covering such development must clearly specify how this will be achieved, and construction plans must contain all the pertinent information and be readily available to crews in the field. Training of construction crews and field workers must be conducted to ensure that all conditions are met. A responsible party must be specified.
- Development of roads in canyon bottoms should be avoided whenever feasible. If an alternative location outside the MHPA is not feasible, then the road must be designed to cross the shortest length possible of the MHPA in order to minimize impacts and fragmentation of sensitive species and habitat. If roads cross the MHPA, they should provide for fully-functional wildlife movement capability. Bridges are the preferred method of providing for movement, although culverts in selected locations may be acceptable. Fencing, grading and plant cover should be provided where needed to protect and shield animals, and guide them away from roads to appropriate crossings.
- Where possible, roads within the MHPA should be narrowed from existing design standards to minimize habitat fragmentation and disruption of wildlife movement and breeding areas. Roads must be located in lower quality habitat or disturbed areas to the extent possible.
- For the most part, existing roads and utility lines are considered a compatible use within the MHPA and therefore will be maintained. Exceptions may occur where underutilized or duplicative road systems are determined not to be necessary.

5.1.2 MHPA Land Use Adjacency Guidelines

The City's MSCP Subarea Plan also contains policies found in Section 1.4.3, Land Use Adjacency Guidelines, which are designed to help limit the impact of activities located adjacent to MHPAs. Applicable guidelines include:

- Uses in or adjacent to the MHPA should be designed to minimize noise impacts. Excessively noisy uses or activities adjacent to breeding areas must incorporate noise reduction measures and be curtailed during the breeding season of sensitive species.
- Invasive non-native plant species shall not be introduced into areas adjacent to the MHPA.
- All developed and paved areas must prevent the release of toxins, chemicals, petroleum products, exotic plant materials, and other elements that might degrade or harm natural environment or ecosystem processes within the MHPA.

5.1.3 General Management Directives

The following management directives are in addition to the General Planning Policies and Guidelines outlined in Section 5.1.1 above.

- Mitigation, when required as part of project approvals, shall be performed in accordance with the City’s ESL Regulations and Biology Guidelines.
- Restoration or revegetation undertaken within the MHPA shall be performed in a manner acceptable to the City. Wetland restoration/revegetation proposals are subject to permit authorization by federal and state agencies.
- Remove giant reed, tamarisk, pampas grass, castor bean, artichoke thistle, and other exotic invasive species from creek and river systems, canyons and slopes, and elsewhere within the MHPA as funding becomes available. Avoid removal activities during reproductive seasons of sensitive species and avoid/minimize impacts to sensitive species or native habitats.
- Perform standard maintenance, such as clearing and dredging of existing flood channels, during the non-breeding or nesting season of sensitive bird or wildlife species utilizing the riparian habitat. For the least Bell’s vireo, the non-breeding season generally includes mid-September through mid-March.
- Review existing flood control channels within the MHPA periodically (every 5 to 10 years) to determine the need for their retention and maintenance, and to assess alternatives such as restoration of natural rivers and floodplains.

5.1.4 Specific Management Policies and Directives

Tijuana River Valley

The southwestern portion of the study area (Smuggler’s Gulch and Tijuana River) is located in the Tijuana River Valley portion of the MSCP. As outlined in MSCP Section 1.5.5, the following specific management policy would apply to this project:

Flood control in the Tijuana River Valley is limited to existing agreements with the Resource Agencies that allow clearing or sand removal within existing low-flow or pilot channel(s), and any flood control projects resulting from the 1994 BSI Consultants “Tijuana River Valley Flood Control and Infrastructure Study.” Any flood control facility must be consistent with City, State, and FEMA regulations and be designed and constructed to maintain riparian and wetland ecosystems within the channel and the valley.

Other specific management policies and directives listed in MSCP Sections 1.5.3 through 1.5.10 are not applicable to this project.

5.1.5 Special Conditions for Covered Species

Special conditions apply to the 3 covered species observed during field surveys within the study area (coastal California gnatcatcher, Cooper’s hawk, and northern harrier), as well as to 3 covered species with high potential to occur in the study area (least Bell’s vireo, San Diego barrel cactus, and Nuttall’s lotus). Special conditions for the southwestern willow flycatcher

were also included in this discussion and have been combined with those for the vireo, as the conditions are nearly identical. The conditions relevant to the potential maintenance activities are noted below.

- Area-specific management directives for the coastal California gnatcatcher must include measures to reduce edge effects and minimize disturbance during the nesting period, fire protection measures to reduce the potential for habitat degradation due to unplanned fire, and management measures to improve habitat quality including vegetation structure. No clearing of occupied habitat within the City's MHPA may occur between March 1 and August 15.
- Area-specific management directives for the least Bell's vireo and southwestern willow flycatcher must include measures to provide appropriate successional habitat, upland buffers for all known populations, cowbird control, and specific measures to protect against detrimental edge effects to this species. Any clearing of occupied habitat must occur between September 15 and March 15 for vireo and between September 1 and May 1 for willow flycatcher (i.e., outside the nesting season).
- Area-specific management directives for Cooper's hawk must include 300-foot impact avoidance areas around active nests and minimization of disturbance in oak woodlands and oak riparian forests.
- Area-specific management directives for the northern harrier must manage agricultural and disturbed lands within 4 miles of nesting habitat to provide foraging habitat, include an impact avoidance area (900 feet) around active nests, and include measures for maintaining winter foraging habitat in preserve areas in Proctor Valley, around the Sweetwater Reservoir, San Miguel Ranch, Otay Ranch east of Wueste Road, Lake Hodges, and San Pasqual Valley.
- Area-specific management directives for San Diego barrel cactus must include measures to protect this species from edge effects, unauthorized collection, and include appropriate fire management/control practices to protect against a too-frequent fire cycle.
- Area-specific management directives for Nuttall's lotus must include specific measures to protect against detrimental edge effects.

5.2 WILDLIFE CORRIDORS

Wildlife corridors can be local or regional in scale; their functions may vary temporally and spatially based on conditions and species presence. Wildlife corridors represent areas where wildlife movement is concentrated due to natural or anthropogenic constraints. Local corridors provide access to resources such as food, water, and shelter. Animals use these corridors, which are often hillsides or riparian areas, to move between different habitats. Regional corridors provide these functions and link 2 or more large habitat areas. They provide avenues for wildlife dispersal, migration, and contact between otherwise distinct populations.

Approximately 100.4 acres of the study area are within the City's MHPA, which provide connectivity through several creeks and tributaries as well as the San Diego River corridor.

Several channels within the Master Program are likely to function as wildlife corridors, including but not limited to the San Diego and Tijuana rivers and Rose, Chollas, Soledad, and Los Peñasquitos creeks.

5.3 REGULATORY ISSUES

Biological resources within the study area are subject to regulatory administration by the federal government, State of California, and City.

The federal government administers non-marine plant- and wildlife-related issues through the U.S. Fish and Wildlife Service (USFWS), while the Corps administers WUS, including wetland and non-wetland) issues. California law relating to wetland, water-related, and wildlife issues is administered by the CDFG.

Laws and regulations that may apply include the federal Endangered Species Act (ESA), Clean Water Act, Coastal Zone Management Act, Porter-Cologne Water Quality Control Act, CEQA, California Fish and Game Code, and City’s ESL ordinance and MSCP Subarea Plan. Several meetings have taken place between the project proponent and various regulatory agencies to discuss various aspects of the project (Table 9).

| Date | Form of Communication | Major Topic(s) | Person/Affiliation |
|------------------|------------------------------|------------------------------------|---|
| November 2007 | Phone | Clean Water Act Section 404 Permit | Tom Huffman (HELIX) Mark Durham (Corps) Robert Smith (Corps) |
| February 4, 2008 | Meeting | Clean Water Act Section 404 Permit | Bruce McIntyre (HELIX) Tom Huffman (HELIX) Stacy Nigro (HELIX) Daniel Lottermoser (City of San Diego) Kerry Santoro (City of San Diego) Robert Smith (Corps) Terry Dean (Corps) |
| April 3, 2008 | Meeting | Rose Creek Conservancy | Bruce McIntyre (HELIX) Kelly Fisher (CDFG) Daniel Lottermoser (City of San Diego) Kerry Santoro (City of San Diego) Ann Van Leer (Land Conservation Broker) |
| April 9, 2008 | Meeting | Rose Creek Conservancy | Bruce McIntyre (HELIX) Tom Huffman (HELIX) Ann Van Leer (Land Conservation Broker) Mike Nelson (San Diego River Conservancy) |

**Table 9 (cont.)
AGENCY COORDINATION**

| Date | Form of Communication | Major Topic(s) | Person/Affiliation |
|-------------------|----------------------------------|---|--|
| April 16, 2008 | Meeting | Wetland Mitigation Approach | Bruce McIntyre (HELIX) Daniel Lottermoser (City of San Diego) Jeanne Krosch (City of San Diego) Kerry Santoro (City of San Diego) Kristy Foreburger (City of San Diego) |
| May 14, 2008 | Meeting | Streambed Alteration Agreement | Bruce McIntyre (HELIX) Tom Huffman (HELIX) Daniel Lottermoser (City of San Diego) Kerry Santoro (City of San Diego) Kelly Fisher (CDFG) |
| June 9, 2008 | Meeting | Clean Water Act Section 404 Permit | Tom Huffman (HELIX) Kerry Santoro (City of San Diego) Kris McFadden (City of San Diego) Daniel Lottermoser (City of San Diego) Robert Smith (Corps) |
| June 12, 2008 | Meeting | Clean Water Act Section 401 Certification | Bruce McIntyre (HELIX) Tom Huffman (HELIX) Kerry Santoro (City of San Diego) Kris McFadden (City of San Diego) Daniel Lottermoser (City of San Diego) Robert Smith (Corps) Mike Porter (RWQCB) Chiara Clemente (RWQCB) Lori Walsh (RWQCB) Christina Arias (RWQCB) |
| November 26, 2008 | Submittal of Draft Public Notice | Clean Water Act Section 404 Permit | Steve Neudecker (HELIX) Robert Smith (Corps) |
| July 14, 2009 | Meeting | Mitigation Concept, 401 Certification Process | Bruce McIntyre, HELIX Steve Neudecker, HELIX Kerry Santoro, City of San Diego Chiara Clemente, RWQCB Mike Porter, RWQCB Eric Becker, RWQCB |

**Table 9 (cont.)
AGENCY COORDINATION**

| Date | Form of Communication | Major Topic(s) | Person/Affiliation |
|-------------------|------------------------------|-------------------------------------|---|
| February 17, 2010 | Meeting | Mitigation Ratios and Location | Anne Jarque, City of San Diego Bruce McIntyre, HELIX Daniel Lottermoser, City of San Diego David Zoutendyk (by phone), USFWS Dennis Bowling, Rick Engineering Elizabeth Goldman (by phone), U.S. EPA Gus Brown, City of San Diego Mike Porter (by phone), RWQCB Eric Becker, RWQCB Kelly Fisher (by phone), CDFG Kerry Santoro, City of San Diego Pat Gower (by phone), USFWS Steve Neudecker, HELIX Terry Dean (Corps) Tony Heinrichs, City of San Diego |
| March 18, 2010 | Meeting | Appropriate Compensatory Mitigation | Anne Jarque, City of San Diego Bruce McIntyre, HELIX Daniel Lottermoser, City of San Diego David Gibson, RWQCB Elizabeth Goldman (by phone), U.S. EPA Gus Brown, City of San Diego Jody Ebsen, RWQCB Mike Porter, RWQCB Steve Neudecker, HELIX Terry Dean, (Corps) Therese O'Rourke, (Corps) Tony Heinrichs, City of San Diego |

**Table 9 (cont.)
AGENCY COORDINATION**

| Date | Form of Communication | Major Topic(s) | Person/Affiliation |
|-----------------|-----------------------|--|--|
| August 11, 2010 | Site Visits | Murphy Canyon Channel (Map 58) Soledad Creek Channel (Maps 15-17) Chollas Creek Channel (Map 93), Alvarado Channel (Map 59) | Representatives from San Diego Coastkeeper, San Diego Chapter of Sierra Club, San Diego Audubon Society, San Diego Canyonlands, San Diego Chapter of California Native Plant Society, and Friends of Rose Canyon Anne Jarque, City of San Diego Bruce McIntyre, HELIX Chiara Clemente, RWQCB Daniel Lottermoser, City of San Diego Dennis Bowling, Rick Engineering Gus Brown, City of San Diego Kris McFadden, City of San Diego Mike Porter (by phone), RWQCB Steve Neudecker, HELIX Tony Heinrichs, City of San Diego |
| March 7, 2011 | Meeting | Update regarding Master Permits | Steve Neudecker (HELIX) Bruce McIntyre (HELIX) Meris Bantilan-Smith (Corps) Chiara Clemente (RWQCB) Kelly Fisher (CDFG) Kris McFadden (City of San Diego) Anne Jarque (City of San Diego) |

5.3.1 Federal Government

Administered by the USFWS, the federal ESA provides the legal framework for the listing and protection of species (and their habitats) that are identified as endangered or threatened with extinction. Actions that jeopardize endangered or threatened species and the habitats upon which they rely are considered a “take” under the ESA. Section 9(a) of the ESA defines take as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct.” “Harm” and “harass” are further defined in federal regulations and case law to include actions that adversely impair or disrupt a listed species’ behavioral patterns. Under the federal ESA, an incidental take permit is required when non-Federal activities would result in “take” of a threatened or endangered species. A Habitat Conservation Plan (HCP) must accompany an application for a Federal Incidental Take Permit (ITP). Take authorization for federally listed wildlife species covered in the HCP shall generally be effective upon approval of the HCP.

Federal wetland regulation (non-marine issues) is guided by the Rivers and Harbors Act of 1899 and Clean Water Act (CWA). The Rivers and Harbors Act deals primarily with discharges into navigable waters, while the purpose of the CWA is to restore and maintain the chemical, physical, and biological integrity of all WUS. Permitting for projects filling WUS (including wetlands) is overseen by the Corps under Section 404 of the Clean Water Act. Projects are typically permitted on an individual basis or are covered under one of several approved general, or Nationwide Permits (NWP).

For actions such as maintenance activities contemplated by the proposed Master Program in which repeated and similar activities throughout a jurisdiction would occur, a Regional General Permit (RGP) may be issued. The Corps issues RGPs to augment the NWP program and authorize regionally occurring activities not addressed in the NWP. Thus, an RGP is a comprehensive permit that the City could pursue for impacts to WUS resulting from ongoing flood control maintenance activities. However, pursuant to the Coastal Zone Management Act (CZMA), for projects within the coastal zone, the Corps cannot issue an RGP until the federal consistency requirements of Section 307(c)(3)(A) of the CZMA have been met. Receiving Coastal Development Permits (CDPs) or exemptions from the California Coastal Commission (CCC) or through the Federal Consistency Unit CCC project review can meet these requirements.

Another type of potential Corps permit for the Master Program is the Letter of Permission (LOP) that may be used for work that the Corps' District Engineer determines to be minor, would not have significant individual or cumulative impacts on the environment, and should encounter no appreciable public opposition. The proposal is coordinated with federal and state resource agencies and in most cases adjacent property owners who might be affected by the proposal. LOPs are typically used to authorize activities regulated under Section 10 of the CWA (e.g., work pertaining to piers, wharves, docks, jetties, artificial reefs, beach fill, dredged material disposal, etc.) but can be used to authorize activities regulated under Section 404 of the CWA if the process for this type of review has been established via an Individual Permit (IP). The resultant IP that would be issued would be considered an IPLOP.

