RESOURCE AGENCY REVIEW DRAFT

EELGRASS PROTECTION AND MITIGATION PLAN FOR SHALLOW WATERS IN LOWER NEWPORT BAY:

AN ECOSYSTEM BASED MANAGEMENT PROGRAM

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SUMMARY OF THE EELGRASS PROTECTION AND MITIGATION PLAN

The purpose of this document is to describe an approach (the Plan) to eelgrass (*Zostera marina*) protection and mitigation within Newport Harbor for maintenance dredging activities associated with residential and small commercial docks, including repair/replacement of docks, typically undertaken by individual property owners. The Plan focuses on the shallow water eelgrass protection and mitigation measures associated with the following actions, referred as the Covered Activities:

(1) Minor maintenance dredging under and adjacent to currently authorized private, public, and commercial docks, floats, and piers. Dredging depth is not to exceed -10 feet mean lower low water (MLLW; plus 2 feet of allowable over depth).

(2) The repair, minor modification, and replacement of private residential and small commercial docks, floats, piers, and bulkheads (but not the replacement of bulkheads). There would be no increase in dock square footage allowed, except as required to meet current design standards necessary to meet public safety requirements. For example, many docks in Newport Bay were constructed in the 1960s and 1970s when 3-foot wide finger floats were allowed. The current design standard is 4 feet wide. The number and size of replacement piles would be the minimum necessary to support the reconfigured structure, in compliance with current design standards and building codes. In some cases, it may be necessary to increase the diameter of new piles, even if the number of piles remains unchanged. Any repairs, replacement, or minor expansions would occur in compliance with City of Newport Beach (City) Waterfront Project guidelines and standards.

These types of impacts to eelgrass are temporary in nature as eelgrass re-establishes itself in these areas as natural rates of siltation occur. Based on Newport Harbor-specific data reported by Coastal Resources Management Inc. (2010), the shallow water population of eelgrass is found at depths up to -6 to -15 feet relative to MLLW, with greater depth penetration in the portions of the harbor closest to the ocean inlet and lower penetration within Upper Newport Bay. Eelgrass is spread by seed, and it can colonize these areas within a few years along the edges of the dredged area. Because eelgrass impacted by dredging is usually at the edge of a dredged area (i.e., it does not grow under the existing docks or boats), the depth of dredging is usually shallower at the sides than within the boat slip, and this slope is within the zone that can be occupied by eelgrass.

The area within Newport Harbor where these activities would occur is referred to as the Plan Area and comprises portions of the harbor generally defined as:

> The bulkhead to pierhead line plus 20 feet bayward, including those exceptions for structures that extend beyond this boundary as of 2013 in conformance with harbor development regulations or policy.

The eelgrass management threshold (EMT) is the long-term average acreage of eelgrass based on the detailed biannual survey data collected by the City within the Plan Area. Separate EMTs will be determined for the Stable and Transitional Zones within the harbor. The EMTs are used to establish mitigation actions under three tier levels. The tier levels are based on the long-term average acreage of eelgrass as determined from the preceding surveys along with the 95% confidence limits.

Under all tier levels, the maximum amount of dredging in Stable and Transitional Zones of the Plan Area will be limited to 8 acres per year; however, the allowable impact to eelgrass will be limited depending upon the tier level. For example, in Tier 1 when the extent of eelgrass within the Plan Area from the most recent survey meets or exceeds the EMT, direct impacts to eelgrass are restricted to a maximum of 1.5 acres annually. If the extent of eelgrass in the Plan Area is below the long-term average, lesser amounts of eelgrass impacts will be allowed and specific mitigation actions to promote eelgrass establishment will be required. The tier levels and the actions that the City will undertake are defined in Table 1, and a flow chart demonstrating the process is shown on Figure 1.

Mitigation for temporary and/or minor permanent loss of eelgrass, for activities covered under this Plan, would be implemented under an approach that includes four elements:

> (1) **City Assumes Lead Responsibility –** The City will enforce compliance with the Plan, subject to agency oversight.[1] Consistent with its management role, the City, rather than individual property owners, will generally be responsible for surveying and data gathering. This will ensure decisions are made based on the City's reliable, professionally gathered data, while relieving individual property owners of a burden they generally lack the expertise to effectively implement.
>
> (2) **Eelgrass Management Threshold –** The Plan promotes an ecosystem-based approach; the key metric of eelgrass protection is the maintenance of a sustainable

[1] The Plan will be implemented in coordination with Regional General Permit 54, which was issued to the City by the U.S. Army Corps of Engineers, and subject to agency oversight. Other projects that have temporary impacts to eelgrass that require Individual Permits under Section 404 of the Clean Water Act could qualify, if they occur within the Plan Area in Newport Bay and are within the thresholds established under this Plan.

shallow water eelgrass population.[2] The EMT is the running average of the eelgrass acreage determined from biannual surveys conducted by the City. The focus of the City's management will be to protect and promote shallow water eelgrass populations and as long as the EMT is reached or exceeded, up to 8 acres of dredging will be allowed annually within the Stable and Transitional Zones in the Plan Area with no more than 1.5 acres of direct impacts to eelgrass on an annual basis. Dredging is conditioned on compliance with best management practices (BMPs) for avoiding eelgrass disturbance where possible. Should the shallow water eelgrass population drop below the EMT, allowed annual impacts to eelgrass will decrease and increased mitigation will be implemented in a phased manner. If additional impacts to eelgrass within the Plan Area are proposed after the annual limit is reached, the proponent of the proposed project will need to apply directly to the agencies for their activity and mitigation would be consistent with the Southern California Eelgrass Mitigation Policy (SCEMP) or other applicable plan.

(3) **Best Management Practices –** The City will approve the application of the Plan for projects subject to property owner compliance with BMP standards. BMPs include avoidance and, when appropriate under the tier levels, active eelgrass establishment techniques, such as seeding using buoy deployed seed bags (BDSB) and/or use of TERFS™.[3] BMPs will minimize negative impacts to existing eelgrass and encourage additional population growth.

(4) **Program to Promote Regrowth and Establishment –** The City will encourage and support pilot testing of BDSB and TERF™ strategies, begin an education program to encourage the public to view eelgrass as a valuable component of the ecosystem rather than a nuisance weed that restricts boat and dock use, and where appropriate, consider other methods to create areas suitable for eelgrass.

The Plan provides an incentive to the City and property owners to promote a healthy eelgrass population in Newport Bay, as the increased eelgrass occurrence will be accommodated by the flexibility of the Plan to allow for greater temporary impacts. The policy will encourage innovative and effective methods to be used to promote eelgrass establishment throughout the bay, where conditions are suitable, as opposed to limited project-by-project mitigation.

[2] The EMT is based on the shallow water eelgrass population within the Plan Area. Additional areas of shallow water eelgrass are also found outside this Plan Area and will continue to be monitored, but these areas are not used for calculating the EMT.

[3] TERF™ refers to "Transplanting Eelgrass Remotely with Frame Systems." Adult plants are transplanted using a frame system to which the plants are attached.

The mitigation elements of the Plan would be implemented via a three-tiered approach (Table 1). The initial EMT has been set by the average of the past four City-sponsored surveys of shallow water eelgrass populations within the Plan Area as reported in Appendix A. It may be adjusted based on adaptive management actions taken following a review of this Plan and based on subsequent surveys.

During the initial 2-year startup period of this program, the City will be allowed to permit up to an annual total of 1.5 acres per year of eelgrass impacts to accommodate limitations on dredging within eelgrass areas over the past 6 years due to difficulty of securing permits or completing mitigation actions. In return for this consideration, the City engaged a consultant in 2013 to undertake full harbor surveys for eelgrass (shallow and deep water populations) and to conduct additional oceanographic studies on temperature, light, and salinity conditions in areas occupied by eelgrass.

Table 1. Eelgrass Tiers for Activities Occurring in the Shallow Water Eelgrass Zone (Plan Area) in Newport Harbor

Shallow Water Eelgrass in Plan Area		Allowable Impacts to Shallow Water Eelgrass (Plan Area)[1]	City of Newport Beach Action
Stable Zone	**Transitional Zone**		
Tier 1			
Is at or above long-term mean[2] Current EMT ≥ 16.7 acres	Is at or above long-term mean Current EMT ≥ 3.8 acres	Up to a total 1.5 acres per year with a maximum of 8 acres of allowable dredging in the Plan Area	• Develop, test, and/or improve methods to collect and use eelgrass seeds for deployable seed bagging when needed and to construct or use eelgrass TERFS™ devices • The City conducts surveys every 2 years to determine extent of eelgrass coverage in shallow water eelgrass zone (above 10 feet below MLLW) • Conduct education program to help the public see eelgrass as a valuable ecosystem component rather than a nuisance weed that restricts boat and dock use • Encourage owners to minimize the size of docks and floating structures or use docks and floating structures that maximize light penetration • Continue to update BMP procedures to minimize impacts to eelgrass and to promote eelgrass coverage
Tier 2			
Between the long-term mean and the lower 95% confidence limit Eelgrass extent in Plan Area < 16.7 to ≥ 15.0 acres	Between the long-term mean and the lower 95% confidence limit Eelgrass extent in Plan Area < 3.9 to 1.2 acres	Up to a total of 0.75 acres per year Within the Transitional Zone, no more than 25% of surveyed eelgrass from the most recent survey	• The City will require property owners who have undertaken the Project Activity to implement deployable seed bagging and/or TERFS BMP at impact area • The City conducts surveys every 2 years to determine extent of eelgrass coverage in shallow water eelgrass zone (above 10 feet below MLLW) • Conduct education program to help the public see eelgrass as a valuable ecosystem component rather than a nuisance weed that restricts boat and dock use • Encourage owners to minimize the size of docks and

