PROFESSIONAL SERVICES AGREEMENT WITH MARINE TAXONOMIC SERVICES, LTD. FOR 2024 NEWPORT HARBOR SHALLOW-WATER & DEEP-WATER EELGRASS SURVEY

THIS PROFESSIONAL SERVICES AGREEMENT ("Agreement") is made and entered into as of this 23rd day of July, 2024 ("Effective Date"), by and between the CITY OF NEWPORT BEACH, a California municipal corporation and charter city ("City"), and MARINE TAXONOMIC SERVICES, LTD., an Oregon corporation ("Consultant"), whose address is 920 Rancheros Drive, Suite F-1, San Marcos, CA 92069, and is made with reference to the following:

RECITALS

A. City is a municipal corporation duly organized and validly existing under the laws of the State of California with the power to carry on its business as it is now being conducted under the statutes of the State of California and the Charter of City.

B. City desires to engage Consultant to conduct a shallow-water survey (Zostera marina) and a deep-water survey (Zostera pacifica) of eelgrass within Newport Harbor. ("Project").

C. Consultant possesses the skill, experience, ability, background, certification and knowledge to provide the professional services described in this Agreement.

D. City has solicited and received a proposal from Consultant, has reviewed the previous experience and evaluated the expertise of Consultant, and desires to retain Consultant to render professional services under the terms and conditions set forth in this Agreement.

NOW, THEREFORE, it is mutually agreed by and between the undersigned parties as follows:

1. TERM

The term of this Agreement shall commence on the Effective Date, and shall terminate on July 23, 2026, unless terminated earlier as set forth herein.

2. SERVICES TO BE PERFORMED

Consultant shall diligently perform all the services described in the Scope of Services attached hereto as Exhibit A and incorporated herein by reference ("Services" or "Work"). City may elect to delete certain Services within the Scope of Services at its sole discretion.

3. TIME OF PERFORMANCE

3.1 Time is of the essence in the performance of Services under this Agreement and Consultant shall perform the Services in accordance with the schedule included in Exhibit A. In the absence of a specific schedule, the Services shall be performed to completion in a diligent and timely manner. The failure by Consultant to strictly adhere to the schedule set forth in Exhibit A, if any, or perform the Services in a diligent and timely manner may result in termination of this Agreement by City.

3.2 Notwithstanding the foregoing, Consultant shall not be responsible for delays due to causes beyond Consultant's reasonable control. However, in the case of any such delay in the Services to be provided for the Project, each party hereby agrees to provide notice within two (2) calendar days of the occurrence causing the delay to the other party so that all delays can be addressed.

3.3 Consultant shall submit all requests for extensions of time for performance in writing to the Project Administrator as defined herein not later than ten (10) calendar days after the start of the condition that purportedly causes a delay. The Project Administrator shall review all such requests and may grant reasonable time extensions for unforeseeable delays that are beyond Consultant's control.

3.4 For all time periods not specifically set forth herein, Consultant shall respond in the most expedient and appropriate manner under the circumstances, by hand-delivery or mail.

4. COMPENSATION TO CONSULTANT

4.1 City shall pay Consultant for the Services on a time and expense not-to-exceed basis in accordance with the provisions of this Section and the Schedule of Billing Rates attached hereto as Exhibit B and incorporated herein by reference. Consultant's compensation for all Work performed in accordance with this Agreement, including all reimbursable items and subconsultant fees, shall not exceed **One Hundred Seventy Three Thousand Four Hundred Twenty Four Dollars and 60/100 ($173,424.60),** without prior written authorization from City. No billing rate changes shall be made during the term of this Agreement without the prior written approval of City.

4.2 Consultant shall submit monthly invoices to City describing the Work performed the preceding month. Consultant's bills shall include the name of the person who performed the Work, a brief description of the Services performed and/or the specific task in the Scope of Services to which it relates, the date the Services were performed, the number of hours spent on all Work billed on an hourly basis, and a description of any reimbursable expenditures. City shall pay Consultant no later than thirty (30) calendar days after approval of the monthly invoice by City staff.

4.3 City shall reimburse Consultant only for those costs or expenses specifically identified in Exhibit B to this Agreement or specifically approved in writing in advance by City.

4.4 Consultant shall not receive any compensation for Extra Work performed without the prior written authorization of City. As used herein, "Extra Work" means any Work that is determined by City to be necessary for the proper completion of the Project, but which is not included within the Scope of Services and which the parties did not reasonably anticipate would be necessary at the execution of this Agreement. Compensation for any authorized Extra Work shall be paid in accordance with the Schedule of Billing Rates as set forth in Exhibit B.

5. PROJECT MANAGER

5.1 Consultant shall designate a Project Manager, who shall coordinate all phases of the Project. This Project Manager shall be available to City at all reasonable times during the Agreement term. Consultant has designated Robert Mooney to be its Project Manager. Consultant shall not remove or reassign the Project Manager or any personnel listed in Exhibit A or assign any new or replacement personnel to the Project without the prior written consent of City. City's approval shall not be unreasonably withheld with respect to the removal or assignment of non-key personnel.

5.2 Consultant, at the sole discretion of City, shall remove from the Project any of its personnel assigned to the performance of Services upon written request of City. Consultant warrants that it will continuously furnish the necessary personnel to complete the Project on a timely basis as contemplated by this Agreement.

5.3 If Consultant is performing inspection services for City, the Project Manager and any other assigned staff shall be equipped with a cellular phone to communicate with City staff. The Project Manager's cellular phone number shall be provided to City.

6. ADMINISTRATION

This Agreement will be administered by the Public Works. City's Director of Public Works or designee shall be the Project Administrator and shall have the authority to act for City under this Agreement. The Project Administrator shall represent City in all matters pertaining to the Services to be rendered pursuant to this Agreement.

7. CITY'S RESPONSIBILITIES

To assist Consultant in the execution of its responsibilities under this Agreement, City agrees to provide access to and upon request of Consultant, one copy of all existing relevant information on file at City. City will provide all such materials in a timely manner so as not to cause delays in Consultant's Work schedule.

8. STANDARD OF CARE

8.1 All of the Services shall be performed by Consultant or under Consultant's supervision. Consultant represents that it possesses the professional and technical personnel required to perform the Services required by this Agreement, and that it will perform all Services in a manner commensurate with community professional standards and with the ordinary degree of skill and care that would be used by other reasonably

competent practitioners of the same discipline under similar circumstances. All Services shall be performed by qualified and experienced personnel who are not employed by City. By delivery of completed Work, Consultant certifies that the Work conforms to the requirements of this Agreement, all applicable federal, state and local laws, and legally recognized professional standards.

8.2 Consultant represents and warrants to City that it has, shall obtain, and shall keep in full force and effect during the term hereof, at its sole cost and expense, all licenses, permits, qualifications, insurance and approvals of whatsoever nature that is legally required of Consultant to practice its profession. Consultant shall maintain a City of Newport Beach business license during the term of this Agreement.

8.3 Consultant shall not be responsible for delay, nor shall Consultant be responsible for damages or be in default or deemed to be in default by reason of strikes, lockouts, accidents, acts of God, or the failure of City to furnish timely information or to approve or disapprove Consultant's Work promptly, or delay or faulty performance by City, contractors, or governmental agencies.

9. HOLD HARMLESS

9.1 To the fullest extent permitted by law, Consultant shall indemnify, defend and hold harmless City, its City Council, boards and commissions, officers, agents, volunteers and employees (collectively, the "Indemnified Parties") from and against any and all claims (including, without limitation, claims for bodily injury, death or damage to property), demands, obligations, damages, actions, causes of action, suits, losses, judgments, fines, penalties, liabilities, costs and expenses (including, without limitation, attorneys' fees, disbursements and court costs) of every kind and nature whatsoever (individually, a Claim; collectively, "Claims"), which may arise from or in any manner relate (directly or indirectly) to any breach of the terms and conditions of this Agreement, any Work performed or Services provided under this Agreement including, without limitation, defects in workmanship or materials or Consultant's presence or activities conducted on the Project (including the negligent, reckless, and/or willful acts, errors and/or omissions of Consultant, its principals, officers, agents, employees, vendors, suppliers, consultants, subcontractors, anyone employed directly or indirectly by any of them or for whose acts they may be liable, or any or all of them).

9.2 Notwithstanding the foregoing, nothing herein shall be construed to require Consultant to indemnify the Indemnified Parties from any Claim arising from the sole negligence or willful misconduct of the Indemnified Parties. Nothing in this indemnity shall be construed as authorizing any award of attorneys' fees in any action on or to enforce the terms of this Agreement. This indemnity shall apply to all claims and liability regardless of whether any insurance policies are applicable. The policy limits do not act as a limitation upon the amount of indemnification to be provided by Consultant.

10. INDEPENDENT CONTRACTOR

It is understood that City retains Consultant on an independent contractor basis and Consultant is not an agent or employee of City. The manner and means of conducting the Work are under the control of Consultant, except to the extent they are limited by statute, rule or regulation and the expressed terms of this Agreement. No civil service status or other right of employment shall accrue to Consultant or its employees. Nothing in this Agreement shall be deemed to constitute approval for Consultant or any of Consultant's employees or agents, to be the agents or employees of City. Consultant shall have the responsibility for and control over the means of performing the Work, provided that Consultant is in compliance with the terms of this Agreement. Anything in this Agreement that may appear to give City the right to direct Consultant as to the details of the performance of the Work or to exercise a measure of control over Consultant shall mean only that Consultant shall follow the desires of City with respect to the results of the Services.

11. COOPERATION

Consultant agrees to work closely and cooperate fully with City's designated Project Administrator and any other agencies that may have jurisdiction or interest in the Work to be performed. City agrees to cooperate with the Consultant on the Project.

12. CITY POLICY

Consultant shall discuss and review all matters relating to policy and Project direction with City's Project Administrator in advance of all critical decision points in order to ensure the Project proceeds in a manner consistent with City goals and policies.

13. PROGRESS

Consultant is responsible for keeping the Project Administrator informed on a regular basis regarding the status and progress of the Project, activities performed and planned, and any meetings that have been scheduled or are desired.

14. INSURANCE

Without limiting Consultant's indemnification of City, and prior to commencement of Work, Consultant shall obtain, provide and maintain at its own expense during the term of this Agreement or for other periods as specified in this Agreement, policies of insurance of the type, amounts, terms and conditions described in the Insurance Requirements attached hereto as Exhibit C, and incorporated herein by reference.

15. PROHIBITION AGAINST ASSIGNMENTS AND TRANSFERS

Except as specifically authorized under this Agreement, the Services to be provided under this Agreement shall not be assigned, transferred contracted or subcontracted out without the prior written approval of City. Any of the following shall be construed as an assignment: The sale, assignment, transfer or other disposition of any

of the issued and outstanding capital stock of Consultant, or of the interest of any general partner or joint venturer or syndicate member or cotenant if Consultant is a partnership or joint-venture or syndicate or co-tenancy, which shall result in changing the control of Consultant. Control means fifty percent (50%) or more of the voting power or twenty-five percent (25%) or more of the assets of the corporation, partnership or joint-venture.

16. SUBCONTRACTING

The subcontractors authorized by City, if any, to perform Work on this Project are identified in Exhibit A. Consultant shall be fully responsible to City for all acts and omissions of any subcontractor. Nothing in this Agreement shall create any contractual relationship between City and any subcontractor nor shall it create any obligation on the part of City to pay or to see to the payment of any monies due to any such subcontractor other than as otherwise required by law. City is an intended beneficiary of any Work performed by the subcontractor for purposes of establishing a duty of care between the subcontractor and City. Except as specifically authorized herein, the Services to be provided under this Agreement shall not be otherwise assigned, transferred, contracted or subcontracted out without the prior written approval of City.

17. OWNERSHIP OF DOCUMENTS

17.1 Each and every report, draft, map, record, plan, document and other writing produced, including but not limited to, websites, blogs, social media accounts and applications (hereinafter "Documents"), prepared or caused to be prepared by Consultant, its officers, employees, agents and subcontractors, in the course of implementing this Agreement, shall become the exclusive property of City, and City shall have the sole right to use such materials in its discretion without further compensation to Consultant or any other party. Additionally, all material posted in cyberspace by Consultant, its officers, employees, agents and subcontractors, in the course of implementing this Agreement, shall become the exclusive property of City, and City shall have the sole right to use such materials in its discretion without further compensation to Consultant or any other party. Consultant shall, at Consultant's expense, provide such Documents, including all logins and password information to City upon prior written request.

17.2 Documents, including drawings and specifications, prepared by Consultant pursuant to this Agreement are not intended or represented to be suitable for reuse by City or others on any other project. Any use of completed Documents for other projects and any use of incomplete Documents without specific written authorization from Consultant will be at City's sole risk and without liability to Consultant. Further, any and all liability arising out of changes made to Consultant's deliverables under this Agreement by City or persons other than Consultant is waived against Consultant, and City assumes full responsibility for such changes unless City has given Consultant prior notice and has received from Consultant written consent for such changes.

17.3 All written documents shall be transmitted to City in formats compatible with Microsoft Office and/or viewable with Adobe Acrobat.

18. CONFIDENTIALITY

All Documents, including drafts, preliminary drawings or plans, notes and communications that result from the Services in this Agreement, shall be kept confidential unless City expressly authorizes in writing the release of information.

19. INTELLECTUAL PROPERTY INDEMNITY

Consultant shall defend and indemnify City, its agents, officers, representatives and employees against any and all liability, including costs, for infringement or alleged infringement of any United States' letters patent, trademark, or copyright, including costs, contained in Consultant's Documents provided under this Agreement.

20. RECORDS

Consultant shall keep records and invoices in connection with the Services to be performed under this Agreement. Consultant shall maintain complete and accurate records with respect to the costs incurred under this Agreement and any Services, expenditures and disbursements charged to City, for a minimum period of three (3) years, or for any longer period required by law, from the date of final payment to Consultant under this Agreement. All such records and invoices shall be clearly identifiable. Consultant shall allow a representative of City to examine, audit and make transcripts or copies of such records and invoices during regular business hours. Consultant shall allow inspection of all Work, data, Documents, proceedings and activities related to the Agreement for a period of three (3) years from the date of final payment to Consultant under this Agreement.

21. WITHHOLDINGS

City may withhold payment to Consultant of any disputed sums until satisfaction of the dispute with respect to such payment. Such withholding shall not be deemed to constitute a failure to pay according to the terms of this Agreement. Consultant shall not discontinue Work as a result of such withholding. Consultant shall have an immediate right to appeal to the City Manager or designee with respect to such disputed sums. Consultant shall be entitled to receive interest on any withheld sums at the rate of return that City earned on its investments during the time period, from the date of withholding of any amounts found to have been improperly withheld.

22. ERRORS AND OMISSIONS

In the event of errors or omissions that are due to the negligence or professional inexperience of Consultant which result in expense to City greater than what would have resulted if there were not errors or omissions in the Work accomplished by Consultant, the additional design, construction and/or restoration expense shall be borne by Consultant. Nothing in this Section is intended to limit City's rights under the law or any other sections of this Agreement.

23. CITY'S RIGHT TO EMPLOY OTHER CONSULTANTS

City reserves the right to employ other Consultants in connection with the Project.

24. CONFLICTS OF INTEREST

24.1 Consultant or its employees may be subject to the provisions of the California Political Reform Act of 1974 (the "Act") and/or Government Code §§ 1090 et seq., which (1) require such persons to disclose any financial interest that may foreseeably be materially affected by the Work performed under this Agreement, and (2) prohibit such persons from making, or participating in making, decisions that will foreseeably financially affect such interest.

24.2 If subject to the Act and/or Government Code §§ 1090 et seq., Consultant shall conform to all requirements therein. Failure to do so constitutes a material breach and is grounds for immediate termination of this Agreement by City. Consultant shall indemnify and hold harmless City for any and all claims for damages resulting from Consultant's violation of this Section.

25. NOTICES

25.1 All notices, demands, requests or approvals, including any change in mailing address, to be given under the terms of this Agreement shall be given in writing, and conclusively shall be deemed served when delivered personally, or on the third business day after the deposit thereof in the United States mail, postage prepaid, first-class mail, addressed as hereinafter provided.

25.2 All notices, demands, requests or approvals from Consultant to City shall be addressed to City at:

Attn: Director of Public Works
Public Works
City of Newport Beach
100 Civic Center Drive
Newport Beach, CA 92660

25.3 All notices, demands, requests or approvals from City to Consultant shall be addressed to Consultant at:

Attn: Robert Mooney
Marine Taxonomic Services, LTD.
920 Rancheros Drive, Suite F-1
San Marcos, CA 92069

26. CLAIMS

Unless a shorter time is specified elsewhere in this Agreement, before making its final request for payment under this Agreement, Consultant shall submit to City, in writing,

all claims for compensation under or arising out of this Agreement. Consultant's acceptance of the final payment shall constitute a waiver of all claims for compensation under or arising out of this Agreement except those previously made in writing and identified by Consultant in writing as unsettled at the time of its final request for payment. Consultant and City expressly agree that in addition to any claims filing requirements set forth in the Agreement, Consultant shall be required to file any claim Consultant may have against City in strict conformance with the Government Claims Act (Government Code sections 900 *et seq.).*

27. TERMINATION

27.1 In the event that either party fails or refuses to perform any of the provisions of this Agreement at the time and in the manner required, that party shall be deemed in default in the performance of this Agreement. If such default is not cured within a period of two (2) calendar days, or if more than two (2) calendar days are reasonably required to cure the default and the defaulting party fails to give adequate assurance of due performance within two (2) calendar days after receipt of written notice of default, specifying the nature of such default and the steps necessary to cure such default, and thereafter diligently take steps to cure the default, the non-defaulting party may terminate the Agreement forthwith by giving to the defaulting party written notice thereof.

27.2 Notwithstanding the above provisions, City shall have the right, at its sole and absolute discretion and without cause, of terminating this Agreement at any time by giving no less than seven (7) calendar days' prior written notice to Consultant. In the event of termination under this Section, City shall pay Consultant for Services satisfactorily performed and costs incurred up to the effective date of termination for which Consultant has not been previously paid. On the effective date of termination, Consultant shall deliver to City all reports, Documents and other information developed or accumulated in the performance of this Agreement, whether in draft or final form.

28. STANDARD PROVISIONS

28.1 Recitals. City and Consultant acknowledge that the above Recitals are true and correct and are hereby incorporated by reference into this Agreement.

28.2 Compliance with all Laws. Consultant shall, at its own cost and expense, comply with all statutes, ordinances, regulations and requirements of all governmental entities, including federal, state, county or municipal, whether now in force or hereinafter enacted. In addition, all Work prepared by Consultant shall conform to applicable City, county, state and federal laws, rules, regulations and permit requirements and be subject to approval of the Project Administrator and City.

28.3 Waiver. A waiver by either party of any breach, of any term, covenant or condition contained herein shall not be deemed to be a waiver of any subsequent breach of the same or any other term, covenant or condition contained herein, whether of the same or a different character.

28.4 Integrated Contract. This Agreement represents the full and complete understanding of every kind or nature whatsoever between the parties hereto, and all preliminary negotiations and agreements of whatsoever kind or nature are merged herein. No verbal agreement or implied covenant shall be held to vary the provisions herein.

28.5 Conflicts or Inconsistencies. In the event there are any conflicts or inconsistencies between this Agreement and the Scope of Services or any other attachments attached hereto, the terms of this Agreement shall govern.

28.6 Interpretation. The terms of this Agreement shall be construed in accordance with the meaning of the language used and shall not be construed for or against either party by reason of the authorship of the Agreement or any other rule of construction which might otherwise apply.

28.7 Amendments. This Agreement may be modified or amended only by a written document executed by both Consultant and City and approved as to form by the City Attorney.

28.8 Severability. If any term or portion of this Agreement is held to be invalid, illegal, or otherwise unenforceable by a court of competent jurisdiction, the remaining provisions of this Agreement shall continue in full force and effect.

28.9 Controlling Law and Venue. The laws of the State of California shall govern this Agreement and all matters relating to it and any action brought relating to this Agreement shall be adjudicated in a court of competent jurisdiction in the County of Orange, State of California.

28.10 Equal Opportunity Employment. Consultant represents that it is an equal opportunity employer and it shall not discriminate against any subcontractor, employee or applicant for employment because race, religious creed, color, national origin, ancestry, physical handicap, medical condition, marital status, sex, sexual orientation, age or any other impermissible basis under law.

28.11 No Attorneys' Fees. In the event of any dispute or legal action arising under this Agreement, the prevailing party shall not be entitled to attorneys' fees.

28.12 Counterparts. This Agreement may be executed in two (2) or more counterparts, each of which shall be deemed an original and all of which together shall constitute one (1) and the same instrument.