The USFWS identifies critical habitat for endangered and threatened species. Critical habitat is defined as areas of land considered necessary for recovery of threatened or endangered species. The ultimate goal is to restore healthy populations of listed species within their native habitat so they can be removed from the list. Once an area is designated as critical habitat pursuant to the federal ESA, all federal agencies must consult with the USFWS to ensure that any action they authorize, fund, or carry out is not likely to result in destruction or adverse modification of the critical habitat. Critical habitat for least Bell's vireo occurs within the Smuggler's Gulch/Tijuana River portion of the study area (Maps 138 and 138a-c; Figure 5). Critical habitat for San Diego fairy shrimp (*Branchinecta sandiegonensis*) occurs in the central portion of the study area adjacent to Map 58a. Critical habitat for spreading navarretia occurs on Otay Mesa within and adjacent to Map Nos. 124 and 126 (Figure 5). Although present nearby, the storm water facilities do not actually overlap critical habitat for San Diego fairy shrimp and spreading navarretia. Although critical habitat for several other species occurs within City boundaries, the Master Program would not involve maintenance in these areas.

All migratory bird species that are native to the U.S. or its territories are protected under the federal MBTA as amended under the Migratory Bird Treaty Reform Act (MBTRA) of 2004 (FR Doc. 05-5127; USFWS 2004). The MBTA is generally protective of migratory birds but does not actually stipulate the type of protection required. In common practice, USFWS places restrictions on disturbances allowed near active raptor nests.

5.3.2 State of California

Primary environmental legislation in California is found in CEQA and its implementing guidelines (State CEQA Guidelines), requiring that projects with potential adverse effects or impacts on the environment undergo environmental review. Adverse impacts to the environment are typically mitigated as a result of the environmental review process in accordance with existing laws and regulations.

Under Section 401 of the federal CWA, an applicant for a federal permit that may result in a discharge to a water body must obtain certification from the state that the proposed activity will comply with state water quality standards and water quality objectives. Section 401 provides the RWQCB with regulatory authority to certify or deny the proposed activity. A Section 401 Certification must be obtained prior to issuance of a 404 Permit.

The California ESA is similar to the federal ESA in that it contains a process for listing of species and regulating potential impacts to listed species. Section 2081 of the California ESA authorizes CDFG to enter into a memorandum of agreement for take of listed species for scientific, educational, or management purposes.

The Native Plant Protection Act (NPPA) enacted a process by which plants are listed as rare or endangered. The NPPA regulates collection, transport, and commerce in listed plants. The California ESA followed the NPPA and covers both plants and animals determined to be endangered or threatened with extinction. Plants listed as rare under NPPA were designated rare under the California ESA.

Raptors and owls and their active nests are protected by California Fish and Game Code 3503.5, which states that it is unlawful to take, possess, or destroy any birds of prey or to take, possess, or destroy the nest or eggs of any such bird unless authorized by CDFG.

The California Fish and Game Code (Sections 1600 et seq.) requires a CDFG agreement for projects affecting riparian and wetland habitats through issuance of a Streambed Alteration Agreement (SAA).

5.3.3 City of San Diego

Impacts to biological resources in the City must comply with the City's ESL Regulations. The purpose of the regulations is to "protect, preserve and, where damaged restore, the environmentally sensitive lands of San Diego and the viability of the species supported by those lands." Environmentally sensitive lands are defined to include sensitive biological resources, steep hillsides, coastal beaches, sensitive coastal bluffs, and 100-year floodplains.

The ESL requires impacts to wetlands be avoided unless the activities meet specific exemption criteria established in the ordinance. Impacts to City-defined wetlands require approval of deviation findings as required by ESL regulations. For projects occurring within the Coastal Overlay Zone, impacts are only allowed for those uses identified in Section 143.0130(d). These uses are limited to aquaculture, nature study projects or similar resource dependent uses, wetland restoration projects, and incidental public service projects. Impacts to wetlands should only occur if they are unavoidable, have been minimized to the greatest degree possible, and have adequate mitigation. Wetlands must be mitigated in accordance with Section III(B)(1)(a) of the Land Development Manual Biology Guidelines (City 2001). The ESL also requires that buffers be maintained around all wetlands (as appropriate) to protect their functions and values. Examples of functions and values include wildlife habitat, food chain productivity, water quality/sediment filtration, ground water recharge, and storm water abatement. Typical buffer zone widths in southern California are 100 feet around wetlands and 50 feet around riparian areas, although final buffer zone widths for a project must be determined in consultation with the Corps, CDFG, and CCC, as applicable. Buffer widths may either be increased or decreased as determined on a case-by-case basis, taking into consideration the size and type of project proposed, sensitivity of the wetland resource to detrimental edge effects, topography, specific functions and values of the wetland, as well as the need for transitional upland habitat (City 2001).

In July 1997, the USFWS, CDFG, and City adopted the Implementing Agreement for the MSCP. This program allows the incidental take of threatened and endangered species as well as regionally-sensitive species that are conserved by it (covered species). The term “MSCP Covered” refers to species covered by the City’s Federal ITP issued pursuant to Section 10(a) of the Federal ESA (16 U.S.C. § 1539[a][2][A]). As of April 20, 2010, the City surrendered authorization for incidental take of the following 2 vernal pool animal species and 5 vernal pool plant species previously identified as MSCP covered species (San Diego fairy shrimp [*Branchinecta sandiegonensis*], Riverside fairy shrimp [*Streptocephalus woottoni*], San Diego button-celery [*Eryngium aristulatum* ssp. *parishii*], California Orcutt’s grass [*Orcuttia californica*], San Diego mesa mint [*Pogogyne abramsii*], spreading navarretia [*Navarretia fossalis*], and Otay mesa mint [*Pogogyne nudiscula*]). Development involving the take of any of these 7 species requires authorization from the USFWS through the federal process until the City completes a new HCP and enters into another Implementing Agreement for a new Federal ITP for those species.

The MSCP designates regional preserves that are intended to be mostly void of development activities, while allowing development of other areas subject to the requirements of the program. Impacts to biological resources are regulated by the City’s ESL regulations. Mitigation requirements for sensitive resources discussed in this document follow the City’s ESL Biology Guidelines (Section II, Development Regulations; City 2001). The coastal California gnatcatcher (threatened), least Bell’s vireo (endangered), southwestern willow flycatcher (endangered), and light-footed clapper rail (endangered) are the only federally listed animal species known to occur or with high probability of occurring within or adjacent to some of the Master Program facilities. All but the clapper rail are covered species under the City’s MSCP Subarea Plan. The gnatcatcher could occur near or adjacent to various Master Program facilities and the vireo could occur in or adjacent to several facilities. The flycatcher has high potential to occur only along the San Diego River, and the clapper rail has been documented in the Los Peñasquitos Channel, just east of I-5.

6.0 PROJECT IMPACTS

The following analysis is intended to provide a programmatic estimate of the magnitude of impacts to biological resources that could occur from the various maintenance activities anticipated to result from implementation of the proposed Master Program. This analysis includes potential impacts associated with bringing equipment into the storm water facilities on access roads which have been identified for each facility included in the Master Program. The estimated disturbance widths are identified in Appendix A.

The following analysis characterizes impacts as direct or indirect. An impact is considered direct when the primary effect is removal of existing habitat and/or species. Direct impacts would result from clearing of vegetation and removal of accumulated sediment and debris. Indirect impacts occur when secondary effects of adjacent activities such as noise, reduced water quality, dust, or non-native plant invasion adversely affect adjacent biological resources. The magnitude of an indirect impact may be the same as a direct impact; however, the effect usually takes a longer time to become apparent.

The impacts of the proposed maintenance activities are evaluated in terms of their relationship to the guidelines established by the MSCP.

The significance of impacts to identified biological resources or those with potential to occur was determined based upon the sensitivity of the resource and the extent of the anticipated impacts. For certain highly sensitive resources (e.g., a federally listed species) any impact would be significant. Conversely, other resources that have a low sensitivity (e.g., species with a large, locally stable population in the City but declining elsewhere) could sustain an impact with insignificant effect.

6.1 DIRECT IMPACTS

Impacts to biological resources associated with the proposed Master Program would consist of removal of vegetation and/or accumulated soil from Program facilities, and associated access and staging. In addition, impacts could occur from implementation of mitigation measures which involve interim erosion control (e.g. check dams) or offsite enhancement, restoration or creation of habitat to offset impacts from maintenance.

Quantifying the impact of offsite habitat enhancement, restoration or creation is considered speculative pursuant to Section 15145 of the CEQA Guidelines. As discussed in the mitigation section of this report, both the amount and location of offsite mitigation are dependent on a number of factors which cannot be forecast at this time. However, impacts would normally consist of temporary to permanent displacement of the vegetation and wildlife which occur on the offsite mitigation site prior to implementation. As offsite mitigation traditionally is limited to areas which do not support high quality biological resources, it is anticipated that offsite mitigation would not result in a significant impact on biological resources. Mitigation is expected to result in improved biological resources once established.

Similarly, quantifying the impact of water quality control measures implemented as a part of a maintenance activity is difficult to determine. Temporary check dams or similar features may be required to reduce water quality impacts from maintenance. The initial impact of these features would be estimated and mitigated as part of the mitigation program developed for the overall maintenance activity which would include installation of the water quality control feature. As temporary facilities, they are intended to be removed when no longer required. For example, once the vegetation has become re-established, it is anticipated that check dams and other interim facilities would be removed. Where these features are located within native vegetation, removal may cause minimal impact in the course of dismantling the feature. These impacts would not be significant as mitigation would already have occurred for the installation process and because temporarily impacted vegetation would be expected to re-establish.

Quantifying the impact of maintenance on biological resources would depend on the results of a site-specific Individual Hydraulic/Hydrology Assessment (IHHA) required to be completed for each maintenance activity. As discussed in Master Program, the IHHA would identify the minimum amount of vegetation required to be removed to maximize the ability of storm water facilities to convey floodwater. In order to provide a programmatic basis for evaluating the impacts of maintenance on biological resources, it is assumed that disturbance would be limited to the channel bottom and the adjacent 2 feet whenever a channel has a bank-to-bank width of over 20 feet. Where the overall width is less than 20 feet, it is assumed that the channel banks as well as bottom would have to be cleared to maximize floodwater conveyance. The list of storm water facilities included in the Master Program, contained in Appendix A, quantifies the assumed width of disturbance in each channel based on these parameters.

6.1.1 Vegetation Communities

Based on the width of disturbance identified in Appendix A, maintenance activities analyzed in this report could affect up to approximately 41.62 acres of vegetated wetland habitat and 37.08 acres of unvegetated earthen-bottom streambed/natural flood channel. An estimated 61.3 acres of upland habitat could be impacted, of which approximately 50.3 acres are developed (82 percent). Unvegetated concrete-lined channels were considered developed lands in calculating impacts to vegetation communities. A breakdown of estimated wetland impacts by facility name/location is provided in Appendix F. A total of 14.59 acres of wetland impacts, 29.23 acres of unvegetated streambed impacts, and 0.3 acre of sensitive upland impacts could occur within the MHPA (Table 10). A total of 10.62 acres of wetland impacts and 9.19 acres of unvegetated natural flood channel impacts could occur within the coastal overlay zone. The proposed maintenance activities would occur over an extended period; thus, impacts would not occur at any one time to all channels in the Master Program. Impacts would be determined on an annual basis through the SCR process.

Wetland/Riparian Vegetation Communities

As previously stated, maintenance activities could impact up to 41.62 acres of vegetated wetland/riparian habitats, including 4.95 acres of southern riparian forest (including disturbed), 0.09 acre of southern sycamore riparian woodland, 7.49 acres of southern willow scrub (including disturbed), 1.99 acres of mule fat scrub (including disturbed), 0.15 acre of riparian scrub, 17.90 acres of freshwater marsh (including disturbed), 1.57 acres of coastal salt marsh, 0.51 acre of

coastal brackish marsh, and 6.97 acres of disturbed wetland. In addition, up to 37.08 acres of earthen-bottom streambed/natural flood channel could be impacted (Table 10). To minimize the number of tables within the body of this report, estimated wetland impacts associated with each specific channel are presented in Appendices E (Corps jurisdiction) and F (CDFG and City jurisdiction). Unavoidable impacts to wetland buffers would be mitigated based on ratios provided in Section 7.0. Impacts to wetland vegetation communities are considered significant and would require mitigation.

Upland Vegetation Communities

Maintenance activities could impact up to 4.9 acres of sensitive upland habitat, including 2.2 acres of Diegan coastal sage scrub (including disturbed), 0.2 acre of southern mixed chaparral, and 2.5 acres of non-native grassland (Table 10). Impacts to these communities would be significant and would require mitigation.

Impacts up to 56.4 acres of non-sensitive uplands (0.2 acre of eucalyptus woodland, 2.8 acres of non-native vegetation/ornamental, 3.1 acres of disturbed habitat/ruderal, and 50.3 acres of developed land) would not be considered significant under the City's Biology Guidelines; therefore, no mitigation is required.

6.1.2 Benthic Macroinvertebrate Populations

Unlike many other animals, benthic macroinvertebrates (BMI) are not able to readily move into adjacent habitat in response to maintenance activities because they are confined to sediments. In order to determine the potential effect of maintenance on BMI, an evaluation was done by William Isham, an aquatic ecologist with Weston Solutions (Weston 2011). His findings are summarized below.

BMI are important components of ecosystems associated with streambeds. They provide a valuable food source for wildlife including fish, birds, and small mammals and also play an important role in the breakdown of organic matter. BMI typically include the larval and adult stages of aquatic insects as well as all life stages of non-insects (e.g., amphipods, crayfish, and flatworms). No sensitive BMI are expected to occur within the storm water facilities included in the Master Program. Sensitive BMI are restricted to more pristine, non-urbanized sites and have either been eliminated from the urban environment or were never present due to pre-development hydrologic limitations.

The capacity of storm water facilities to support BMI is based on 2 primary factors: surface water flow and substrate characteristics. The most favorable substrate consists of fine sediments. Low surface flows are the most favorable for BMI. High surface water flows result in scouring which displaces BMI residing in the relocated substrate.

Maintenance of storm water facilities would impact BMI. Direct impacts would occur from excavation of sediment material to increase the capacity of facilities to convey floodwater. BMI occurring within this excavated material would be eradicated. In addition, the removal of vegetation during maintenance has the potential to accelerate erosion of the underlying substrate.

When erosion occurs, BMI residing in this substrate material would likely experience high mortality in the process of being transported downstream with displaced sediment.

Although maintenance would impact BMI, the impacts would not be significant. Physical disruption to a limited section of a stream would generally have a short-term, quickly reversible impact to BMI communities. The resilience of BMI has been documented in numerous situations in San Diego County in recent years, including Forester Creek in the City of Santee (Weston 2011). Restoration in Forester Creek began with complete removal of the stream substrate for a length of approximately 800 meters. Construction activities took approximately one and a half years to complete. In the course of this work, surveys of BMI were conducted, including 2 pre-restoration surveys, 2 surveys during restoration, and 2 post-restoration surveys. Although quality, richness, and abundance of the BMI community were affected to a moderate degree by disruption of the streambed, even major disturbance did not eliminate the BMI community altogether. Furthermore, impacts on the BMI community were entirely reversed once the vegetation reestablished. Although maintenance activities in earthen-bottom channels could result in temporary impacts to BMI communities, no significant impacts on BMI are expected to occur as the types of BMI communities expected to be present are resilient in nature and quickly reestablish following regrowth of vegetation.

The example of Forester Creek would be different from the scenario that would be encountered in concrete-lined channels. In some concrete channels, eroded sediment and cobble from upstream sources have accumulated on the channel bottom and, over time, vegetation may become established. As a result, what was once a very poor substrate for BMI becomes habitat of much higher quality. Channel maintenance activities that remove sediment and vegetation would have a greater and more long-lasting impact on the BMI community than in a more natural streambed. However, since the accumulation of sediment would likely begin soon after maintenance and remain until the next maintenance event, no significant impacts on BMI are anticipated to occur from maintenance in concrete channels.