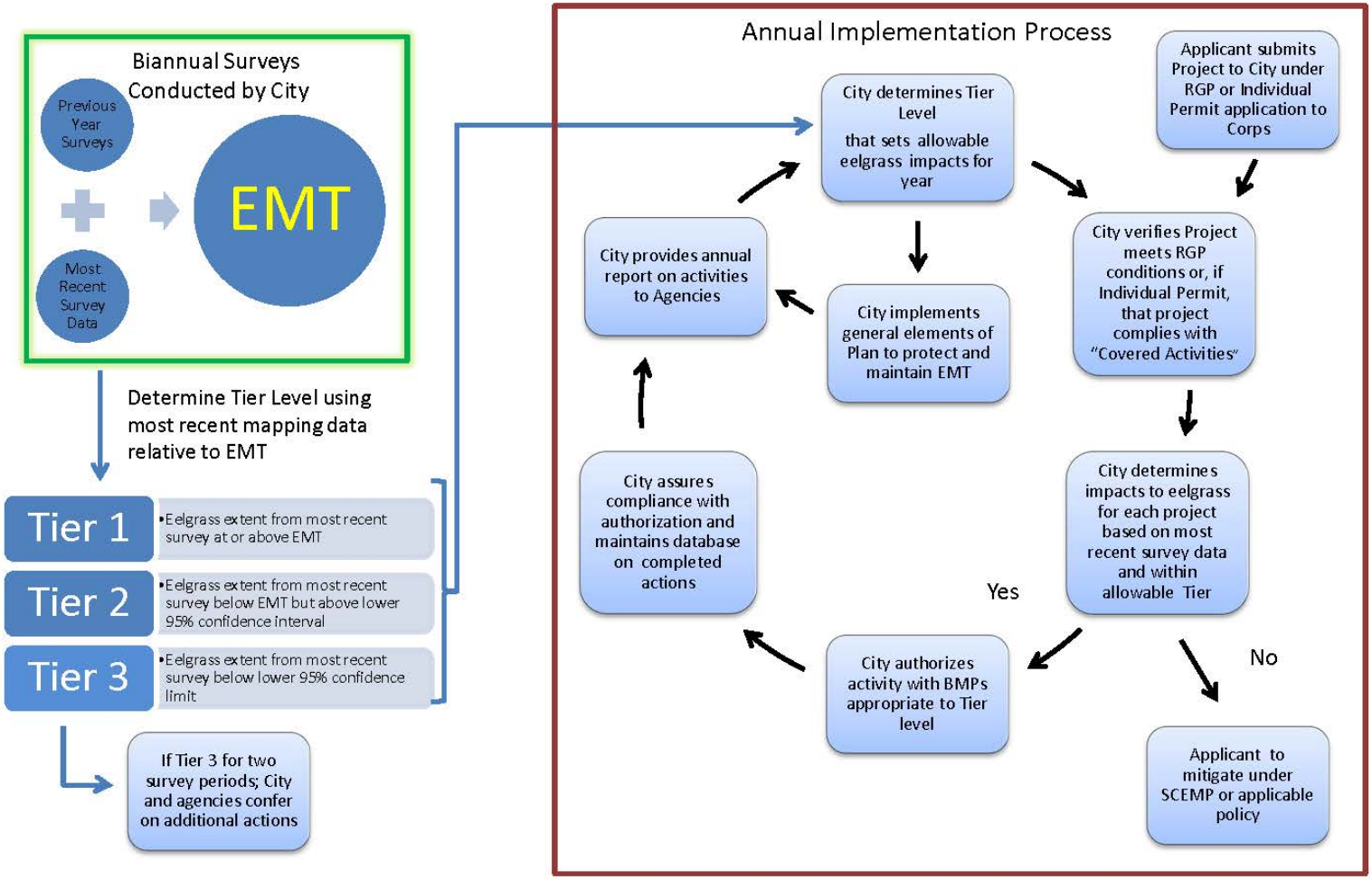
Shallow Water Eelgrass in Plan Area		Allowable Impacts to Shallow Water Eelgrass (Plan Area)[1]	City of Newport Beach Action
Stable Zone	**Transitional Zone**		
			floating structures or use docks and floating structures that maximize light penetration • Continue to update BMP procedures to minimize impacts to eelgrass and to promote eelgrass coverage
Tier 3			
Eelgrass extent in Plan Area is less than 15.0 acres	Eelgrass Extent in Plan Area is less than 1.2 acres	No more than a total of 0.5 acres per year Within the Transitional Zone, no more than 10% of surveyed eelgrass from the most recent survey	• The City conducts surveys every 2 years to determine extent of eelgrass coverage in shallow water eelgrass zone (above 10 feet below MLLW) • Conduct education program to help the public see eelgrass as a valuable ecosystem component rather than a nuisance weed that restricts boat and dock use • Encourage owners to minimize the size of docks and floating structures or utilize docks & floating structures that maximize light penetration • Continue to update BMP procedures to minimize impacts to eelgrass and to promote eelgrass coverage • Any impacts to eelgrass will be mitigated using the methods (e.g. transplanting) and mitigation ratios in the National Marine Fisheries Service Southern California Eelgrass Mitigation Policy or applicable policy in effect at that time • If shallow water population remains below lowest Tier-2 level (currently 15.5 acres) for two consecutive survey periods, the City will work with the agencies to determine the cause of the decline and, if necessary, initiate additional actions to improve or create habitat suitable for re-establishment of eelgrass populations to the EMT level

Notes:

1 If additional impacts to eelgrass are proposed within the Plan Area after the Tier limit is reached during any annual reporting period, mitigation would be provided by the project proponent independent of this Plan and consistent with the SCEMP or other applicable mitigation policy.

2 The Tier limits are based on long-term averages and confidence intervals from four biennial surveys conducted between 2003 and 2013 and are subject to change based on additional data.

Newport Bay Eelgrass Protection and Mitigation Plan



INTRODUCTION

The purpose of this document is to describe an Eelgrass Protection and Management Plan (the Plan) for temporary and minor impacts to eelgrass(*Zostera marina*), associated with maintenance dredging at boat docks, and the repair and replacement of residential and commercial docks typically undertaken by individual property owners and small commercial operators. The Covered Activities under the Plan include:

(1) Minor maintenance dredging to be performed under and adjacent to currently authorized private, public, and commercial docks, floats, and piers. Dredging depth is not to exceed -10 feet mean lower low water (MLLW), plus 2 feet of allowable over depth.

(2) The repair, minor modification, and replacement of private residential and small commercial docks, floats, piers, and bulkheads (but not the replacement of bulkheads). There would be no increase in dock square footage allowed, except as required to meet current design standards necessary to meet public safety requirements. Any repairs, replacement, or minor expansions would occur in compliance with City of Newport Beach (City) Waterfront Project guidelines and standards.

The Plan is an outcome of the City of Newport Beach Harbor Area Management Plan (HAMP), as issued in April 2010 and approved by City Council in November 2010. The HAMP established goals and best management practices (BMPs) to ensure a healthy eelgrass population within Newport Harbor, including the development of the Plan.

Consistent with its role as Newport Bay's primary steward and the Southern California Eelgrass Mitigation Policy's (SCEMP) or other applicable plan, the City developed this Plan tailored specifically to Newport Bay's shallow waters adjoining residences. The Plan will govern practices related to a portion of Lower Newport Bay's existing eelgrass population—the shallow water eelgrass zone generally found at depths less than 10 feet below MLLW. Much of the shallow water eelgrass population is located in areas occupied by private piers, docks, and small commercial facilities. The Plan focuses on those impacts that are temporarily associated with maintenance dredging in these shallow waters.

Eelgrass is very resilient in these areas and recolonizes areas between dredging events as the areas silt in over time. There appears to be an abundant source of seeds to allow for eelgrass establishment in areas affected by the dredging activity. Based on Newport Harbor-specific data reported by Coastal Resources Management Inc. (2010), the shallow water population of eelgrass is found at depths up to -6 to -15 feet relative to MLLW, with greater depth penetration in the portions of the harbor closest to the ocean inlet and lower penetration within Upper Newport Bay. Because eelgrass impacted by dredging is usually at the edge of a dredged area (i.e., it does not grow under existing docks or boats), the depth of dredging is

usually shallower at the sides than within the boat slip, and this slope is within the zone that can be occupied by eelgrass. Additionally, because Covered Activities are not occurring in all areas at the same time, various stages of eelgrass recovery occur throughout the harbor.

The Plan will serve the principal goals of protecting and promoting a long-term sustainable eelgrass population while serving Lower Newport Bay's navigational and recreational beneficial uses. The touchstone of the Plan is an ecosystem-based approach that works by protecting a sustainable eelgrass population in the Lower Newport Bay and enforcing BMPs that will promote eelgrass growth.

The approach to managing the Harbor's resources embodied in this Plan is consistent with the California Ocean Protection Council's (COPC) Five Year Strategic Plan to implement ecosystem-based management (EBM; COPC 2006). According to COPC, the goal of EBM is, "to maintain an ecosystem in a healthy, productive, and resilient condition so that it can provide the services humans want and need. Ecosystem-based management differs from current approaches that focus on a single species, sector, activity, or concern."

EBM recognizes there are multiple objectives and benefits provided by marine systems, rather than single ecosystem or species services. Such benefits include vibrant commercial and recreational fisheries, biodiversity conservation, renewable energy, and coastal protection. In addition, EMB is adaptable to changing conditions and taking into consideration that healthy systems exhibit resilience to disturbances; therefore, management measures should consider and adapt to large and small scale factors that affect ecosystem change. The EMB approach is also consistent with the *Final Recommendations of the Interagency Ocean Policy Task Force* (CEQ 2010), which emphasizes the concept of Coastal and Marine Spatial Planning for management of coastal resources. The National Marine Fisheries Service (NMFS) has taken a lead role in promoting and implementing EMB within its fisheries, coral reef, and marine sanctuaries management programs. The extension of this approach to eelgrass management in Newport Harbor is proposed in this Plan.

BACKGROUND

The City, as the primary steward of Newport Bay, has invested significant resources to ensure a healthy eelgrass population thrives in the Bay. For instance, the City has retained experts to develop this Plan, conducted eelgrass mitigation banking projects, engaged contractors to conduct bay-wide monitoring and surveying of eelgrass distribution using consistent and repeatable methods, and, most importantly, worked to make the bay more hospitable to eelgrass through the implementation of water quality protection measures. Most recently, the City approved a HAMP that sets an overall goal to, "support a sustainable estuary ecosystem able to be integrated with upstream sustainable watersheds and adjacent coastal area systems."

As a result of these extensive efforts, City staff, as well as the scientists and consultants who have been retained to assist the City, have developed considerable data, knowledge, and expertise about eelgrass ecology in Newport Bay.

The City, as part of its commitment to the 2010 HAMP, developed this Plan for the shallow water eelgrass population in the Lower Bay that promotes a healthy eelgrass habitat and maintains the Bay's navigational, commercial, and recreational uses. The Plan specifically addresses the temporary impacts to eelgrass from maintenance and repair/replacement of private residential and small commercial docks and floats and small maintenance dredging projects associated with those facilities with the Plan Area. The Plan Area is defined as follows:

> The bulkhead to pierhead line plus 20 feet bayward and including those exceptions for structures that extend beyond this boundary as of 2013 in conformance with harbor development regulations or policy.

The specific boundary of the Plan Area has been established based on harbor surveys of existing docks and is attached as Appendix A of this document.

The Stable and Transitional Zones are those areas within the Harbor where eelgrass has been known to occur based on long-term surveys and is scientifically based on known oceanographic factors (e.g., circulation, turbidity, salinity, and temperature) that affect eelgrass establishment and growth. Further discussion of these zones and a map showing their occurrence are found on Figure 2.

The Plan consists of four main parts:

> (1) The first part establishes the City as the primary steward of eelgrass habitat in the Bay by placing the responsibility for approving use of the Plan for Covered Activities, as well as monitoring, surveying, and data gathering on the City rather than on individual property owners. The City would take lead responsibility for

approving Covered Activities within the Plan Area and assuring that such projects are consistent with this Plan.