[SIGNATURES ON NEXT PAGE]

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed on the dates written below.

APPROVED AS TO FORM:
CITY ATTORNEY'S OFFICE
Date: 7/10/24

By: _____
Aaron C. Harp
City Attorney

ATTEST:
Date: _____

By: _____
Leilani I. Brown
City Clerk

CITY OF NEWPORT BEACH,
a California municipal corporation
Date: _____

By: _____
Will O'Neill
Mayor

CONSULTANT: MARINE TAXONOMIC SERVICES, LTD., an Oregon corporation
Date: _____

By: _____
Robert Mooney
Vice President

Date: _____

By: _____
Robin Jones
Secretary, Chief Financial Officer

[END OF SIGNATURES]

Attachments:
Exhibit A – Scope of Services
Exhibit B – Schedule of Billing Rates
Exhibit C – Insurance Requirements
Exhibit D – Evaluation of Various Restoration Techniques for Eelgrass in Newport Harbor

EXHIBIT A
SCOPE OF SERVICES

The City is required to survey shallow-water eelgrass distribution in the harbor every two years, and to survey deep-water eelgrass every four years as detailed in the City's *Eelgrass Protection and Mitigation Plan for Shallow Waters in Lower Newport Bay: An Ecosystem Best Management Program*.[1] (EPMP 2015). Eelgrass is surveyed within three zones (based on eelgrass presence and variation in overall abundance):

(1) Stable Zone, (2) Transitional Zone, and (3) Unvegetated Zone (See Figure 2). Each zone is subject to different allowable annual temporary impacts to eelgrass that may be temporarily impacted by routine maintenance dredging activities. Every two years, a shallow-water eelgrass survey is conducted to track eelgrass distribution in relation to these established zones and to assess long-term eelgrass trends within the harbor. Detailed information on the distribution and abundance of eelgrass shall be documented in a comprehensive report that will facilitate the designation and amount of allowable impacts while also assessing the harbor's overall eelgrass health and total quantity. This current cycle will include the focused deep-water survey.

Consultant shall conduct both the shallow-water survey (Zostera marina) and the deep-water survey (Zostera pacifica) of eelgrass within Newport Harbor in Newport Beach, California. Consultant will be responsible for deploying and storing any vessels or equipment related to services, though it is possible, but not guaranteed, that a small slip or side-tie may be available at the City's Balboa Yacht Basin marina or at Marina Park.

Geographic Extents

The extent of the shallow-water eelgrass survey shall, at a minimum, reflect the extents presented on Figures 1 and 2 (attached). The eelgrass survey must also include the following areas within Lower Newport Bay:

- Areas extending north of Pacific Coast Highway (PCH) to Dover Shores and the Newport Aquatic Center.
- Shallow-water habitat fronting the Back Bay Science Center, the University of California Irvine Rowing Team Crew Base, the public launch ramp at the Newport Dunes, and docks fronting the Back Bay Bistro restaurant.
- Newport Dunes Marina and the full extent of the inner and outer De Anza Peninsula (commencing immediately north of PCH).
- Unvegetated Eelgrass Zone (please consider alternate and more cost-effective methodologies for this area).

The extent of the deep-water eelgrass survey shall, at a minimum, reflect the same extents presented on Figure 3 (attached). It is important to note that the deep-water eelgrass survey is immediately adjacent to, but not within, the shallow-water survey boundary.

The shallow and deep-water surveys should be noted as separate cost line items for clarity. It should be assumed that the extent of eelgrass mapped in 2022 (Figure 4) provided full coverage of the locations identified above and as reflected in Figures 1-3.

[1] Eelgrass Protection and Mitigation Plan for Shallow Waters in Lower Newport Bay: An Ecosystem Best Management Program (EPMP, City of Newport Beach, 2015). Accessible online at: http://www.newportbeachca.gov/home/showdocument?id=21830

Prior to initiating eelgrass surveys, Consultant shall work closely with the City to confirm the final geographic extents. Up to five additional shallow-water survey days are included at the option of the City to account for any contingencies, changes to the geographic extents, or unforeseen City requests.

Survey Methodology

Shallow-Water Survey

Assessing shallow-water eelgrass dynamics relies on the completion of quality and consistent surveys and mapping. Parameters included in the eelgrass survey include: 1) spatial distribution, 2) areal extent, 3) percentage of vegetated cover, and 4) the turion (shoot) density. The methodology shall be consistent with the EPMP and in compliance with the California Eelgrass Mitigation Policy and Implementing Guidelines (CEMP) [2].

The survey shall be conducted by qualified biologists consisting of a diver and a surface support biologist in a kayak. The biologist diver shall first locate the beginning of an eelgrass bed and mark it with a buoy. The surface support biologist shall then initiate tracking of the biologist diver with GPS as the diver swims the perimeter of the individual eelgrass bed. Once the diver returns to the beginning point, the GPS polygon area mapping shall be terminated. Eelgrass patches that are less than two square meters in size shall be referenced as a GPS "point". Down-looking sonar shall be used to augment the shallow- water eelgrass survey where shallow-water areas are too large to be surveyed by diving or where diving conditions are too hazardous.

To assess eelgrass turion density, a minimum of 10 eelgrass turion counts shall be performed visually via SCUBA and within each of the 23 eelgrass regions as defined in Figure 1 (230 turion counts total). The diving biologist shall count the number of live, green shoots at the sediment/shoot interface within a 0.07- square-meter quadrat. Turion counts shall be conducted along an underwater transect between the shallow and deep edge of each eelgrass bed. The counting methods shall be standardized prior to conducting the surveys to ensure the accuracy of counts between different team members.

The following shall also be observed and noted during the survey: general eelgrass health, eelgrass blade lengths and widths, sedimentary conditions, water visibility, water temperature, water depths, and fauna and flora. Additionally, within the 230 areas where turion counts are conducted, the biologist diver shall survey perpendicular through the center of the eelgrass bed to assess presence/absence of *Caulerpa*.

Consultant shall refer to the City's GIS mapping site, and click on the various survey layers to understand the extent of previous surveys. (Once on the site, click on Layers to find previous surveys.)

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[2] National Marine Fisheries Service, 2014. California Eelgrass Mitigation Policy and Implementing Guidelines. October 2014. Accessed online at the following link: http://www.westcoast.fisheries.noaa.gov/publications/habitat/california_eelgrass_mitigation/Final%20CEMP%20October%202014/cemp_oct_2014_final.pdf

Deep-water Survey

Additional Survey Requirements

Caulerpa

While completing the shallow-water eelgrass survey, Consultant shall also conduct a surveillance level *Caulerpa* survey consistent with the Caulerpa Survey Protocol (updated as of October 2021)[3]. This is inclusive of the more detailed survey within areas where turion counts are conducted.

While completing the deep-water eelgrass survey, Consultant shall also conduct a surveillance level *Caulerpa* survey consistent with the Caulerpa Survey Protocol.

The final report shall include a section describing the areas of more focused surveys or peripheral surveys, and documenting the results. A Caulerpa Survey Report shall also be included and submitted per the requirements of the Caulerpa Control Protocol.

Identified Debris

While completing both the shallow and deep-water surveys, the Consultant shall also survey and document any large debris found. The identification shall be limited to objects including, but not limited to, small derelict/sunken vessels, electronic equipment, dock/float debris, furniture etc. The final report shall include a table with a brief description of the debris and GPS coordinates. The intent of the debris identification effort is to support subsequent harbor clean-up efforts. Particular attention should be paid to the public pier areas.

Eelgrass Restoration Method Study

In 2019, the City retained a Consultant to assess different eelgrass restoration methods and more specifically to evaluate the relative effectiveness of eelgrass transplanting efforts utilizing both new and traditional eelgrass transplanting methods. The goal was to build upon existing eelgrass transplanting information by designing a study to evaluate the relative effectiveness in performance and cost of three unique eelgrass transplanting methods: 1) traditional bare-root bundle planting; 2) transplanting eelgrass remotely with frames (TERFs); and 3) transplanting eelgrass remotely with rope (TERR). The results of the analysis were presented in a report, Evaluation of Various Restoration Techniques for Eelgrass in Newport Harbor, provided to the agencies as part of the RGP 54 annual report. Consultant's final report shall include a discussion on how the study area sites are functioning. A copy of the study is included as Exhibit D to this Agreement.

Reporting

Progress Updates

The Consultant shall be required to provide weekly progress updates to the City, and attend up to two in-person preparation meetings at the City's office in Newport Beach or via video conference.

[3] https://media.fisheries.noaa.gov/2021-12/caulerpa-control-protocol-v5.pdf

Maps

In compliance with the CEMP and consistent with the EPMP, eelgrass maps shall, at a minimum, include the following:

- A graphic scale bar, north arrow, legend, and horizontal and vertical datum.
- A boundary illustrating the limits of the area surveyed.
- Bathymetric contours for the survey area, including both the action area(s) and reference site(s) in increments of not more than one foot.
- The boundary of the defined eelgrass bed including an identification of area exclusions based on physical unsuitability to support eelgrass habitat.
- The existing eelgrass cover within the defined eelgrass bed at the time of the survey.
- Separate habitat map of the deep-water survey.
- Electronic maps and all data files shall be submitted to the City as part of the final PDF report. Transfer of data files will be coordinated with the City's GIS Division and will be compatible with their system.

Final Report

Consultant's final report shall generally conform to previous eelgrass survey reports prepared for the City and shall provide a detailed description of the survey coverage (acreage) and any interpolation methods used in mapping. Information shall be presented relative to the established eelgrass zones presented in Figures 1, 2 and 3. Eelgrass distribution and abundance shall be summarized and compared across sampling areas. Eelgrass turion density shall be analyzed by station with a comparative analysis between station and all previous surveys. Summary statistics for each eelgrass turion density station shall be generated and shall include mean, standard deviation, number of samples, and minimum and maximum values. Eelgrass density data shall be presented in the number of turions per square meters. Deep-water eelgrass acreage calculation shall also be provided. Other marine life, including *Caulerpa*, and large debris identification results shall also be generated and presented as part of the final report.

Schedule

As survey areas are completed, the data shall be submitted to the City in batches to aid in year-over-year calculations as required in the annual report. The final report and all electronic files for both the shallow-water and deep-water surveys shall be provided to the City by **November 30, 2024**.

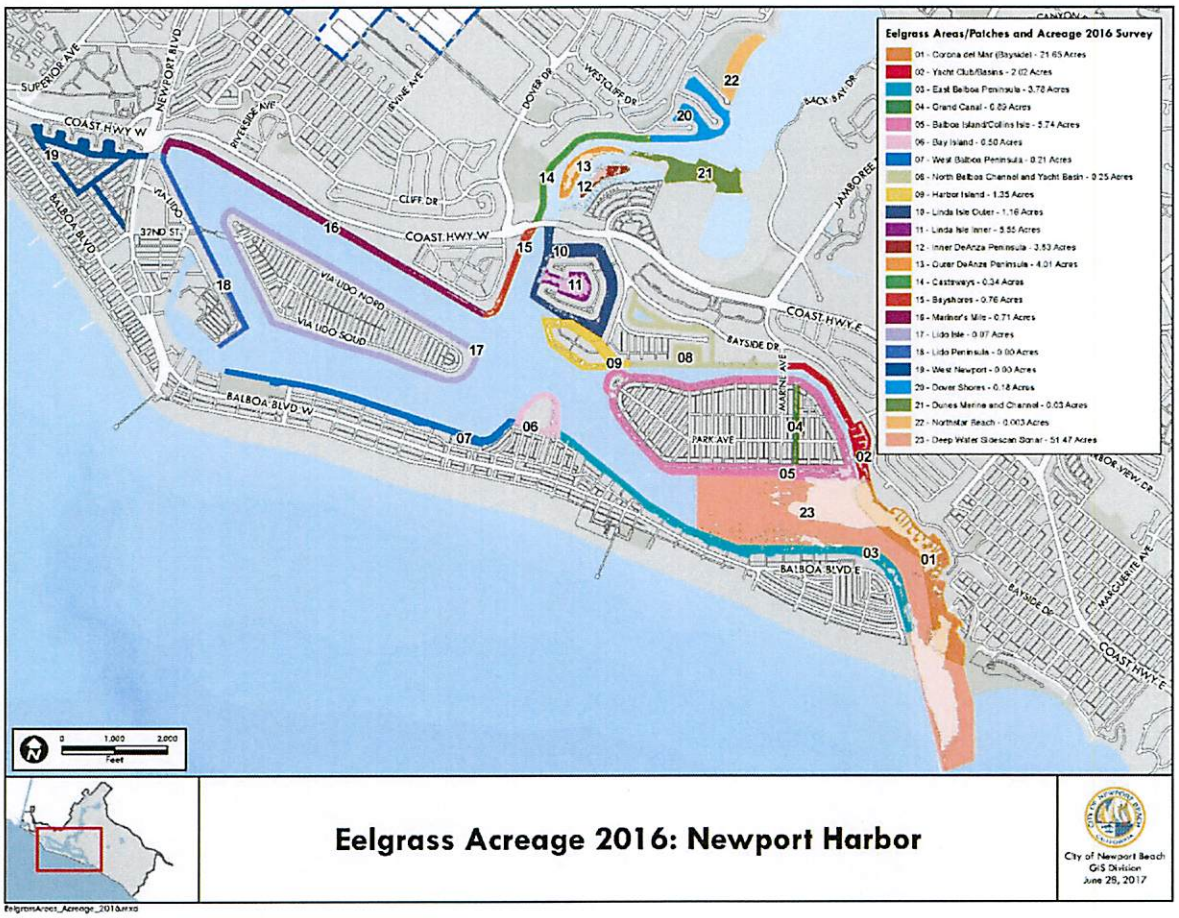

Figure 1. Eelgrass Acreage 2016: Newport Harbor

Table 2. City-Sponsored Shallow Water Eelgrass Surveys in Newport Harbor

Survey Dates	Eelgrass in the Plan Area (Acres)	Notes
December 2003 to August 2004	24.51	Largest shallow water eelgrass population recorded in the harbor to date. Water quality conditions ideal with low winter rainfall.
December 2006 to October 2007	18.87	Decline in eelgrass area, primarily around north Balboa Island, Harbor Island, Linda Isle, and Upper Newport Bay.
December 2009 to November 2010	16.20	Decline in transitional zones attributed to strong winter storms, which contributed to high turbidity.
March 2012 to April 2014	22.76	Overall increase in eelgrass observed in Stable and Transitional Zones and additional survey conducted in the deep channel

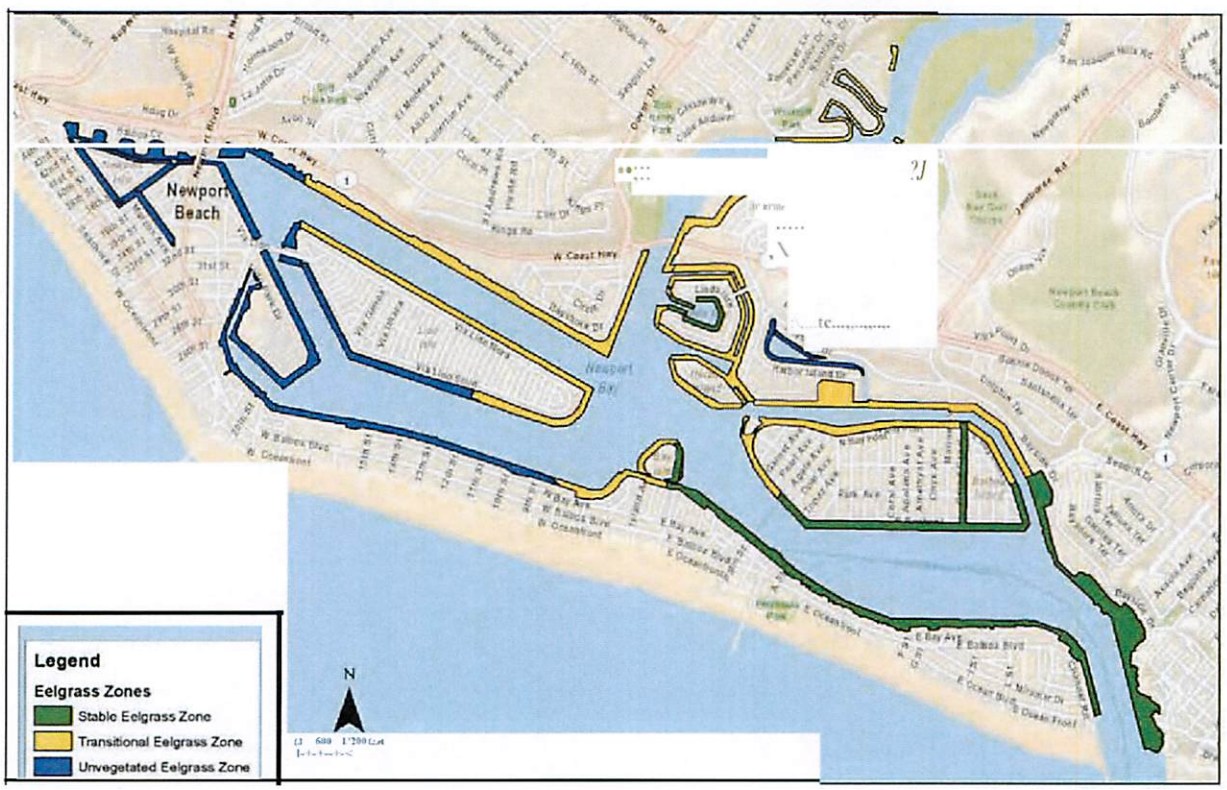

Figure 2. Location of Stable, Transitional, and unvegetated eelgrass zones based on CRM (2010).

Figure 2: Location of Stable, Transitional and Unvegetated Eelgrass Zones

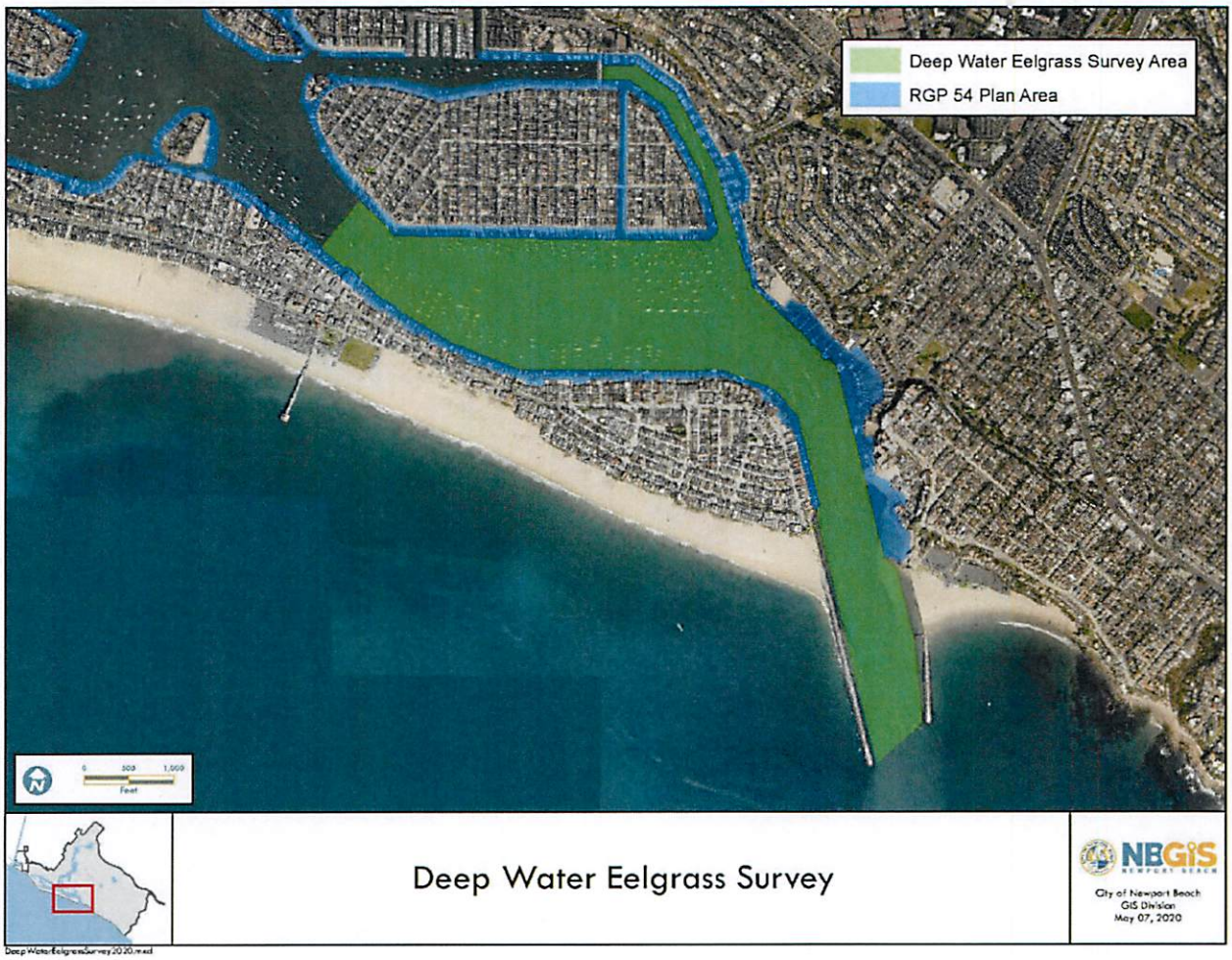

Figure 3: Deep-water Eelgrass Survey Area

Figure 4 – Map of eelgrass coverage observed during the 2022 survey.