6.1.3 Sensitive Plant Species

Implementation of the proposed project could directly impact 4 sensitive plant species observed within the study area: single-whorl burrobush, San Diego marsh-elder, southwestern spiny rush, and San Diego sunflower. Although direct counts of the number of each species observed during field surveys that would be impacted were not conducted, the relatively low abundance of these species within the impact areas together with avoidance and minimization measures are expected to result in low numbers of individuals being affected; thus, proposed maintenance activities would not be considered significant. Species not observed but with potential to occur are addressed in Section 6.1.4.

Table 10
ESTIMATED AREA OF VEGETATION COMMUNITIES AFFECTED*

| HU | Wetlands Outside MHPA † | | | | | | | | | | | Total |
|--------------------------|-------------------------|-------------|-------------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|--------------|--------------|
| | SRF | SRW | SWS | MFS | RS | FWM | CAM | CSM | CBM | DW | STM/ NFC | |
| San Dieguito | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.16 | 0.00 | 0.00 | 0.00 | 0.02 | 0.01 | 0.19 |
| Peñasquitos | 0.00 | 0.00 | 1.60 | 0.35 | 0.00 | 4.66 | 0.00 | 0.19 | 0.05 | 0.00 | 1.35 | 8.20 |
| San Diego | 0.00 | 0.09 | 0.75 | 0.00 | 0.00 | 2.96 | 0.00 | 0.00 | 0.00 | 0.27 | 0.20 | 4.27 |
| Pueblo San Diego | 0.00 | 0.00 | 1.68 | 0.46 | 0.15 | 4.36 | 0.00 | 0.32 | 0.00 | 4.78 | 6.29 | 18.04 |
| Sweetwater | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.02 |
| Otay | 0.00 | 0.00 | 0.28 | 0.00 | 0.00 | 1.73 | 0.00 | 0.00 | 0.00 | 0.06 | 0.00 | 2.07 |
| Tijuana | 0.00 | 0.00 | 0.50 | 0.01 | 0.00 | 1.04 | 0.00 | 0.00 | 0.00 | 0.54 | 0.00 | 2.09 |
| Non-MHPA Subtotal | 0.00 | 0.09 | 4.81 | 0.82 | 0.15 | 14.91 | 0.00 | 0.51 | 0.05 | 5.69 | 7.85 | 34.88 |
| HU | Wetlands Within MHPA † | | | | | | | | | | | Total |
| | SRF | SRW | SWS | MFS | RS | FWM | CAM | CSM | CBM | DW | STM/ NFC | |
| San Dieguito | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Peñasquitos | 0.00 | 0.00 | 1.90 | 0.17 | 0.00 | 1.81 | 0.00 | 1.06 | 0.46 | 0.04 | 3.90 | 9.34 |
| San Diego | 4.95 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.11 | 22.88 | 28.94 |
| Pueblo San Diego | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Sweetwater | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Otay | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tijuana | 0.00 | 0.00 | 0.78 | 1.00 | 0.00 | 0.18 | 0.00 | 0.00 | 0.00 | 1.13 | 2.45 | 5.54 |
| MHPA Subtotal | 4.95 | 0.00 | 2.68 | 1.17 | 0.00 | 2.99 | 0.00 | 1.06 | 0.46 | 1.28 | 29.23 | 43.82 |
| WETLANDS TOTAL | 4.95 | 0.09 | 7.49 | 1.99 | 0.15 | 17.90 | 0.00 | 1.57 | 0.51 | 6.97 | 37.08 | 78.70 |

**Table 10 (cont.)
ESTIMATED AREA OF VEGETATION COMMUNITIES AFFECTED***

| HU | Uplands Outside MHPA† | | | | | | | Total |
|--------------------------|-----------------------|------------|------------|------------|-------------|------------|-------------|-------------|
| | Tier II | Tier IIIA | Tier IIIB | Tier IV | | | | |
| | DCSS | SMC | NNG | EW | NNV/ ORN | DH/ RUD | DEV | |
| San Dieguito | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.2 | 1.2 |
| Peñasquitos | 0.0 | 0.1 | 0.2 | 0.0 | 0.9 | 0.2 | 12.8 | 14.2 |
| San Diego | 0.4 | 0.0 | 0.3 | 0.1 | 0.4 | 0.7 | 7.0 | 8.9 |
| Pueblo San Diego | 1.8 | 0.0 | 1.4 | 0.0 | 0.8 | 1.1 | 25.7 | 30.8 |
| Sweetwater | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 | 0.4 |
| Otay | 0.0 | 0.0 | 0.1 | 0.0 | 0.4 | 0.9 | 0.8 | 2.2 |
| Tijuana | 0.0 | 0.0 | 0.3 | 0.0 | 0.2 | 0.1 | 1.5 | 2.1 |
| Non-MHPA Subtotal | 2.2 | 0.1 | 2.3 | 0.1 | 2.7 | 3.0 | 49.4 | 59.8 |
| HU | Uplands Within MHPA† | | | | | | | Total |
| | Tier II | Tier IIIA | Tier IIIB | Tier IV | | | | |
| | DCSS | SMC | NNG | EW | NNV/ ORN | DH/ RUD | DEV | |
| San Dieguito | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Peñasquitos | 0.0 | 0.1 | 0.2 | 0.1 | 0.1 | 0.0 | 0.1 | 0.6 |
| San Diego | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.8 | 0.8 |
| Pueblo San Diego | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Sweetwater | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Otay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tijuana | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.1 |
| MHPA Subtotal | 0.0 | 0.1 | 0.2 | 0.1 | 0.1 | 0.1 | 0.9 | 1.5 |
| UPLANDS TOTAL | 2.2 | 0.2 | 2.5 | 0.2 | 2.8 | 3.1 | 50.3 | 61.3 |

*Totals reflect rounding

†Habitat acronyms: CAM=cismontane alkali marsh, CBM=coastal brackish marsh, CSM=coastal salt marsh, DCSS=Diegan coastal sage scrub, DH/RUD=disturbed habitat/ruderal, DEV=developed, DW=disturbed wetland, EW=eucalyptus woodland, FWM=freshwater marsh, MFS=mule fat scrub, NFC=City natural flood channel, NNG=non-native grassland, NNV/ORN=non-native vegetation/ornamental, RS=riparian scrub, SMC=southern mixed chaparral, SRF=southern riparian forest, SRW=southern sycamore riparian woodland, STM=CDFG streambed (includes open water habitat), SWS=southern willow scrub

6.1.4 Sensitive Animal Species

With regard to sensitive animal species detected within the study area, proposed maintenance activities could directly impact the federally listed threatened coastal California gnatcatcher by clearing small areas of habitat for construction of access roads and staging areas. These activities also could result in impacts to nesting raptors. Any impacts to listed animal species or nesting raptors would be considered significant.

Maintenance activities within the channels have potential to impact other sensitive species such as the yellow warbler, and little blue heron. These impacts would not be considered significant due to the low sensitivity status of these species and measures to avoid disruption during the breeding season.

6.1.5 Sensitive Plant and Animal Species with Potential to Occur

Several listed and/or narrow endemic plant species with moderate to low potential to occur in or adjacent to the Master Program study area include the following: San Diego ambrosia (*Ambrosia pumila*), willowy monardella (*Monardella viminea*), Otay tarplant (*Deinandra conjugens*), snake cholla (*Opuntia californica* var. *californica*), variegated dudleya (*Dudleya variegata*), San Diego thorn-mint (*Acanthomintha ilicifolia*), San Diego button-celery (*Eryngium aristulatum* var. *parishii*), California Orcutt's grass (*Orcuttia californica*), Otay mesa mint (*Pogogyne nudiuscula*), and spreading navarretia (*Navarretia fossalis*). San Diego ambrosia is known to occur within floodplain areas, and willow monardella can be found in dry creek beds; both have been reported in the vicinity of Master Program mapped areas (Tables 6 and 7). Snake cholla is primarily a sage scrub species; it has been reported in the vicinity of several storm water facilities in the Master Program study area. The remaining plants are primarily grassland or vernal pool species and were considered to have low to moderate potential to occur because of their known distributions in the Otay Mesa area where some Master Program channels are located, and where critical habitat for spreading navarretia occurs. Critical habitat for spreading navarretia would be expected to support other listed vernal pool plants such as San Diego thorn-mint, San Diego button-celery, California Orcutt's grass, and Otay mesa mint.

Although the Master Program would not impact vernal pools, they may occur near certain areas in which maintenance is proposed. Any impacts to listed or narrow endemic plant species would be significant.

The potential for impacts to other listed and/or narrow endemic plant species including Shaw's agave (*Agave shawii*), aphanisma (*Aphanisma blitoides*), coastal dunes milk vetch (*Astragalus tener* var. *titi*), Encinitas baccharis (*Baccharis vanessae*), short-leaved dudleya (*Dudleya brevifolia*), prostrate navarretia (*Navarretia prostrata*), San Diego mesa mint (*Pogogyne abramsii*), thread-leaved brodiaea (*Brodiaea filifolia*), Del Mar manzanita (*Arctostaphylos glandulosa* ssp. *crassifolia*), Orcutt's spineflower (*Chorizanthe orcuttiana*), salt marsh bird's beak (*Cordylanthus maritimus*), Mexican flannelbush (*Fremontodendron mexicanum*), Orcutt's hazardia (*Hazardia orcuttii*), and small-leaved rose (*Rosa minutifolia*) are low based on habitat affiliations combined with recent and previous surveys of the study area documented in the CNDDDB, cross-referenced with the areas of

proposed impact. As a result, maintenance of mapped storm water facilities occurring as part of the Master Program would not be expected to have a significant impact on the sensitive plants listed above.

The potential for impacts to listed animal species such as San Diego fairy shrimp, Quino checkerspot butterfly (*Euphydryas editha quino*), Riverside fairy shrimp (*Streptocephalus woottoni*), arroyo toad (*Bufo californicus*), western snowy plover (*Charadrius alexandrinus nivosus*), California black rail (*Laterallus jamaicensis coturniculus*), Belding's savannah sparrow (*Passerculus sandwichensis beldingi*), California least tern (*Sternula antillarum browni*), and Pacific pocket mouse (*Perognathus longimembris pacificus*) are low based on habitat affiliations combined with recent and previous surveys of the study area documented in the CNDDDB and USFWS database cross-referenced with the areas of proposed impact. As a result, maintenance of mapped storm water facilities occurring as part of the Master Program is not expected to have a significant impact on the sensitive animals listed above.

Although appropriate habitat for the arroyo toad occurs within the Master Program study area, this species was considered to have low potential to occur because there are no recorded CNDDDB or USFWS locations for this species in the study area and the list of known arroyo toad locations provided in the MSCP does not include creeks within the Master Program study area.

The western yellow-billed cuckoo (*Coccyzus americanus occidentalis*) and southwestern willow flycatcher have low to moderate potential to occur in areas of the Master Program that support mature riparian woodland, with the exception of the San Diego River, in which the southwestern willow flycatcher has high potential to occur based on USFWS records from 2009. Within the Master Program, the most probable locations for these 2 species to occur are along the San Diego River and Soledad Creek. Any impacts to these species would be considered significant.

Implementation of the proposed project is expected to impact the habitat of the federally and state listed endangered least Bell's vireo, which has been documented in CNDDDB and by USFWS as occurring in various locations within or near the study area. Any impacts to this species would be significant.

Implementation of the proposed project may impact the habitat of the federally and state listed endangered light-footed clapper rail (*Rallus longirostris levipes*), which has been documented by USFWS as occurring in the Los Peñasquitos Channel, just east of I-5. Any impacts to this species would be significant.

The remaining sensitive animal species with the potential to occur are not federally or state listed. Of these, the following have high potential to occur within the study area: salt marsh skipper (*Panoquina errans*), orange-throated whiptail (*Cnemidophorus hyperthyrus*), San Diego horned lizard (*Phrynomysoma coronatum* ssp. *blainvillei*), 2-striped garter snake (*Thamnophis hammondi*), yellow-breasted chat (*Icteria virens*), and Mexican long-tongued bat (*Choeronycteris mexicana*). Other sensitive species not specifically addressed in this section have low or moderate likelihood of occurring on site.

Implementation of the proposed project is expected to significantly impact the habitat of yellow-breasted chat, which shares the same habitat requirements as the least Bell's vireo.

Any impacts to the remaining non-listed sensitive animal species would be adverse but less than significant because these species are not highly sensitive, and their habitat would not be permanently lost due to the frequency and nature of the maintenance clearing.

6.1.6 Jurisdictional Areas (Corps, CDFG, and City)

Up to 29.22 acres of wetlands and 72.98 acres of non-wetland WUS subject to Corps jurisdiction, including 39.51 acres of earthen-bottom channels and 33.47 acres of concrete-lined channels, could be impacted within study area (Table 11). Appendix F contains a detailed estimate of Corps jurisdictional impacts by facility name/location.

Up to approximately 41.62 acres of wetlands/riparian habitat and 37.08 acres of unvegetated earthen-bottom streambed subject to CDFG jurisdiction could be affected by maintenance activities (Table 12). Vegetated habitat includes concrete-lined channels that support a dominance of wetland vegetation. Appendix G contains an estimation of CDFG and City jurisdictional impacts by facility name/location.

Up to approximately 41.62 acres of vegetated wetland and 37.08 acres of unvegetated natural flood channel subject to City jurisdiction could be affected by maintenance activities (Table 12). The vegetated wetland acreage includes concrete-lined channels that support a dominance of wetland vegetation. Approximately 10.62 acres of these impacts could occur to wetlands within the coastal overlay zone and 9.19 acres to unvegetated natural flood channels within the coastal overlay zone. Appendix G contains a detailed list of estimated City jurisdictional impacts by facility name/location.

6.1.7 Wildlife Corridors

Significant long-term impacts to wildlife corridors are not anticipated to occur from proposed maintenance activities. Many of the Master Program facilities consist of concrete-lined channels, often surrounded by chain-link fencing, and traversing highly urban areas with no adjacent habitat. Access to these channels for most wildlife is extremely limited due to fencing and surrounding roads and other development. In addition, such channels provide only limited habitat. As a result, no significant impacts to wildlife movement or corridors are anticipated to occur in these areas.

In contrast, some of the Master Program channels are within the City's MHPA and may be used as local wildlife movement corridors. In these locations, the MHPA is not limited to just the channels, but also incorporates wider swaths of adjacent habitat. Maintenance activities in these areas could temporarily disrupt animal movement during vegetation/sediment removal activities, but are not expected to have a significant impact over the long term since such Master Program facilities are part of wider linkages, and the maintenance activities would be restricted to a relatively small component of these areas. In addition, vegetation would not be cleared from the slopes of channels that are wider than 20 feet from bank to bank, thus leaving vegetative cover intact for portions of the channel. Maintenance would only occur periodically, allowing time for

some vegetative cover to reestablish between maintenance events. Furthermore, periodic removal of vegetation and debris from the channel bottom may even aid in wildlife passage in areas where the channel was choked with vegetation and debris prior to maintenance and vegetation remaining on the slopes provides cover.

Although the temporary loss of cover in portions of the Master Program facilities could temporarily change how wildlife move through certain areas, the overall wildlife linkages would not be significantly impacted by implementation of the Master Program, as these linkages are part of broader areas of habitat suitable for wildlife movement.

6.1.8 MSCP

As illustrated in Table 13, maintenance activities would be consistent with relevant policies and guidelines of the City's MSCP.