(2) The second part establishes an Eelgrass Management Threshold (EMT) based on specific Plan Area survey data collected by the City on a biannual basis. An EMT is the average acreage of eelgrass found in the Plan Area during previous biannualbiennial surveys that have been undertaken by the City. Separate EMTs are determined for the Stable and Transitional Zones. The requirements for various actions under the Plan would be based on the most recent survey data compared to the long-term eelgrass population statistics.

As described in Table 1, three Tiers are established based on the long-term dataset. Tier 1 is defined by EMT within the Stable and Transitional Zones. When the extent of eelgrass from the most recent biennial survey is at or above the EMT, dredging activities for projects permitted under this Plan will be limited to 8 acres per year within the Plan Area with a restriction of no more than 1.5 acres per year of direct impact to eelgrass. If the extent of eelgrass falls below the EMT, but within the lower 95% confidence limit, the impact limitations to eelgrass and the mitigation measures associated with Tier 2 will apply. If the extent of eelgrass falls below the lower 95% confidence limit, the impact limitations and mitigation measures associated with Tier 3 will apply. If additional impacts to eelgrass are proposed, after limits associated with the appropriate tier is reached, mitigation will be provided by the project proponent independent of this Plan and consistent with the SCEMP or other applicable eelgrass mitigation policy in effect at that time.

(3) The third part establishes BMPs in order to minimize negative impacts and encourage eelgrass population growth, especially following periods when natural events may reduce eelgrass population levels.

(4) The fourth part establishes a program by which the City will implement methods to promote eelgrass growth and promote public education on eelgrass and includes measures to implement adaptive management as new information is developed.

The City has met with NMFS in the development of this Plan and has incorporated the Service's comments and recommendations into the Plan. The City has also met with the Los Angeles District of the Corps of Engineers, the Santa Ana Regional Water Quality Control Board, the U.S. Fish and Wildlife Service, the California Department of Fish and Wildlife, and the California Coastal Commission during the development of this Plan. Comments received from these agencies have been incorporated into the Plan. The City has been conducting biennial surveys of eelgrass in the Plan Area since 2003 and initiated some elements of the Plan in 2012 and 2013 with the funding of oceanographic studies and

provision of funding of $10,000 to the Coastkeeper for the testing of various eelgrass restoration techniques and in 2013 with funding of a survey of shallow water eelgrass in the Plan Area and the deep channels in the entrance to the harbor.

With approval from the resource agencies, this Plan will be considered a special management plan area under the SCEMP, or any subsequent California Eelgrass Mitigation Policy (CEMP), and will be used for the Plan Area and for the Covered Activities. Applicants whose projects qualify as Covered Activities will reference the Plan when proposing work in areas containing eelgrass and the resource agencies will use the Plan as a basis for compliance with eelgrass mitigation. The City will prepare annual reports on its progress in implementing the Plan and will maintain records of projects approved under the Plan.

ELEMENTS OF PLAN

CITY ASSUMES LEAD RESPONSIBILITY

The City will have responsibility for implementing the Plan, subject to agency oversight. Applicants will be required to submit an application to the City to use the Plan as mitigation for impacts to eelgrass. The City will consider the nature of the project and the approximate area of eelgrass impact that would result from the project. If the City approves the applicant's project to use the Plan, the applicant will reference the Plan in their regulatory permit application, including verification by the City certifying the project. For those projects covered under the Regional General Permit (RGP) issued to the City, the reporting and permitting will be undertaken as specified in the RGP.

The City's eelgrass survey and maps will replace the requirement for individual applicants to conduct eelgrass surveys and can be used in support of the agency regulatory approval process. The City will be responsible for tracking eelgrass in the Plan Area based on the most recent survey completed prior to the proposed work and for reporting those impacts to the agencies in compliance with the RGP. The City will not authorize any dredging activities for Covered Activities within the Plan area in excess of 8 acres per year in the Stable and Transitional Zones and for any impacts to eelgrass exceeding the tier level in place at that time. The City will report to the agencies when the impact limit has been reached for the year.

The designation of the various survey areas is shown on Figure 1. In addition, based on survey results to date (2003 to 2013), a survey will not be required for those areas that have not supported eelgrass in the past.[4] For example, portions of the southern shoreline of the Newport Channel west of Bay Island and portions of the western, southern, and northern shores of Lido Isle. However, these areas will be inspected to determine if eelgrass is colonizing these areas and, if so, a survey using the standardized techniques used elsewhere in the harbor will be initiated.

Basis for City Responsibility for Surveys

Since 2003, the City has been conducting routine surveys throughout the harbor on eelgrass distribution and density (Table 2). The survey methodology is described in CRM (2010) and the data have been entered into a Geographic Information System (GIS) Database maintained by the City's Harbor Resources Division. This information is among the most detailed long-term data set on eelgrass distribution available in Southern California. For portions of the northwestern harbor (e.g., Newport Channel west of Bay Island and portions of Lido Isle), no eelgrass has been found during any of the surveys, whereas in other areas, it thrives from year to year. The distribution of eelgrass in the Lower Newport Bay is related primarily to

[4] Subject to change if eelgrass is shown to colonize these areas in future years.

light availability and tidal flushing times. Those areas with the most rapid tidal flushing times and best light availability are most likely to be colonized by eelgrass.

Based on the detailed studies completed by the City's consultant, Coastal Resources Management (CRM), there are three eelgrass zones within the Lower Bay (Figure 2).

- **Stable Eelgrass Zone –** A zone where eelgrass distribution appears relatively stable from year to year. This zone is located primarily within the Lower Bay and includes the channel entrance, the southern and eastern portions of Balboa Island and Grand Canal, Corona del Mar, and lower Balboa Peninsula. This zone is also characterized by a tidal flushing time of less than 6 days, which contributes to the higher water clarity.
- **A Transitional Eelgrass Zone –** A zone where eelgrass is susceptible to year-to-year variation in extent and density. This zone is largely found in the central part of the Lower Bay in areas such as Harbor Island, Linda Isle, the northern and western portions of Balboa Island, and the northern side of the Lido Channel. This zone is characterized by a tidal flushing time of 7 to 14 days and is located in a zone that is influenced by turbidity from San Diego Creek discharge during winter months.
- **An Unvegetated Zone–** A zone where eelgrass has not been found or is rarely found. This zone is primarily within the western portion of the Lower Bay and also areas of the Upper Bay north of Castaways Park. These areas are characterized by a tidal flushing time of greater than 14 days.

The survey data provides a depiction of the eelgrass dynamics in the Lower Bay and, because of their detail, can be used as a substitute for the current site-specific survey requirements contained in the SCEMP. The City will conduct these surveys once every 2 years. For areas of the Harbor defined as unvegetated, detailed eelgrass surveys would not be undertaken unless further expansion of eelgrass occurs here. These areas will be visited during the biennial surveys to determine if eelgrass has expanded to those areas, and if so, the Plan Area will be expanded to include those areas where eelgrass is then shown to occur.

Figure 1. Location of sampling areas within the shallow water eelgrass zone of Lower Newport Bay.

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Table 2. City-Sponsored Shallow Water Eelgrass Surveys in Newport Harbor (CRM 2010)

Survey Dates	Eelgrass (Acres)	Notes
December 2003 to August 2004	30.2	Largest shallow water eelgrass population recorded in the harbor to date. Water quality conditions ideal with low winter rainfall.
December 2006 to October 2007	23.1	Estimated 7.4-acre decline in eelgrass area, primarily around north Balboa Island, Harbor Island, Linda Isle, and Upper Newport Bay.
December 2009 to November 2010	19.9	Estimated 7-acre decline in transitional zones attributed to strong winter storms, which contributed to high turbidity.
February 2013 to July 2013	42.0	Includes expanded survey area adjacent to Harbor Entrance Channel that contained approximately 10 acres of eelgrass; however, overall increase in eelgrass observed in Stable and Transitional Zones.

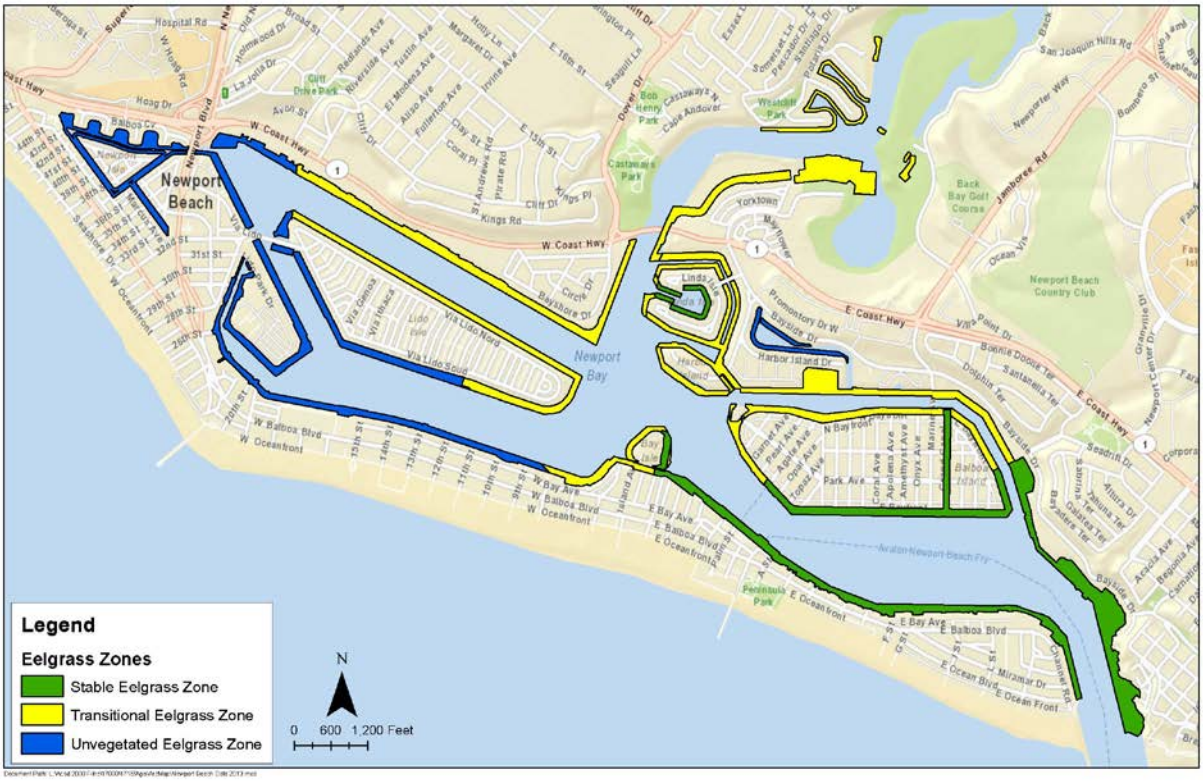

Figure 2. Location of Stable, Transitional, and unvegetated eelgrass zones based on CRM (2010).