MARINE TAXONOMIC SERVICES, LTD.

Proposal to Perform the 2024 Newport Harbor Shallow Water & Deep Water Eelgrass Survey

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June 11, 2024

Prepared for:

Chris Miller
Manager – Public Works Department
City of Newport Beach

Prepared By:

Marine Taxonomic Services, Ltd.
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SAN MARCOS, CA 92069

Coastal Resources Management, Inc.
23 MORNING WOOD DRIVE
LAGUNA NIGUEL, CA 92677

Point of Contact:

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Dear Selection Committee:

Introduction

Thank you for taking the time to review this proposal from Marine Taxonomic Services (MTS) for the 2024 Newport Harbor Shallow-Water & Deep-Water Eelgrass Survey in Newport Beach, CA (RFP 24-79). MTS is an environmental consulting firm committed to providing innovative solutions to help our clients create valuable scientific knowledge while promoting growth in a sustainable manner. Our firm has extensive experience working in the eastern Pacific from the Arctic to Baja California with an emphasis in southern California. As a small business, we can offer individualized service and cost-effective solutions to fulfill project needs.

Extensive Experience

The MTS Team has considerable experience with complicated environmental issues and can provide innovative insights and problem resolution. We can effectively coordinate and serve as a liaison between clients and regulatory agencies. Our knowledge base and field experiences allow us to provide leadership and direction from a project's inception through fulfillment. We specialize in providing sampling services for marine resource investigations including eelgrass monitoring and mitigation, invasive species management, water quality monitoring, and focused marine and aquatic organism surveys. In support of these activities, our staff relies on their experiences with study design, field sampling, sample processing, data analysis, mapping, and reporting.

Proposed Services

We welcome the opportunity to work with the Harbor Resources Division (HRD) under the Public Works Department of the City of Newport Beach in fulfilling its mission to ***"protect and improve the resources of Newport Harbor, Upper Newport Bay, and the ocean beaches to ensure their proper use and enjoyment by all things that derive life, recreation, or commerce from our City's most important asset."*** By providing shallow-water and deep-water eelgrass surveys in Newport Harbor, MTS can help the HRD obtain information that is invaluable to ensuring that the beneficial uses of Newport Harbor can be obtained by all while protecting the resources that make Newport Beach so special. Our staff hopes to help the HRD fulfill this mission by collecting high-quality eelgrass data that can be used to maintain and improve the value of eelgrass resources in Newport Harbor while allowing for sustainable growth. Our staff is some of the most qualified personnel to offer marine biological surveys on the west coast. Our primary personnel for this work category have extensive first-hand experience performing eelgrass monitoring and restoration in southern California.

The following technical proposal and cost proposal was developed with full understanding of your past survey protocols under the California Eelgrass Mitigation Policy and the Eelgrass Protection and Mitigation Plan for Shallow Waters in Newport Bay. Our intention is to continue to utilize the high-quality standards that were put into place under prior surveys to maintain a quality and consistent data record. Additionally, MTS has been an active participant in many Newport Bay *Caulerpa* surveys and is currently working on the *Caulerpa prolifera* eradication effort. MTS will be able to adapt the

harbor wide eelgrass survey to include a surveillance level (20%) search for *Caulerpa* within the designated survey areas.

To ensure the quality and consistency with previous monitoring events, we have teamed with Coastal Resources Management, Inc. (CRM). CRM has led or participated in all prior eelgrass survey events. The inclusion of CRM means that the MTS Team offers the best means to ensure data quality and consistency relative to the prior surveys. We believe the protocols put in place by CRM provide a solid foundation for quality data collection and see little need to deviate from those standards. Maintaining a consistent data set also preserves the integrity of the data such that any potential eelgrass mitigation programs are not threatened with costly consequences.

I have the authority to enter into a binding agreement on behalf of MTS and provide an Advance Notice Requirements Statement confirming MTS' ability to provide service on short notice. Please see cover for contact information. I have reviewed all RFP documents, including the Q&A, and emails that were provided during the bidding period.

Sincerely,

Robert Mooney, PhD

Contents

1 Service Offerings

The below section is intended to illustrate to the City of Newport Beach our team's experience and qualifications to provide eelgrass survey services in accordance with the RFP. In the sections below, we provide our staff experience, corporate experience, and a brief overview of our proposed work approach.

1-1 Experience of Proposed Staff

MTS is prepared to meet the unique demands of performing the shallow-water and deep-water eelgrass survey in Newport Harbor. The work demands a team with a multitude of experiences working with eelgrass to ensure that data are collected that are compatible with previous survey efforts. Staff need to understand which techniques and technologies are appropriate under various circumstances and how implementation of a specific strategy may best ensure quality and consistency of data.

Our team for this project includes Mr. Rick Ware with Coastal Resources Management (CRM). CRM will be responsible for transferring knowledge and lessons learned from prior work in Newport Harbor to MTS staff. CRM will also participate in field data collection and provide data and report review to ensure quality. In particular, CRM will be responsible for collecting all deep-water eelgrass data using remote sensing techniques and will collect shallow water data in some specific areas using the same techniques and, in a manner, similar to past surveys.

In addition to understanding the sampling methods, the successful team needs to have a strong understanding of sampling design and statistics to ensure that data are appropriately collected and analyzed in ways that are consistent with data usage. The MTS team provides these qualifications and more. In turn, MTS helps the HRD ensure that its monitoring programs are run in a manner that generate data that provide an unbiased view of eelgrass coverage and health for proper resource management, while being sensitive to natural resources and their protection.

1-2 Firms' Relevant Experience

The MTS Team includes staff members from MTS and CRM. Relevant experience of the two firms is provided below.

1-2.1 Marine Taxonomic Services, Ltd.

Marine Taxonomic Services

Main Office:
920 Rancheros Dr. F-1
San Marcos, CA 92069
Phone: 760.331.7897

Oregon Office:
5125 NW Crescent Valley Dr.
Corvallis, OR 97330

South Lake Tahoe Office:
1155 Golden Bear Trail
South Lake Tahoe, CA 96150

Marine Taxonomic Services, Ltd. MTS was founded in 1980 and incorporated in 1993. MTS is a small business with offices in Corvallis, Oregon and San Diego, California. Though founded on their expertise in marine taxonomy, MTS is a greatly expanded environmental consulting firm that provides a wide range of marine ecological services.

MTS built a reputation as a quality marine biological services provider when the modern fields of marine ecology and conservation were in their infancy. MTS is prepared to leverage our 40-years of field experience to provide an expert team that can lead the survey and reporting activities required by the scope of work. MTS has extensive experience using teams on field surveys and sample collections. We have worked with private clients, local agencies, and governmental agencies. MTS' experiences make it uniquely suited to support this Project. MTS has performed countless marine biological investigations in southern California and Newport Harbor. These experiences include many eelgrass investigations.

MTS has twenty employees at offices in San Marcos, California; Lake Tahoe, California; and Corvallis, Oregon and is fully equipped with a suite of marine habitat monitoring equipment including side-scan and single-beam sonar, differential GPS, geographically registered underwater video equipment (remote and towed), benthic sampling gear and fisheries sampling gear. MTS' scientific consulting services include:

- Experimental design and sampling design for field biological studies
- Statistical data analysis
- Benthic sediment sampling
- Marine invertebrate identification
- Eelgrass mapping
- Eelgrass mitigation planning and implementation
- Sonar-based aquatic habitat mapping
- Aquatic invasive species control
- *Caulerpa* surveys
- Fisheries inventories
- Bathymetric surveys
- Salt marsh restoration
- Marine mammal surveys
- Biological monitoring of in-water construction

1-2.2 Coastal Resources Management, Inc.

Coastal Resources Management

23 Morning Wood Drive
Laguna Niguel, CA 92677
Phone: 949.412.9446

Coastal Resources Management, Inc. (CRM), located in Long Beach, California, is a certified Small Business Enterprise and State of California registered S-Corporation. Founded in 1992 by Mr. Rick Ware, the firm was incorporated in 2006. CRM has worked on projects along the West Coast of the U.S., as well as in Alaska, Hawaii, Palau, Fiji, and the British Virgin Islands. CRM is a recognized leader in eelgrass monitoring and restoration and has led numerous monitoring and mitigation programs in southern California. CRM brings the MTS Team direct experience with the previous harbor-wide eelgrass survey efforts in Newport Harbor as well as staff redundancy to ensure timelines are met and data are collected in a manner consistent with previous efforts. The added layers of expertise allow for QA/QC of work products and data between team members.

CRM conducts numerous types of field studies, including habitat mapping, biological sampling and analysis for wetlands, bays, harbors, and open coastal environments; water quality sampling and analysis; CEQA and NEPA environmental impact reports/environmental impact statements and assessments; mitigation planning and monitoring studies for wetlands, bays, harbors, and open coastal habitats; and technical report preparation. CRM's U.S. client base includes numerous southern California cities such as Newport Beach as well as county governments, state and federal agencies, and private entities.

CRM scientists are certified American Academy of Underwater Sciences (AAUS) technical divers and are certified by the National Marine Fisheries Service to conduct invasive algae (*Caulerpa spp*) surveys. Mr. Rick Ware, CRM President and Senior Marine Biologist is well qualified to prepare CEQA documentation related to embayments and nearshore marine habitats, having 39 years of experience in the marine biological consulting field. The types of services that CRM provides include:

- Marine biological and wetland baseline ecological inventories;
- Focused surveys for invasive species;
- Focused surveys for sensitive species;
- California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) document preparation and consultation;
- California Coastal Commission Coastal Development Permit and ACOE Section 10/404 Permit acquisition assistance;
- Marine Managed Area (MMA) evaluations, research, and monitoring programs;
- Habitat mapping and marine biological surveys for sandy beach, rocky intertidal, seagrass beds, benthic soft bottom and hard bottom, coral reefs, salt marshes, kelp beds;
- Vessel Support and Lease of CRM's 22 ft and 13.5 ft vessels
- Bioacoustical Surveys;
- Remote Underwater Video Surveys;
- Underwater Photographic Surveys;
- Marine Mammal and Sea Turtle Monitoring;
- Habitat restoration and mitigation program design, implementation, and monitoring for seagrass beds, kelp beds, reefs, and salt marshes;
- Oceanographic surveys, water and sediment sampling, data analysis; and
- Oil spill contingency planning and damage assessment

1-3 Approach to the Scope of Services

1-3.1 Implementation of Shallow Water Surveys

Three methods are proposed to map eelgrass. The methods follow those of prior surveys (Coastal Resources Management 2017) and the methods are consistent with guidelines within the California Eelgrass Mitigation Policy (CEMP) and the Eelgrass Protection and Mitigation Plan for Shallow Waters in Newport Bay (EPMP).

For shallow-water eelgrass habitat, the primary method will utilize biologist-divers using SCUBA and a surface support vessel (generally a kayak) equipped with a differential global positioning system (dGPS) to outline eelgrass bed areas. Each diver will be supported by a support vessel. The support vessel will follow their diver and maintain communication with the diver. When the diver encounters an eelgrass bed, the diver will notify the topside person via underwater communications equipment. The diver will then swim the eelgrass boundary while the topside person follows and logs positions with a dGPS.

In most regions, diver surveys will include the bayfloor from the low intertidal zone to about 30 feet past the end of docks and piers except where the pierhead lines are irregular such as along Carnation and China Cove where shallow-water eelgrass beds extend toward the navigational channel.

Where conditions are not safe to dive or where eelgrass beds are extensive or extend well beyond the pierhead line, remote sensing techniques (side-scan sonar and possibly down-looking sonar) will be used to survey for eelgrass. These methods are consistent with CRM (2017) and the sonar work performed by this team will be performed by CRM. Sonar data will be validated through the use of underwater video. These methods are provided in more detail below relative to the deep-water surveys.

Additional survey elements will include documenting any large debris items observed in sonar records or noted by divers. A table of coordinates and brief description will be provided in the report. Eelgrass density will be monitored by randomly placing quadrats in eelgrass beds and counting leaf shoots (turions) within each quadrat. Data will also be collected on eelgrass canopy height, water temperature, other species present, and other environmental variables consistent with CRM (2017).

During the surveys, divers will perform an anticipated 20% coverage *Caulerpa* survey in accordance with NMFS protocols. The primary means to observe for *Caulerpa* will be using *Caulerpa* certified divers performing the eelgrass surveys in the shallow-water areas. While searching for and surveying around eelgrass beds, divers will survey a significant amount of seafloor. Based on the current understanding of *Caulerpa* presence in Newport Harbor, MTS plans to perform some additional survey efforts specifically for *Caulerpa*. The diver tracks will be recorded regardless of whether the diver encounters eelgrass. This information along with data on other *Caulerpa* survey efforts will be reviewed. MTS will then choose areas for additional surveys to fill any gaps in the Caulerpa search. In addition, divers will swim through eelgrass beds in those areas where eelgrass density assessments are to occur. Training and intercalibration among divers will occur prior to commencement of data collection. The MTS Team is prepared to meet all data collection requirements specified in the RFP.

The report deliverable will utilize the same report template as prior efforts (refer to MTS and CRM 2020 & 2022). The report template will be updated with the information from the current shallow-water and deep-water eelgrass survey using all the same parameters and methods as the prior efforts with some minor additions within the current effort. The consistency in data collection and reporting will ensure that any existing and future eelgrass mitigation programs have data with confidence to protect the resource. If confidence is lost in the data, mitigation programs can be faced with costly implementation of additional data collection.

1-3.2 Implementation of Eelgrass Study Site Surveys

The goal of this task is to inform upon the success of the experimental eelgrass transplant effort completed in 2019. Survey of the eelgrass study sites would inform the City as to the success of various transplant methods three years after the transplant methods were deployed.

MTS will map eelgrass within the eelgrass study sites during the shallow water eelgrass surveys. MTS will follow data collection methods utilized in the year 1 follow up survey of the eelgrass study sites performed in 2020. MTS will lay transects across the study sites in the location of the experimental eelgrass transplant area and collect information related to coverage and density.

Results from the evaluation of the eelgrass study sites will be summarized and included within the report deliverable provided for the harbor wide survey effort.

1-3.3 Implementation of Deep-Water Surveys

The purpose of this task is to update the database of eelgrass distribution in Newport Bay Deep Water Habitat (DWEH) in July 2024 using remote survey methods rather than diver survey, since large-scale diver surveys conducted within active navigational channels in Newport Harbor can present significant diver safety issues and can be extremely labor-intensive. Remote sensing techniques (side-scan sonar and remote underwater video) eliminate these issues.

Deep Water Eelgrass surveys are necessary so that the City has a detailed and complete knowledge of eelgrass bed resources within Newport Bay, as required for the implementation of the City of Newport Beach "Eelgrass Protection and Mitigation Plan for Shallow Waters in Lower Newport Bay: An Ecosystem Based Management Program". The Deepwater Habitat survey will update CRM Deepwater Habitat Surveys conducted in 2008, 2012, 2016, 2020, and 2022 (CRM 2009, 2014, 2016, MTS and CRM 2020, and 2022) that mapped 45.86 acres of eelgrass in the navigation channels in 2008, 45.92 acres of eelgrass in 2012, 51.5 acres in 2016, 37.94 acres in 2020, and 96.4 acres in 2022. The 2022 map is shown in Figure 1.

For the FY 2022 Deep-Water survey, the MTS Team proposes to have CRM provide eelgrass habitat surveys using side-scan sonar in the following locations:

- Side-scan Sonar
- Deepwater Side-scan Area 260 acres
- City Mitigation Area -3.5 acres
- Balboa Yacht Basin 2.5 acres
- Channels Surrounding Linda Isle (south and east) 11 acres
- Inner Linda Isle 8.5 acres

- Balboa Marina Channel/North Linda Isle Channel 4 acres
- Castaways 15 acres
- DeAnza West, to the Launch Ramp 30 acres
- DeAnza East 12 acres
- Dunes Marina

This work is consistent with the areal cover and the methods employed during previous studies and consistent with the RFP (Figure 1). The intent is to survey for eelgrass with sonar methods in expansive areas and areas where navigational channels pose a hazard for diving. Within all of these areas diver surveys will provide eelgrass detail inside the pierhead line and will be used to validate sonar methods. Note that many of the areas described above are beyond the boundaries shown in Figure 1 and the RFP. They are consistent with the text of the RFP that describes performance of eelgrass surveys in areas north of the PCH Bridge.

Figure 1. Survey Area (Shown with the 2022 Deep-water Eelgrass Habitat Survey Results).

CRM will incorporate side-scan sonar technology linked with high-resolution underwater video. Methods to be employed will be the same as utilized during the 2008, 2012, 2016, 2020, and 2022 side-scan sonar surveys (CRM 2009, 2014, 2016, MTS and CRM 2020, and 2022). It is extremely important to utilize consistent methodology, equipment, personnel, and data analysis techniques

using remote survey methods, since the use of different instrumentation, personnel, and data management systems, and comparing previously collected data can result in varying results. Thus, our proposal to provide these services allows the City to make direct comparisons over time when submitting the results of the survey to the regulatory agencies.

The remote sensing methods we employ are approved techniques to map eelgrass as outlined in the California Eelgrass Mitigation Policy (National Marine Fisheries Service 2014). In addition, a proposed NOAA Southern California Eelgrass Regional-Wide Monitoring Program will include a recommendation that eelgrass habitat mapping efforts should be conducted using side-scan sonar methods and where possible, be accompanied by the collection of bathymetric data.

The project deliverable will be an eelgrass habitat map of eelgrass along with a calculation of eelgrass acreage found within Newport Harbor's Deep-Water Habitat. In accordance with the RFP, the MTS Team will submit preliminary acreages and electronic data files (compatible with the City of Newport Beach's GIS mapping system) associated with the deep-water eelgrass survey to the City. If necessary, MTS and CRM can provide results of the deep-water surveys prior to finalization of the report; it will take longer to complete the dive efforts than the sonar efforts. The results will also be incorporated in the final report and all electronic files for both the shallow water and deep-water surveys shall be provided to the City by November 30, 2024.

1-3.4 Management Approach

Effective communication is critical to the successful implementation of dive and survey programs at the scale of this Project. The work effort will require teams to efficiently distribute survey efforts and implement those surveys in a safe and timely fashion. As such, clear transfer of information from Project objectives down to the daily assignment of tasks is critical to efficient, cost-effective Project management.

The Project will require effective management to ensure team organization, task management, adherence to the project goals, and timely reporting. MTS proposes to utilize a project manager as the primary point of contact between the HRD project management team and the MTS Team. This role will be established with a level of redundancy by supplying a field manager that is also capable of taking over as project manager. If the field manager is not available for work, the project manager will assume both roles. In this way, the team ensures a top-down management approach whereby the HRD ensures that its goals, needs, and instructions are realized by the task leaders and their work teams with maximum continuity among staff.

As the primary point of contact for the MTS Team, the project manager will be responsible for communicating project challenges, safety concerns, and management decisions to the HRD in a timely manner. The MTS project manager will coordinate with HRD staff and can provide status updates on projects at any required interval to summarize current project status and present any challenges or concerns. The project manager will provide immediate email and telephone notification of significant safety concerns or other events that threaten the project or its efficiency. Any such significant events and corrective actions will be additionally addressed during status reports.

MTS recognizes the level of commitment required by HRD staff to ensure the success of the multitude of projects in progress at any given time. As such, MTS management will do all it can to effectively

communicate with HRD management and its own team. We recognize that effective communication is necessary to allow resource managers to understand working situations and provide for adaptive management. It is also critical that the team's management structure allow for the safest and most efficient means of deploying resources. MTS brings its decades of aquatic experience to this Project. This means we can offer solutions where funds are spent efficiently and effectively. Aquatic operations can be expensive so MTS makes it our priority to coordinate and manage the resources effectively so that goals can be realized on time and within budget.