Table 11
ESTIMATED CORPS JURISDICTIONAL AREAS (WUS) AFFECTED (acre[s])*

| HU† | Wetlands‡ | | | | | | | | | | | Non-wetland WUS | | TOTAL |
|------------------|-------------|-------------|-------------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|-----------------------|-----------------|-----------------|--------------|
| | SRF | SRW | SWS | MFS | RS | FWM | CAM | CSM | CBM | DW | Total Wetland Impacts | Earthen bottom | Concrete bottom | |
| San Dieguito | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 1.19 | 1.21 |
| Peñasquitos | 0.00 | 0.00 | 1.94 | 0.08 | 0.00 | 5.55 | 0.00 | 1.25 | 0.31 | 0.01 | 9.14 | 5.15 | 10.61 | 24.90 |
| San Diego | 4.95 | 0.00 | 0.30 | 0.00 | 0.00 | 2.76 | 0.00 | 0.00 | 0.00 | 0.02 | 8.03 | 23.30 | 5.47 | 36.80 |
| Pueblo San Diego | 0.00 | 0.00 | 0.75 | 0.19 | 0.06 | 2.74 | 0.00 | 0.32 | 0.00 | 2.90 | 6.96 | 7.38 | 14.13 | 28.47 |
| Sweetwater | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.26 | 0.26 |
| Otay | 0.00 | 0.00 | 0.28 | 0.00 | 0.00 | 1.46 | 0.00 | 0.00 | 0.00 | 0.05 | 1.79 | 0.00 | 0.47 | 2.26 |
| Tijuana | 0.00 | 0.00 | 0.77 | 0.22 | 0.00 | 1.06 | 0.00 | 0.00 | 0.00 | 1.24 | 3.29 | 3.67 | 1.34 | 8.30 |
| TOTAL | 4.95 | 0.00 | 4.04 | 0.49 | 0.06 | 13.58 | 0.00 | 1.57 | 0.31 | 4.22 | 29.22 | 39.51 | 33.47 | 72.98 |

*Totals reflect rounding

†The HUs correspond to the following Storm Water Facility map pages in Appendix B: San Dieguito HU=Maps 1-3; Peñasquitos HU=Maps 6-46, and 55-57; San Diego HU=Maps 47-54, 58-66, 81-83, 145-147; Pueblo San Diego HU=Maps 67-80, 84-121; Sweetwater HU=Map 122; Otay HU=Maps 131-134; Tijuana HU=Maps 123-130, 136-139

‡Habitat acronyms: CAM=cismontane alkali marsh, CBM=coastal brackish marsh, CSM=coastal salt marsh, DW=disturbed wetland, FWM=freshwater marsh, MFS=mule fat scrub, RS=riparian scrub, SRF=southern riparian forest, SRW=southern sycamore riparian woodland, SWS=southern willow scrub

Table 12
ESTIMATED CDFG AND CITY JURISDICTIONAL AREAS AFFECTED (acre[s])*

| HU† | Wetland/Riparian Habitat‡ | | | | | | | | | | | Drainage | Total CDFG/ City |
|------------------|---------------------------|-------------|-------------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|---------------------------------|--------------|------------------|
| | SRF | SRW | SWS | MFS | RS | FWM | CAM | CSM | CBM | DW | Total Wetland/ Riparian Impacts | STM/ NFC | |
| San Dieguito | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.16 | 0.00 | 0.00 | 0.00 | 0.02 | 0.18 | 0.01 | 0.19 |
| Peñasquitos | 0.00 | 0.00 | 3.50 | 0.52 | 0.00 | 6.47 | 0.00 | 1.25 | 0.51 | 0.04 | 12.29 | 5.25 | 17.54 |
| San Diego | 4.95 | 0.09 | 0.75 | 0.00 | 0.00 | 3.97 | 0.00 | 0.00 | 0.00 | 0.38 | 10.14 | 23.08 | 33.22 |
| Pueblo San Diego | 0.00 | 0.00 | 1.68 | 0.46 | 0.15 | 4.36 | 0.00 | 0.32 | 0.00 | 4.78 | 11.75 | 6.29 | 18.04 |
| Sweetwater | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.02 | 0.00 | 0.02 |
| Otay | 0.00 | 0.00 | 0.28 | 0.00 | 0.00 | 1.73 | 0.00 | 0.00 | 0.00 | 0.06 | 2.07 | 0.00 | 2.07 |
| Tijuana | 0.00 | 0.00 | 1.28 | 1.01 | 0.00 | 1.21 | 0.00 | 0.00 | 0.00 | 1.67 | 5.17 | 2.45 | 7.62 |
| TOTAL | 4.95 | 0.09 | 7.49 | 1.99 | 0.15 | 17.90 | 0.00 | 1.57 | 0.51 | 6.97 | 41.62 | 37.08 | 78.70 |

*Totals reflect rounding

†The HUs correspond to the following Storm Water Facility map pages in Appendix B: San Dieguito HU=Maps 1-3; Peñasquitos HU=Maps 6-46, and 55-57; San Diego HU=Maps 47-54, 58-66, 81-83, 145-147; Pueblo San Diego HU=Maps 67-80, 84-121; Sweetwater HU=Map 122; Otay HU=Maps 131-134; Tijuana HU=Maps 123-130, 136-139

‡Habitat acronyms: CAM=cismontane alkali marsh, CBM=coastal brackish marsh, CSM=coastal salt marsh, DW=disturbed wetland, FWM=freshwater marsh, MFS=mule fat scrub, NFC= City natural flood channel, RS=riparian scrub, SRF=southern riparian forest, SRW=southern sycamore riparian woodland, SWS=southern willow scrub, STM=CDFG streambed (includes open water habitat)

Table 13
MSCP CONSISTENCY EVALUATION

| MSCP POLICY/GUIDELINE | EVALUATION | CONSISTENT? |
|--|---|---------------------------|
| General Planning Policies and Guidelines | | |
| <p>Flood control should generally be limited to existing agreements with Resource Agencies unless demonstrated to be needed based on a cost-benefit analysis and pursuant to the compensation plan. Floodplains within and upstream from the MHPA, if feasible, should remain in a natural condition and configuration in order to allow for the ecological, geological, hydrological, and other natural processes to remain or be restored.</p> | <p>While implementation of the Master Program would periodically remove natural vegetation associated with earthen storm water facilities to assure proper flood control function, the natural configuration of the facilities would not be modified other than to remove accumulated sediment. Impacts to wetland vegetation associated with the channel would depart from the overall goal of maintaining natural drainage courses. This impact is unavoidable, given the project's primary goal of retaining the channel's ability to safely transport floodwaters. These impacts would occur with authorization from appropriate federal, state, or local agencies, and compensation would be required.</p> | <p align="center">Yes</p> |
| <p>No berming, channelization, or man-made constraints or barriers to creek, tributary, or river flows should be allowed in any floodplain within the MHPA unless reviewed by all appropriate agencies, and adequately mitigated. Review must include impacts to upstream and downstream habitats, flood flow volumes, velocities and configurations, water availability, and changes to the water table level.</p> | <p>The Master Program would not include new permanent berming, channelization, or man-made constraints or barriers to channel flows in any floodplain within the MHPA and therefore would not have significant impacts associated with these activities. Short-term erosion control measures (e.g. check dams) used to limit downstream sedimentation would be removed when vegetation becomes re-established.</p> | <p align="center">Yes</p> |
| <p>No riprap, concrete, or other unnatural material shall be used to stabilize river, creek, tributary, and channel banks within the MHPA. River, stream, and channel banks shall be natural and stabilized where necessary with willows and other appropriate native plantings. Rock gabions may be used where necessary to dissipate flows and should incorporate design features to ensure wildlife movement.</p> | <p>The Master Program may replace riprap, concrete or other unnatural materials currently occurring in storm water facilities but would not introduce any permanent, non-natural erosion control facilities. As indicated above, short-term erosion control measures (e.g. check dams) used to limit downstream sedimentation would be removed when vegetation becomes re-established.</p> | <p align="center">Yes</p> |

**Table 13 (cont.)
MSCP CONSISTENCY EVALUATION**

| MSCP POLICY/GUIDELINE | EVALUATION | CONSISTENT? |
|--|---|---------------------------|
| General Planning Policies and Guidelines (cont.) | | |
| <p>Temporary construction areas of roads or staging areas must not disturb existing habitats unless determined to be unavoidable. All such activities must occur on existing agricultural lands or other disturbed areas rather than in habitat. If temporary habitat disturbance is unavoidable, restoration and/or mitigation for disturbed areas after project completion will be required.</p> | <p>Access, staging and stockpiling locations have been selected to minimize impacts to sensitive habitat.</p> | <p align="center">Yes</p> |
| <p>Construction and maintenance activities in wildlife corridors must avoid significant disruption of corridor usage. MMRPs and environmental documents covering such development must specify how this will be achieved, and construction plans must contain all pertinent information and be readily available to field crews. Training of crews and field workers must be conducted to ensure that all conditions are met. A responsible party must be specified.</p> | <p>Maintenance activities would be of limited durations (typically less than one week) and would occur during daylight hours when wildlife movement is limited. Maintenance activities would follow the protocols developed for this project, which includes training of field personnel in the protocols established to avoid and minimize impacts to sensitive resources.</p> | <p align="center">Yes</p> |
| <p>Roads in the MHPA will be limited to those identified in Community Plan Circulation Elements, collector streets essential for area circulation, and necessary maintenance/emergency access.</p> | <p>Access, staging and stockpiling locations have been selected to minimize impacts to sensitive habitat.</p> | <p align="center">Yes</p> |

**Table 13 (cont.)
MSCP CONSISTENCY EVALUATION**

| MSCP POLICY/GUIDELINE | EVALUATION | CONSISTENT? |
|---|---|-------------|
| General Planning Policies and Guidelines (cont.) | | |
| Development of roads in canyon bottoms should be avoided whenever feasible. If a location outside the MHPA is not feasible, the road must be designed to cross the shortest length of the MHPA in order to minimize impacts and fragmentation of sensitive species and habitat. If roads cross the MHPA, they should provide for fully functional wildlife movement capability. Bridges are preferred for providing movement, although culverts in selected locations may be acceptable. Fencing, grading, and plant cover should be provided where needed to protect, shield, and guide animals from roads to appropriate crossings. | Access, staging and stockpiling locations have been selected to minimize impacts to sensitive habitat. | Yes |
| Where possible, roads within the MHPA should be narrowed from existing design standards to minimize habitat fragmentation and disruption of wildlife movement and breeding areas. Roads must be located in lower quality habitat or disturbed areas to the extent possible. | Access roads would be improved to the minimum width required to accommodate moving equipment in and out of the channels and would be located in the least sensitive habitat to the greatest extent practicable. | Yes |
| For the most part, existing roads and utility lines are considered a compatible use within the MHPA and therefore will be maintained. Exceptions may occur where underutilized or duplicative road systems are determined not to be necessary. | Wherever possible, access for maintenance would occur along existing roads and paths. | Yes |

**Table 13 (cont.)
MSCP CONSISTENCY EVALUATION**

| MSCP POLICY/GUIDELINE | EVALUATION | CONSISTENT ? |
|--|---|--------------|
| MHPA Adjacency Guidelines | | |
| Lighting of all developed adjacent areas should be directed away from the MHPA. Where necessary, development should provide adequate shielding with non-invasive plant materials (preferably native), berms, and/or other methods to protect MHPA and sensitive species from night lighting. | Maintenance activities would be of limited durations (generally less than one week) and would occur during daylight hours. Lighting would only be used in emergencies when maintenance cannot be limited to daylight hours. | Yes |
| Uses in or adjacent to the MHPA should be designed to minimize noise impacts. Excessively noisy uses or activities adjacent to breeding areas must incorporate noise reduction measures and be curtailed during the breeding season of sensitive species. | Wherever possible, maintenance activities would avoid breeding seasons for sensitive bird species. When avoidance is not feasible, the IBAs required as part of the SCR process would identify actions required to minimize noise impacts to sensitive bird species, including noise limitations, acoustical measurements, and noise reduction measures. A biologist shall be on site during maintenance. If noise measurements or the biological monitor indicates that nearby sensitive birds may be adversely impacted by maintenance noise, additional noise attenuation measures shall be undertaken, or maintenance activities shall be curtailed or stopped until the breeding season end. | Yes |
| Invasive non-native plant species shall not be introduced into areas adjacent to the MHPA. | The Master Program includes protocols that prohibit use of invasive plants in revegetation and measures to limit spread of existing invasive species into downstream areas during removal. | Yes |
| When required as part of project approvals, mitigation shall be performed in accordance with the City's ESL Ordinance and Biology Guidelines. | Mitigation measures would be carried out in compliance with the ESL Regulations and Biology Guidelines. | Yes |

**Table 13 (cont.)
MSCP CONSISTENCY EVALUATION**

| MSCP POLICY/GUIDELINE | EVALUATION | CONSISTENT ? |
|--|---|-----------------|
| MHPA Adjacency Guidelines (cont.) | | |
| Restoration or revegetation undertaken within the MHPA shall be performed in a manner acceptable to the City. Wetland restoration/revegetation proposals are subject to permit authorization by federal and state agencies. | Restoration or revegetation would be subject to approval of the City as well as state and federal agencies. | Yes |
| Remove giant reed, tamarisk, pampas grass, castor bean, artichoke thistle, and other exotic invasive species from creek and river systems, canyons and slopes, and elsewhere within the MHPA as funding or other assistance becomes available. Avoid removal activities during the reproductive seasons of sensitive species and avoid/minimize impacts to sensitive species or native habitats. | By their nature, maintenance activities would promote this guideline because they would remove these species due to their adverse impact on the flood control function of storm water facilities. In addition, the Master Program includes protocols to minimize the downstream spread of invasive species during removal. | Yes |
| Perform standard maintenance, such as clearing and dredging of existing flood channels, during the non-breeding or nesting season of sensitive bird or wildlife species utilizing the riparian habitat. For the least Bell's vireo, the non-breeding season generally includes mid-September through mid-March. | Wherever possible, maintenance activities would avoid breeding seasons for sensitive bird species. As indicated earlier, if avoidance is not feasible, measures included in the Master Program would require identification and implementation of effective noise attenuation or for maintenance activities generating unacceptable noise to cease until the breeding season end. | Yes |
| Review existing flood control channels within the MHPA periodically (every 5 to 10 years) to determine the need for their retention and maintenance, and to assess alternatives, such as restoration of natural rivers and floodplains. | The Master Program would provide for the routine inspections and maintenance identified in this guideline. | Yes |

**Table 13 (cont.)
MSCP CONSISTENCY EVALUATION**

| MSCP POLICY/GUIDELINE | EVALUATION | CONSISTENT ? |
|---|---|---------------------------|
| Special Conditions for Covered Species | | |
| <p>Area-specific management directives for the coastal California gnatcatcher must include measures to reduce edge effects and minimize disturbance during the nesting period, fire protection measures to reduce potential for habitat degradation due to unplanned fire and management measures to improve habitat quality, including vegetation structure. No clearing of occupied habitat within the City’s MHPA may occur between March 1 and August 15.</p> | <p>Wherever possible, maintenance activities would avoid breeding seasons for sensitive bird species. As indicated earlier, if avoidance is not feasible, measures included in the Master Program would require identification and implementation of effective noise attenuation or require maintenance activities generating unacceptable noise to cease until the end of the breeding season.</p> | <p align="center">Yes</p> |
| <p>Area-specific management directives for the least Bell’s vireo and southwestern willow flycatcher must include measures to provide appropriate successional habitat, upland buffers for all known populations, cowbird control, and specific measures to protect against detrimental edge effects to these species. Any clearing of occupied habitat must occur between September 15 and March 15 for the vireo and between September 1 and May 1 for the flycatcher (i.e., outside the nesting season).</p> | <p>Wherever possible, maintenance activities would avoid breeding seasons for sensitive bird species. As previously stated, if avoidance is not feasible, measures included in the Master Program would require identification and implementation of effective noise attenuation or require maintenance activities generating unacceptable noise to cease until the end of the breeding season.</p> | <p align="center">Yes</p> |
| <p>Area-specific management directives for the Cooper’s hawk must include 300-foot impact avoidance areas around active nests, and minimization of disturbance in oak woodlands and oak riparian forests.</p> | <p>The Master Program includes a protocol, which would require maintenance activities to maintain a setback of 300 feet from active nests.</p> | <p align="center">Yes</p> |