EELGRASS MANAGEMENT THRESHOLD

The EMT concept is an ecosystem-based approach designed to take advantage of years of data, research, and knowledge on eelgrass in Newport Bay. The EMT, when coupled with the other parts of this Plan, will benefit the harbor ecosystem and will maintain and promote the growth of eelgrass in the Harbor. The Covered Activities undertaken by individual owners within the confines of this Plan will not have a significant effect on eelgrass resources. Combined with the eelgrass populations in other areas of the harbor, the limitations on eelgrass impacts under the Plan would allow for eelgrass to persist throughout Newport Bay, while accommodating maintenance needs arising from the Bay's other recognized beneficial uses such as navigation and recreation. BMPs that will promote eelgrass growth and establishment will minimize potentially deleterious consequences of maintenance projects via avoidance measures, and in the event the eelgrass declines below specific population levels, will promote the continued proliferation of eelgrass through seeding and other measures.

Dredging within the Plan Area for Covered Activities, under the Plan under all tiers, will be limited to a maximum of 8 acres per year within the Stable and Transitional Zones[5]. On an ecosystem-basis, the total of 8 acres of dredging within the areas occupied by eelgrass on an annual basis represents a small percentage of the total harbor area. The Plan Area itself covers approximately 240 acres and the Stable and Transitional Zones where eelgrass occurs cover approximately 170 acres. Within the Stable or Transitional Zones, the total acreage of eelgrass is 20.5 acres or approximately 12% of the Plan Area. Therefore, in most instances, the dredging activity will have limited direct impacts on eelgrass, and some projects will have no direct impact on eelgrass. The maximum of 8 acres of dredging in the Stable and Transitional Zones represents only 5% of the entire area and provides for sufficient areas available for maintenance of the EMT.

The Plan establishes tier levels in relation to the EMT that determine the BMPs that will be implemented. The current EMT is set at the average of the past four biannual surveys (2003 to 2013) and is based on the surveyed extent of eelgrass within the Plan Area. It is 16.7 acres for the Stable Zone and 3.8 acres for the Transitional Zone for a total of 20.5 acres. As long as the extent of eelgrass is at or exceeds the EMT, the allowable direct impact to eelgrass is 1.5 acres per year.

If the shallow water eelgrass population, based on the most recent survey in the Project Area, drops below the EMT, but remains at or above the lower 95% confidence limit for the Stable

[5] There is no limit established for dredging within the unvegetated zone except for those established under the Regional General Permit and/or any applicable Individual Permit authorization for activities not covered under the RGP.

Zone and the Transitional Zone, Covered Activities will not be allowed to impact more than 0.75 acres of eelgrass in any 1 year (referred to as Tier 2).

If the shallow water eelgrass population drops below the Tier-2 levels, Covered Activities under Tier 3 will not be allowed to impact more than 0.5 acres within the Plan Area in any 1 year. For any impact to eelgrass, the project proponent will follow the mitigation measures (e.g. transplanting) and replacement ratios contained in the SCEMP or applicable NMFS policy in effect at that time. In addition, applicants conducting dredging that is located in eelgrass amenable areas will continue to be required to use seed bags to promote eelgrass growth.

In the future, the EMT will be updated with subsequent survey information and subject to review by the City and NMFS based on data and information collected in Newport Bay. If additional impacts to eelgrass are proposed within the Plan Area, after the annual limit imposed at the specific tier level is reached, mitigation would be provided by the project proponent independent of this Plan and consistent with the SCEMP or other applicable plan.

During the first 2 years of the program, a maximum of eelgrass impact of 1.5 acres per year will be allowed within the Project Area to allow for some catch-up in the backlog of small projects that have not occurred during the development of this Plan. In return for this exception (if needed under the Plan), the City agreed to undertake a full harbor survey in 2012-2013 for shallow water eelgrass and to conduct additional oceanographic studies on light, temperature, and salinity to determine possible controlling factors on eelgrass distribution. This information will be valuable in providing additional management information to the City and the resource agencies.

Basis for EMT

The determination of the EMT is based on the average of four sample periods using similar sampling methodology. The results from the four survey periods of 2003 to 2004, 2006 to 2007, 2009 to 2010, 2012 to 2013 were grouped by their occurrence within Stable and Transitional Zones of the Harbor for the Project Area and outside the Project Area (see Appendix B for data tables and maps for each sampling period). The EMT from these surveys is 20.5 acres with a 95% confidence interval of 7.15 acres.

The areas with stable eelgrass populations are influenced by ocean water as they are subject to the higher flushing rates in the portion of the Harbor nearest the inlet channel (Figure 3). As a result, they are less affected by turbidity reduction from inflow of the San Diego Creek into the Upper Bay. There has been little to no dredging for private docks within eelgrass areas during the period covered by the surveys; so, it is expected these numbers represent the

baseline conditions.[6] In the Stable Zone, the amount of eelgrass averaged approximately 16.7 acres for the Project Area in the four survey periods with a 95% confidence limit of 1.7 acres.

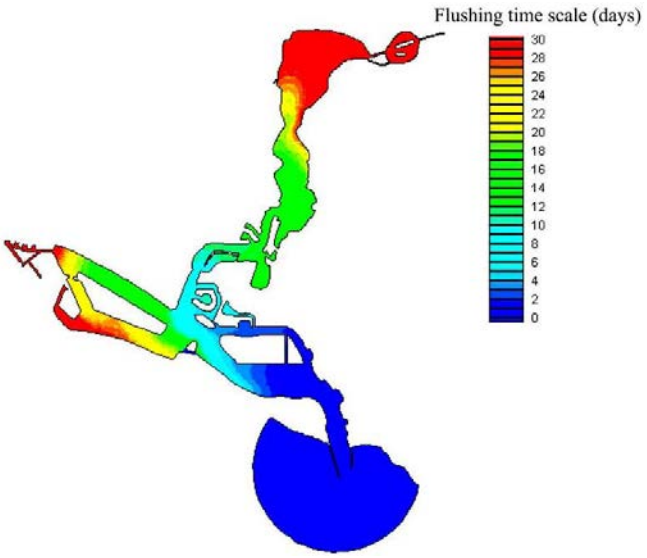

Figure 3. Tidal flushing in days for the Lower and Upper Newport Bay area. Everest Consulting (from CRM 2005).

The Transitional Zone is strongly influenced by reductions in light penetration and perhaps lowered salinities during normal to above normal rainfall years.[7] The significant decline observed from 2003 to 2010 is likely the result of higher rainfall years during the sampling events. Eelgrass in some areas within the Transitional Zone has disappeared during years of high runoff and low light penetration. This is particularly true when strong winter storms in 2009 to 2010 contributed to high turbidity throughout the Harbor. The cooler water temperatures observed in the summer of 2010 may have also stalled recovery by slowing growth (R. Ware, pers. comm.). During the most recent survey, rainfall was lower and therefore turbidity was reduced. For the Transitional Zones, the average within the Project Area was 3.8 acres with 95% confidence limits of the mean at ± 2.6 acres. The variation observed over the four sampling periods is larger than that seen in the Stable Zones.

The inter-annual variation in the transitional areas contributes to most of the variation of shallow water eelgrass as this area is most influenced by variation on turbidity associated

[6] According to the dredging permit activity log maintained by the City, minimal to no dredging of eelgrass has occurred during this analysis period due to the difficulty and cost of completing mitigation associated with eelgrass impacts. So, it is assumed the eelgrass population as measured represents a natural variation from periods of high growth (2003 to 2004 data) and lower growth due to higher turbidity (most recent data).

[7] CRM has found that very small differences in mean light intensity can affect whether eelgrass will establish and grow at specific locations (CRM 2010). Based on light measurements taken in 2008 to 2009, CRM observed the mean light intensity in eelgrass occupied areas was 354 µmol m^{-2} s^{-1} compared to 294 µmol m^{-2} s^{-1}, and that generally light energy in eelgrass beds was greater by approximately 100-200 µmol m^{-2} s^{-1}.

with outflows from San Diego Creek and Upper Newport Bay (Figure 4). Primary emphasis on sustaining eelgrass populations in the Harbor should be placed on maintenance of acreage within the Stable Zone (from which seeds are likely produced to re-establish eelgrass in transitional zones).

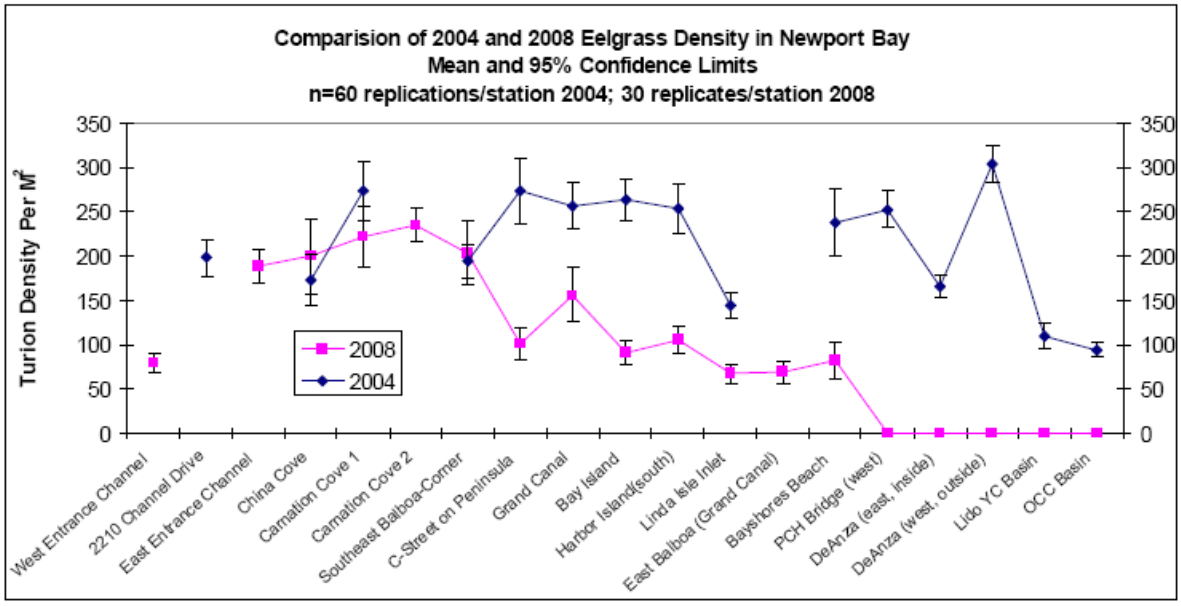

Figure 4. Comparison of 2004 and 2008 eelgrass turion density by location within Newport Bay. Transitional areas showing greatest decline between survey dates (CRM 2010).

In addition to restrictions on the amount of eelgrass that could be impacted within Stable and Transitional Zones each year, the location of those impacts would be restricted. Because dredging requires substantial pre-project planning and the cost of dredging for small projects is high, adjoining landowners may wish to combine their efforts and conduct dredging over several properties. This may have an impact on the local population of eelgrass; therefore, it is proposed that no contiguous properties will impact more than 0.5 acres of eelgrass when EMT is exceeded, and no more than 0.3 acres when shallow water eelgrass population is within Tier 2. Because there are some areas of the bay, such as Carnation Cove and portions of Balboa Island and Channel, where this restriction may present an economic hardship, especially as the eelgrass population increases, should any eelgrass impacts exceed these restrictions, written approval from NMFS would be obtained to exceed these levels.