1-4 Service Offerings Summary

The above personnel experience, corporate qualifications, and project examples illustrate that MTS and teaming partner CRM have the expertise and materials required to successfully perform the scope of work. MTS and CRM routinely perform remote sensing surveys to map marine habitats and possess all equipment necessary to perform towed video, remotely operated vehicle, down-looking sonar, and side-scan sonar surveys. Our staff has experience performing eelgrass surveys in Newport Harbor and they understand how to safely and effectively operate within Newport Harbor. Our team member CRM developed the protocols specified in the RFP for performance of shallow water and deep-water eelgrass surveys. We intend to adhere to those methods to maintain a consistent dataset that the City of Newport Beach can have confidence in. This will allow for consistency in project planning within the regulatory context of Newport Harbor and prevent costly project delays associated with inadequate data collection.

2 Pricing

Pricing information to complete the scope of work is provided in a separate file in accordance with instructions within RFP 24-79. The separate bid document provides an itemized not to exceed budget for the proposed work as well as a fee schedule for labor and equipment to be used within the terms of the contract.

The budget includes three additional days of diver field work to cover areas needed to complete the 20% survey effort for *Caulerpa* and for surveying the experimental eelgrass survey sites. Depending on how survey efforts are combined and completed during the eelgrass mapping effort it is possible that all or a portion of the three additional survey days may not be used. Additionally, the budget includes five contingency days should the City allow for additional budget to complete eelgrass and/or *Caulerpa* surveys within the harbor at the discretion of the City. Finally, it should be noted that we have included budget to cover significant area beyond the RGP 54 monitoring area. However, this is intended to provide a consistent and detailed map of all eelgrass believed to exist within Newport Harbor. Our team would be happy to discuss the pricing and budget and reduce the level of effort and budget during the contract negotiation period.

3 Organizational Information

The below section is provided to illustrate key personnel to be assigned to this project from MTS and CRM. We also detail the contracting relationship between MTS and CRM and our lead contact for work with the HRD.

3-1 Key Personnel

The MTS Team consists of team members from both MTS and CRM. Dr. Robert Mooney will act as the project manager and will be the primary point of contact for the City of Newport Beach. Ms. Grace Teller will support Dr. Mooney as field manager responsible for ensuring that fieldwork is carried out in a safe, efficient, and professional manner. Mr. Rick Ware with CRM will support the team with training and quality control to ensure data collection methods are consistent with previous efforts. He will also perform collection of down-looking sonar data, side-scan sonar data, quality control, and reporting. The key personnel are highlighted below.

3-1.1 Project Manager – Robert Mooney (MTS)

Dr. Mooney is Vice President and Principal Scientist at MTS. He manages the MTS Consulting Division and has full authority to represent MTS in all contractual matters. With over 20 years of experience studying and mapping coastal marine resources, he is regularly called upon for his knowledge as a scientist and researcher across multiple disciplines. His experience includes instruction of wildlife biology, research methods, statistics, and sampling design at the university level.

Dr. Mooney will serve as a research and sampling team leader, responsible for eelgrass monitoring program design, development of specialized instrumentation and survey equipment, and production of time-synchronized and geographically referenced data sets. He has extensive experience with the development of technology in the marine environment and continually seeks innovative improvements for the efficient collection of quality data. He regularly works with bathymetric survey instrumentation (single-beam and multi-beam sonar), tide loggers, side-scan sonar, sub-bottom profilers, towed cameras, and remotely operated vehicles to map marine substrates and habitats.

Dr. Mooney has performed hundreds of surveys for eelgrass using side-scan sonar and SCUBA, designed and led numerous eelgrass mitigation planning, transplantation and monitoring programs and is recognized as regional leader in eelgrass monitoring and restoration. His understanding of sampling theory and experimental design along with his experience performing eelgrass monitoring and restoration in Newport Harbor makes him uniquely qualified to help the HRD achieve its eelgrass management goals. Dr. Mooney also led the eradication effort for *Caulerpa taxifolia* in southern California and co-leads the eradication effort for *Caulerpa prolifera* in Newport Harbor and San Diego Bay. He and his team at MTS can be depended upon to properly implement *Caulerpa* monitoring alongside surveys for eelgrass.

Dr. Mooney's exceptional knowledge of eelgrass resources in California and specifically in Newport Harbor make him uniquely qualified to lead the 2024 shallow-water and deep-water eelgrass survey. Dr. Mooney managed the 2018, 2020, and 2022 eelgrass surveys for Newport Harbor with assistance from Rick Ware of CRM. He has been able to develop a research team at MTS that affords him the ability to make certain that data are collected in accordance with appropriate sampling theory and with equipment and techniques specific to site conditions. He understands that the methods

employed must be sensitive to the physical and biological environment within which work is performed and that a single approach cannot be applied to all circumstances.

In addition to the 2018, 2020, and 2022 shallow-water eelgrass survey, Dr. Mooney's work in Newport Harbor has included the recent multi-beam bathymetric mapping of Upper Newport Bay as part of the year-10, post-restoration monitoring. Dr. Mooney was also contracted with Orange County Public Works to further evaluate the performance of the sediment basins in Upper Newport Bay. While working at another firm, he was responsible for bay-wide surveys in Newport Harbor and other systems in southern California to assess their invasibility for the invasive alga, *Caulerpa*. Dr. Mooney performed ecosystem modelling and implemented sonar surveys to map the bottom and eelgrass habitat throughout Newport Harbor as part of that effort. He has performed numerous surveys for eelgrass for construction projects in Newport Harbor over the past 20 years and has managed eelgrass transplants within Newport Harbor.

3-1.2 Field Manager – Grace Teller (MTS)

Grace Teller is a senior project manager with a diverse background ranging from terrestrial to marine and aquatic ecology. Ms. Teller serves as a marine scientist and project manager at MTS, responsible for logistics and mobilization, operating and maintaining all instrumentation and survey equipment, integrating collected data inputs into geographically referenced data sets, and compilation of report deliverables.

During the past 10 years she has worked as a dive master and as a marine scientist. Ms. Teller has worked in a diverse range of habitats where she has experience studying and mapping wildlife and environmental resources. Her recent work has focused on physical and biological data collection in marine and coastal ecosystems. Her work typically is focused on biological restoration and monitoring programs. Ms. Teller is routinely consulted for her experience with eelgrass monitoring, water quality monitoring, fisheries sampling, macroinvertebrate core collection, invasive species monitoring, tidal monitoring, habitat mapping, and bathymetric surveys. She regularly performs surveys to document biological resources and potential project impacts in the coastal estuaries and bays of California.

Ms. Teller currently manages offshore water quality projects for treated wastewater, including collection of water column profile data and sampling of seawater at designated sampling stations around the diffuser pipeline. She is responsible for managing construction monitoring for sensitive species including marine mammals, sea turtles, and birds. Ms. Teller leads eelgrass monitoring efforts throughout California. Ms. Teller led the shallow-water eelgrass field survey efforts for the City of Newport Beach in 2018, 2020, and 2022.

3-1.3 Project Planning Deep-Water Survey and Quality Control – Rick Ware (CRM)

Rick Ware is the Principal Scientist and President of CRM. He has over 40 years of experience conducting marine biological resource surveys and evaluating the impacts of coastal development on marine communities in California, Alaska, and the Pacific Basin. He is familiar with federal (NEPA), State of California (CEQA), and California Coastal Commission guidelines and regulations and has managed and/or participated in the preparation of numerous state and federal-mandated environmental assessment and planning documents.

Mr. Ware has conducted numerous types of field studies, including habitat mapping; biological sampling and analysis for wetlands, bays, harbors, and open coastal environments; water quality sampling; environmental impact assessments, mitigation planning and monitoring studies; and technical report preparation. He is well versed in the taxonomy of Pacific Coast marine plants and animals, the ecology of coastal marine communities, the environmental impacts of development, and the restoration and monitoring of coastal resources. He regularly provides his marine biological expertise on projects that require permits from the California Coastal Commission, the State Regional Water Quality Control Board, EPA, and the U.S Army Corps of Engineers and is very familiar with the environmental permitting process.

Mr. Ware has investigated seagrass ecosystems since 1978 throughout southern California. He has supervised and conducted extensive eelgrass habitat mapping studies, eelgrass habitat impact analysis, and eelgrass restoration/mitigation programs between Bodega Bay and San Diego County embayments. He has been the principal investigator for eelgrass transplants in Morro Bay, CA, Los Angeles Harbor, Alamitos Bay, Sunset Harbour/Huntington Harbour, and San Diego Bay. He developed the program for performing harbor-wide surveys for eelgrass resources in Newport Harbor and has performed all of the recent harbor-wide surveys. His leadership has created a robust eelgrass dataset of significant importance to the management of Newport Harbor.

3-2 Contractor Relationships

MTS and CRM have entered into a teaming agreement to fulfill the scope of work. MTS will act as the prime contractor. As prime contractor, MTS will be responsible for communicating project goals, schedule, and completion of milestones with the City of Newport Beach HRD. MTS project manager Dr. Robert Mooney will be the primary point of contact for any contracting or service requests under the contract. CRM will act as a subcontractor to MTS in accordance with the teaming agreement. CRM has previously provided support to train staff to ensure data collection methods are consistent with previous harbor-wide eelgrass surveys. CRM will continue performing that role as necessary. Additionally, CRM will also perform the sonar and camera survey work and will review data and map products for quality control purposes.

4 References & Recent Project History

In the below section we briefly highlight relevant and recent project histories for MTS and CRM and then provide detailed project references for a subset of projects.

4-1 Recent Project History

MTS and CRM pride themselves on providing a high level of field sampling, analysis, and reporting expertise. The combination of experiences across multiple sites and habitats is ideal for the current Project. The combination of needing to be field savvy while performing a technical task with understanding of scientific principles makes this team uniquely qualified. A brief list of recent and relevant experiences includes;

- Performing *Caulerpa prolifera* eradication at China Cove and Collins Island in Newport Harbor in 2021, 2022, and 2023 (MTS)
- Performing *Caulerpa prolifera* eradication at Coronado Cays in Coronado in 2024.
- Performing the 2020 and 2022 shallow-water and deep-water eelgrass surveys for Newport Harbor (MTS & CRM)
- Performing the 2018 shallow-water eelgrass surveys for Newport Harbor (MTS & CRM)
- Performing an assessment of potential eelgrass restoration sites for the Port of San Diego (MTS)
- Performing baseline eelgrass monitoring for planning associated with dock reconfiguration at 101 Bayside, Newport Harbor (MTS)
- Implementing eelgrass restoration at Colorado Lagoon in Long Beach (MTS)
- Performing an assessment of the Santa Margarita River Estuary for Marine Corps Base Camp Pendleton which included sonar and video eelgrass mapping via kayak (MTS)
- Marine biological assessment, essential fish habitat assessment, and eelgrass surveys for the Coronado Cays Yacht Club, Coronado (MTS)
- Baseline eelgrass monitoring for temporary dock relocation at Channel Road Marina, Newport Harbor (MTS)
- Eelgrass mapping, transplanting, and mitigation monitoring at Newport Marina, Newport Harbor (MTS)
- Eelgrass mapping, transplanting, and mitigation monitoring at Balboa Marina and Balboa marina West in Newport Harbor (MTS)
- *Caulerpa* surveys along Balboa Island for beach nourishment activities in Newport Harbor (MTS)
- Performing eelgrass and bathymetric monitoring relating to marsh alteration to combat sea level rise at Seal Beach National Wildlife Refuge (MTS)
- Completing a baseline eelgrass inventory for redevelopment of Harbor Island West Marina, San Diego (MTS)
- Performing eelgrass inventory and special studies in support of the proposed expansion of Fifth Avenue Landing Marina, San Diego (MTS)
- On-call contractor for eelgrass monitoring in the Port of Los Angeles (MTS)
- On-call contractor for eelgrass monitoring for the Port of San Diego (MTS)
- Performance of eelgrass surveys for restoration of salt marsh habitat at ponds 10/11 in San Diego Bay for the Southwest Wetlands Interpretive Association (MTS)
- Performing annual eelgrass mitigation site monitoring at multiple sites in San Diego Bay (MTS)

- Performing baseline and pre-construction eelgrass and *Caulerpa* monitoring at the Shelter Island Boat Launch Facility (MTS)
- On-call contractor for eelgrass monitoring in the Coronado Cays, Coronado (MTS)
- Performing seafloor mapping for the post-restoration monitoring of Upper Newport Bay (MTS)
- Performing harbor-wide eelgrass GIS mapping for the City of Newport Beach in Newport Harbor between 2003 and 2016 (CRM)
- Performing 200 public use monitoring surveys for central Orange County areas of special biological significance in 2012 (CRM)
- Conducted extensive eelgrass restoration in association with Orange County Coastkeeper along the De Anza-Bayside Peninsula in Upper Newport Bay under grants from the California Coastal Conservancy and NOAA between 2012 and 2015 (CRM)
- Conducted eelgrass and invasive algae surveys, prepared Essential Fish Habitat Impact (EFH) analyses, and submitted detailed marine biological impact assessment technical appendices for Balboa Marina and Balboa Marina West in Newport Harbor
- Retained by the City of Newport Beach and the California Department of Fish and Game to conduct biological surveys, prepare a biological project description, a project impact assessment and construction BMPs for the construction of the Back Bay Science Center, Orange County Water Quality Laboratory, and Cal Fish and Game Headquarters, on Shellmaker Island, Newport Bay, CA (CRM)
- Prepared a marine biological impact assessment, Essential Fish Habitat (EFH) technical studies, and a mitigation plan to avoid impacts for eelgrass for the Aerie Dock Project (201-207 Carnation Ave) in Carnation Cove, Newport Harbor (CRM)

4-2 Project Examples

The following project examples highlight the qualifications of the team members proposed for this project. Information provided with the project examples can be used to obtain appropriate project references.

4-2.1 Marine Taxonomic Services – Project Examples / References

China Cove Caulerpa Eradication and Surveys

Merkel and Associates, Inc. / California Regional Water Quality Control Board

Client Contact	*Total Project Cost*	*Percentage of Work Performed*	*Duration of Contract*
Terri Reeder **Santa Ana Regional Water Quality Control Board** 951.782.4995 Terri.reeder@waterboards.ca.gov	$420,000	50%	2021-2022

MTS was contracted to perform *Caulerpa* eradication and surveys in China Cove in Newport Beach, California. The work was performed under two sub-contracts with Merkel & Associates with funding provided by the California Regional Water Quality Control Board and NOAA Fisheries. The eradication was performed to address the presence of approximately 200 square meters of seafloor infested with *Caulerpa prolifera* (*C. prolifera*), distributed over roughly 1.2-hectare infestation area within China Cove. The eradication effort served to remove *C. prolifera* effectively and efficiently from the known infestation area.

Image of *C. prolifera* observed during the initial localized eradication level diver survey.

MTS performed an initial localized eradication level diver transect survey to determine and refine the known extent of the C. prolifera infestation. Once the extent of infestation was refined, an initial localized removal effort was performed by suction-assisted diver removal (June 2021). Additional divers were utilized during the suction removal to selectively remove small patches of C. prolifera from eelgrass beds neighboring the main C. prolifera bed. Following the suction-assisted diver removal, the infestation area was surveyed again with eradication level surveys every 2 weeks following the removal effort (June 2021-February 2022). During these surveys, C. prolifera patches that had regrown from rhizoids or were missing in the initial removal were removed by trained divers by hand and placed in collection bags designed to prevent the loss of fragments. The location of subsequent collections of C. prolifera were recorded using mapping software and a differential global positioning device.

MTS was responsible for coordinating with regulatory agencies including NOAA, U.S. Army Corps of Engineers, California Department of Fish and Wildlife, U.S. Fish and Wildlife Service, the California Regional Water Quality Control Board, and the City of Newport Beach. Additionally, MTS provided survey supplies to complete the initial eradication level survey, initial removal effort, and subsequent eradication level surveys after the removal effort.

Key Staff:
Robert Mooney, Principal Scientist
Seth Jones, Field Manager
Grace Teller, Field Manager

Port of San Diego Eelgrass Restoration Site Identification Project

Port of San Diego Environmental and Land Use Management Department

Client Contact	*Total Project Cost*	*Percentage of Work Performed*	*Duration of Contract*
Eileen Maher, Assistant Director 619.686.6200 emaher@portofsandiego.org	$16,000	100%	2015

MTS was contracted by the Port of San Diego Environmental and Land Use Management Department to implement a study to identify sites that could be utilized as potential eelgrass restroation sites. The sites were to be identified between Point Loma and the Mexico border including San Diego Bay. The project involved implementation of a model to determine sites with the greatest likelihood of suporting eelgrass with minimal site modification. Field verification surveys were performed to validate the model and the data used to generate the model.

The project identified 18 potential eelgrass restoration sites. The sites included locations inside and outside of San Diego Bay. The sites ranged from less than 1 acre to 80 acres. At each proposed location, MTS developed a preliminary site plan. The site plans provided proposed depth contours necessary to ensure successful restoration of eelgrass at each of the chosen sites. The site plans included cut or fill volumes necessary to implement the restoration effort at each location. The produced document is intended to guide resource managers as future decisions on the managment of eelgrass resources are made.

MTS successfully completed project on schedule and within budget. The Port requested a fairly short turnaround time for the deliverable and MTS met the challenge.

Key Staff:
Robert Mooney, Principal Scientist
Grace Teller, QA/QC Lead

Shallow Water Eelgrass Resource Monitoring in Newport Bay, Newport Beach, California

Client Contact
Chris Miller
Public Works Administrative Manager
City of Newport Beach Public Works
949.644.3043
CMiller@newportbeachca.gov

Total Project Cost
$82,000

Percentage of Work Performed
100%

Duration of Contract
2020

Portion of Newport Bay eelgrass mapped during the resource monitoring.

MarineTaxonomic Services, Ltd. (MTS) and its sub-contractor, Coastal Resources Management, Inc, (CRM) was contracted by the City of Newport Beach (City) to provide eelgrass-mapping services in Newport Bay as part of the 2020 shallow-water and deep water eelgrass assessment. The survey consisted of mapping shallow-water eelgrass habitat (SWEH) and deep water eelgrass habitat (DWEH) in support of the City's Eelgrass Protection and Mitigation Plan for Waters in Lower Newport Bay: An Ecosystem Based Management Program and the City of Newport Beach Harbor Area Management Plan. MTS was responsible for surveying the SWEH, data analysis, and report composition. CRM completed the DWEH survey and provided MTS with survey results from portions of SWEH and DWEH using sonar based methods beyond 20 feet (ft) bayward of all dock structures and in areas where it was not safe to perform diver based surveys. This was the seventh SWEH and DWEH survey since the program was initiated in 2003.

The purpose of this assessment was to provide the City with detailed information on the distribution and abundance of eelgrass within Newport Harbor; including Lower and Upper Newport Bay. Monitoring and maintaining a database of the Bay's eelgrass resources is essential for the City to manage these resources and understand where proposed projects might have impacts. The data provided in this report will be used by the City in support of their Regional General Permit (RGP) 54 issued collectively by the U.S. Army Corps of Engineers, the California Coastal Commission and the Water Board. MTS surveyed approximately 18 miles of shore line, resulting in 112.38 acres of eelgrass mepped within Newport Bay.

Key Staff:
Robert Mooney, Principal Scientist
Grace Teller, Associate Biologist, Lead Field Technician
Hannah Joss, Field Technician
Raelynn Heinitz, Field Technician

Colorado Lagoon Eelgrass Restoration

L.A. Engineering

Client Contact	*Total Project Cost*	*Percentage of Work Performed*	*Duration of Contract*
Mitch Ward **Project Managing Engineer** 626.454.5222 x 237 mward@laeng.net	$35,000	100%	2016-2017

MTS was contracted to perform an eelgrass transplant at Colorado Lagoon in Long Beach, California. The transplant was performed as part of a restoration project involving upland, intertidal, and sub-tidal restoration. The transplanted eelgrass served to provide mitigation for a project in Alamitos Bay that had minor impacts to eelgrass. MTS planted eelgrass beyond that necessary for mitigation to create an eelgrass mitigation bank that can be used to support future projects in Alamitos Bay and Long Beach that have impacts to eelgrass. MTS strategically planted eelgrass over approximately 0.5 acre such that eelgrass will grow and expand into neighboring areas. This strategy will provide up to 4.5 acres of eelgrass restoration available for banking. This approach saved the City of Long Beach over $100,000 in additional eelgrass planting.