**Table 13 (cont.)
MSCP CONSISTENCY EVALUATION**

| MSCP POLICY/GUIDELINE | EVALUATION | CONSISTENT ? |
|---|---|-----------------|
| Special Conditions for Covered Species (cont.) | | |
| Area-specific management directives for the northern harrier must manage agricultural and disturbed lands within 4 miles of nesting habitat to provide foraging habitat and include both a 900-foot impact avoidance area around active nests and measures for maintaining winter foraging habitat in preserve areas in Proctor Valley, around Sweetwater Reservoir, San Miguel Ranch, Otay Ranch east of Wueste Road, Lake Hodges, and San Pasqual Valley. | The Master Program includes a protocol that would require maintenance activities to maintain a setback of 900 feet from active nests. | Yes |
| Area-specific management directives for San Diego barrel cactus must include measures to protect this species from edge effects, unauthorized collection, and include appropriate fire management/control practices to protect against a too frequent fire cycle. | The Master Program includes mitigation measures that require relocation or replanting in the event a substantial number of sensitive plants would be lost in the course of maintenance. | Yes |
| Area-specific management directives for Nuttall's lotus must include specific measures to protect against detrimental edge effects. | The Master Program includes mitigation measures that require relocation or replanting in the event a substantial number of sensitive plants would be lost in the course of maintenance. | Yes |

6.2 INDIRECT IMPACTS

Potential indirect impacts from maintenance activities would normally be associated with secondary effects, including habitat insularization, water quality, lighting, noise, roadkill, exotic plant species, animal behavioral changes, fugitive dust, and human intrusion. The magnitude of an indirect impact can be the same as a direct impact, but the effect usually takes more time to become apparent. Many indirect impacts are particularly critical from work proposed both within and adjacent to the MHPA and are addressed by the City's MSCP Subarea Plan as Compatible Land Uses and Land Use Adjacency Guidelines.

6.2.1 Habitat Insularization

Habitat insularization is the fragmentation of large habitat areas into smaller "islands" effectively isolated from one another. Such fragmentation presents barriers to wildlife movement and breeding, splits animal and plant populations, and increases edge effects. Often, habitat insularization is associated with local species extinctions since smaller habitat areas support relatively fewer species than larger ones.

No habitat insularization impacts are expected to occur as a result proposed maintenance activities because the activities would not result in the isolation of any habitat areas.

6.2.2 Water Quality

Runoff is often associated with increased erosion, sedimentation, and pollution that have the potential to significantly impact water quality in adjacent and downstream areas. The use of petroleum products (i.e., fuels, oils, lubricants) by maintenance equipment could potentially contaminate surface water and adversely affect biological resources both in and outside of the MHPA, and has potential to be significant. The removal of wetland vegetation occurring as part of the Master Program may result in a decrease in pollutant uptake by plants, as vegetation in the channel bottoms would be removed. Plants such as cattails are capable of absorbing pollutants such as excess nitrogen and heavy metals commonly found in urban runoff. Vegetation clearing may temporarily reduce the filtering capacity of channels and result in adverse water quality impacts downstream. These impacts would be considered significant. Additional impacts to water quality could occur as a result of disturbance of sediment on the channel bottom during clearing activities and subsequent increases in turbidity if water is present at the time of maintenance. These impacts could be significant if not mitigated.

6.2.3 Lighting

Night lighting exposes adjacent wildlife species to an unnatural light regime, may alter their behavior patterns, and consequently result in a loss of species diversity. Except in the case of emergency maintenance, maintenance activities would take place during daylight hours. Due to the short-term duration of emergency maintenance, night-time lighting would not represent a significant impact.

6.2.4 Noise

Project-related noise from such sources as machinery potentially used for clearing could result in a temporary impact to wildlife. Noise-related impacts would be considered significant if sensitive species were displaced from their nests or territories and failed to breed.

Indirect noise impacts to nesting/breeding coastal California gnatcatchers, least Bell's vireos, raptors, and other sensitive bird species could occur if grubbing, clearing, grading, or other maintenance activities create noise in excess of 60 decibels (dB) hourly average in occupied habitat within the MHPA during the gnatcatcher breeding season (March 1 to August 15), vireo breeding season (March 15 to September 15), or raptor breeding season (February 1 to August 1). These impacts would be considered significant and require mitigation.

6.2.5 Roadkill

Roadkill is not a significant issue for this project, as all maintenance machinery would be slow-moving and the project would not open up access roads for use by the general public.

6.2.6 Exotic Plant Species

Non-native plants could colonize areas disturbed by maintenance and could potentially spread into the adjacent preserve areas. Such invasions could displace native plant species, reducing diversity, increasing flammability and fire frequency, change ground and surface water levels, and adversely affect the native wildlife that are dependent on native vegetation.

The limited amount of clearing expected to occur in upland habitats would not open significant amounts of upland areas to non-native species invasion. Clearing of native wetland vegetation within the channels and ditches could result in subsequent colonization by non-native vegetation such as giant reed. However, many of the channels and ditches within the MHPA already support a variety of non-native wetland-affiliated species growing in conjunction with native species. Clearing the channels would remove both native and non-native species, and quick-growing species such as cattails could be expected to recolonize many of the wetter areas over the short term. Non-native plant invasion of the MHPA in areas where they previously did not exist would be considered a significant impact.

6.2.7 Animal Behavioral Changes

Vegetation clearing associated with channel maintenance would indirectly impact animal populations that use these vegetation communities for foraging, nesting, and movement, which may result in decreased reproductive success or increased mortality. However, most of the animals associated with storm water facilities would be able to relocate into areas up- and down-stream of maintenance activities and return once vegetation begins to re-establish following maintenance. These indirect impacts would be considered significant for any federally or state listed species or raptors located within the MHPA. Raptors, which have potential to occur in trees within riparian forests and eucalyptus woodlands, or in adjacent grasslands, may be susceptible to disturbance from maintenance, and any such activity within 300 feet of an

active Cooper's hawk (*Accipiter cooperii*) nest, 900 feet of an active northern harrier (*Circus cyaneus*) nest, and 500 feet of any other raptor nest would be considered significant. Such activity may cause temporary or permanent abandonment of a nest, which would expose eggs or nestlings to predation or exposure to the elements.

6.2.8 Fugitive Dust

Fugitive dust produced by maintenance could disperse onto vegetation in the MHPA, and cause adverse effects to sensitive vegetation. A continual cover of dust may reduce the overall vigor of individual plants by reducing their photosynthetic capabilities and increasing their susceptibility to pests or disease. In turn, this could affect animals dependent on these plants. Fugitive dust is a temporary maintenance impact not expected to be a significant issue due to the restricted areas of potential clearing and the relatively short duration of maintenance within each storm water facility.

6.2.9 Human Intrusion

Increases in human activity in natural areas could result in degradation of sensitive vegetation communities by fragmenting habitat, forming edges (through creation of roads and trails), and removing existing plants. In addition, illegal dumping of landscape debris and trash may occur. No significant impacts would occur as a result of human activity given that many of the areas are already used as homeless encampments and for illegal dumping. Maintenance activities in the storm water facilities are not expected to result in an increase in these activities.

6.3 CUMULATIVE IMPACTS

Although impacts to sensitive biological resources may not be significant when considered independently, when multiple impacts such as from several projects within an area are combined, they may be cumulatively significant. The MSCP was designed to compensate for the regional loss of biological resources throughout the region. According to the City's Significance Determination Guidelines (City 2011), projects that conform to the MSCP as specified by the City's ESL Regulations and Biology Guidelines would not result in a significant cumulative impact for those upland vegetation communities adequately covered by the MSCP (Tiers I through IV vegetation communities with the exception of native grasslands and vernal pools). Cumulative impacts to wetlands are being addressed by the regional permit process and comprehensive mitigation plan. Impacts to species covered by the MSCP would not be considered cumulatively significant, provided that all mitigation and conditions of coverage are implemented. Impacts to or federally or state listed species not covered by the MSCP would be considered cumulatively significant. Other sensitive species not analyzed for coverage under the MSCP would typically be considered adequately conserved through the habitat-based mitigation as described in the City's Biology Guidelines.

Implementation of the proposed project is not expected to result in cumulative impacts to sensitive biological communities, as the project would conform to the MSCP and other City plans and policies (e.g. ESL) intended to protect biological resources and require individual projects to compensate for impacts. In addition, no impacts to native grasslands or vernal pools are anticipated. Implementation of the proposed project is not expected to result in cumulative impacts

to listed or sensitive plant or animal species that are covered by the MSCP, as impacts to all covered species would be mitigated and appropriate conditions of coverage implemented. Impacts to other, non-listed sensitive species not covered by the MSCP would be considered adequately conserved through the habitat-based mitigation required by ESL and CEQA mitigation requirements. Although impacts would occur within the MHPA, no net loss of the MHPA would occur. However, because focused surveys for listed species have not been conducted, there exists potential for impacts to listed plant and animal species from project implementation. Any such impacts to listed species not covered by the MSCP would be considered cumulatively significant, including impacts to species such as Otay tarplant, San Diego and Riverside fairy shrimp, western yellow-billed cuckoo, and light-footed clapper rail. Potential impacts to listed species not covered by the MSCP would be further evaluated during the IBA process, and additional avoidance and/or mitigation measures developed, as necessary.

6.4 PROJECT ALTERNATIVES

Because the proposed maintenance activities would affect wetlands, alternatives are provided pursuant to 404 (B)(1) Guidelines of the Clean Water Act to assure that proposed maintenance activities are the least environmentally damaging. Based on the requirements of CEQA that alternatives meet most of the basic objectives of the proposed project and reduce significant impacts associated with the proposed project, the Program EIR analyzes alternatives which would reduce the need for regular maintenance of storm water facilities. These alternatives include:

- Raising the channel banks by constructing walls or berms along the top of the channels;
- Diverting storm water in pipes around constrained segments;
- Widening channels to accommodate vegetation; and/or
- Reducing off-site runoff generation through use of low impact development measures.

Alternative locations are not considered given the nature of the proposed project. Proposed maintenance activities must occur within the channel segments included in the Master Program in order to achieve the primary goal of protecting human life and property from flooding. Conducting maintenance activities in other locations would not achieve this goal and would result in continued flooding of adjacent property.

In addition, as mandated by CEQA, the following discussion addresses two forms of a No Project alternative. The first, identified as the “No Project: No Maintenance alternative”, assumes that no maintenance is performed with the storm water facilities. The second, referred to as the “No Project: Maintenance With Separate Permits”, alternative assumes that maintenance would be carried out but under separate permits rather than a Master Permit.

6.4.1 No Project: No Maintenance Alternative

Under this alternative, the City would not conduct any maintenance activities within the storm water system. Vegetation would grow unchecked within the channels and sediment would not be removed.

Although this alternative would avoid all impacts of the proposed project, the City rejected the alternative because it would not fulfill the basic objective to protect life and property from flooding. The overgrowth within the storm water facilities that would occur from lack of regular maintenance would impede flood waters and cause flooding.

6.4.2 No Project: Maintenance With Separate Permits Alternative

Under this alternative, storm water maintenance would occur pursuant to separate permits issued for individual maintenance projects, as it has been historically done in the City. However, given the long lead times to secure separate permits, it is anticipated that maintenance under this alternative would occur less frequently than under a Master Permit program. Furthermore, it is considered likely that maintenance would be primarily restricted to activities which clearly meet the Resource Agency definitions of emergency maintenance.

As a result of the difficulties anticipated with acquiring separate permits in a timely manner, it is assumed that impacts to vegetation communities would be reduced due to the less frequent and less extensive nature of maintenance. As a result, this alternative also would likely impact less jurisdictional habitat than the proposed Master Program. This No Project alternative would also likely allow vegetation to continue to grow within storm water facilities for longer periods of time than would the proposed Master Program. This would be beneficial to affected wildlife, as their habitat would be retained for longer periods of time.

6.4.3 Raised Bank Alternative

Under this alternative, levees or walls would be added along the top of channels to allow them to contain vegetation without compromising their ability to transport flood waters. The structures would offset the effect of vegetation and sediment by allowing water elevations to increase without spilling out into adjacent areas. However, accumulation of sediment and vegetation would ultimately eliminate the increased flood capacity created by the structures. Channel-specific engineering would be undertaken to determine the additional “bank” height needed.

Although this alternative would potentially impact less wetland acreage, the City rejected this alternative because of potential impacts to wildlife. The structures along storm water facilities necessary to contain flood water would have an adverse impact on wildlife by making it more difficult for upland wildlife to access the channels for water, food and cover. In addition, the City concluded that walling off the storm water facilities would have an adverse visual impact. Furthermore, the cost of designing, acquiring private property and constructing walls or levees along existing drainage facilities would be substantial.

6.4.4 Channel By-pass Alternative

This alternative would involve construction of underground pipes that would divert some or all of the flow around a channel segment to allow the channel to be naturally vegetated. Channel-specific engineering would be undertaken to determine the location and sizing of by-pass pipes to assure that vegetated channel segments can continue to support vegetation without resulting in flooding.

Although this alternative would potentially impact less wetland acreage, the City rejected the alternative as financially infeasible. The cost of constructing the by-pass pipes would be high. Beyond the cost of acquiring easements, adjacent development would make it difficult to construct by-pass pipes without impacting structures including homes and businesses. Condemning structures would further add to the cost of the by-pass alternative. In addition, this alternative would not be effective in the long-term because accumulation of sediment in the main channel would likely eventually offset the additional capacity created by the by-pass. Given these cost factors, accommodating flood waters with by-pass pipes is considered infeasible.

6.4.5 Widened Channel Alternative

Under this alternative, the configuration of channels would be modified to increase the volume capacity of the channel. The goal of increasing the channel volume would be to enable vegetation to exist in the channel without causing flooding. Channel-specific hydraulic analysis would be undertaken to determine the additional width needed. In most cases, the capacity would likely be increased by widening the cross-section of the channel. Increasing the depth of the channel would also increase capacity but is expected to be difficult to achieve in most cases due to constraints imposed by the slope limitations on the channel banks and maintaining downstream gradients.

Although this alternative would allow vegetation to remain over some portion of the widened channels without periodic maintenance, the initial widening would impact the same amount of vegetation as the full maintenance approach. However, since a portion of the vegetation within a widened channel would be allowed to remain during future maintenance, the long-term impact of maintenance on wetland habitat would be reduced. Also, as with the proposed project, the actions within channels would not result in the permanent loss of the channels themselves.

The City considers this to be an infeasible alternative to the proposed Master Plan due to the social and economic cost of condemning and purchasing adjacent development needed to allow for widened channels to render this alternative infeasible. Social and economic considerations that contribute to the infeasibility of this alternative include the cost of property acquisition, imposition of financial hardship and relocation of homes and businesses, adverse effects on the affordable housing stock in the City, and the cost of designing and constructing wider channels.

7.0 MITIGATION MEASURES

As discussed earlier, the proposed maintenance activities would be expected to impact sensitive vegetation communities and impact sensitive plant and animal species. The following measures are proposed to mitigate for these direct and indirect impacts.