Maintaining the EMT

With a healthy EMT, there will be ample seeds available in this well-mixed tidal system that most viable areas will be supplied with seeds naturally, such that seeding would be unnecessary. However, the City will support the testing of methods to collect eelgrass seeds for seed bagging and conduct pilot testing of seed bagging. By testing the

methodology, the City will be well prepared to instruct those owners who undertake dredging on successful methods in the event the population of shallow water eelgrass falls below the EMT.

The City will also support the testing of eelgrass Transplant Eelgrass Remotely with Frame Systems (TERFS™), which will allow the transplanting of adult eelgrass plants in the event it becomes desirable to supplement seeding efforts.

The City will begin an education program to assist property owners in coming to view eelgrass as a valuable ecological resource rather than a nuisance weed that impedes navigation and recreation.

Below the EMT

In addition to the BMPs described for Tier 1, if the shallow water eelgrass population in the Project Area is within the Tier-2 level, the City will require those property owners who undertake Covered Activities in either the Stable or the Transition Zones to take active regrowth efforts by deploying seed bags or by using TERFS off their docks in the areas of suitable depth within their lot(s). The City will limit direct impacts to eelgrass from Covered Activities in the Plan Area to no more than 0.75 acre per year.

If the population is within the Tier-3 level, impacts to eelgrass in the Plan Area will be limited to no more than 0.5 acres annually. Any eelgrass lost would have to be replaced by the individual project proponent using methods (e.g. transplanting) and at a ratio consistent with the SCEMP or applicable plan then in effect.

If population within the Project Area remains in Tier 3 for two consecutive survey periods, the City will evaluate, in conjunction with the agencies, the field data to determine if the cause is related to natural events such as consecutive heavy rainfall years. If no natural causes for this decline can be determined, the City will consider options to increase eelgrass habitat within the Harbor in consultation with the resource agencies.

BEST MANAGEMENT PRACTICES

The City will require the use of BMPs as part of the review process when owners propose dredging and/or expanding docks within the Project Area appropriate to the tier level. Approvals determined by the City will be conditioned on individual property owner's compliance with the BMPs.

Basis for the BMPs

The purpose of the BMPs is to avoid and minimize the temporary impacts to eelgrass to the extent practicable and, where possible, to implement measures to promote eelgrass establishment. The overall plan provides incentives to property owners and the City to promote eelgrass establishment, as it will reduce costs and time associated with the current permitting and mitigation requirements. The BMPs allow the City and the property owners to address maintenance needs while promoting eelgrass stewardship.

Depending on site-specific conditions, the BMPs would include the following:

- **When Shallow Water Eelgrass in the Project Area is in Tier 1:**
  - **Avoidance Where Practicable –** The City will review proposed Covered Activities to ensure avoidance of existing eelgrass beds is maximized to the extent practicable. Avoidance measures may include reducing the proposed dredging area or shifting the dredging area.
  - **Educate Property Owners –** The City will develop a public education program on the importance of eelgrass beds and the reasons they should be protected, so boat owners and property owners view the establishment of eelgrass as a positive outcome. The program will likely consist of information on the City's web site and a fact sheet attached to permit application packages.

- **When Shallow Water Eelgrass in the Project Area is in Tier 2 or Tier 3:**
  - **Promote Population Growth –** After Covered Activities are concluded, the City will require the property owners to use either of the following means:
    - **Buoyed Deployed Seed Bags (BDSB) –** These will be used to improve seeding adjacent to the disturbed area (Pickerell et al. 2006; Boyer et al. 2008). This method will allow for natural re-seeding of the temporarily disturbed areas and will likely be more successful than transplanting adult plants, because viable seed will be spread throughout the area and will germinate and survive in those areas best suited for eelgrass. It does not require significant expertise, intensive and expensive site-selection studies, or the use of divers, all of which are needed for transplanting. Seeds may be collected from the area prior to disturbance or from donor beds in the Stable Eelgrass Zone.

- TERFS™ – These are designed to allow for the stable transplanting of adult plants and will be deployed by the property owners if sufficient suitable area is available in the area surrounding the dredging activity. This would allow for re-establishment within its most suitable habitat area. TERFS will be deployed by the property owner who undertook the project activity.

Over time and through biennial monitoring, the City will be able to determine those methods that are most effective. It is expected that BMPs will evolve or additional ones will be adopted over time, as the City continues its efforts to acquire more information about the ecology, light requirements, and seedling survival rates of eelgrass.

If the shallow water eelgrass population in the Project Area is within the Tier-3 category for two survey periods, the City will undertake a rigorous adaptive management program. The City will examine the field data collected in conjunction with its survey program to determine if the decline is the result of natural causes, e.g. consecutive years of high runoff, or is caused by anthropogenic causes. The City will also work with the agencies to consider more transplanting or seeding methods or creation of suitable areas for eelgrass colonization.

PROGRAM TO PROMOTE EELGRASS GROWTH AND ESTABLISHMENT

The City will test eelgrass propagation methods in order to ensure the EMT is maintained through the use and development of restoration techniques, such as BDSBs (Pickerell *et al.* 2006) and TERFS™ (Short and Coles 2001).

The City is committed to minimizing temporary impacts to eelgrass by individual property owners through BMPs in the Plan Area to no more than 1.5 acres of eelgrass annually when the EMT is met and allowing less impacts in the event the shallow water eelgrass population declines below the EMT. The City has undertaken an extensive monitoring program within the Harbor to assess light levels, salinity, and temperature throughout the year. It is expected these data can be useful not only in explaining inter-annual differences in eelgrass populations but to also determine areas most feasible for methods that can best promote eelgrass growth.

The City will investigate expanding eelgrass habitat within the Bay, buttressing the City's ability to respond should the population fall below the EMT:

- Use BDSBs to disperse seeds into Transitional Eelgrass Zone areas when population levels decline to promote more rapid recovery of eelgrass (Pickerell et al. 2006). BDSBs are mesh bags that contain inflorescences (with ripened seeds) that are deployed over the area where eelgrass has a potential to grow but has been eliminated by some natural cause such as seasonally low light levels caused by storm events. This method could also be used to improve eelgrass regeneration in areas temporally impacted by dredging that have suitable conditions for eelgrass growth. In San Francisco Bay, BDSBs have been found to also increase genetic diversity over transplant techniques (Boyer et al. 2008).
- Use TERFS to establish eelgrass in areas of high wave action but with suitable light and substrate conditions. The purpose would be to test the ability of TERFS to provide stable structures for the initial establishment of eelgrass in more wave-prone areas.

It is expected that these programs will be undertaken in Stable and Transitional Zones to determine their effectiveness.

INITIAL OFF-SETTING MEASURES

The City will undertake several programs to provide an off-setting of the initial temporary impacts to eelgrass associated with the Plan. While eelgrass does re-establish itself rapidly in areas subject to temporary disturbance, some initial losses may occur during the initial period of plan implementation. These measures will have the effect of promoting eelgrass growth in the Newport Harbor immediately upon approval of the management plan by the agencies and are in addition to the measures to be implemented as part of the overall plan.

The measures proposed include:

- An annual $10,000 contribution to the CoastKeeper or other appropriate non-profit organization over 3 years that will be directed toward a program to promote education on eelgrass and to initiate restoration research to re-establish eelgrass in the Back Bay. The first contribution to CoastKeeper was made in 2012. In 2008, the Coastkeeper initiated a partnership with the Bay Back Science Center and the California Department of Fish and Game. It includes an educational program for life science and biology classes and provides teachers with training and classroom materials on eelgrass protection. The program includes an eelgrass cultivation and research program that is directed toward answering critical questions on the future conservation, management, and restoration of eelgrass in Newport Bay. Experimental tanks have been installed to test hypotheses on how best to establish eelgrass in the Upper Bay. The donation will be used to support these programs and to encourage the experimental transplantation of eelgrass in Newport Bay.
- Distribution and ecological studies on eelgrass conducted by the City will be made available online and available to the Southern California Eelgrass Monitoring Regional Program. This program is aimed at improving the knowledge of eelgrass distribution in southern California and is coordinated with the Southern California Coastal Water Research Program (SCCWRP). The level of information collected by the City is consistent with the goals of the program and the City will cooperate with SCCWRP to assure data consistency with the program.
- The City will promote the use of dock designs that may improve light intensity below and adjacent to docks. While the City is not in a position to require that dock owners retrofit dock and piers, they can provide information to dock owners who are seeking changes or modifications on methods that could be employed that would improve dock design, such as translucent or grated deck materials, light concentrators, or other materials that may be suitable for use in areas where eelgrass is present. The City will work with NMFS and the California Department of Fish and Wildlife to identify those materials or modifications that have been proven effective and do not compromise safety and structural strength.
- The City will provide information on use of environment friendly mooring buoys to yacht clubs and other facilities that have mooring fields in areas that may support eelgrass. This educational program will provide these users with information on the installation of these mooring devices and the environmental benefits. Most mooring fields have double-point moorings that do not result in anchor chain circles. However, the Carnation Cove mooring field does have single moorings that are maintained and rented by Orange County. The City will request the County consider the use of these types of environment friendly moorings.

REPORTING AND ADAPTIVE MANAGEMENT

The City will prepare annual reports, due by January 31 of each year, on the activities undertaken to implement and manage the Plan. The report will document the current EMT tier level under which the City is operating, the individual projects that have been approved to use the Plan, and the amount of eelgrass that has been impacted during that year. The City will also provide documentation on the activities that have been undertaken, the status of the Initial Off-Setting Measures, and technical reports that have been completed during the reporting period. The report will be submitted to the National Marine Fisheries Service, the Corps of Engineers, the Santa Ana Regional Water Quality Control Board, the California Department of Fish and Wildlife, and the California Coastal Commission.

As new information is made available on eelgrass distribution and ecology in the project area, the City will, in concert with agency review and input, may propose revisions to the Plan and the EMT thresholds. In addition, new technology related to eelgrass ecology will also be incorporated into possible revisions. The resource and permitting agencies will review any new proposals and will provide consent to implement changes.

Given the investment made by the City and the commitments to prospective individuals wishing to dredge, the Plan will remain in effect for 5 years and may be revised by the City in consultation with the agencies. The agencies may seek modifications to the Plan following review of the biennial eelgrass survey data or should there be a precipitous drop in the eelgrass populations in the Bay. The City and the agencies will work together to resolve implementation issues that foreseen when the Plan was developed.

Should eelgrass populations fall precipitously or remain at Tier 3 for two sampling periods, the City and the agencies will meet to review actions needed to preserve and protect eelgrass in the lower Bay.

ACKNOWLEDGEMENTS

This Plan was prepared by WRA, Inc., for the City's Harbor Resources Division. Dr. Michael Josselyn was the primary preparer of the Plan. Larry Paul and Associates, Anchor QEA, LLC, Harbor Commissioner Doug West and Harbor Resources Manager Chris Miller participated in the revisions of the Plan. The participation of the National Marine Fisheries Service during the review and revision of the Plan, especially that of Bryant Chesney, is greatly appreciated.