MTS divers prepare to harvest eelgrass.

MTS was responsible for obtaining permits from the California Department of Fish and Wildlife (CDFW). MTS worked with CDFW to develop a monitoring plan to ensure that eelgrass donor beds were not significantly impacted by the project. MTS was responsible for all transplant elements including delineation of transplant boundaries in accordance with the plan, preparing bare root bundles, planting, and the post-restoration report.

MTS worked closely with the Colorado Lagoon design and construction team to ensure that the planting efforts were initiated as soon as possible after site preparation. The work was performed on time and within budget.

Key Staff:
Robert Mooney, Principal Scientist
Seth Jones, Field Manager

Upper Newport Bay Post-Restoration Monitoring: Bathymetry and New Least Tern Island Elevation Checks

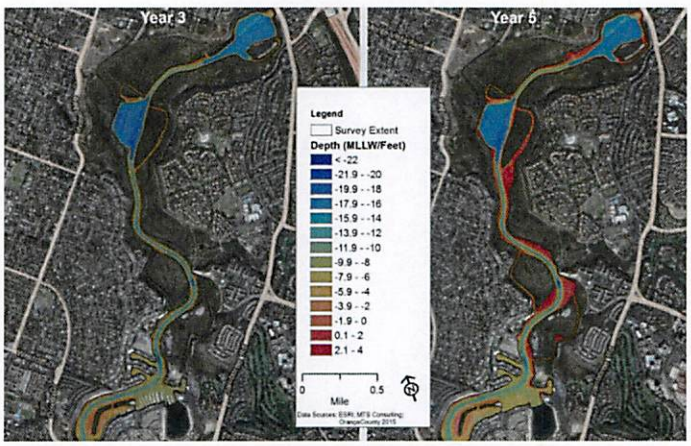
Orange County Public Works

Client Contact
Rita Abellar
Environmental Resource Specialist
714.955.0663
rita.abellar@ocpw.ocgov.com

Total Project Cost
$60,000

Percentage of Work Performed
100%

Duration of Contract
2015-2020



Results of the Year 5 multi-beam bathymetric survey relative to Year 3.

The United States Army Corps of Engineers implemented a restoration plan for Upper Newport Bay. The construction was completed in 2010 and resulted in improved water flow through the system to increase beneficial uses associated with the Upper Newport Bay. The post-restoration monitoring plan called for periodic bathymetric surveys to evaluate the rate of sedimentation within the system as well as biological monitoring to evaluate the use of the system by wildlife. Bathymetric monitoring is critical to ensuring that the Upper Newport Bay ecosystem is maintained in a manner that protects beneficial uses associated with wetlands and wildlife. The United States Army Corps of Engineers (ACOE) developed a monitoring program for the restoration project following completion of construction. The monitoring program specified that post-restoration bathymetric monitoring be performed in monitoring years 1, 2, 3, 5, and 10.

MTS was contracted by Orange County Public works to perform the Year 5 bathymetric monitoring and to perform an elevation check of the New Tern Island that was constructed as part of the restoration. Prior surveys had been performed by the Army Corps of Engineers and evaluated by a different consulting firm.

MTS was contracted after Orange County Public works assumed the monitoring program from the Army Corps of Engineers. MTS performed the Year 5 bathymetric monitoring with a multi-beam sonar. Following completion of the sonar survey, MTS calculated the amount of sediment that had accumulated in the restoration area since the prior survey by comparing the surfaces generated by the MTS and the prior Army Corps surveys.

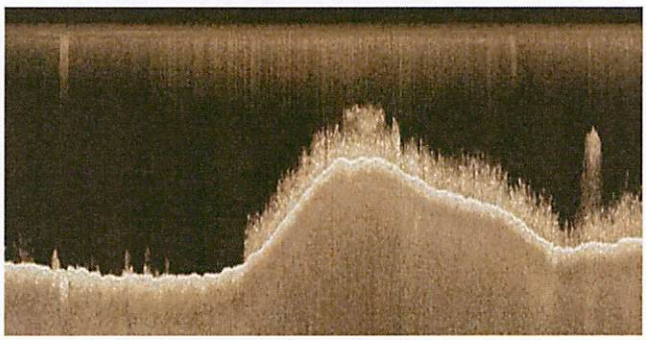
Key Staff:
Robert Mooney, Principal Scientist

4-2.2 Coastal Resources Management – Project Descriptions / References

USACE Los Angeles River Estuary Dredge Project and Material Disposal Area Eelgrass Mapping Surveys (ACOE #W912PL-11-D-00151616)

Kinnetic Laboratories, Inc.

Client Contact	*Total Project Cost*	*Percentage of Work Performed*	*Duration of Contract*
Kenneth Kronschnahl 831-457-3950	$45,993.00	100%	2014-2016



The US Army Corps of Engineers, Los Angeles District (Corps) performed maintenance dredging of the Los Angeles River Estuary (LARE) federal channel to its authorized design depths to maintain safe navigability of the channel between May and August, 2013 and material dredged from the LARE federal channel was transported via dredge scows to the Cherry Avenue Nearshore Disposal Area (Nearshore Placement Area) between May 18th, 2015 and August 5th, 2015. The team of Coastal Resources Management, Inc. (CRM) and Nearshore and Wetland Surveys (NWS) was retained by Kinnetic Laboratories to conduct pre-and-post dredging and dredge material placement eelgrass (Zostera spp.) surveys for the ACOE. CRM and NWS conducted the eelgrass surveys in August 2014 and October 2015 using side-scan sonar and downlooking sonar techniques. Extensive ground-truthing and Submerged Aquatic Vegetation (SAV) target verification of the side-scan and downlooking sonar survey data was accomplished using a remotely deployed video camera system. No eelgrass was mapped in the LARE; however, extensive eelgrass beds were mapped immediately inshore of the dredge material placement area. The results of the post-construction eelgrass survey indicated that the project did not affect eelgrass bed resources.

Key Staff:
Rick Ware, Principal CRM

Newport Bay Eelgrass GIS Mapping Project

City of Newport Beach.

Client Contact	*Total Project Cost*	*Percentage of Work Performed*	*Duration of Contract*
Chris Miller 949-644-3041	$312,000 (since 2003)	100%	2003-2017

Coastal Resources Management (CRM) contracted with the City of Newport Beach's Harbor Resources Division to conduct eelgrass (*Zostera marina*) habitat mapping surveys and provide eelgrass ecological information for Lower Newport Bay and Upper Newport Bay as part of the City's preparation and implementation of a long-term and baywide eelgrass management plan and Newport Bay-specific eelgrass mitigation plan. These surveys mapped the distribution, abundance, and long-term trends in eelgrass acreages, and the species of plants and animals within eelgrass beds. CRM defined eelgrass zones in Newport Bay as stable, transitional, and unvegetated eelgrass zones based upon the results of the surveys. To date, CRM conducted five biannual surveys; 2003-2004, 2006-2007, 2009-2010, and 2013-2014, and 2016 and mapped between 65 and 105 acres of eelgrass in Newport Bay. CRM conducted eelgrass habitat mapping surveys using diver/DGPS mapping methods in shallow water habitats. CRM and Nearshore and Wetland Surveys, Inc. conducted deeper water and navigational channel eelgrass mapping surveys using side-scan and downlooking sonar. Ground-truthing and target verification of the bioacoustical surveys were accomplished using remotely deployed underwater video cameras, and secondly, diver verification. CRM's project reports and eelgrass bed maps are on the City's public website, and are used by the City of Newport Beach resource managers as part of their long-term bay eelgrass habitat management program. CRM also conducted bi-weekly oceanographic studies (temperature, pH, dissolved oxygen, salinity, oxidation/reduction potential, light illuminance and light energy) in 2008-2009 to assist in determining the factors that affect eelgrass distribution and abundance.

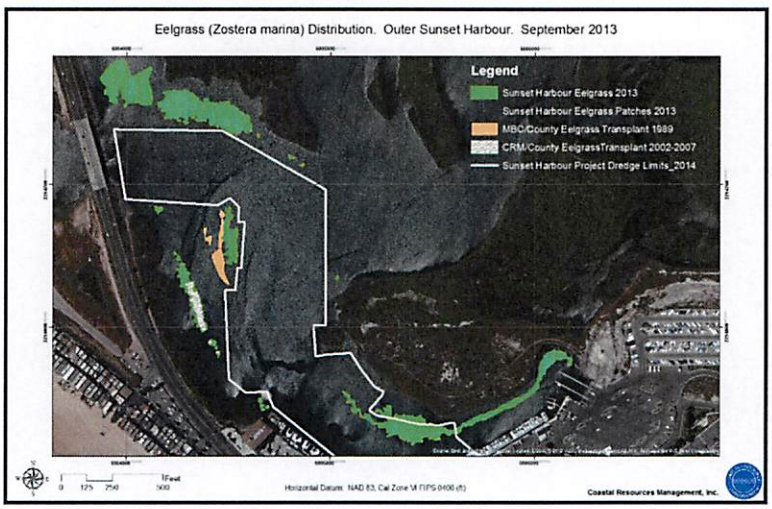
Key Staff:
Rick Ware, Principal CRM

County of Orange Sunset Bay/Huntington Harbour Dredging Project Eelgrass Mapping, Mitigation Planning, and Eelgrass Transplant Projects

County of Orange Public facilities Resources Department

Client Contact	*Total Project Cost*	*Percentage of Work Performed*	*Duration of Contract*
Susan Broduer 949-585-6448	$150,000	100%	1996-1997 2013-2015

Moffatt & Nichole; Kim Garvey
562-426-9551



Under contract to the County of Orange and Moffatt Nichol, CRM conducted extensive marine biological survey work and prepared marine biological assessments for County dredging projects in Sunset Bay and Huntington Harbour, Ca between 1996 and 2015. The purposes of the studies were to (1) define the existing distribution and abundance of eelgrass in regions where maintenance dredging operations are required; (2) prepare marine biological resource impact assessments and Essential Fish Habitat (EFH) analysis for the project environmental documents and permits; (3) prepare mitigation plans to avoid and reduce potential impacts of the project on eelgrass; (4) monitor dredge operational impacts on eelgrass habitat (5) conduct eelgrass transplant programs and (6) conduct five-year eelgrass transplant monitoring programs per NMFS Eelgrass Mitigation Policies. Between 1996 and 2007, CRM conducted eelgrass surveys using diver/DGPS techniques. CRM conducted baseline eelgrass surveys in 2013 for the project's CEQA analysis and then conducted pre-construction eelgrass habitat mapping surveys in 2015 employing both diver/DGPS mapping methods and bioacoustical mapping methods. The bioacoustical surveys utilized state-of-the-art side-scan sonar, downlooking sonar, and bathymetric survey equipment and follow-up ground truthing/target verification of the side-scan/downlooking sonar data to provide an accurate accounting of eelgrass beds and patches for project impact and mitigation analyses. Eelgrass mapping information was entered and presented in ESRI ArcGIS mapping format. CRM also prepared a beach nourishment ecological assessment for Sunset/Surfside beaches as part of the dredge material disposal program for the project.

Key Staff:
Rick Ware, Principal CRM

5 Advance Notice Requirements Statement

MTS and CRM can begin work within two weeks of a notice to proceed. MTS and CRM are also prepared to respond quickly to any additional work requests to utilize contingency funds for related or similar work.

6 Consultant Proposal Worksheet

MTS and CRM have prepared a proposal worksheet detailing the costs associated with implementation of the scope of work. That worksheet is provided as a separate document as required by the RFP. Our primary proposal worksheet provides the costs to implement the scope of work as described in the RFP. We have additionally provided a worksheet with optional bathymetry costs. The RFP specifies that bathymetry be included on the eelgrass maps. MTS and CRM propose to utilize whatever existing information the City can provide relative to bathymetry. However, we have optionally provided costs to collect bathymetry data and produce contour lines within the survey limits.

7 Acknowledgement of City's Standard Terms and Conditions

MTS and CRM acknowledge and agree to the City's standard terms and conditions as outlined in RFP 24-79 for the 2024 Newport Harbor Shallow-Water & Deep-Water Eelgrass Survey. MTS has requested some exceptions relative to insurance limits.

Attachment A – Key Personnel Resumes

Key personnel resumes are provided on the following pages.

Robert Mooney – Marine Taxonomic Services, Ltd.

Vice President and Principal Marine Scientist

Marine Taxonomic Services, Ltd.

Dr. Mooney has over 20 years of experience studying and mapping estuarine and coastal marine resources. His recent work has focused on physical and biological data collection for long-term post-restoration monitoring programs, including the restoration of Upper Newport Bay and Bolsa Chica. For these projects, Dr. Mooney has been the task leader or key participant in multiyear sampling elements including eelgrass monitoring, water quality monitoring, fisheries sampling, macroinvertebrate core collection, tidal monitoring, and bathymetric surveys to track inlet conditions. He regularly performs surveys to document biological resources and potential project impacts in the coastal estuaries and bays of California. In San Diego Bay, he directed a 5-year program to determine the post-dredging recovery time of benthic and epibenthic fish and invertebrate communities in comparison to undredged areas. He has arguably managed more eelgrass monitoring surveys in San Diego Bay than any other person over the past 20 years. Many of his projects are documented in complex reports that Dr. Mooney either authored or co-authored. He is skilled in the acquisition and management of spatial datasets for developing GIS-based mapping products.

KEY QUALIFICATIONS

- ✓ Ph.D. Conservation Biology
- ✓ 20 years of fisheries/ estuarine restoration, survey, and reporting experience
- ✓ Experimental design and configuration expert
- ✓ Data analysis and biostatistics specialists
- ✓ Extensive knowledge of mechanical systems

PERMITS

- ✓ CDFW scientific collecting permit
- ✓ NAUI open water diver and PADI advanced diver certifications
- ✓ AAUS certified SCUBA diver
- ✓ First Aid, CPR, Emergency Oxygen
- ✓ *Caulerpa* surveyor
- ✓ Qualified NOAA marine mammal observer

Dr. Mooney serves as research team leader at MTS, responsible for study design, logistics and mobilization, operating and maintaining all instrumentation and survey equipment, and integrating collected data inputs into time-synchronized and geographically referenced data sets. He has extensive experience with the use of side-scan sonar and GIS for eelgrass mapping and continually seeks innovative improvements to the quality and efficiency of data collection. He regularly works with bathymetric survey instrumentation, tide loggers, side-scan sonar, sub-bottom profilers, and towed and remotely operated vehicles to map marine and estuarine substrates and habitats.

Education

Doctor of Philosophy, 2001, Conservation Biology, University of British Columbia, British Columbia

Bachelor of Science (Magna cum laude), 1994, Biological Sciences, California State Polytechnic University, Pomona

Representative San Diego Bay Eelgrass Project Experience

- Performed eelgrass surveys for Sheraton San Diego Hotel and Marina.
- Managed bathymetry, sub-bottom survey, and eelgrass surveys for San Diego Yacht Club.
- Project Manager for design of sediment remediation habitat cap, eelgrass mitigation planning, eelgrass transplant, and eelgrass monitoring for the Sediment Remediation at the Former Campbell Shipyard Project.
- Project Manager for eelgrass mitigation planning, eelgrass transplant implementation, and eelgrass monitoring for Marine Group Boat Works.
- Managed the creation of a predictive model for eelgrass occurrence based on operational parameters of the South Bay Power Plant to support NPDES permit requirements.
- Project manager for the 2004 San Diego Bay-Wide Eelgrass Inventory.
- Co-managed the 2008 San Diego Bay-Wide Eelgrass Inventory.
- Managed the annual collection of eelgrass monitoring data for the US Navy eelgrass mitigation sites and maintained the eelgrass bank ledger for those sites.
- Performed eelgrass surveys to support the 2004/2005 San Diego Bay Channel Deepening Project
- Project Manager for the eelgrass surveys to support the monitoring of the US Navy's Pier Rehabilitation Project at Naval Amphibious Base Coronado.
- Project Manager for the eelgrass surveys to support the installation and rehabilitation of the US Navy's marine mammal training center at Naval Base Point Loma.
- Project Manager for eelgrass surveys to support construction activities at the US Navy's submarine base at Naval Base Point Loma.
- Project Manager for eelgrass surveys to support construction activities at the US Coast Guard Base San Diego.
- Project Manager for eelgrass surveys to support construction at Coronado Yacht Club.
- Project Manager for eelgrass surveys to support construction activities for the US Navy at Fiddler's Cove.
- Project Manager for the eelgrass transplant for the Port of San Diego at the Chula Vista "borrow pit".
- Project Manager for the eelgrass survey in support of environmental cleanup of the A-8 anchorage for the Port of San Diego.
- Project Manager for the eelgrass surveys, mitigation planning, and eelgrass transplant in support of construction activities at Grape Street Pier for Hornblower Cruises and Events.
- Project Manager for the eelgrass surveys, mitigation planning, and eelgrass transplant in support of construction activities for the installation of new docks for San Diego Harbor Excursions.
- Project Manager for the eelgrass surveys in support of the Coronado Bridge Seismic Retrofit Project.
- Field Manager for the City of Coronado eelgrass mitigation site creation and eelgrass transplant in Glorietta Bay.
- Project Manager for the baseline bathymetry, biological surveys, and eelgrass surveys for the Chula Vista Yacht Club

- Project Manager for eelgrass surveys in support of the Shelter Island Boat Launch Facilities Improvement Project.
- Project Manager for baseline eelgrass survey in support of redevelopment of Harbor Island West Marina
- Project Manager for eelgrass and marine biological assessment in support of environmental review for the expansion of Fifth Avenue Landing Marina
- Project manager for dozens of other small eelgrass related projects in San Diego Bay over the last two decades.

Grace Teller – Marine Taxonomic Services, Ltd.

Marine Scientist and Project Manager

Ms. Grace Teller has a diverse background ranging from terrestrial to marine and aquatic ecology. During the past 10 years she has worked as a dive master and as a marine scientist. Ms. Teller has worked in a diverse range of habitats where she has experience studying and mapping wildlife and environmental resources. Her recent work has focused on physical and biological data collection in marine and coastal ecosystems. Her work typically is focused on biological restoration and monitoring programs. Ms. Teller is routinely consulted for her experience with eelgrass monitoring, water quality monitoring, fisheries sampling, macroinvertebrate core collection, invasive species monitoring, tidal monitoring, habitat mapping, and bathymetric surveys. She regularly performs surveys to document biological resources and potential project impacts in the coastal estuaries and bays of California.

Ms. Teller currently manages offshore water quality projects for treated wastewater, including collection of water column profile data and sampling of seawater at designated sampling stations around the diffuser pipeline. Ms. Teller leads eelgrass monitoring efforts throughout California. She is responsible for managing construction monitoring for sensitive species including marine mammals, sea turtles, and birds.

Ms. Teller serves as a marine scientist and assistant project manager at MTS, responsible for logistics and mobilization, operating and maintaining all instrumentation and survey equipment, integrating collected data inputs into time-synchronized and geographically referenced data sets, and compilation of report deliverables.

KEY QUALIFICATIONS

- ✓ M.Sc. Biological Oceanography
- ✓ 8 years of natural resource management experience
- ✓ In-depth understanding of local marine and coastal ecosystems
- ✓ Over 2,000 hours of research time underwater
- ✓ Over 3,000 hours of time spent on research vessels.
- ✓ Advanced dive skills

PERMITS

- ✓ Qualified NOAA marine mammal observer
- ✓ Covered under MTS' CDFW organizational collection permit
- ✓ PADI certified Divemaster
- ✓ PADI Nitrox certified diver
- ✓ First Aid, CPR, and emergency oxygen
- ✓ *Caulerpa* surveyor

Education

Master of Science, 2016 Biological Oceanography, Scripps Institution, University of California San Diego, San Diego

Bachelor of Science, 2013, Environmental Conservation and Resource Management, University of Washington, Seattle

Representative Recent Project Experience

Pillar Point Harbor Eelgrass Management (2019), Half Moon Bay, CA

Ms. Teller performed side-scan sonar to determine the extent of eelgrass present within the Pillar Point Marina. She facilitated creation of eelgrass maps for the mitigation plan written by MTS for foreseen impacts to the mapped eelgrass resources relative to proposed changes at Pillar Point Marina.

Evaluation of Eelgrass Restoration Techniques in Newport Harbor (2019-Ongoing), Newport Beach, CA

The City of Newport Beach was required to conduct an eelgrass transplanting methods study as part of their dredge contract. MTS created a work plan and provided staff and a small vessel to fulfill the needs of the transplant study. Ms. Teller harvested and transplanted eelgrass using three methodologies. The study was designed to assess the effectiveness of each transplanting method along with the cost and labor involved with utilizing each method on a per unit basis. She will perform a follow up survey one year after the transplant effort to evaluate the success of each transplanting method.