7.1 MITIGATION FOR DIRECT IMPACTS

Overall, the guidelines and protocols established in the Master Program would result in fewer biological resource impacts when compared to the previous method of cleaning out all or the majority of drainages during maintenance. For example, the IHHA's required by the Master

Program would determine the minimal amount of vegetation and sediment required to maximize the ability of a facility to convey flood water, and maintenance plans would be required to limit disturbance to the area recommended by the IHHA. In addition, as outlined in Section 1.1.4, the Master Plan includes numerous protocols designed to reduce impacts to biological resources. In addition to these protocols, this section presents additional measures that would be required, as well as providing the mitigation approach for direct impacts to sensitive habitats. A conceptual wetland mitigation plan is provided in Appendix H to describe the mitigation approach in greater detail than is presented below.

7.1.1 Wetland Mitigation

Wetland mitigation often consists of a combination of creation, enhancement, or restoration to satisfy local, state, and federal mitigation requirements. Typically, creation at a ratio of 1:1 is required as a component of the mitigation. However, in the case of mitigating for storm water facility maintenance activities conducted in channels, enhancement and restoration without the traditional creation component is considered appropriate for 3 primary reasons. First, the channel itself would remain after maintenance and would continue to function for wildlife movement and, in the case of earthen bottom facilities, would continue to filter out urban runoff pollutants. Second, wetland vegetation has historically returned to these channels between maintenance events. Third, maintenance, in most cases, occurs in urban channels where repeated maintenance activities have already occurred for many years. No mitigation is required for impacts to unvegetated channels (i.e., streambed/natural flood channels) because the drainage course would remain in place, unlike other types of projects that physically eliminate these areas, and no vegetation communities would be impacted.

Mitigation for maintenance impacts to wetlands would be through one or a combination of the following: (1) enhancement, (2) restoration, (3) creation, or (4) purchase of mitigation credits. These actions would occur on a one-time basis pursuant to the ratios shown in Table 14. However, if the mitigation were carried out and successfully established before the impact were to occur, the mitigation ratio would be 1:1 for that particular impact since no temporal loss would occur.

Enhancement

Wetland enhancement includes actions taken to increase the function of an existing wetland. Enhancement activities would include removal of invasive plants, minor grading to remove accumulated sediment and restore surface conditions, and installing native wetland plants as seed and/or container stock. Installation of cuttings, container stock, and seed would begin following removal of invasive species. Irrigation may be provided, depending on the type and location of the habitat to be restored.

Restoration

Wetland restoration includes actions taken to return wetland functions to an area that was previously a wetland but has since become an upland habitat. Restoration actions would be essentially the same as described above for enhancement.

For the restoration to achieve the highest wildlife and water quality value, these activities would occur in large, continuous areas (e.g., San Diego River and Rose Creek) to the greatest extent practicable. In addition, wherever possible, the restoration would occur at the uppermost region of a drainage course or watershed to minimize the likelihood of invasive plants being transported downstream into the mitigation site. Mitigation would occur within the same watershed as the impact to the greatest extent practicable.

Mitigation ratios are proportional to the habitat type and quality, and are typically higher for wetland habitat types that have a higher function and diversity and typically take longer to establish. Restoration activities would be considered “permanent” mitigation and, assuming the initial mitigation continues to thrive, would allow storm channel maintenance to occur at the impacted area without additional mitigation for future clearing events.

| WETLAND TYPE | MITIGATION RATIO¹ |
|-------------------------------------|-------------------------------------|
| Southern riparian forest | 3:1 |
| Southern sycamore riparian woodland | 3:1 |
| Coastal salt marsh | 4:1 |
| Coastal brackish marsh | 4:1 |
| Southern willow scrub | 2:1 |
| Mule fat scrub | 2:1 |
| Riparian scrub | 2:1 |
| Freshwater marsh | 1:1 |
| Cismontane alkali marsh | 4:1 |
| Disturbed wetland | 1:1 |
| Streambed/natural flood channel | -- |

¹Mitigation done in advance or through purchase of mitigation credits would be at a 1:1 ratio.

To assure the long-term success of the restoration, a 5-year monitoring and maintenance program would be undertaken. Maintenance would target the removal of all invasive species as well as installing replacement plants, as necessary. Annual monitoring would include qualitative (visual assessment) and/or quantitative (transect data collection) sampling. The sampling would include assessments of cover (native and non-native), observations of plant recruitment, and lists of wildlife and plant species observed on site each year. Success criteria would include requirements for native wetland/riparian species coverage and/or richness, as well as establishing limits on the presence of non-native species and invasive exotics. Once the mitigation area has met success criteria and is considered self-sufficient, a long-term maintenance program would be carried out to maintain the restored area for as long as the mitigation is required to offset storm

water maintenance impacts.

Purchase of Mitigation Credits

In place of restoration, the City could choose to purchase mitigation credits. Mitigation credit purchase would consist of buying wetland credits from an approved mitigation bank. Mitigation ratios would be 1:1 for all wetland habitat impacts when the native habitat associated with mitigation credits is fully established in advance of the impact. In some cases, mitigation credits would have a higher value than the impacted habitat. The responsibility of long-term maintenance for these mitigation areas would fall upon the party responsible for the mitigation bank.

Creation

Wetland creation refers to actions taken to create wetlands where none previously occurred. As with enhancement and restoration, creation would include a combination of invasive species removal followed by seeding and/or container stock installation. In addition, grading may be required to create suitable hydrologic conditions.

Although opportunities for creation have not been specifically identified, the City may opt to create wetland habitat as part of the mitigation process should suitable locations arise and be economically feasible. Creation could include widening existing channels to allow vegetation to remain in the channel without compromising the channel's ability to convey floodwater. Mitigation could be achieved if the widening resulted in a net increase in the amount of wetland vegetation that would occur in the long-term.

To illustrate the amount of wetland mitigation that may be required as result of full implementation of the proposed Master Program, Tables 15 and 16 present the estimated wetland mitigation requirements for Corps, CDFG, and City jurisdictional areas, respectively. It should be noted that these tables are based on the estimated disturbance width identified in Appendix A to this report and Table 3-1 of the PEIR. Based on these tables, the maximum amount of restoration/enhancement would be as 49.35 acres (Corps) and 67.57 acres (CDFG and City).

Table 15
SUMMARY OF IMPACTS AND MITIGATION WITHIN CORPS JURISDICTIONAL WETLANDS (acre[s])*

| HU | Estimated Wetland Impacts† | | | | | | | | | | Total Wetland Impacts‡ |
|-------------------------------|----------------------------|-------------|-------------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|------------------------------------|
| | SRF | SRW | SWS | MFS | RS | FWM | CAM | CSM | CBM | DW | |
| San Dieguito | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| Peñasquitos | 0.00 | 0.00 | 1.94 | 0.08 | 0.00 | 5.55 | 0.00 | 1.25 | 0.31 | 0.01 | 9.14 |
| San Diego | 4.95 | 0.00 | 0.30 | 0.00 | 0.00 | 2.76 | 0.00 | 0.00 | 0.00 | 0.02 | 8.03 |
| Pueblo San Diego | 0.00 | 0.00 | 0.75 | 0.19 | 0.06 | 2.74 | 0.00 | 0.32 | 0.00 | 2.90 | 6.96 |
| Sweetwater | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Otay | 0.00 | 0.00 | 0.28 | 0.00 | 0.00 | 1.46 | 0.00 | 0.00 | 0.00 | 0.05 | 1.79 |
| Tijuana | 0.00 | 0.00 | 0.77 | 0.22 | 0.00 | 1.06 | 0.00 | 0.00 | 0.00 | 1.24 | 3.29 |
| Total Impacts | 4.95 | 0.00 | 4.04 | 0.49 | 0.06 | 13.58 | 0.00 | 1.57 | 0.31 | 4.22 | 29.22 |
| Mitigation | Estimated Mitigation | | | | | | | | | | Total Estimated Wetland Mitigation |
| Restoration/Enhancement Ratio | 3:1 | 3:1 | 2:1 | 2:1 | 2:1 | 1:1 | 4:1 | 4:1 | 4:1 | 1:1 | -- |
| Acre(s) | 14.85 | 0.00 | 8.08 | 0.98 | 0.12 | 13.58 | 0.00 | 6.28 | 1.24 | 4.22 | 49.35 |
| Mitigation Credit Ratio | 1:1 | 1:1 | 1:1 | 1:1 | 1:1 | 1:1 | 1:1 | 1:1 | 1:1 | 0.5:1 | -- |
| Acre(s) | 4.95 | 0.00 | 4.04 | 0.49 | 0.06 | 13.58 | 0.00 | 1.57 | 0.31 | 2.11 | 27.11 |

*Totals reflect rounding

†Habitat acronyms: CAM=cismontane alkali marsh, CBM=coastal brackish marsh, CSM=coastal salt marsh, DW=disturbed wetland, FWM=freshwater marsh, MFS=mule fat scrub, RS=riparian scrub, SRF=southern riparian forest, SRW=southern sycamore riparian woodland, SWS=southern willow scrub

‡Does not include impacts from maintenance conducted in non-wetland WUS, as no mitigation is anticipated

Table 16
SUMMARY OF IMPACTS AND MITIGATION WITHIN CDFG AND CITY JURISDICTIONAL WETLANDS (acre[s])*

| HU | Estimated Wetland Impacts† | | | | | | | | | | Total Estimated Riparian Impacts‡ |
|-----------------------------------|----------------------------|-------------|--------------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|---|
| | SRF | SRW | SWS | MFS | RS | FWM | CAM | CSM | CBM | DW | |
| San Dieguito | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.16 | 0.00 | 0.00 | 0.00 | 0.02 | 0.18 |
| Peñasquitos | 0.00 | 0.00 | 3.50 | 0.52 | 0.00 | 6.47 | 0.00 | 1.25 | 0.51 | 0.04 | 12.29 |
| San Diego | 4.95 | 0.09 | 0.75 | 0.00 | 0.00 | 3.97 | 0.00 | 0.00 | 0.00 | 0.38 | 10.14 |
| Pueblo San Diego | 0.00 | 0.00 | 1.68 | 0.46 | 0.15 | 4.36 | 0.00 | 0.32 | 0.00 | 4.78 | 11.75 |
| Sweetwater | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.02 |
| Otay | 0.00 | 0.00 | 0.28 | 0.00 | 0.00 | 1.73 | 0.00 | 0.00 | 0.00 | 0.06 | 2.07 |
| Tijuana | 0.00 | 0.00 | 1.28 | 1.01 | 0.00 | 1.21 | 0.00 | 0.00 | 0.00 | 1.67 | 5.17 |
| Total Impacts | 4.95 | 0.09 | 7.49 | 1.99 | 0.15 | 17.90 | 0.00 | 1.57 | 0.51 | 6.97 | 41.62 |
| Mitigation | Estimated Mitigation | | | | | | | | | | Total Estimated Riparian Habitat Mitigation |
| Enhancement/ Restoration Ratio | 3:1 | 3:1 | 2:1 | 2:1 | 2:1 | 1:1 | 4:1 | 4:1 | 4:1 | 1:1 | -- |
| Acre(s) | 14.85 | 0.27 | 14.98 | 3.98 | 0.30 | 17.90 | 0.00 | 6.28 | 2.04 | 6.97 | 67.57 |
| Mitigation Credit Ratio | 1:1 | 1:1 | 1:1 | 1:1 | 1:1 | 1:1 | 1:1 | 1:1 | 1:1 | 0.5:1 | -- |
| Acre(s) | 4.95 | 0.09 | 7.49 | 1.99 | 0.15 | 17.90 | 0.00 | 1.57 | 0.51 | 3.49 | 38.14 |

*Totals reflect rounding

†Habitat acronyms: CAM=cismontane alkali marsh, CBM=coastal brackish marsh, CSM=coastal salt marsh, DW=disturbed wetland, FWM=freshwater marsh, MFS=mule fat scrub, RS=riparian scrub, SRF=southern riparian forest, SRW=southern sycamore riparian woodland, SWS=southern willow scrub

‡Does not include impacts from maintenance conducted in unvegetated streambeds, as no mitigation is anticipated

7.1.2 Upland Mitigation

Upland mitigation is traditionally accomplished by off-site acquisition of existing habitat. The amount of upland habitat acquired would be based on the ratios identified in Table 17. In addition, the City has established a Habitat Acquisition Fund, which is intended to be used to mitigate for upland habitat losses of typically less than 5 acres. In such cases, a per-acre fee is paid into a City fund used to purchase mitigation land.

| Table 17 UPLAND HABITAT MITIGATION RATIOS* | | | |
|---|-------------|--|----------------|
| Vegetation Type | Tier | Location of Impact with Respect to the MHPA | |
| | | Inside | Outside |
| Diegan coastal sage scrub | II | 1:1 | 1:1 |
| Southern mixed chaparral | IIA | 1:1 | 0.5:1 |
| Non-native grassland | IIIB | 1:1 | 0.5:1 |
| Eucalyptus woodland | IV | -- | -- |
| Non-native vegetation/ornamental | IV | -- | -- |
| Disturbed habitat/ruderal | IV | -- | -- |
| Developed | IV | -- | -- |

*Assumes mitigation occurs within an MHPA

In order to encourage mitigation to occur within areas targeted for preserves, the City has established lower mitigation ratios for upland habitats. Similarly, the mitigation ratios for impacts to preserve areas are higher in order to discourage impacts within these preserves.

To illustrate the maximum amount of upland mitigation that may be required as result of full implementation of the proposed Master Program, Table 18 presents the estimated maximum upland mitigation requirements. Full mitigation of upland impacts could require acquisition of up to 3.8 acres of upland vegetation, including 2.2 acres of Diegan coastal sage scrub, 0.15 acre of southern mixed chaparral, and 1.4 acres of non-native grassland.

**Table 18
ESTIMATED PROGRAM IMPACTS AND MITIGATION TO UPLAND VEGETATION COMMUNITIES***

| HU | Upland Impact Outside MHPA† | | | | | | | Total |
|--------------------------|---|------------|------------|------------|------------|------------|-------------|--------------------------|
| | Tier II | Tier IIIA | Tier IIIB | Tier IV | | | | |
| | DCSS | SMC | NNG | EW | NNV/ORN | DH/RUD | DEV | |
| San Dieguito | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.2 | 1.2 |
| Peñasquitos | 0.0 | 0.1 | 0.2 | 0.0 | 0.9 | 0.2 | 12.8 | 14.2 |
| San Diego | 0.4 | 0.0 | 0.3 | 0.1 | 0.4 | 0.7 | 7.0 | 8.9 |
| Pueblo San Diego | 1.8 | 0.0 | 1.4 | 0.0 | 0.8 | 1.1 | 25.7 | 30.8 |
| Sweetwater | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 | 0.4 |
| Otay | 0.0 | 0.0 | 0.1 | 0.0 | 0.4 | 0.9 | 0.8 | 2.2 |
| Tijuana | 0.0 | 0.0 | 0.3 | 0.0 | 0.2 | 0.1 | 1.5 | 2.1 |
| Non-MHPA Subtotal | 2.2 | 0.1 | 2.3 | 0.1 | 2.7 | 3.0 | 49.4 | 59.8 |
| Mitigation | Estimated Mitigation for Upland Impacts Outside of the MHPA‡ | | | | | | | Total Max Est Mit |
| Ratio | 1:1 | 0.5:1 | 0.5:1 | -- | -- | -- | -- | -- |
| Required (acre[s]) | 2.2 | 0.05 | 1.2 | -- | -- | -- | -- | 3.5 |

**Table 18 (cont.)
ESTIMATED PROGRAM IMPACTS AND MITIGATION TO UPLAND VEGETATION COMMUNITIES***

| HU | Upland Impact Within MHPA † | | | | | | | Total |
|----------------------|--|-------------|------------|------------|------------|------------|-------------|--------------------------|
| | Tier II | Tier IIIA | Tier IIIB | Tier IV | | | | |
| | DCSS | SMC | NNG | EW | NNV/ORN | DH/RUD | DEV | |
| San Dieguito | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Peñasquitos | 0.0 | 0.1 | 0.2 | 0.1 | 0.1 | 0.0 | 0.1 | 0.6 |
| San Diego | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.8 | 0.8 |
| Pueblo San Diego | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Sweetwater | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Otay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tijuana | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.1 |
| MHPA Subtotal | 0.0 | 0.1 | 0.2 | 0.1 | 0.1 | 0.1 | 0.9 | 1.5 |
| Uplands Total | 2.2 | 0.2 | 2.5 | 0.2 | 2.8 | 3.1 | 50.3 | 61.3 |
| Mitigation | Estimated Mitigation for Upland Impacts Within the MHPA ‡ | | | | | | | Total Max Est Mit |
| Ratio | 1:1 | 1:1 | 1:1 | -- | -- | -- | -- | -- |
| Required (acre[s]) | 0.0 | 0.1 | 0.2 | -- | -- | -- | -- | 0.3 |
| Overall mit required | 2.2 | 0.15 | 1.4 | -- | -- | -- | -- | 3.8 |

*Totals reflect rounding

†Habitat acronyms: DCSS=Diegan coastal sage scrub, DEV=developed, DH/RUD=disturbed habitat/ruderal, EW=eucalyptus woodland, NNG=non-native grassland, NNV/ORN=non-native vegetation/ornamental, SFD=southern foredunes, SMC=southern mixed chaparral

‡Mitigation is assumed to occur within the MHPA

7.1.3 Mitigation Measures

The following mitigation measures would be implemented for the proposed project. Measures 7.1.3a through 7.1.3i address general procedures to be followed as part of the project implementation.