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APPENDIX A

MAPBOOK SHOWING PROJECT AREA COVERED BY PLAN

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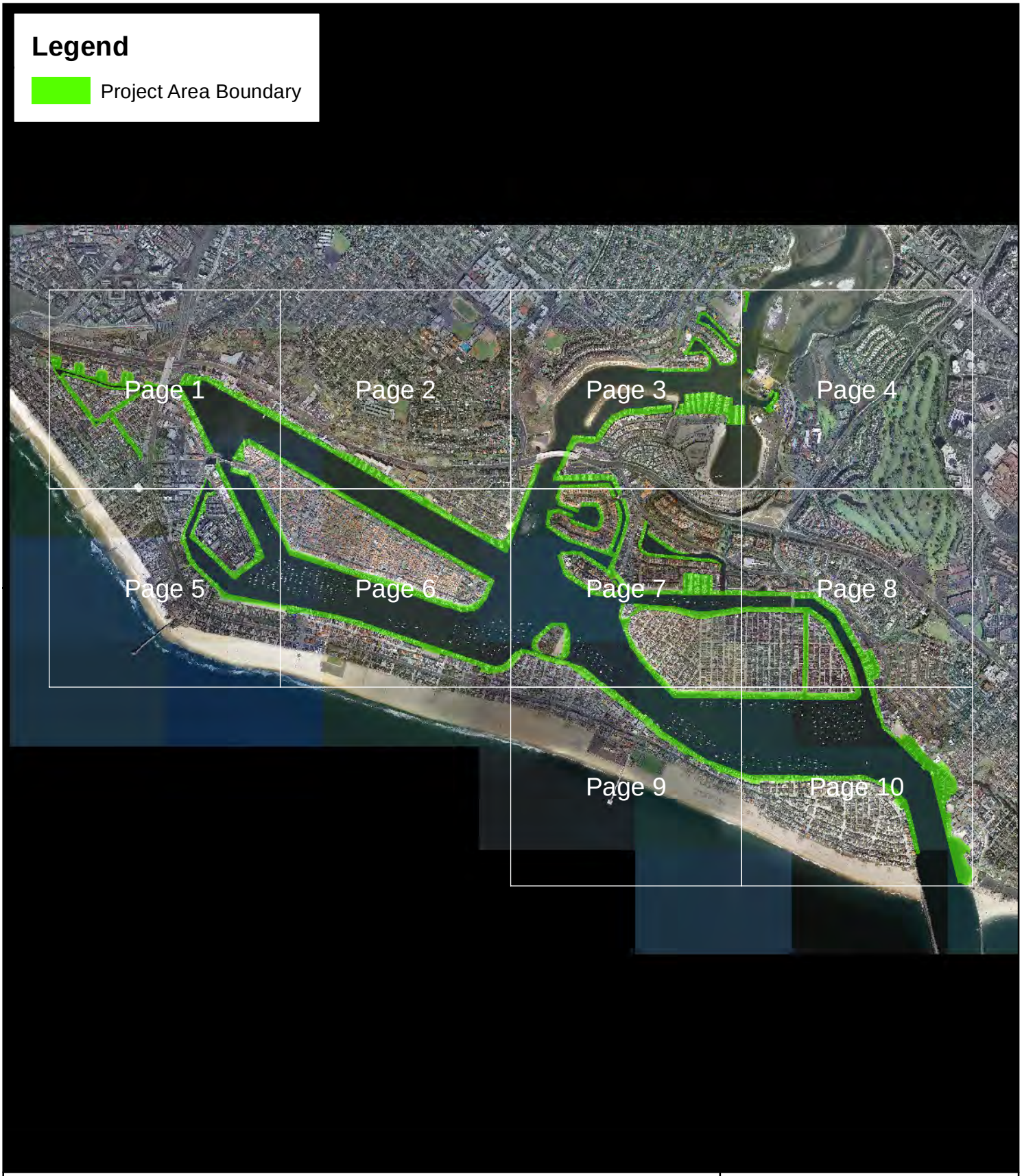

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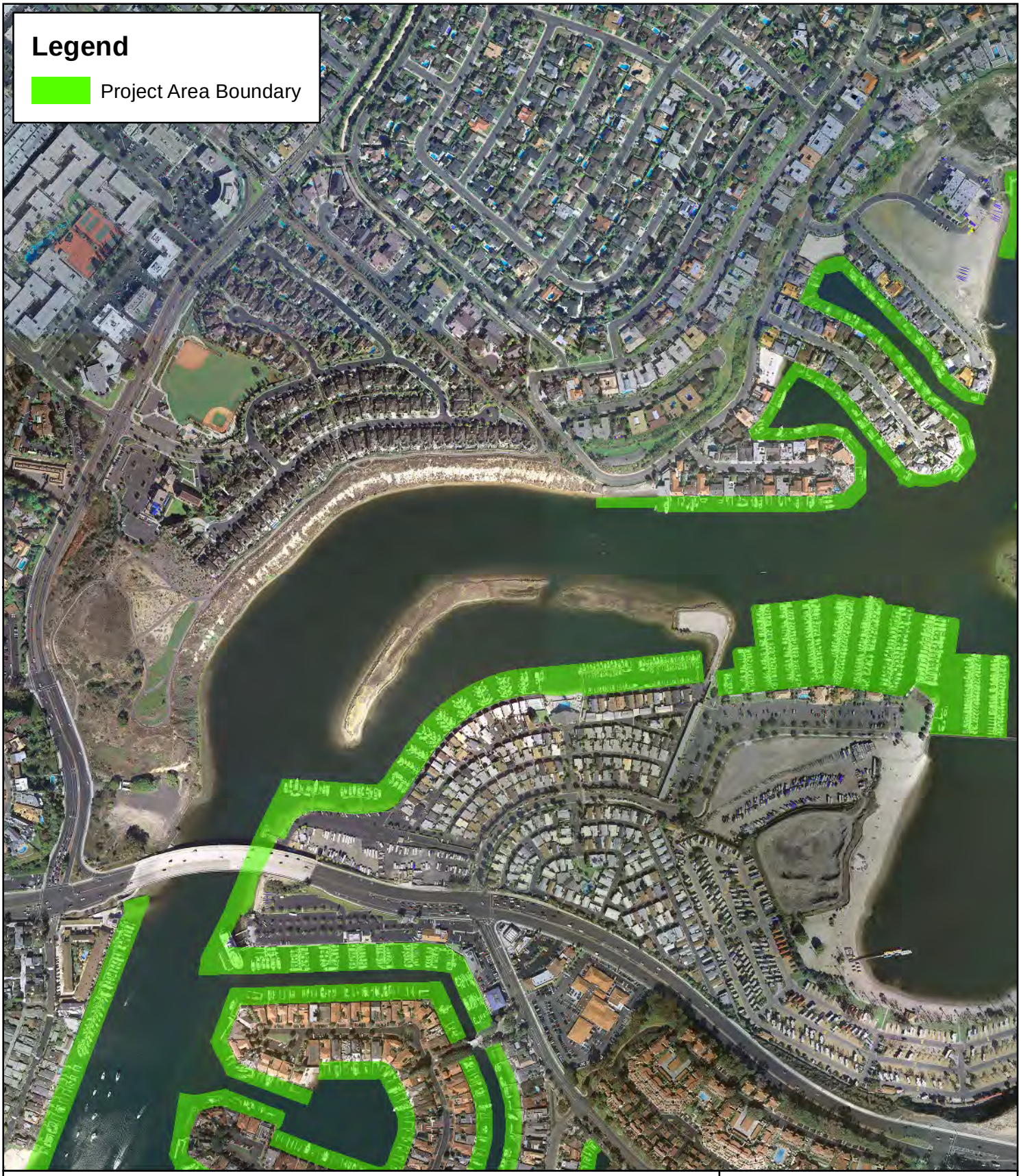

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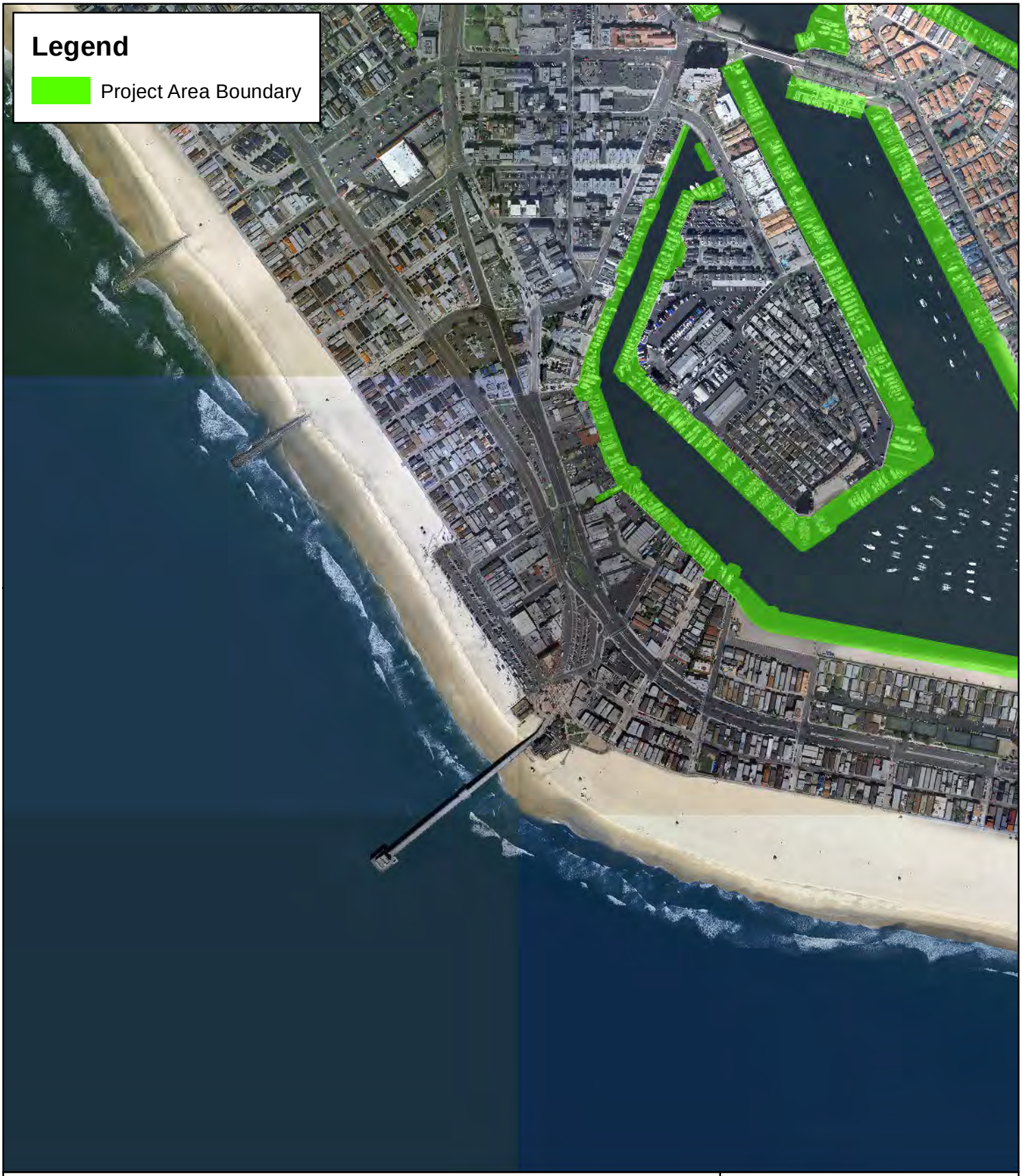