CCHOA On-Call Support Services (2016-Ongoing), Coronado, CA

Ms. Teller assists the Coronado Cays Homeowners Association by providing marine environmental services and helping with project permitting support. She had been part of environmental monitoring services including performing eelgrass surveys, marine biological assessment, essential fish habitat assessments, and construction monitoring as necessary to support over-water construction projects and the environmental permitting associated with those projects.

Marine Group Boat Works Baseline Eelgrass Survey (2019), San Diego, CA

Ms. Teller provided eelgrass mapping services for a proposed dredge project at the Marine Group Boat Works facility in National City, California and a proposed mitigation site in Chula Vista, California. She compiled all results from the survey in a report that was provided to the client. The intent of the survey was to provide resource information to regulatory agencies for planning purposes.

Eelgrass Mitigation and Monitoring Services (2018-Ongoing), San Diego, CA

Ms. Teller conducted eelgrass monitoring at three sites in San Diego Bay. She assisted in permitting needs and creating a monitoring plan for the future eelgrass transplant effort. For the Shelter Island Boat Launch Facility, she was responsible for conducting pre and post-construction eelgrass surveys and for the eelgrass transplant effort after construction was complete. Additionally, MTS was contracted to conduct eelgrass mitigation site monitoring for five years at the SIBLF, Campbell Shipyard, and the Chula Vista Borrow Pit. She is currently responsible for managing side-scan sonar and eelgrass survey efforts across these monitoring sites. At the end of each survey effort she is responsible for drafting reports summarizing the survey results to The Unified Port of San Diego.

Seal Beach National Wildlife Refuge Pier Realignment Project Eelgrass Monitoring (2019-Ongoing), Orange County, CA

Ms. Teller was assisting with dive verification of the sonar record for eelgrass, but now manages field related activities including collection of side-scan sonar data and deployment of the diver for eelgrass mapping verification and density collection. Additionally, she provided a map of the survey results to the Client and compared current results to previous survey findings.

Eelgrass Mitigation and Monitoring Services for Shelter Island Boat Launch Facility (2019-Ongoing), San Diego, CA

Ms. Teller conducted monitoring of the SIBLF post construction. Additionally, she harvested eelgrass for transplant within the SIBLF mitigation site. She planted and conducted a 0-month survey of the facility. She provided a report summarizing survey results to the client for permitting purposes. MTS is responsible for a 6 month and annual monitoring for 5 years post-transplant of the mitigation site.

Pier 6 Dredging – Eelgrass and Caulerpa (2019-2020), San Diego, CA

Ms. Teller utilized side-scan sonar and SCUBA to identify and map eelgrass resources and look for *Caulerpa taxifolia* within the project site. She summarized the results from the survey and provided it to the client for the intent to inform regulatory agencies.

1316 W. Bay Street Dock Construction Project (2020), Newport Beach, CA

Ms. Teller was responsible for performing a pre-construction eelgrass and *Caulerpa* survey in support of permit needs related to the dock construction project.

Marine Biological Monitoring for the Anacapa Wharf Replacement Project (2020), Landing Cove, Anacapa Island, CA

As assistant project manager, Ms. Teller provided diver services at landing cove for the wharf replacement at Anacapa, CA. MTS conducted a thorough biological survey for fish, invertebrates, kelp, and non-kelp algae within the vicinity of the wharf replacement. The goal of the survey was to identify pre-construction conditions and compare to conditions observed upon project completion for impact to habitat or wildlife.

Caulerpa Surveys for Small Dredge Projects in Newport Beach (2022), Newport Beach, CA

As project manager, Ms. Teller provided guidance to lead field teams to perform numerous surveys for *Caulerpa* spp. within Newport Harbor, in Orange County, California. MTS provided a small dive vessel, and all gear necessary to complete *Caulerpa* surveys within dredge footprints. Ms. Teller was responsible for providing review of summary reports after each survey was completed.

Eelgrass and Caulerpa Survey for Port of San Diego Wharf 2/5/7 (2023), San Diego, CA

As project manager, Ms. Teller provided vessel support for an eelgrass and *Caulerpa* survey for the Port of San Diego Wharf 2/5/7 Mitigation and Facilities Improvements Project. MTS was tasked with mapping and reporting on eelgrass resources found within the Project area. MTS provided a small research vessel as well as all survey equipment.

EXHIBIT B
SCHEDULE OF BILLING RATES

Chris Miller
Public Works Manager
City of Newport Beach, CA

June 25, 2024

Re: Cost Proposal for RFP No. 24-79: 2024 Newport Harbor Shallow Water & Deep Water Eelgrass Survey

Dear Mr. Miller:

The attached cost proposal supports Marine Taxonomic Services response to the subject RFP. We have made no formal exceptions with regards to the RFP. However, we are hopeful that the City would be able to help facilitate areas where we can keep our small support vessel overnight when performing survey work. We have not included launch and dock fees in our proposal to provide you with the best possible value. Again, we take no formal exceptions and understand if no accommodation with regards to equipment storage can be made.

Please also note that in accordance with the language in the RFP we have provided for 5 additional field survey days in our budget. Those 5 days are called out as a separate task and totals are provided with and without the additional days for your evaluation. Our costs table (Table 1) provides the costs to perform the surveys as stipulated in the RFP. We have also provided a separate schedule of fees showing our proposed rates for labor and equipment for the term of this contract.

If you have any questions about this cost proposal, do not hesitate to contact me at 760.331.7897 or via email (robert@consultmts.com). I look forward to the opportunity to work with you on this project.

Sincerely,

Robert Mooney
Principal Consultant

Table 1. Base cost to perform the scope of work.

		SR. SCIENTIST	FIELD TECHNICIAN	ASSOCIATE SCIENTIST	DIRECT COSTS	
	Rates	Units	Units	Units	Units	Totals
TASK 1. DIVER SURVEY MOBILIZATION & TEAM CALIBRATION						
LOGISTICS AND EQUIPMENT PREP						
R. Mooney (PM)	$137.00	4				$548.00
G. Teller (FM)	$111.00			12		$1,332.00
Mileage	$0.670				160	$107.20
Technician	$68.00		12			$816.00
CITY COORDINATION						
R. Mooney	$137.00	4				$548.00
					SUBTOTAL	**$3,351.20**
TASK 2a. DIVER SURVEY FIELD WORK						
DIVER SURVEY (40 DAYS)						
R. Mooney (PM)	$137.00	24				$3,288.00
G. Teller (FM)	$111.00			420		$46,620.00
Technician	$68.00		420			$28,560.00
SCUBA	$42.00				42	$1,764.00
Small Vessel	$150.00				42	$6,300.00
Kayak	Incl.				42	$0.00
dGPS	$40.00				42	$1,680.00
Mileage	$0.670				5040	$3,376.80
DATA MANAGEMENT						
G. Teller (FM)	$111.00			45		$4,995.00
GIS Technician	$111.00			58		$6,438.00
Technician	$68.00		54			$3,672.00
					SUBTOTAL	**$106,693.80**
TASK 2b. CONTINGENCY FIELD DAYS						
DIVER SURVEY (5 CONTINGENCY DAYS)						
G. Teller (FM)	$111.00			50		$5,550.00
Technician	$68.00		50			$3,400.00
GIS Technician	$111.00			5		$555.00
SCUBA	$42.00				5	$210.00
Small Vessel	$150.00				5	$750.00
Kayak	Incl.				5	$0.00
GPS	$40.00				5	$200.00
Mileage	$0.670				600	$402.00
					SUBTOTAL	**$11,067.00**
TASK 3. DOWNLOOKING SONAR & VIDEO DATA COLLECTION FOR SHALLOW WATER						
MOBILIZATION						
R. Ware	$137.00	8				$1,096.00
Equipment & ODCs	$2,988.60				1	$3,791.60
FIELD SURVEY						
R. Ware	$137.00	48				$6,576.00
DATA ANALYSIS AND MAPPING						
R.Ware	$137.00	30				$4,110.00
					SUBTOTAL	**$15,573.60**
TASK 4. SIDESCAN SONAR & VIDEO/DIVER DATA COLLECTION FOR DEEP-WATER						
MOBILIZATION						
R. Ware	$137.00	12				$1,644.00
Equipment	$10,247.00				1	$10,247.00
FIELD SURVEY						
R. Ware	$137.00	40				$5,480.00
DATA ANALYSIS + REPORT PREP						
R.Ware	$137.00	80				$10,960.00
					SUBTOTAL	**$28,331.00**
TASK 5. FINAL REPORT						
Report Preparation						
R. Mooney (PM)	$137.00	8				$1,096.00
G. Teller (FM)	$111.00	48				$5,328.00
GIS Technician	$111.00	8				$888.00
					SUBTOTAL	**$7,312.00**
TASK 6. QA/QC PROGRAM OVERSIGHT						
Program Oversight						
R. Ware	$137.00	8				$1,096.00
					SUBTOTAL	**$1,096.00**
TOTAL (without Contingency Field Days)						**$162,357.60**
TOTAL (with Contingency Field Days)						**$173,424.60**

SCHEDULE OF FEES
City of Newport Beach
RFP No. 24-79

CONSULTING AND LABOR RATES

PROJECT MANAGER	$137 / hour
FIELD MANAGER	$111 / hour
TECHNICIAN	$68 / hour
GIS TECHNICIAN	$111 / hour

VEHICLES AND VESSELS

VEHICLE MILEAGE (2024 IRS rate)	$0.67 / mile
SMALL VESSEL	$150 / day
KAYAK	Included

GENERAL FIELD EQUIPMENT

DIFFERENTIAL GPS	$40 / day

SPECIALIZED DIVE SUPPORT EQUIPMENT

SCUBA DIVE GEAR	$42 / day

EXHIBIT C

INSURANCE REQUIREMENTS – PROFESSIONAL SERVICES

1. Provision of Insurance. Without limiting Consultant's indemnification of City, and prior to commencement of Work, Consultant shall obtain, provide and maintain at its own expense during the term of this Contract, policies of insurance of the type and amounts described below and in a form satisfactory to City. Consultant agrees to provide insurance in accordance with requirements set forth here. If Consultant uses existing coverage to comply and that coverage does not meet these requirements, Consultant agrees to amend, supplement or endorse the existing coverage.

2. Acceptable Insurers. All insurance policies shall be issued by an insurance company currently authorized by the Insurance Commissioner to transact business of insurance in the State of California, with an assigned policyholders' Rating of A- (or higher) and Financial Size Category Class VII (or larger) in accordance with the latest edition of Best's Key Rating Guide, unless otherwise approved by the City's Risk Manager.

3. Coverage Requirements.

   A. Workers' Compensation Insurance. Consultant shall maintain Workers' Compensation Insurance providing statutory benefits and Employer's Liability Insurance with limits of at least one million dollars ($1,000,000) each employee for bodily injury by accident and each employee for bodily injury by disease in accordance with the laws of the State of California. U.S. Longshoremen's and Harbor Workers' Act (USL&H) shall be required for employees performing services covered by said Act.

   Consultant shall submit to City, along with the certificate of insurance, a Waiver of Subrogation endorsement in favor of City, its City Council, boards and commissions, officers, agents, volunteers and employees.

   B. General Liability Insurance. Consultant shall maintain commercial general liability insurance, and if necessary excess/umbrella liability insurance, with coverage at least as broad as provided by Insurance Services Office form CG 00 01, in an amount not less than two million dollars ($2,000,000) per occurrence, four million dollars ($4,000,000) general aggregate. The policy shall cover liability arising from premises, operations, personal and advertising injury, and liability assumed under an insured contract (including the tort liability of another assumed in a business contract).

   C. Automobile Liability Insurance. Consultant shall maintain automobile insurance at least as broad as Insurance Services Office form CA 00 01 covering bodily injury and property damage for all activities of Consultant

arising out of or in connection with Work to be performed under this Contract, including coverage for any owned, hired, non-owned or rented vehicles, in an amount not less than one million dollars ($1,000,000) combined single limit for each accident.

D. Water Pollution Liability. Consultant shall provide Water Pollution Liability for both sudden and accidental and gradual and continuous pollution events with limits no less than one million dollars ($1,000,000) each loss and in the aggregate. The policy shall not exclude any hazardous materials for which there is exposure.

E. Professional Liability (Errors & Omissions) Insurance. Consultant shall maintain professional liability insurance that covers the Services to be performed in connection with this Agreement, in the minimum amount of two million dollars ($2,000,000) per claim and four million dollars ($4,000,000) in the aggregate. Any policy inception date, continuity date, or retroactive date must be before the Effective Date of this Agreement and Consultant agrees to maintain continuous coverage through a period no less than three years after completion of the Services required by this Agreement.

F. Excess/Umbrella Liability Insurance. If any Excess or Umbrella Liability policies are used to meet the limits of liability required by this contract, then said policies shall be "following form" of the underlying policy coverage, terms, conditions, and provisions and shall meet all of the insurance requirements stated in this contract, including, but not limited to, the additional insured and primary & non-contributory insurance requirements stated herein. No insurance policies maintained by the City, whether primary or excess, and which also apply to a loss covered hereunder, shall be called upon to contribute to a loss until the Consultant's primary and excess/umbrella liability policies are exhausted.

4. Other Insurance Requirements. The policies are to contain, or be endorsed to contain, the following provisions:

A. Waiver of Subrogation. All insurance coverage maintained or procured pursuant to this Contract shall be endorsed to waive subrogation against City, its City Council, boards and commissions, officers, agents, volunteers and employees, or shall specifically allow Consultant or others providing insurance evidence in compliance with these requirements to waive their right of recovery prior to a loss. Consultant hereby waives its own right of recovery against City, and shall require similar written express waivers and insurance clauses from each of its subcontractors.

B. Additional Insured Status. All liability policies including general liability, products and completed operations, excess/umbrella liability, pollution

liability, and automobile liability, if required, but not including professional liability, shall provide or be endorsed to provide that City, its City Council, boards and commissions, officers, agents, volunteers and employees shall be included as additional insureds under such policies.

C. Primary and Non-Contributory. Consultant's insurance coverage shall be primary insurance and/or the primary source of recovery with respect to the City, its City Council, boards and commissions, officers, agents, volunteers and employees. All liability coverage shall apply on a primary basis and shall not require contribution from any insurance or self-insurance maintained by City.

D. Notice of Cancellation. All policies shall provide City with thirty (30) calendar days' notice of cancellation or nonrenewal of coverage (except for nonpayment for which ten (10) calendar days' notice is required) for each required coverage.

5. Additional Agreements Between the Parties. The parties hereby agree to the following:

A. Evidence of Insurance. Consultant shall provide certificates of insurance to City as evidence of the insurance coverage required herein, along with a waiver of subrogation endorsement for workers' compensation and other endorsements as specified herein for each coverage. All of the executed documents referenced in this Contract must be returned to City within ten (10) regular City business days after the date on the "Notification of Award". Insurance certificates and endorsements must be approved by City's Risk Manager prior to commencement of performance. Current certification of insurance shall be kept on file with City at all times during the term of this Contract. The certificates and endorsements for each insurance policy shall be signed by a person authorized by that insurer to bind coverage on its behalf. At least fifteen (15) days prior to the expiration of any such policy, evidence of insurance showing that such insurance coverage has been renewed or extended shall be filed with the City. If such coverage is cancelled or reduced, Consultant shall, within ten (10) days after receipt of written notice of such cancellation or reduction of coverage, file with the City evidence of insurance showing that the required insurance has been reinstated or has been provided through another insurance company or companies. City reserves the right to require complete, certified copies of all required insurance policies, at any time.

B. City's Right to Revise Requirements. The City reserves the right at any time during the term of the Contract to change the amounts and types of insurance required by giving Consultant ninety (90) calendar days' advance written notice of such change. If such change results in substantial additional cost to Consultant, City and Consultant may renegotiate Consultant's compensation.

C. Right to Review Subcontracts. Consultant agrees that upon request, all agreements with subcontractors or others with whom Consultant enters into contracts with on behalf of City will be submitted to City for review. Failure of City to request copies of such agreements will not impose any liability on City, or its employees. Consultant shall require and verify that all subcontractors maintain insurance meeting all the requirements stated herein, and Consultant shall ensure that City is an additional insured on insurance required from subcontractors. For CGL coverage, subcontractors shall provide coverage with a format at least as broad as CG 20 38 04 13.

D. Enforcement of Agreement Provisions. Consultant acknowledges and agrees that any actual or alleged failure on the part of City to inform Consultant of non-compliance with any requirement imposes no additional obligations on City nor does it waive any rights hereunder.

E. Requirements not Limiting. Requirements of specific coverage features or limits contained in this Section are not intended as a limitation on coverage, limits or other requirements, or a waiver of any coverage normally provided by any insurance. Specific reference to a given coverage feature is for purposes of clarification only as it pertains to a given issue and is not intended by any party or insured to be all inclusive, or to the exclusion of other coverage, or a waiver of any type. If the Consultant maintains higher limits than the minimums shown above, the City requires and shall be entitled to coverage for higher limits maintained by the Consultant. Any available proceeds in excess of specified minimum limits of insurance and coverage shall be available to the City.

F. Self-Insured Retentions. Any self-insured retentions must be declared to and approved by City. City reserves the right to require that self-insured retentions be eliminated, lowered, or replaced by a deductible. Self-insurance will not be considered to comply with these requirements unless approved by City.

G. City Remedies for Non-Compliance. If Consultant or any subconsultant fails to provide and maintain insurance as required herein, then City shall have the right but not the obligation, to purchase such insurance, to terminate this Agreement, or to suspend Consultant's right to proceed until proper evidence of insurance is provided. Any amounts paid by City shall, at City's sole option, be deducted from amounts payable to Consultant or reimbursed by Consultant upon demand.

H. Timely Notice of Claims. Consultant shall give City prompt and timely notice of claims made or suits instituted that arise out of or result from Consultant's performance under this Contract, and that involve or may involve coverage under any of the required liability policies. City

assumes no obligation or liability by such notice, but has the right (but not the duty) to monitor the handling of any such claim or claims if they are likely to involve City.

I. Consultant's Insurance. Consultant shall also procure and maintain, at its own cost and expense, any additional kinds of insurance, which in its own judgment may be necessary for its proper protection and prosecution of the Work.

EXHIBIT D

Evaluation of Various Restoration Techniques for Eelgrass in Newport Harbor

MARINE TAXONOMIC SERVICES, LTD.

Evaluation of Various Restoration Techniques for Eelgrass in Newport Harbor

December 18, 2020

Prepared for:

City of Newport Beach: Public Works
100 Civic Center Drive
Newport Beach, CA 92660

Prepared By:

Marine Taxonomic Services, Ltd.

SOUTHERN CALIFORNIA OFFICE

920 RANCHEROS DRIVE, STE F-1
SAN MARCOS, CA 92069

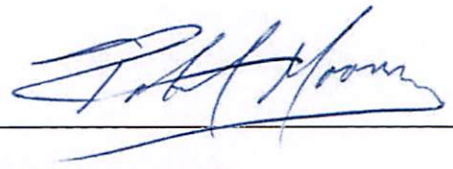
OREGON OFFICE

2834 NW PINEVIEW DRIVE
ALBANY, OR 97321

LAKE TAHOE OFFICE

1155 GOLDEN BEAR TRAIL
SOUTH LAKE TAKOE, CA 96150

Marine Taxonomic Services Ltd. 2020. Evaluation of Various Restoration Techniques for Eelgrass in Newport Harbor. Prepared for Chris Miller, Public Works Manager, December 18, 2020.



Robert Mooney, PhD
Principal Scientist

Participating Marine Taxonomic Services Ltd. Team Members;

Biologist and Report Draft – Grace Teller, MSc.
Technician II – Hannah Joss, BSc.
Technician I – Raelynn Heinitz

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Evaluation of Various Restoration Techniques for Eelgrass in Newport Harbor

December 18, 2020

1 Introduction

Marine Taxonomic Services, Ltd. (MTS) was contracted by the City of Newport Beach to evaluate various restoration techniques for eelgrass (*Zostera marina*) in Newport Harbor, in Newport Beach, CA (Figure 1). Newport Harbor is located within the city limits of Newport Beach, California, and is bordered by three coastal cities: Huntington Beach to the northwest, Costa Mesa to the north, and Laguna Beach to the southeast. The City of Newport Beach (City) is obligated under its approved eelgrass plan "Eelgrass Protection and Mitigation Plan for Shallow Waters in Lower Newport Bay: An Ecosystem Based Management Program" (October 2015), to "test, and/or improve methods to collect and use eelgrass seeds for deployable seed bagging and to construct or use eelgrass TERFS™ devices."