Mitigation Measure (MM) 7.1.3a:

Prior to commencement of any activity within a specific annual maintenance program, a qualified biologist shall prepare an IBA for each area proposed to be maintained. The IBA shall be prepared in accordance with the specifications included in the Master Program.

MM 7.1.3b: No maintenance activities within a proposed annual maintenance program shall be initiated before the City's Assistant Deputy Director (ADD) Environmental Designee and state and federal agencies with jurisdiction over maintenance activities have approved the IMPs and IBAs including proposed mitigation for each of the proposed activities. In their review, the ADD Environmental Designee and agencies shall confirm that the appropriate maintenance protocols have been incorporated into each IMP.

MM 7.1.3c: No maintenance activities within a proposed annual maintenance program shall be initiated until the City's ADD Environmental Designee and Mitigation Monitoring Coordinator (MMC) have approved the qualifications for biologist(s) who shall be responsible for monitoring maintenance activities which may impact sensitive biological resources.

MM 7.1.3d: Prior to undertaking any maintenance activity included in an annual maintenance program, a mitigation account shall be established to provide sufficient funds to implement all biological mitigation associated with the proposed maintenance activities. The fund amount shall be determined by the ADD Environmental Designee. The account shall be managed by the City's SWD, with quarterly status reports submitted to DSD. The status reports shall separately identify upland and wetland account activity. Based upon the impacts identified in the IBAs, money shall be deposited into the account, as part of the project submittal, to ensure available funds for mitigation.

MM 7.1.3e: Prior to commencing any activity where the IBA indicates significant impacts to biological resources may occur, a pre-maintenance meeting shall be held on site with the following in attendance: City's SWD Maintenance Manager (MM), MMC, and Maintenance Contractor (MC). The biologist selected to monitor the activities shall be present. At this meeting, the monitoring biologist shall identify and discuss the maintenance protocols that apply to the maintenance activities.

At the pre-maintenance meeting, the monitoring biologist shall submit to the MMC and MC a copy of the maintenance plan (reduced to 11"x17") that

identifies areas to be protected, fenced, and monitored. This data shall include all planned locations and design of noise attenuation walls or other devices. The monitoring biologist also shall submit a construction schedule to the MMC and MC indicating when and where monitoring is to begin and shall notify the MMC of the start date for monitoring.

MM 7.1.3f: Within 3 months following the completion of mitigation monitoring, 2 copies of a written draft report summarizing the monitoring shall be prepared by the monitoring biologist and submitted to the MMC for approval. The draft monitoring report shall describe the results including any remedial measures that were required. Within 90 days of receiving comments from the MMC on the draft monitoring report, the biologist shall submit one copy of the final monitoring report to the MMC.

MM 7.1.3g: Within six months of the end of an annual storm water facility maintenance program, the monitoring biologist shall complete an annual report which shall be distributed to the following agencies: the City of San Diego DSD, CDFG, RWQCB, USFWS, and Corps. At a minimum, the report shall contain the following information:

- Tabular summary of the biological resources impacted during maintenance and the mitigation;
- Master table containing the following information for each individual storm water facility or segment which is regularly maintained;
- Date and type of most recent maintenance;
- Description of mitigation which has occurred; and
- Description of the status of mitigation which has been implemented for past maintenance activities.

MM 7.1.3h: Prior to commencing any activity that could impact wetlands, evidence of compliance with other permitting authorities is required, if applicable. Evidence shall include copies of permits issued, letters of resolution issued by the Responsible Agency documenting compliance, or other evidence documenting compliance and deemed acceptable by the ADD Environmental Designee.

MM 7.1.3i: Whenever offsite mitigation would result in a physical disturbance to the proposed mitigation area, the SWD will conduct an environmental review of the proposed mitigation plan in accordance with CEQA. If the offsite mitigation would have a significant impact on biological resources associated with the mitigation site, mitigation measures will be identified and implemented in accordance with the MMRP resulting from that CEQA analysis.

7.1.4 Sensitive Upland Vegetation Communities

MM 7.1.4a Upland impacts shall be mitigated through payment into the City's Habitat Acquisition Fund, acquisition and preservation of specific land, or purchase of mitigation credits in accordance with the ratios identified in Table 18. Upland mitigation shall be completed within 6 months of the date the related maintenance has been completed.

7.1.5 Wetland Vegetation Communities

MM 7.1.5a: Wetland impacts resulting from maintenance shall be mitigated in one of the following 3 ways: (1) habitat creation, restoration, and/or enhancement concurrent with maintenance, (2) habitat creation, restoration, and/or enhancement prior to maintenance, or (3) mitigation credits. When mitigation is proposed to be accomplished through concurrent creation, restoration or enhancement, the amount of planting shall be in accordance with ratios in Table 14. When previously created, restored or enhanced wetland habitat is proposed to be used for mitigation, the ratio shall be 1:1, provided the habitat has been determined to be successfully established by the ADD environmental designee in consultation with the Resource Agencies prior to commencing the maintenance activity. Mitigation credits may be used at a ratio of 1:1, provided the mitigation credits are from a mitigation bank which has been approved by the Resource Agencies. No maintenance shall commence until the ADD environmental designee has determined that mitigation proposed for a specific maintenance activity meets one of these 3 options.

Mitigation locations for wetland impacts shall be selected using the following order of preference, based on the best mitigation value to be achieved.

1. Within impacted watershed, within City limits.
2. Within impacted watershed, outside City limits on City-owned or other publicly-owned land.
3. Outside impacted watershed, within City limits.
4. Outside impacted watershed, outside City limits on City-owned or other publically-owned land.

In order to mitigate for impacts in an area outside the limits of the watershed within which the impacts occur, the SWD must demonstrate to the satisfaction of the ADD environmental designee in consultation with the Resource Agencies that no suitable location exists within the impacted watershed.

MM 7.1.5b Whenever maintenance will impact wetland vegetation, a wetland mitigation plan shall be prepared in accordance with the Conceptual Wetland Restoration Plan contained in Appendix H.

Mitigation which involves habitat enhancement, restoration or creation shall include a wetland mitigation plan containing the following information:

- Conceptual planting plan including planting zones, grading, and irrigation;
- Seed mix/planting palette;
- Planting specifications;
- Monitoring program including success criteria; and
- Long-term maintenance and preservation plan.

Mitigation which involves habitat acquisition and preservation shall include the following:

- Location of proposed acquisition;
- Description of the biological resources to be acquired including support for the conclusion that the acquired habitat mitigates for the specific maintenance impact; and
- Documentation that the mitigation area would be adequately preserved and maintained in perpetuity.

Mitigation which involves the use of mitigation credits shall include the following:

- Location of the mitigation bank;
- Description of the credits to be acquired including support for the conclusion that the acquired habitat mitigates for the specific maintenance impact; and
- Documentation that the credits are associated with a mitigation bank which has been approved by the appropriate Resource Agencies.

7.1.6 Sensitive Plant Species

MM 7.1.6a Impacts to listed or endemic sensitive plant species shall be offset through implementation of one or a combination of the following actions:

- Impacted plants would be salvaged and relocated;
- Seeds from impacted plants would be collected for use at an off-site location;
- Off-site habitat that supports the species impacted shall be enhanced and/or supplemented with seed collected onsite; and/or
- Comparable habitat at an off-site location shall be preserved.

Mitigation which involves relocation, enhancement or transplanting sensitive plants shall include the following:

- Conceptual planting plan including grading and, if appropriate, temporary irrigation;
- Planting specifications;
- Monitoring Program including success criteria; and
- Long-term maintenance and preservation plan.

7.1.7 Sensitive Animal Species

MM 7.1.7a Loss of habitat for the coastal California gnatcatcher shall be mitigated through the acquisition of suitable habitat or mitigation credits at a ratio of 1:1. Mitigation shall take place within the MHPA, and shall be accomplished within 6 months of the date maintenance is completed.

MM 7.1.7b Prior to commencing any maintenance activity which may impact sensitive biological resources, the monitoring biologist shall verify that the following actions have been taken, as appropriate:

- Fencing, flagging, signage, or other means to protect sensitive resources to remain after maintenance have been implemented;
- Noise attenuation measures needed to protect sensitive wildlife are in place and effective; and/or
- Nesting raptors have been identified and necessary maintenance setbacks have been established if maintenance is to occur between January 15 and August 31.

The designated biological monitor shall be present throughout the first full day of maintenance, whenever mandated by the associated IBA. Thereafter, through the duration of the maintenance activity, the monitoring biologist shall visit the site weekly to confirm that measures required to protect sensitive resources (e.g., flagging, fencing, noise barriers) continue to be effective. The monitoring biologist shall document monitoring events via a Consultant Site Visit Record. This record shall be sent to the MM each month. The MM will forward copies to MMC.

7.1.8 MHPA

MM 7.1.8a: Prior to the commencing maintenance on any storm water facility within, or immediately adjacent to, a Multi-Habitat Planning Area (MHPA), the ADD Environmental Designee shall verify that all MHPA boundaries and limits of work have been delineated on all maintenance documents.

MM 7.1.8b: A qualified biologist (possessing a valid Endangered Species Act Section 10(a)(1)(a) recovery permit) shall survey those habitat areas inside and outside the MHPA suspected to serve as habitat (based on historical records or site conditions) for the coastal California gnatcatcher, least Bell's vireo and/or other listed species. Surveys for the appropriate species shall be conducted pursuant to

the protocol survey guidelines established by the U.S. Fish and Wildlife Service. When other sensitive species, including, but not limited to, the arroyo toad, burrowing owl, or Quino checkerspot butterfly are known or suspected to be present all appropriate protocol surveys and mitigation measures identified in Subchapter 4.3, Biological Resources, of the PEIR, shall be implemented.

MM 7.1.8c: If a listed species is located within 500 feet of a proposed maintenance activity and maintenance would occur during the associated breeding season, an analysis of the noise generated by maintenance activities shall be completed by a qualified acoustician (possessing current noise engineer license or registration with monitoring noise level experience with listed animal species) and approved by the ADD. The analysis shall identify the location of the 60 dB(A) L_{eq} noise contour on the maintenance plan. The report shall also identify measures to be undertaken during maintenance to reduce noise levels.

MM 7.1.8d: Based on the location of the 60 dB(A) L_{eq} noise contour and the results of the protocol surveys, the Project Biologist shall determine if maintenance has the potential to impact breeding activities of listed species. If one or more of the following species are determined to significantly impacted by maintenance, then maintenance (inside and outside the MHPA) shall, whenever possible, be restricted during the breeding season as follows:

- Coastal California gnatcatcher (between March 1 and August 15 inside the MHPA only; no restrictions outside MHPA);
- Least Bell's vireo (between March 15 and September 15); and
- Southwestern willow flycatcher (between May 1 and September 1).

MM 7.1.8e: If maintenance cannot be avoided during an identified breeding season for a listed bird which is determined to be potentially significantly affected by maintenance, then the following conditions must be met:

- At least 2 weeks prior to the commencement of maintenance activities, under the direction of a qualified acoustician, noise attenuation measures (e.g., berms, walls) shall be implemented to ensure that noise levels resulting from maintenance activities shall not exceed 60 dB(A) hourly average at the edge of occupied habitat. Concurrent with the commencement of maintenance activities and the maintenance of necessary noise attenuation facilities, noise monitoring shall be conducted at the edge of the occupied habitat area to ensure that noise levels do not exceed 60 dB(A) hourly average. If the noise attenuation techniques implemented are determined to be inadequate by the qualified acoustician or biologist, then the associated maintenance activities shall cease until such time that adequate noise attenuation is achieved or until the end of the breeding season of the subject species, as noted above.

- Maintenance noise shall continue to be monitored at least twice weekly on varying days, or more frequently depending on the maintenance activity, to verify that noise levels at the edge of occupied habitat are maintained below 60 dB(A) hourly average. If not, other measures shall be implemented in consultation with the biologist and the ADD, as necessary, to reduce noise levels to below 60 dB(A) hourly average or to the ambient noise level if it already exceeds 60 dB(A) hourly average. Such measures may include, but are not limited to, limitations on the placement of maintenance equipment and the simultaneous use of equipment.
- Prior to the commencement of maintenance activities that would disturb sensitive resources during the breeding season, the biologist shall insure that all fencing, staking and flagging identified as necessary on the ground have been installed properly in the areas restricted from such activities.
- If noise attenuation walls or other devices are required to assure protection to identified wildlife, then the biologist shall make sure such devices have been properly constructed, located and installed.

MM 7.1.8f: A pre-maintenance meeting shall be held with the Maintenance Contractor, City representative and the Project Biologist. The Project Biologist shall discuss the sensitive nature of the adjacent habitat with the crew and subcontractor. Prior to the pre-maintenance meeting, the following shall be completed:

- The Storm Water Department (SWD) shall provide a letter of verification to the Mitigation Monitoring Coordination Section stating that a qualified biologist, as defined in the City of San Diego Biological Resources Guidelines, has been retained to implement the projects MSCP monitoring Program. The letter shall include the names and contact information of all persons involved in the Biological Monitoring of the project. At least thirty days prior to the pre-maintenance meeting, the qualified biologist shall submit all required documentation to MMC, verifying that any special reports, maps, plans and time lines, such as but not limited to, revegetation plans, plant relocation requirements and timing, MSCP requirements, avian or other wildlife protocol surveys, impact avoidance areas or other such information has been completed and updated.
- The limits of work shall be clearly delineated. The limits of work, as shown on the approved maintenance plan, shall be defined with orange maintenance fencing and checked by the biological monitor before initiation of maintenance. All native plants or species of special concern, as identified in the biological assessment, shall be staked, flagged and avoided within Brush Management Zone 2, if applicable.