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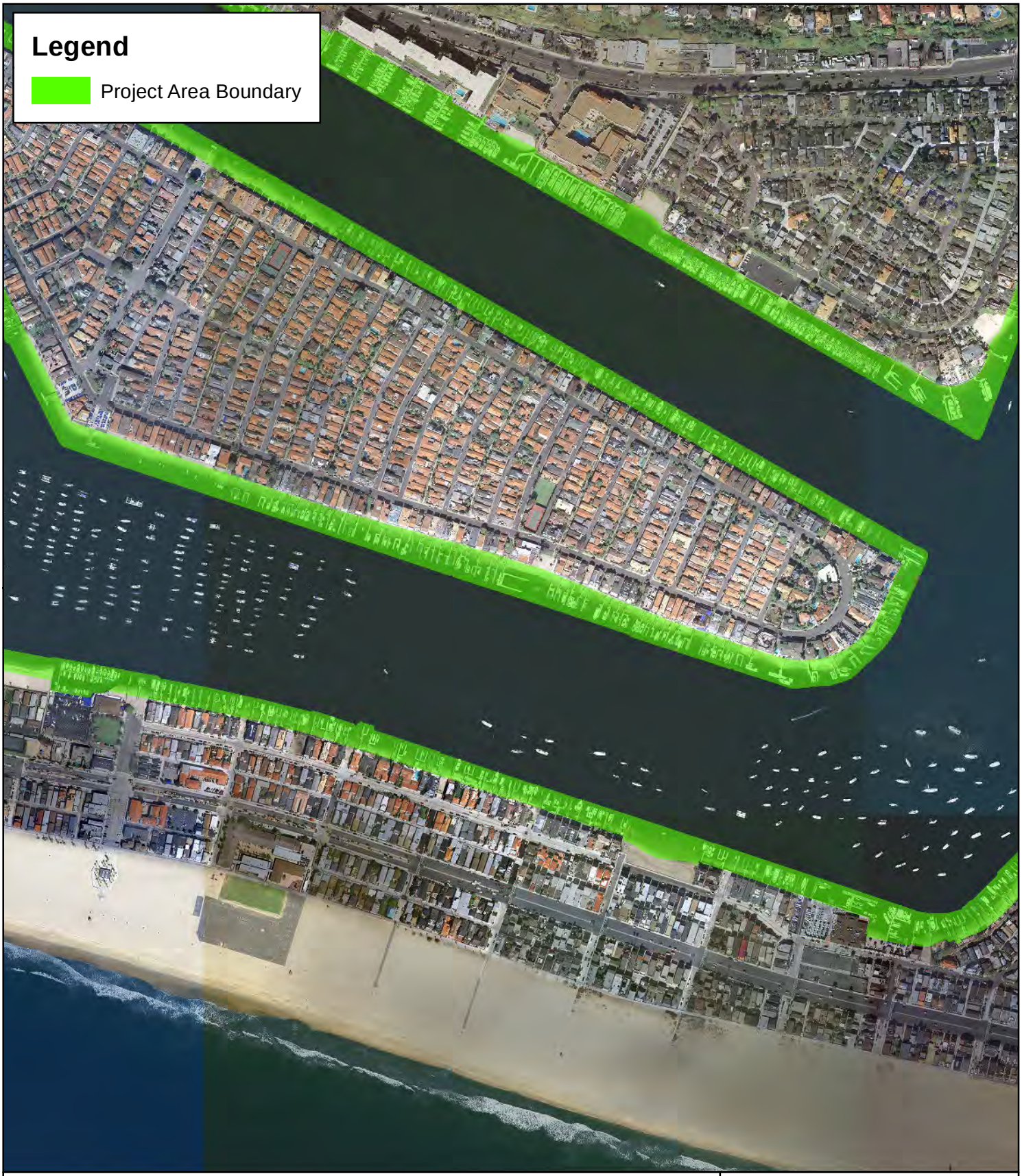

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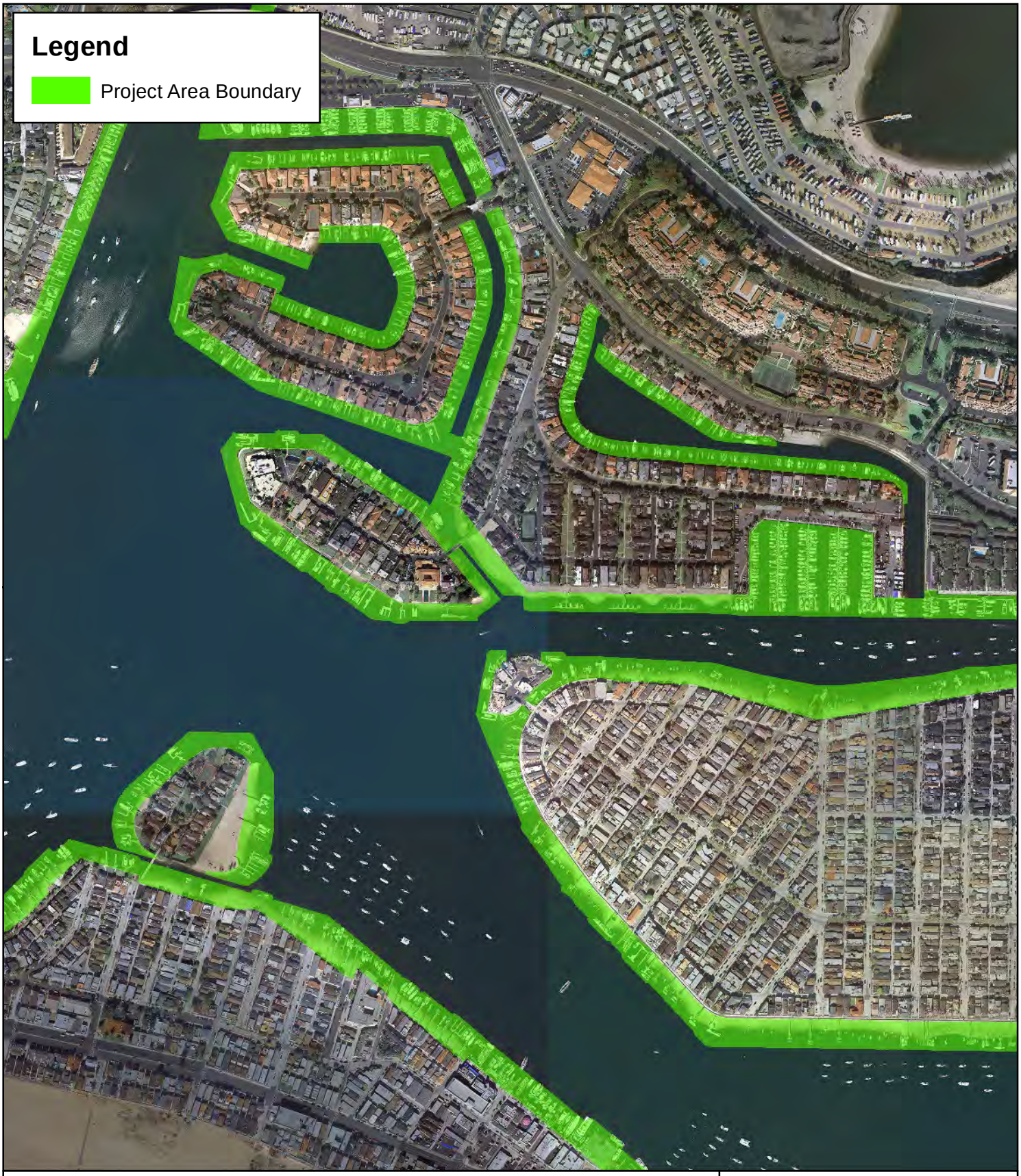

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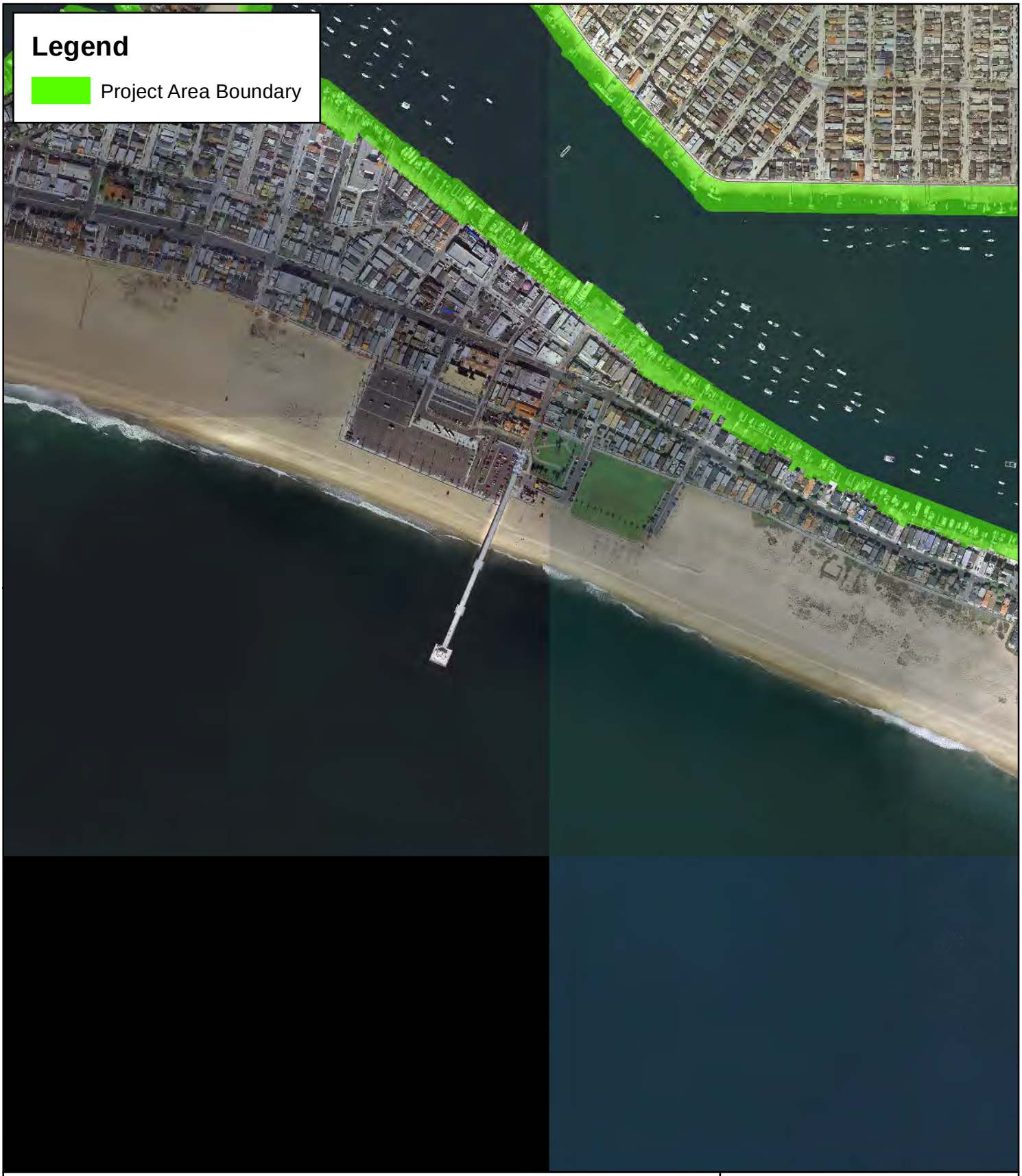