As such, the following study was devised to evaluate the success and efficiency of various eelgrass transplanting methods for mitigating necessary harbor maintenance dredging projects. Specifically, MTS was contracted by the City to develop an eelgrass restoration techniques evaluation study, with the intent of evaluating the relative effectiveness of eelgrass transplanting efforts utilizing both new and traditional eelgrass transplanting methods. To the extent practical, MTS built upon existing eelgrass transplanting information by designing a study to evaluate the relative effectiveness in performance and cost of three unique eelgrass transplanting methods: 1) traditional bare-root bundle planting 2) transplanting eelgrass remotely with frames (TERFs), and 3) Transplanting eelgrass remotely with rope (TERR).

Figure 1. Site map showing the location of Newport Harbor within the City of Newport Beach.

1-1 Goals and Objectives

The goal of this study is to evaluate the effectiveness and efficiency of eelgrass transplanting methods. Traditional bare-root planting methods require substantial inputs of dive labor to implement, however success rates are often high so long as conditions are favorable to growth. TERFs are devices that do not require the utilization of SCUBA, have been put into limited use, and are also known to be effective (OC Coastkeeper 2015 and Short et al. 2002); however not much is known regarding their rates of success when compared to traditional transplanting methods. Finally, TERR as described in the methods section of this report allows for both rapid deployment across potential habitat areas, and reduced time spent diving. This method may also allow for increased spatial deployment to take advantage of any variables in microhabitat that may allow eelgrass to establish in localized areas where conditions are favorable. On the other hand, this study marks the first time this method has ever been attempted in the field, and the first time where the effectiveness and efficiency of this method can be determined.

The objective of this study is to measure and compare the survey results of each of the eelgrass transplanting methods mentioned above following implementation of the experiment in June 2019.

2 Project Background

2-1 2019 Eelgrass Transplant

During the 2019 eelgrass dransplant, MTS and CRM staff prepared harvested eelgrass for each of the three transplanting methods (bare root, TERFs, and TERR) to be deployed across six transplant areas within Newport Bay (Figure 2 and Figure 3).

2-1.1 Traditional Bare Root Method

To prepare eelgrass turions for transplanting using traditional methods, 8 individual turions were bundled together with cotton twine and biodegradable paper stakes just above the rhizomes of each of the eight turions. These bundles were then attached to a PVC "holder" for ease of transport and management of units while the diver delivered and planted units by hand on the seafloor. Each PVC holder was loaded with 15 bundles and would be saved for later once all 15 bundles where removed from the holder by the diver and planted along the seafloor. Photographs illustrating how a single bundle would look before being placed inside the PVC holder, then how the same bundle would look planted on the seafloor once transplanting was complete, can be seen in Figure 3.

2-1.2 TERFs Method

To prepare eelgrass turions for transplanting using the TERFs method, 2 eelgrass turions were tied together just above the rhizomes with small, paper wrapped steel wire bread ties to make a single bundle. Twenty such bundles were tied again using small, paper wrapped steel wire bread ties to an approximately 0.5 x 0.5-meter wire basket. Each bundle was tied in random locations across the bottom of the wire basket, with eelgrass turions oriented upwards inside of the wire basket. Finally, before the basket was taken by boat and placed on the seafloor, two bricks, one for each of the two shorter sides of the rectangular basket, were zip-tied to the outside walls of each basket. Photographs illustrating how a single wire basket with 20 bundles looked before being transplanted, along with how each basket would look on the seafloor following transplanting, is shown in Figure 3.

2-1.1 Transplanting Eelgrass Remotely with a Rope (TERR)

To prepare eelgrass turions for TERR, 8 turions were threaded equally spaced from one another along each meter of polyester rope. Polyester rope was chosen due to its negative buoyancy (density 1.38 g/cm^3). Turions were threaded securely in place at their base while keeping the rhizomes fully exposed. This was repeated across the entire 30-meter-long polyester rope, which was coiled into a 5-gallon bucket so it could be easily unraveled and placed on the bottom from a small boat. Photographs illustrating how a section of rope looked with braded eelgrass bundles before and after placement is shown in Figure 3

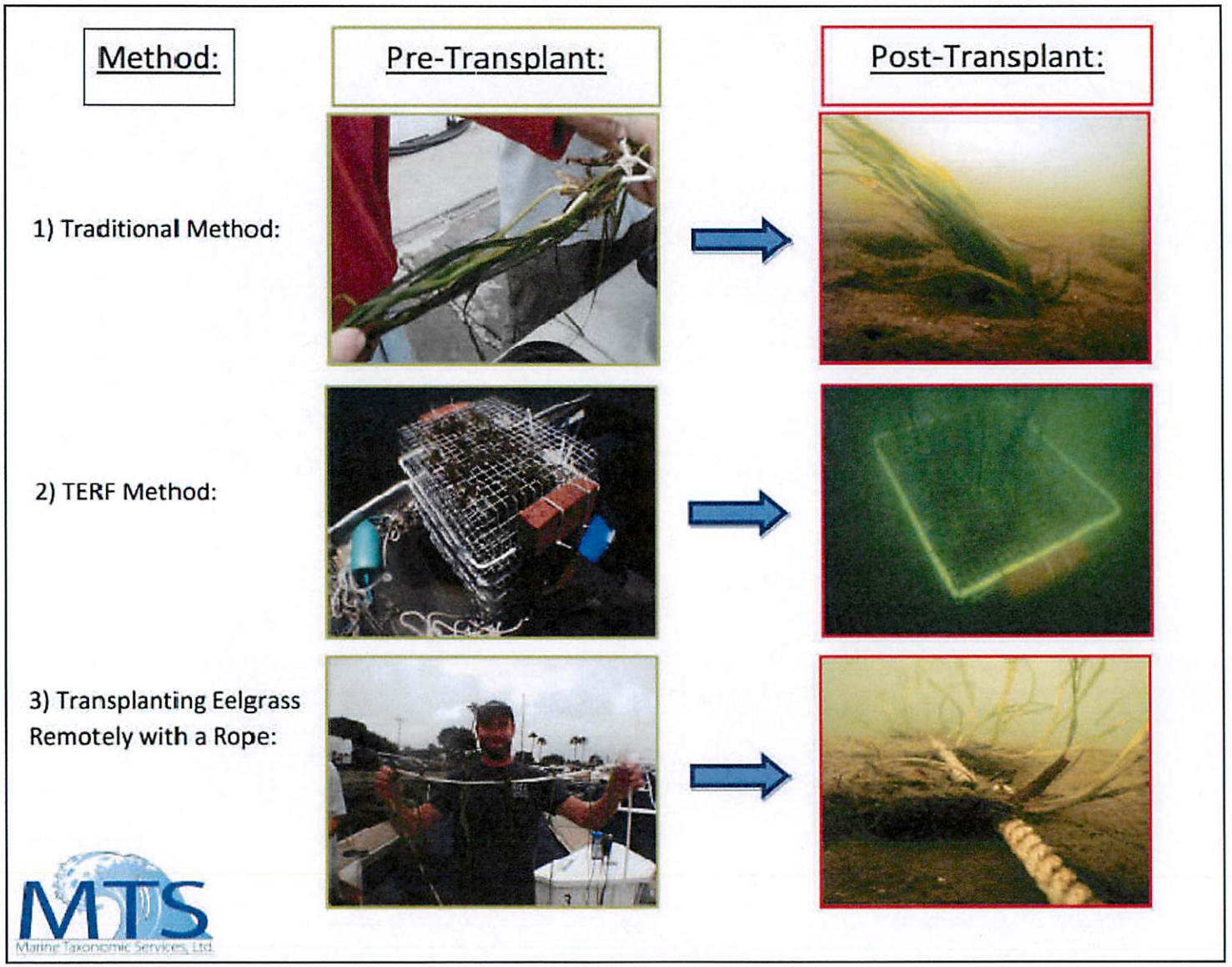
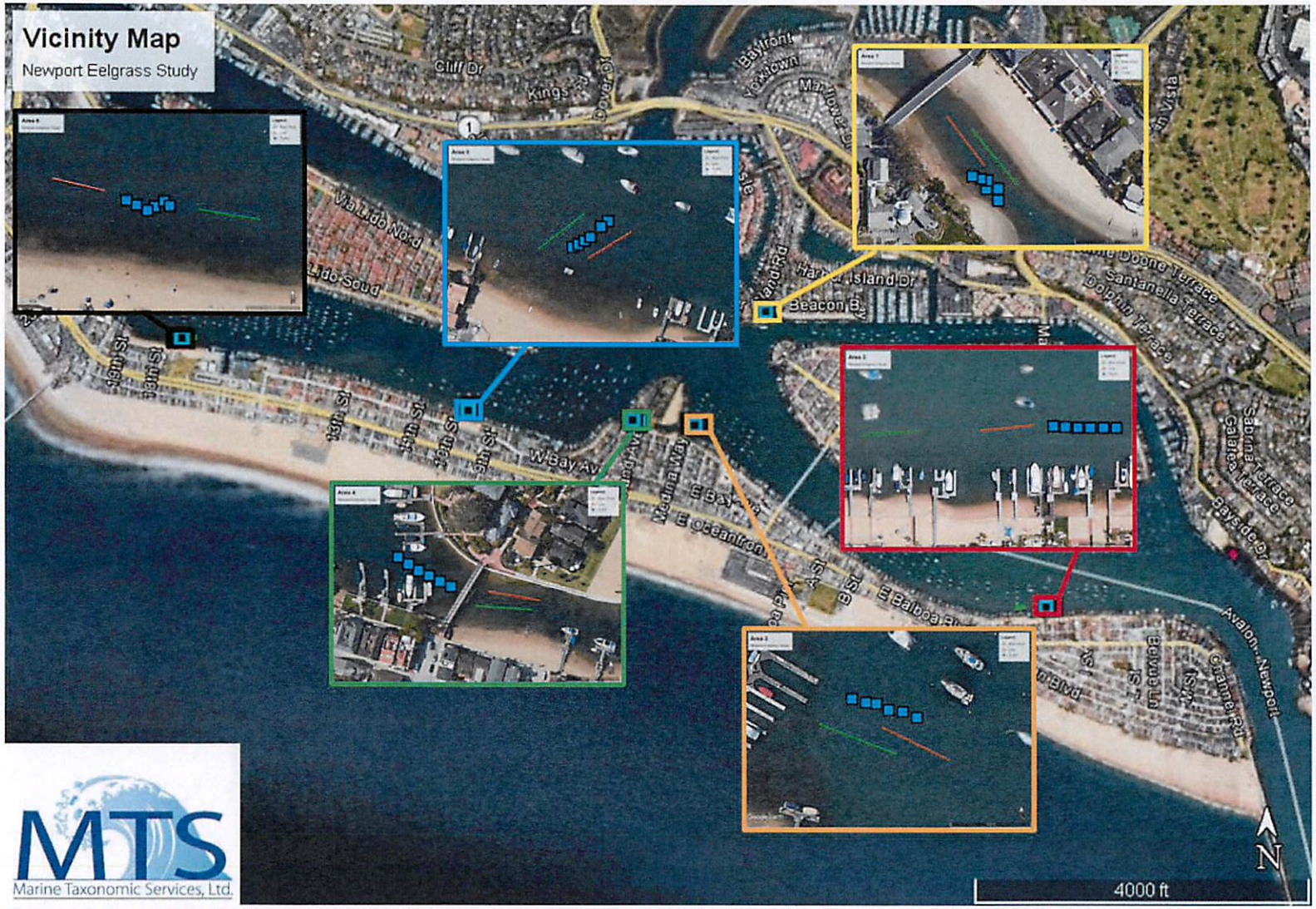


Figure 2. Eelgrass transplanting methods pre-transplant (green) and post-transplant (red).



Marine Taxonomic Services, Ltd.

Figure 3. Eelgrass transplanting methods per transplant area. As seen in Area 6, transect lines marked in red (left) indicate where eelgrass was planted by transplanting eelgrass remotely with a rope. The blue squares (center) indicate where eelgrass was planted utilizing TERF devices, and transect lines marked in green (right) indicate where eelgrass was planted using traditional bare-root bundle methods.

3 Methods

The initial deployment of eelgrass transplant methods was performed in Newport Harbor between June 24 – June 28, 2019 by MTS staff with support from Rick Ware with Coastal Resources Management (MTS 2019). During that time, each of the three transplant methods were implemented along transects. The transects were marked with PVC stakes so that they could be relocated and accurately evaluated during this monitoring effort.

MTS utilized SCUBA diver methods to survey the eelgrass transplant areas on August 3, August 4, September 16, and September 17, 2020 (Figure 3). Transplants Areas 1, 2, and 3 were surveyed in August (Figure 4, Figure 5, Figure 6). Transplant Areas 4, 5, and 6 were surveyed in September (Figure 7, Figure 8, Figure 9). Transplant Areas were located throughout Newport Harbor in localized areas where conditions were determined to be favorable and may allow for eelgrass to establish.

During each survey, the diver mapped all eelgrass within 1-meter of either side of the transect, collected measurements for percent coverage along the transect, and collected density measurements within eelgrass beds mapped within 1 meter of the transect. Results of density and percent cover for eelgrass were statistically analyzed by a one-way analysis of variance (ANOVA).

The diver collecting eelgrass data was accompanied by a dive tender (topside on kayak), equipped with underwater communication, differential geographic positioning system (dGPS), and a tablet equipped with mapping software. For each transect surveyed, a surface marker buoy was deployed at the start point (recorded in 2019). The diver used the surface marker as a reference to descend to the seafloor and search for the underwater marker, either a vertical PVC pipe anchored at the start/end of the bare root and TERR transects or the first TERF of a TERF transect. Once the start point was found, the diver anchored a fiberglass measuring tape to the seafloor and communicated to topside personnel that the start point had been located. In the event that the underwater marker could not be found, the diver anchored the fiberglass measuring tape within 1 meter of the start point recorded in 2019. Once the fiberglass tape measure was anchored, topside personnel placed the dGPS over the diver's bubbles and recorded the transect start point. The diver then used a compass to navigate underwater to the end of the transect. Upon nearing the end of the transect, topside personnel communicated that the end was reached, and the diver searched for the underwater maker at the end of the transect. Once the end point was located, the fiberglass measuring tape was anchored and topside personnel collected the end waypoint using the same methods as was done for the start point. Once the tape measure was secured to the seafloor, eelgrass coverage and density data were collected. The distance along the tape measure between the start and end point was considered the transect and believed to be the best interpretation of the original eelgrass planting treatment area.

3-1 Eelgrass Mapping

The diver swam along the transect looking for eelgrass within 1 meter of either side of the transect. Once an eelgrass bed or patch was located, the diver used underwater voice communications to notify the dive tender that eelgrass was located. The dive tender gave the diver a buoy mounted with a dGPS and connected to the dGPS using mapping software. The diver then swam the perimeter of the eelgrass bed as the dive tender plotted the boundary using the mapping software. Once back to the start point, the diver continued along the transect looking for additional eelgrass beds to delineate. Results of this mapping effort were plotted using ArcGIS mapping software. All eelgrass within 1 meter of either side of the transect was included in each area map.

3-2 Eelgrass Transect Percent Cover

Along each transect, the diver towed a buoy mounted with a dGPS. When the transect directly cut through eelgrass, the transect was considered covered by eelgrass along that portion of the transect. However, if the transect was next to, but not cutting through eelgrass, that portion of the transect was considered unvegetated. For each instance where the transect cut through eelgrass, the diver communicated the start/end for each eelgrass section to the dive tender who then recorded the location using the mapping software. Percent coverage by eelgrass along each transect surveyed was calculated. The values calculated for percent cover reflect the difference in eelgrass cover between pre-transplant and post-transplant surveys. There was approximately 1 meter of pre-existing eelgrass in Area 1 along the bare root transect (MTS 2019).

3-3 Eelgrass Density

Eelgrass density was measured every 10-feet along each 100-foot transect. Density was measured by placing a $1/16^{th}$ square meter quadrat next to the transect at each discrete interval. If eelgrass was encountered within a quadrat the number of turions or eelgrass shoots were counted. If eelgrass was not encountered within a quadrat a value of zero was recorded. Average eelgrass density was compared for similar sampling methods between each area surveyed.

3-4 Eelgrass ANOVA

An ANOVA was performed to statistically evaluate the cover and density of eelgrass across the three treatment groups utilized for this study. The goal of the ANOVA was to determine whether or not statistically significant differences exist between observed success rates of the traditional method, the TERF method, or TERR method. These data were combined with the cost data from MTS 2019 to determine cost per unit effort of successfully established eelgrass.

4 Results

4-1 Eelgrass Mapping

Eelgrass was mapped along transects within each transplant area, except for Area 6 because eelgrass was not observed at this location during the survey (Table 1, Figure 4 through Figure 9). Eelgrass may not have been successful in this area as it was fathes from the harbor mouth where success by eelgrass has historically been more depressed (MTS 2020). Eelgrass was most successful in Areas 1 and 4. Not all TERFs were located during the survey effort. In cases where TERFs were not located, a search effort was made within 2 meters of the recorded deployed waypoint. When the TERF was not recovered, it was assumed that the TERF was either buried, moved (e.g. by anchor), or not visible within 2 meters of the deployment location recorded in 2019. Only 5 TERFs were found in Area 1 and Area 2, 4 TERFs were found in Area 6, and all TERFs were located in Area 3 and Area 5.

Table 1. Table of eelgrass coverage mapped within 1-meter of either side of the transect.

Eelgrass Within 1-Meter						
	square meters					
Method	**Area 1**	**Area 2**	**Area 3**	**Area 4**	**Area 5**	**Area 6**
Bare Root	39.7	0.9	7.0	17.5	4.5	0.0
TERR	3.9	6.0	1.3	61.8	14.0	0.0
TERF	4.0	5.4	0.1	37.4	2.2	0.0

4-2 Eelgrass Transect Percent Cover

Eelgrass percent cover along each transect was comparable to eelgrass mapping efforts where transects with greater eelgrass cover mapped also had a higher coverage by eelgrass along the transect.

Table 2. Table of eelgrass percent coverage along each transect.

Eelgrass Percent Cover						
	percent (%)					
Method	**Area 1**	**Area 2**	**Area 3**	**Area 4**	**Area 5**	**Area 6**
Bare Root	63%	2%	12%	30%	12%	0%
TERR	6%	2%	4%	100%	32%	0%
TERF	14%	11%	0%	74%	6%	0%

Figure 4. Map of Area 1 eelgrass survey results.

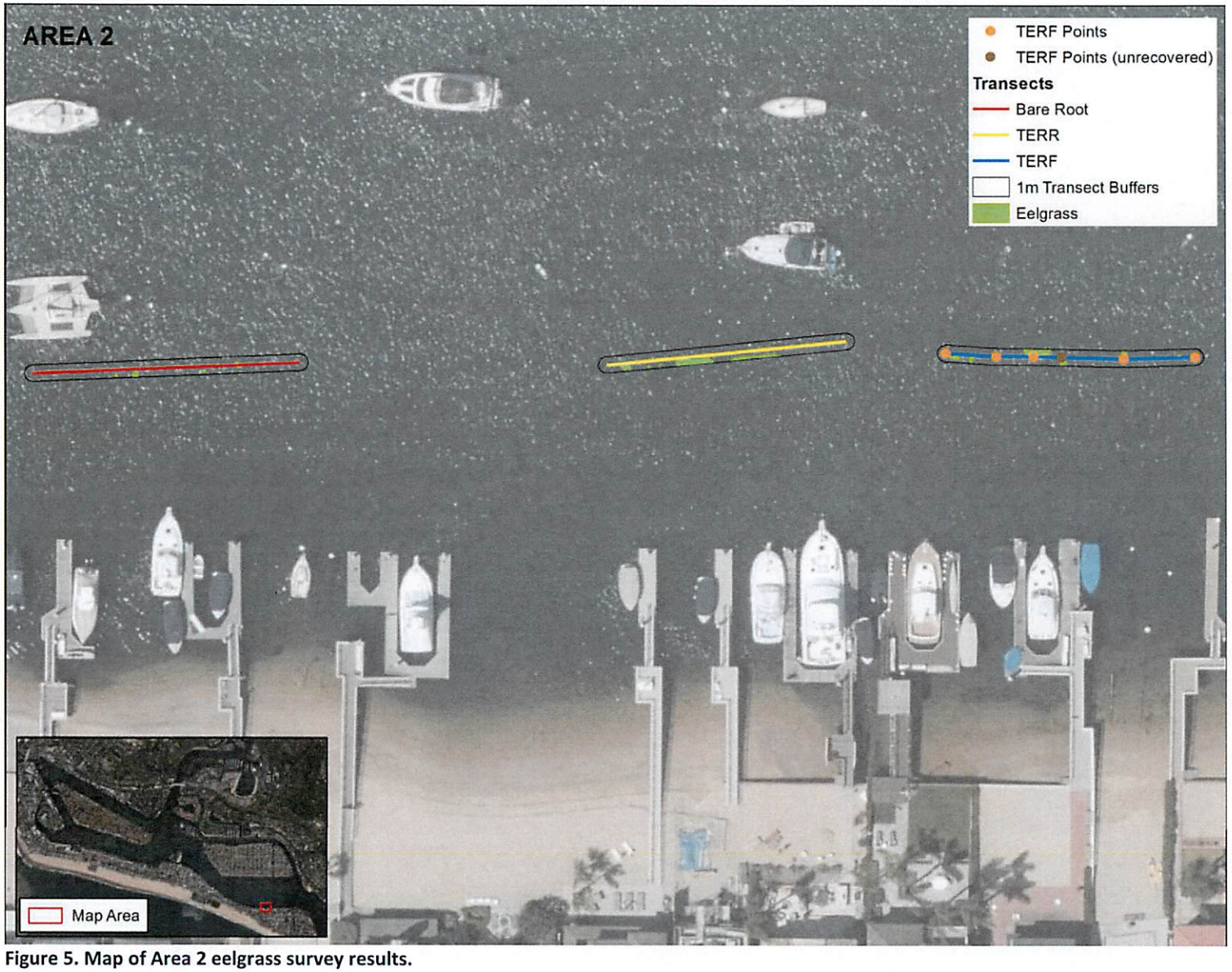


Figure 5. Map of Area 2 eelgrass survey results.