MM 7.1.8g: Maintenance plans shall be designed to accomplish the following:

- Invasive non-native plant species shall not be introduced into areas adjacent to the MHPA. Landscape plans shall contain non-invasive native species adjacent to sensitive biological areas, as shown on approved the maintenance plan.
- All lighting adjacent to, or within, the MHPA shall be shielded, unidirectional, low pressure sodium illumination (or similar) and directed away from sensitive areas using appropriate placement and shields. If lighting is required for nighttime maintenance, it shall be directed away from the preserve and the tops of adjacent trees with potentially nesting raptors, using appropriate placement and shielding.
- All maintenance activities (including staging areas and/or storage areas) shall be restricted to the disturbance areas shown on the approved maintenance plan. The project biologist shall monitor maintenance activities, as needed, to ensure that maintenance activities do not encroach into biologically sensitive areas beyond the limits of work as shown on the approved maintenance plan.
- No trash, oil, parking or other maintenance-related activities shall be allowed outside the established maintenance areas including staging areas and/or storage areas, as shown on the approved maintenance plan. All maintenance related debris shall be removed off-site to an approved disposal facility.

MM 7.1.8h: Prior to commencing any maintenance in, or within 500 feet of any area determined to support coastal California gnatcatchers, the ADD Environmental Designee shall verify that the MHPA boundaries and the following project requirements regarding the coastal California gnatcatcher are shown on the maintenance plans:

No maintenance activities shall occur between march 1 and august 15, the breeding season of the coastal california gnatcatcher, until the following requirements have been met to the satisfaction of the ADD environmental designee:

- A. A qualified biologist (possessing a valid endangered species act section 10(a)(1)(a) recovery permit) shall survey those habitat areas within the mhpa that would be subject to maintenance noise levels exceeding 60 decibels [db(a)] hourly average for the presence of the coastal california gnatcatcher. Surveys for the coastal california gnatcatcher shall be conducted pursuant to the protocol survey guidelines established by the u.s. fish and wildlife service within the breeding season prior to the commencement of any maintenance. If gnatcatchers are present, then the following conditions must be met:

1. Between march 1 and august 15, maintenance of occupied gnatcatcher habitat shall be permitted. Areas restricted from such activities shall be staked or fenced under the supervision of a qualified biologist; and
2. Between march 1 and august 15, no maintenance activities shall occur within any portion of the site where maintenance activities would result in noise levels exceeding 60 db(a) hourly average at the edge of occupied gnatcatcher habitat. An analysis showing that noise generated by maintenance activities would not exceed 60 db(a) hourly average at the edge of occupied habitat must be completed by a qualified acoustician (possessing current noise engineer license or registration with monitoring noise level experience with listed animal species) and approved by the ADD environmental designee at least 2 weeks prior to the commencement of maintenance activities. Prior to the commencement of maintenance activities during the breeding season, areas restricted from such activities shall be staked or fenced under the supervision of a qualified biologist; or
3. At least 2 weeks prior to the commencement of maintenance activities, under the direction of a qualified acoustician, noise attenuation measures (e.g., berms, walls) shall be implemented to ensure that noise levels resulting from maintenance activities will not exceed 60 db(a) hourly average at the edge of habitat occupied by the coastal california gnatcatcher. Concurrent with the commencement of maintenance activities and the construction of necessary noise attenuation facilities, noise monitoring* shall be conducted at the edge of the occupied habitat area to ensure that noise levels do not exceed 60 db(a) hourly average. If the noise attenuation techniques implemented are determined to be inadequate by the qualified acoustician or biologist, then the associated maintenance activities shall cease until such time that adequate noise attenuation is achieved or until the end of the breeding season (august 16).

* Maintenance noise shall continue to be monitored at least twice weekly on varying days, or more frequently depending on the maintenance activity, to verify that noise levels at the edge of occupied habitat are maintained below 60 dB(A) hourly average or to the ambient noise level if it already exceeds 60 dB(A) hourly average. If not, other measures shall be implemented in consultation with the biologist and the ADD environmental designee, as necessary, to reduce noise levels to below 60 dB(A) hourly average or to the ambient noise level if it already exceeds 60 dB(A) hourly average. Such measures may include, but are not limited to, limitations on the placement of maintenance equipment and the simultaneous use of equipment.

- b. If coastal california gnatcatchers are not detected during the protocol survey, the qualified biologist shall submit substantial evidence to the ADD environmental designee and applicable resource agencies which demonstrates whether or not mitigation measures such as noise walls are necessary between march 1 and august 15 as follows:

1. If this evidence indicates the potential is high for coastal California gnatcatcher to be present based on historical records or site conditions, then condition a.iii shall be adhered to as specified above.
2. If this evidence concludes that no impacts to this species are anticipated, no mitigation measures would be necessary.

7.2 MITIGATION FOR INDIRECT IMPACTS

The applicant has proposed storm water protocols (Section 1.1.4) that would minimize impacts to sensitive biological resources. The following mitigation measures are required in addition to project protocols.

7.2.1 Sensitive Plant Species

MM 7.2.1a If maintenance activities will occur within areas supporting listed and/or narrow endemic plants, the boundaries of the plant populations designated sensitive by the resource agencies will be clearly delineated with flagging or temporary fencing that must remain in place for the duration of the activity.

7.2.2 Sensitive Animal Species

MM 7.2.2a Maintenance activities shall not occur within the following areas:

- 300 feet from any nesting site of Cooper's hawk (*Accipiter cooperii*);
- 1,500 feet from known locations of the southern pond turtle (*Clemmys marmorata pallida*);
- 900 feet from any nesting sites of northern harriers (*Circus cyaneus*);
- 4,000 feet from any nesting sites of golden eagles (*Aquila chrysaetos*); or
- 300 feet from any occupied burrow or burrowing owls (*Athene cunicularia*).

MM 7.2.2b If evidence indicates the potential is high for a listed species to be present, based on historical records or site conditions, then clearing, grubbing, or grading (inside and outside the MHPA) shall be restricted during the breeding season where development may impact the following species:

- Western snowy plover (between March 1 and September 15);
- Least tern (between April 1 and September 15);
- Cactus wren (between February 15 and August 15); or
- Tricolored black bird (between March 1 and August 1).

When other sensitive species, including, but not limited to, the arroyo toad, burrowing owl, or Quino checkerspot butterfly are known or suspected to be present all appropriate protocol surveys and mitigation measures shall be implemented.

- MM 7.2.2c* If a subject species is not detected during the protocol survey, the qualified biologist shall submit substantial evidence to the ADD and an applicable resource agency which demonstrates whether or not mitigation measures such as noise walls are necessary between the dates stated above for each species. If this evidence concludes that no impacts to this species are anticipated, no mitigation measures would be necessary.
- MM 7.2.2d* If the SWD chooses not to do the required surveys, then it shall be assumed that the appropriate avian species are present and all necessary protection and mitigation measures shall be required as described in Mitigation Measure 7.2.3c
- MM 7.2.2e* If no surveys are completed and no sound attenuation devices are installed, it will be assumed that the habitat in question is occupied by the appropriate species and that maintenance activities would generate more than 60dB(A) L_{eq} within the habitat requiring protection. All such activities adjacent to the protected habitat shall cease for the duration of the breeding season of the appropriate species and a qualified biologist shall establish a limit of work.
- MM 7.2.2f* If maintenance occurs during the raptor breeding season (January 15 to August 31), a pre-maintenance survey for active raptor nests shall be conducted in areas supporting suitable habitat. If active raptor nests are found, maintenance shall not occur within 300 feet of a Cooper's hawk nest, 900 feet of a northern harrier's nest, or 500 feet of any other raptor's nest until any fledglings have left the nest.
- MM 7.2.2g* If removal of any eucalyptus trees or other trees used by raptors for nesting within a maintenance area is proposed during the raptor breeding season (January 15 through August 31), a qualified biologist shall ensure that no raptors are nesting in such trees. If maintenance occurs during the raptor breeding season, a pre-maintenance survey shall be conducted and no maintenance shall occur within 300 feet of any nesting site of Cooper's hawk or other nesting raptor until the young fledge. Should the biologist determine that raptors are nesting, the trees shall not be removed until after the breeding season. In addition, if removal of grassland or other habitat appropriate for nesting by northern harriers, a qualified biologist shall ensure that no harriers are nesting in such areas. If maintenance occurs during the raptor breeding season, a pre-maintenance survey shall be conducted and no maintenance shall occur within 900 feet of any nesting site of northern harrier until the young fledge.
- MM 7.2.2h* If maintenance activities would occur at known localities for listed fish species or within suitable habitat for other highly sensitive aquatic species (i.e., southwestern pond turtle), avoidance or minimization measures (i.e., exclusionary fencing, dewatering of the activity area, live-trapping, and translocation to suitable habitat) must be implemented.
- MM 7.2.2i* In order to avoid impacts to nesting avian species, including those species not covered by the MSCP, maintenance within or adjacent to avian nesting habitat shall occur outside of the avian breeding season (January 15 to August 31) unless postponing maintenance would result in a threat to human life or property.

8.0 CERTIFICATION/QUALIFICATION

The following individuals contributed to the fieldwork and/or preparation of this report.

| | |
|-------------------|--|
| Matt Cooper | B.A., Geography, emphasis Natural Resources and Environmental Geography, San Diego State University, 2005 A.A., Liberal Arts and Sciences, Palomar College, 2002 |
| Kimberly Davis | M.S., Biological Sciences, emphasis in Ecology/Plant Physiology, California State University-San Marcos, 2008 B.S., Biological Sciences, emphases in Ecology and Molecular Biology, California State University-San Marcos, 2002 A.S., Physics, Mesa Community College, San Diego, 1999 A.S., Biology, Mesa Community College, San Diego, 1999 A.A., Liberal Arts, Mesa Community College, San Diego, 1999 |
| Sarah Haas | M.S., Wildlife Ecology, Mississippi State University, 1999 B.A., Anthropology, University of Arizona, 1995 |
| Heather Haney | M.S., Environmental Biology, University of Pennsylvania, 2002 B.A., Environmental Biology and B.A., Philosophy of Biology, University of Pennsylvania, 2001 |
| Pamela Hartsock | Ph.D., English, University of Missouri-Columbia, 2000 M.A., English, Eastern Illinois University, 1991 B.A., English, Eastern Illinois University, 1990 |
| Shelby Howard | M.S., Biology, San Diego State University, 2004 B.S., Biology, University of Texas at El Paso, 1999 |
| Tom Huffman | M.P.A., San Diego State University, 1994 B.S., Ecology, University of Arizona, 1978 |
| Jason Kurnow | B.S., Wildlife Biology, Humboldt State University, 2001 |
| Bruce McIntyre | M.S., Biology, San Diego State University, 1977 B.S., Zoology, Kansas State University, 1973 |
| Nathan Mendenhall | B.A., Geography, Brigham Young University, 2003 |
| Stacy Nigro | B.S., Wildlife Ecology (Forest Resources and Conservation), University of Florida-Gainesville, 1994 |
| Brian Parker | M.A., Biology, University of California-Los Angeles, 1996 B.S., Ecology, Behavior, and Evolution, University of California-San Diego, 1992 |

Kathy Pettigrew B.S., Wildlife Biology, Colorado State University, 2001

Phillip Tran J.D., Law, Seattle University School of Law, 2001
M.A., Communication, San Diego State University, 1998
B.A., Political Science, University of California-San Diego, 1994

Elizabeth Venz M.B.A. (emphasis Geographic Information Systems), University of Redlands,
2006
B.A., Geography, San Diego State University, 2000

9.0 REFERENCES

- American Ornithologists' Union (AOU). 2010. Check-list of North American Birds, 7th Edition. URL: <http://www.aou.org/checklist/north/suppl/51.php>. 51st Supplement. Updated August 5.
- Baker, R.J., L.C. Bradley, R.D. Bradley, J.W. Dragoo, M.D. Engstrom, R.S. Hoffmann, C.A. Jones, F. Reid, D.W. Rice, and C. Jones. 2003. Revised checklist of North American mammals north of Mexico. Occasional Papers of the Museum, Texas Tech University 223.
- Bowman, R. 1973. Soil Survey of the San Diego Area. USDA in cooperation with the USDI, UC Agricultural Experiment Station, Bureau of Indian Affairs, Department of the Navy, and the U.S. Marine Corps.
- California Department of Fish and Game (CDFG) California Natural Diversity Data Base (CNDDDB). 2011. RareFind Version 3.1.1. Updated January 30.
- 2011a. CNDDDB. Special Animals List. State of California, The Resources Agency, Habitat Conservation Division, Wildlife & Habitat Data Analysis Branch. URL: <http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/SPAnimals.pdf>. January.
- 2011b. CNDDDB. State and Federally Listed Endangered, Threatened, and Rare Plants of California. State of California, The Resources Agency, Habitat Conservation Division, Wildlife & Habitat Data Analysis Branch. URL: <http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/TEPlants.pdf>. January.
- 2011c. CNDDDB. Special Vascular Plants, Bryophytes, and Lichens List. State of California, The Resources Agency, Habitat Conservation Division, Wildlife & Habitat Data Analysis Branch. URL: <http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/SPPlants.pdf>. January. .
- 2011d. CNDDDB. State and Federally Listed Endangered and Threatened Animals of California. State of California, The Resources Agency, Department of Fish and Game Biogeographic Data Branch. URL: <http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/TEAnimals.pdf>. January
- California Native Plant Society (CNPS). 2011. Inventory of Rare and Endangered Plants (online edition, v8-01a). California Native Plant Society. Sacramento, CA. URL: <http://www.rareplants.cnps.org>. February 16.
- City of San Diego (City). 1997. Multiple Species Conservation Program. City of San Diego MSCP Subarea Plan. March.
2001. Land Development Code Biology Guidelines (as amended by Resolution R-294943). May 19.

City of San Diego (cont.)

2002. Guidelines for Conducting Biological Surveys. July.
2007. Significance Determination Guidelines under the California Environmental Quality Act. January.
- Crother, B.I. 2001. Scientific and Standard English Names of Amphibians and Reptiles of North America North of Mexico, With Comments Regarding Confidence in Our Understanding. Society for the Study of Amphibians and Reptiles 29. 84 pp.
- Dudek and Associates. 2006. Draft Biological Resources Technical Report – Tijuana River Valley Maintenance Project. September.
- Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi. 100 pp. with Appendices.
- Heath, F. 2004. An Introduction to Southern California Butterflies. Mountain Press Publishing Company, Missoula, MT.
- Hickman, J.C. 1993. The Jepson Manual: Higher Plants of California. UC Berkeley Press.
- Holland, R.F. 1986. Preliminary descriptions of the terrestrial natural communities of California. State of California, The Resources Agency, 156 pp.
- Keeley, J. and S. Keeley. 1988. Chaparral. Eds. M. Barbour and W. Billings. North American Vegetation: Cambridge University Press. Pp. 165-207.
- Merkel and Associates. 2003. City of San Diego Canyon Sewer Cleaning Program and Long-Term Canyon Sewer Maintenance Program. November.
- Mooney and Associates. 2004. Vegetation Mapping for City of San Diego.
- Reiser, Craig H. 2001. Rare Plants of San Diego County. Aquafir Press. 244 pp. plus Appendix.
- San Diego Natural History Museum (SDNHM). San Diego County Plant Atlas. Weblink: http://www.sdnhm.org/ge_files/GE_atlas.html.
- Unitt, Philip. 2004. San Diego County Bird Atlas. Ibis Publishing Co.
- U.S. Army Corps of Engineers (Corps). 2006. Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region. Eds. J.S. Wakely, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-06-16. Vicksburg, MS; U.S. Army Engineer Research and Development Center. December.

U.S. Army Corps of Engineers (cont.)

2008. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0). Eds. J.S. Wakely, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-08-28. Vicksburg, MS: U.S. Army Engineer Research and Development Center. September.

Weston Solutions, Inc. 2011. Implications of Storm Water Facility Maintenance on Benthic Macroinvertebrates. Prepared by William Isham.