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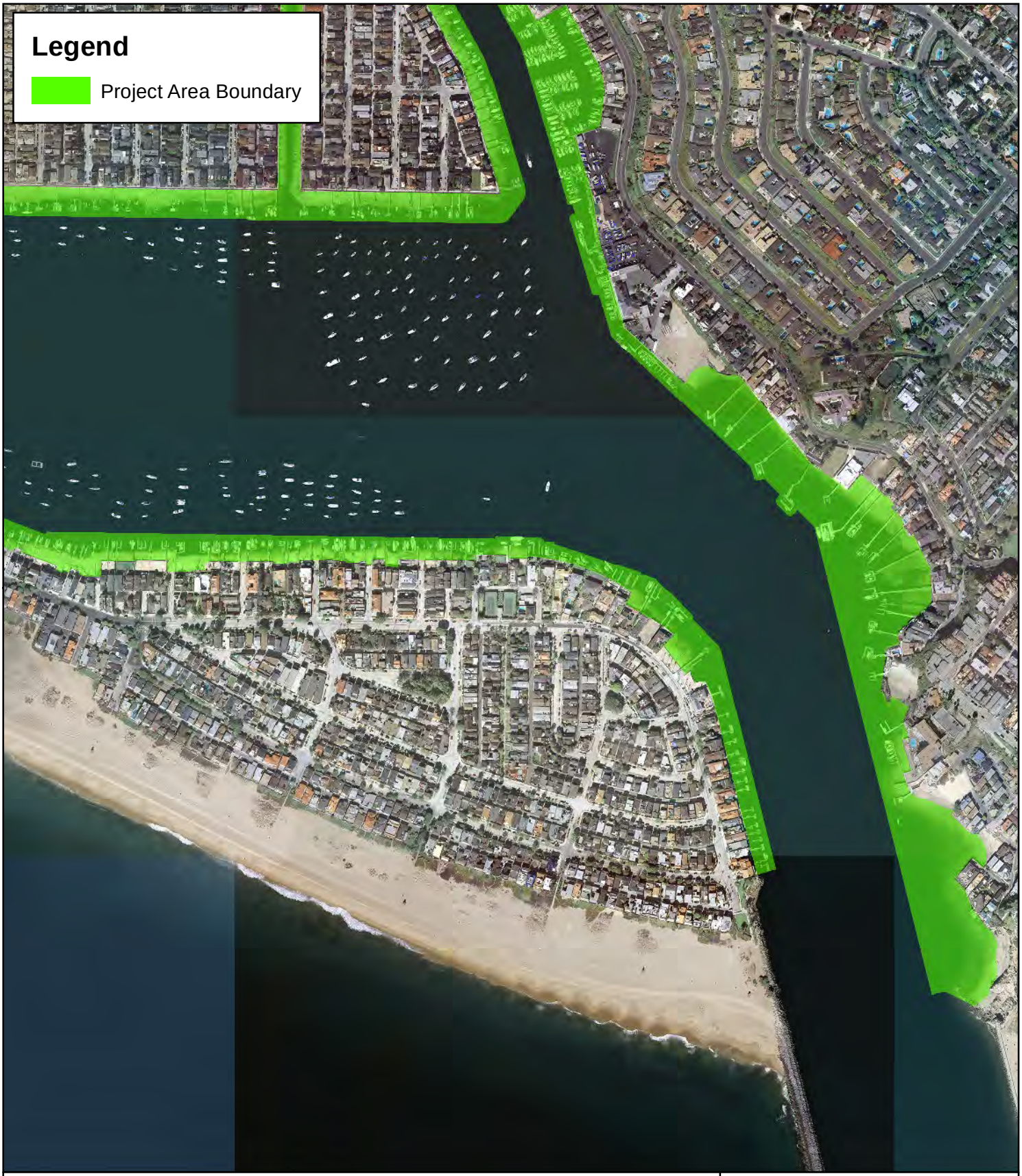

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APPENDIX B

EELGRASS POPULATION DATA FOR PROJECT AREA

COLLECTED BY COASTAL MANAGEMENT RESOURCES

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SHALLOW WATER EELGRASS WITHIN PLAN AREA	2003-2004	2006-2007	2009-2010	2012-2013	MEAN (acres)	STANDARD DEVIATION	95% CONFIDENCE LIMITS
STABLE ZONE							
Balboa Island/Collins Isle	4.16	3.43	2.40	3.24	3.31	0.72	0.71
Bay Island	0.11	0.05	0.04	0.17	0.09	0.06	0.06
Corona del Mar (Bayside)	8.36	8.13	8.49	9.90	8.72	0.80	0.78
East Balboa Peninsula	1.58	1.52	1.38	2.19	1.67	0.36	0.35
Grand Canal	0.9	1.14	0.62	1.06	0.93	0.23	0.23
Linda Isle Inner	0.05	0.51	0.30	0.83	0.42	0.33	0.32
Yacht Club/Basins	1.68	1.42	1.53	1.53	1.54	0.11	0.10
STABLE ZONE WITHIN PLAN AREA	***16.84***	***16.20***	***14.76***	***18.91***	***16.68***	*1.73*	1.69
TRANSITIONAL ZONE							
Balboa Island/Collins Isle	1.88	0.94	0.58	1.13	1.13	0.55	0.54
Bay Island	0.01	0.00	0.00	0.02	0.01	0.01	0.01
Bayshores	0.74	0.65	0.00	0.15	0.39	0.36	0.36
Castaways	0	0.00	0.00	0.01	0.00	0.00	0.00
Harbor Island	2.22	0.62	0.40	0.90	1.04	0.82	0.80
Lido Isle	0.02	0.00	0.00	0.01	0.01	0.01	0.01
Inner DeAnza Peninsula	0	0.00	0.00	0.00	0.00	0.00	0.00
Linda Isle Inner	0.04	0.03	0.03	0.15	0.06	0.06	0.06
Linda Isle Outer	1.29	0.11	0.07	0.42	0.47	0.57	0.56
Mariner's Mile	0.23	0.07	0.07	0.30	0.17	0.12	0.12
North Balboa Channel and Yacht Basin	0.61	0.11	0.12	0.12	0.24	0.25	0.24
West Balboa Peninsula	0.03	0.03	0.01	0.07	0.03	0.02	0.02
Outer DeAnza Peninsula	0	0.00	0.00	0.00	0.00	0.00	0.00
Yacht Club/Basins	0.6	0.11	0.16	0.24	0.28	0.22	0.22
TRANSITIONAL ZONE IN PLAN AREA	***7.67***	***2.67***	***1.44***	***3.51***	***3.82***	*2.70*	2.65
TOTAL FOR PLAN AREA	**24.51**	**18.87**	**16.20**	**22.43**	**20.50**	*3.69*	3.62

SHALLOW WATER EELGRASS OUTSIDE PLAN AREA	2003-2004	2006-2007	2009-2010	2012-2013	MEAN (acres)	STANDARD DEVIATION	95% CONFIDENCE LIMITS
STABLE ZONE							
Balboa Island/Collins Isle	0.41	0.12	0.06	1.488	0.52	0.66	0.65
Bay Island	0.01	0	0	0.000	0.00	0.00	0.00
Corona del Mar (Bayside)	1.14	0.95	1.87	12.472	4.11	5.59	5.48
East Balboa Peninsula	0.05	0.03	0.01	0.079	0.04	0.03	0.03
Grand Canal	0	0	0	0.000	0.00	0.00	0.00
Linda Isle Inner	0.1	2.64	1.64	3.299	1.92	1.39	1.36
Yacht Club/Basins	0.15	0.01	0.06	0.291	0.13	0.12	0.12
STABLE ZONE EELGRASS OUTSIDE PLAN AREA	1.86	3.76	3.66	17.629	6.73	7.32	7.17
TRANSITIONAL ZONE							
Balboa Island/Collins Isle	0.22	0.06	0	0.064	0.09	0.09	0.09
Bay Island	0	0	0	0.000	0.00	0.00	0.00
Bayshores	0.25	0.01	0	0.004	0.07	0.12	0.12
Castaways	0.13	0	0	0.002	0.03	0.06	0.06
Harbor Island	0.72	0.1	0.04	0.012	0.22	0.34	0.33
Lido Isle	0	0	0	0.000	0.00	0.00	0.00
Inner DeAnza Peninsula	0.21	0.01	0	0.077	0.07	0.10	0.09
Linda Isle Inner	0.09	0.09	0	0.134	0.08	0.06	0.06
Linda Isle Outer	1.61	0.16	0	0.052	0.46	0.77	0.76
Mariners Isle	0	0	0	0.000	0.00	0.00	0.00
North Balboa Channel and Yacht Basin	0.15	0.04	0.09	0.139	0.10	0.05	0.05
West Balboa Peninsula	0	0	0	0.000	0.00	0.00	0.00
Outer DeAnza Peninsula	0.77	0	0	1.596	0.59	0.76	0.75
Yacht Club/Basins	0	0	0	0.000	0.00	0.00	0.00
TRANSITIONAL ZONE OUTSIDE PLAN AREA	4.15	0.48	0.14	2.080	1.71	1.83	1.80
TOTAL OUTSIDE PLAN AREA	6.01	4.23	3.79	19.709	8.43	7.58	7.43
SHALLOW WATER EELGRASS TOTALS							
TOTAL STABLE ZONE	**18.69**	**19.95**	**18.42**	**36.54**	**23.40**	**8.79**	**8.61**
TOTAL TRANSITIONAL ZONE	**11.5**	**3.12**	**1.5**	**5.59**	**5.43**	**4.38**	**4.30**
ALL ZONES TOTAL	**30.19**	**23.07**	**19.92**	**42.14**	**28.83**	**9.86**	**9.66**