Figure 6. Map of Area 3 eelgrass survey results.

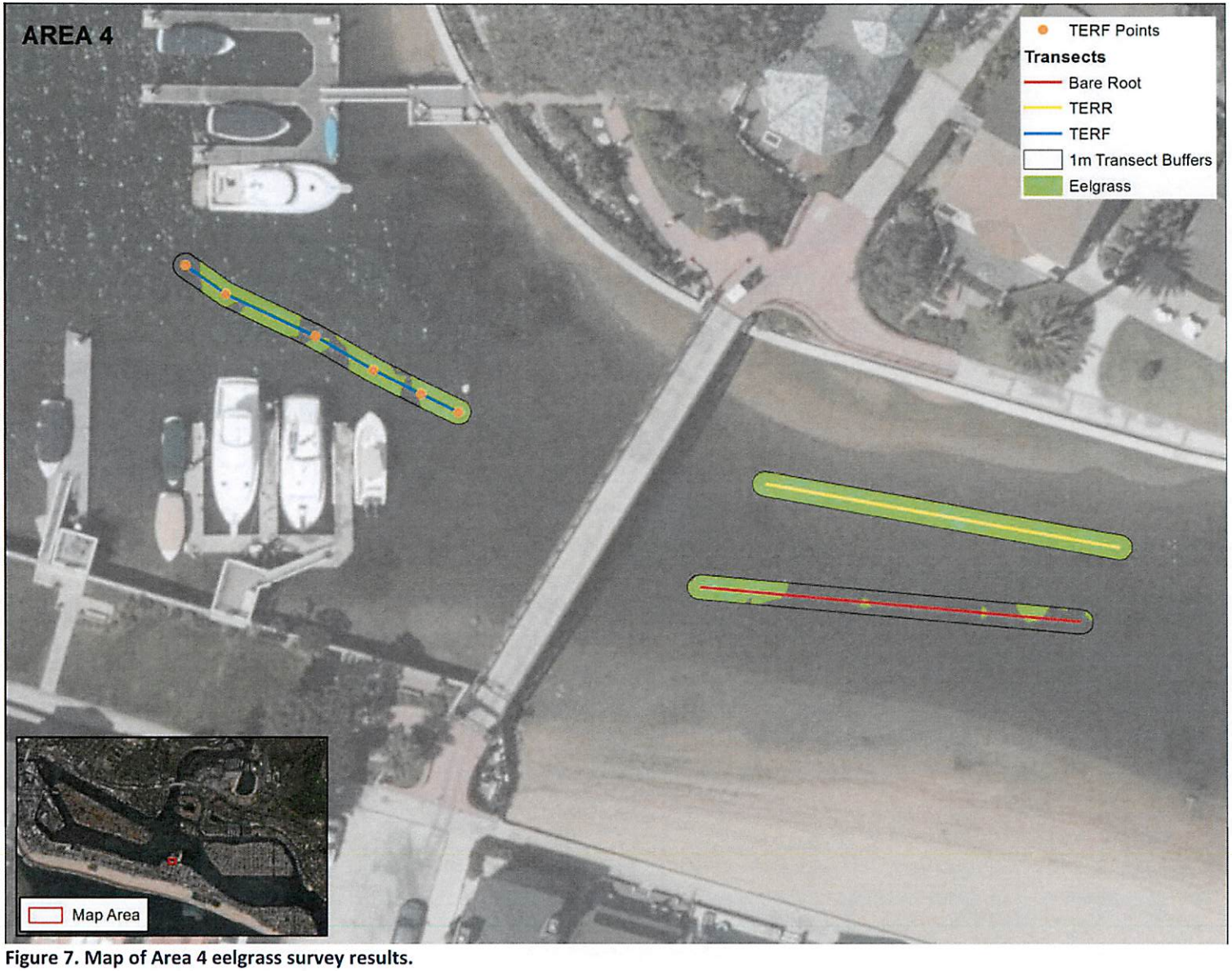


Figure 7. Map of Area 4 eelgrass survey results.

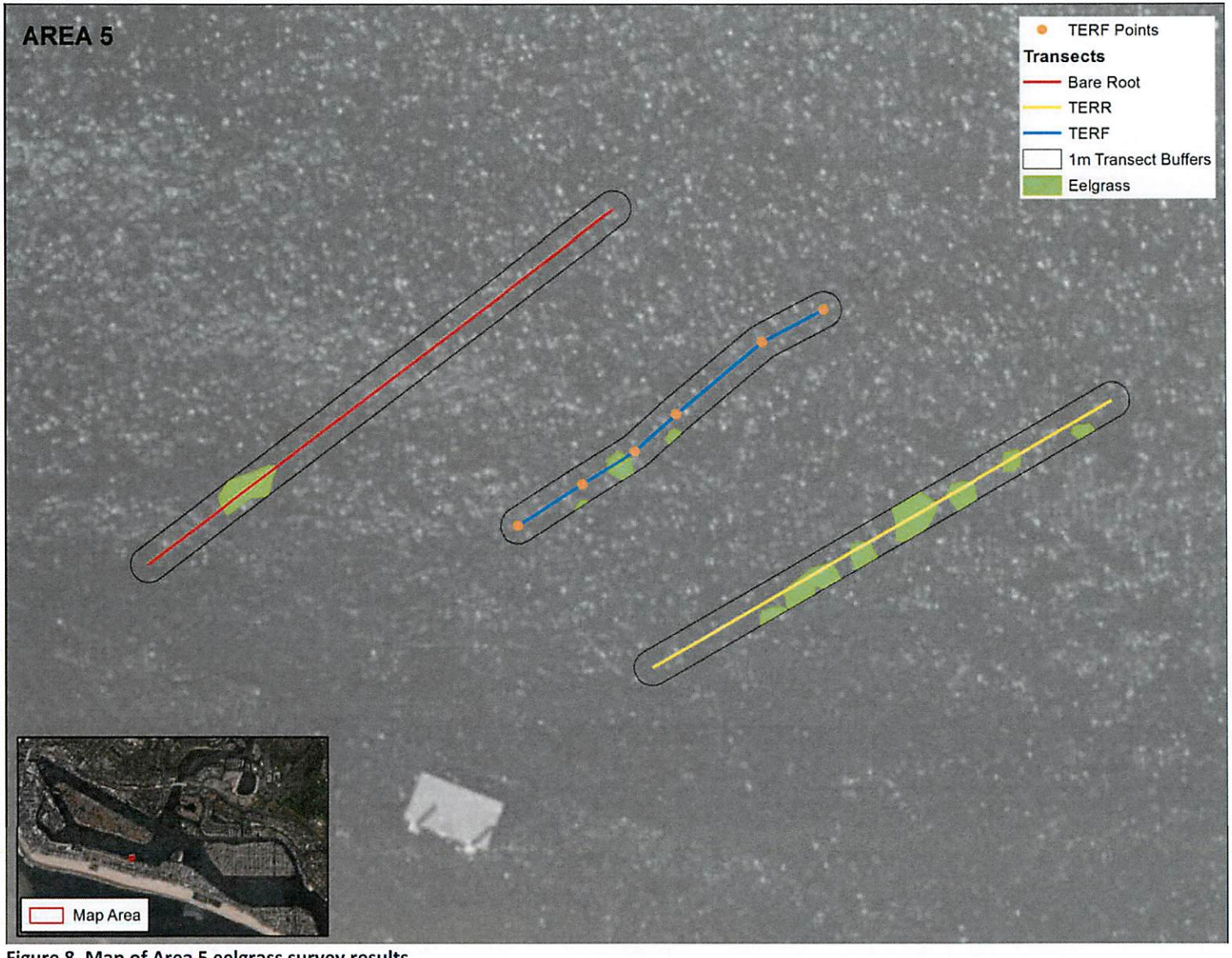


Figure 8. Map of Area 5 eelgrass survey results.

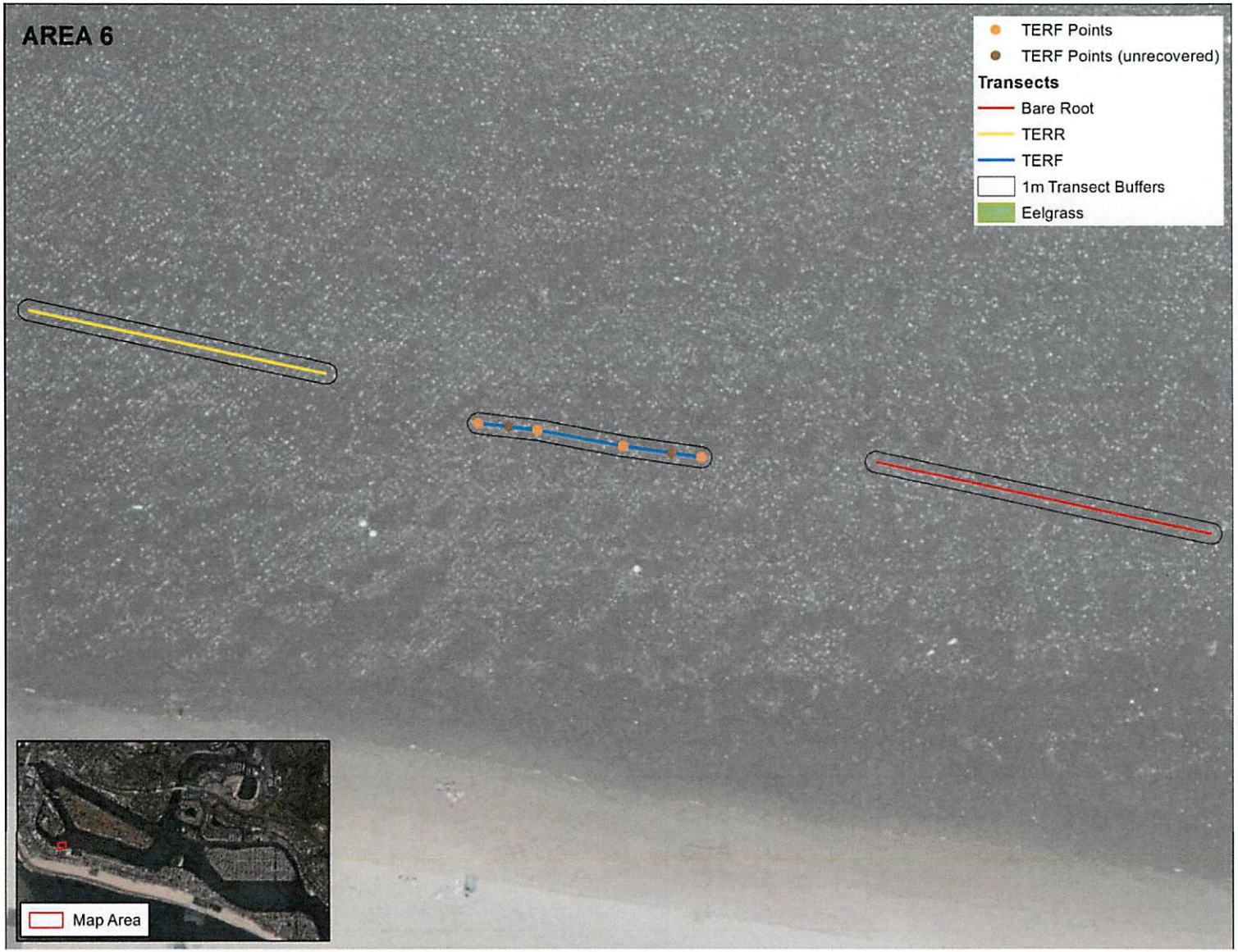


Figure 9. Map of Area 6 eelgrass survey results. Eelgrass was not observed in Area 6.

4-3 Eelgrass Density

Eelgrass density was typically greatest in areas where eelgrass coverage was highest, Area 1 and Area 4 (Figure 10). Greater eelgrass density tended to be associated with the transplant area opposed to the transplant method. In Areas 1, 2, and 4 where eelgrass was successfully established, bare root and TERF transplant methods tended to have greater measured eelgrass density than TERR method.

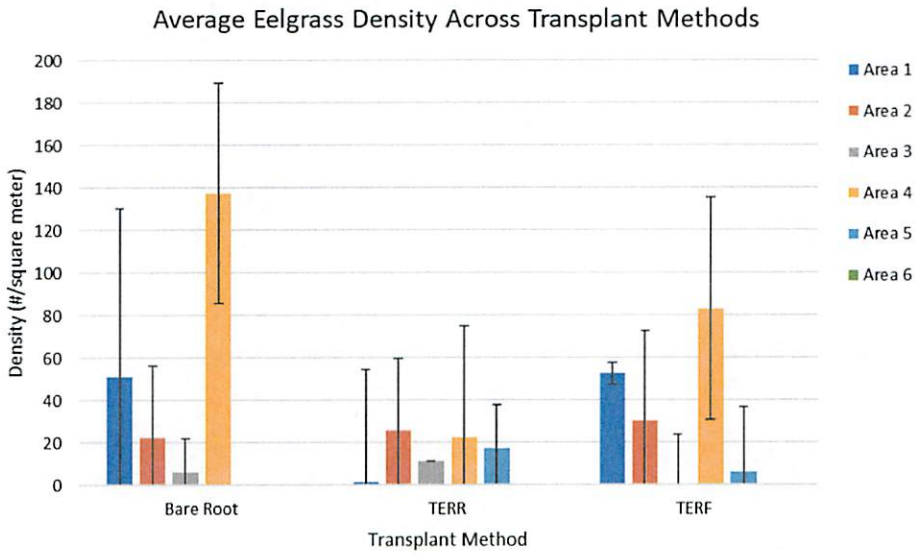


Figure 10. Average eelgrass density across transplant methods for all areas surveyed. Note that no eelgrass was found in Area 6.

4-4 Eelgrass ANOVA

The ANOVA calculated for eelgrass cover within the 1-meter buffer and transect percent coverage did not result in finding a significant difference between eelgrass transplant methods (Table 3 and Table 4). The lack of observed significant difference is likely attributed to the wide range in coverage values reported for each transplant method. The wide range in reported values results in no single method statistically standing out from the rest.

Table 3. ANOVA table comparing total coverage by eelgrass within a 1-meter buffer of the transect.

1-Meter Buffer Source of Variation	df	SS	MS	F	p-value
Among groups	2	120.171	60.085	0.180	0.837
Within groups	15	4994.818	332.988		
Total	17	5114.989			

Table 4. ANOVA table comparing eelgrass percent cover across eelgrass transplant methods.

Percent Cover Source of Variation	df	SS	MS	F	p-value
Among groups	2	0.013	0.007	0.069	0.934
Within groups	15	1.446	0.096		
Total	17	1.459			

5 Discussion

The eelgrass transplant data provide information pertaining to the success of three different eelgrass transplant methods, bare root, TERR, and TERF. The collected data allow resource managers to evaluate the transplant areas in combination with the cost of each transplant method to determine the appropriate transplant method for waters within Newport Harbor.

In summary, the costs described by MTS in 2019 determined that traditional bare root bundle planting was more expensive than alternative methods due to the additional costs related to diving ($177.38 per transect / $5.91 per unit). The TERFs and modified TERR methods were less expensive than bare-root planting primarily due to the reduced time spent diving ($94.26 per transect / $3.14 per unit; $152.29 per transect / $5.08 per unit, respectively).

The results provided within this report indicate that the eelgrass transplant success in Newport Harbor was not largely dependent upon the transplant method and was more dependent upon transplant area. Ultimately, the success of each planting technique varied dependent upon site conditions. While successful coverage was apparent along some of the transects in Areas 1 and 4, the ANOVA analysis across transplant methods did not indicate that any method was significantly different (better or worse) than other method. This is understandable given the high variation within each transplant method studied. While significant differences were not calculated for cover, density measurements indicate that a greater density can be reached within 1 year using bare root or TERF transplant methods. The data provided within this report indicates that transplant area is of greater importance than transplant method. Thus, transplant method selection ultimately comes down to cost and appropriateness of method deployment based on the selected transplant area. TERR methods were less expensive and the successful eelgrass coverage using this method in Areas 1, 4, and 5 is notable.

Recovery of TERFs and TERR transects was challenging and required more time to search for items lying on and below the seafloor. TERFs were typically heavily covered with invertebrate organisms making retrieval and cleaning of the TERF planting units more difficult than anticipated. Should TERFs be utilized as a transplant method in the future consideration should be taken to utilize material that can stay underwater (i.e. non-painted crates that can act as an artificial reef until decomposed). TERR transect lines became embedded in the sediment to a point where finding and recovering the TERR was impossible; use of jute twine or other decomposable material would eliminate the need for recovery. In shallower transplant sites, Area 1 and 3, the PCV markers anchoring the line on one end were broken to the point where the rope could have come off and shifted position since deployment; it is possible that these TERRs were caught by anchors or other items in contact with the seafloor. However, the ropes were highly imbedded into the sediment and hard to determine the exact position along the seafloor. Should the TERR method be used in the future the area of deployment should be considered; the method is best suited to areas where there is minimal potential for bottom disturbance by human activities or areas should be selected where water depths are deep enough to not be easily contacted by humans or vessels.

Transplant site condition and size of transplant should be taken under consideration when selecting an area for eelgrass transplant using bare root, TERR, or TERF transplant methods. Planting bare root bundles on 1-m centers within a transplant area ensures significant bottom coverage throughout the area being transplanted. The other two evaluated methods attempt to cover a given area at varying intensity but without diving. TERFs tend to clump the eelgrass transplant effort into what can be thought of as multiple small eelgrass patches. In so doing, when one TERF fails, it can leave a considerable amount of bare space within the transplant area dependent upon the level of effort (number of TERFs) employed during the transplant. Another consideration relative to transplant methods is recovery of the materials placed in the water. In the case of bare root planting, it is standard practice to layout a rope grid on the bottom to aid divers to navigate the site. The need for gridding is dependent upon the scale of the project with larger projects being able to justify the costs because of time savings due to divers being able to track where they have planted under what are typically low visibility conditions. This grid is typically recovered immediately following planting. The other methods evaluated need to be left in place for eelgrass to establish. This means subsequent effort is required to revisit the site and recover materials. This is an important additional consideration that will vary based on the scale and goals of the transplant program.

6 Recommened Next Steps

Through the establishment of this transplant program eelgrass resources have been created within Newport Harbor. Through this effort the City of Newport Beach has successfully established 205.6 square meters of eelgrass over the period studied. As such, it is recommended that the City of Newport Beach consider ways to utilize this established eelgrass for past or future mitigation needs.

This program was an initial evaluation of eelgrass transplant techniques and serves as an example to build from. Additional monitoring surveys could be conducted to determine the longer term success of the established eelgrass resources. Monitoring surveys could be conducted during the biannual monitoring of shallow water eelgrass habitat within Newport Harbor. If such monitoring is performed in accordance with the CEMP and coordination with regulatory agencies, it may be possible to develop eelgrass mitigation banks.

Additional alternative transplant methods could be considered and evaluated at the discretion of the City of Newport Beach and in consultation with regulatory agencies. The methods employed in this report could be modified to use biodegradable materials. Additionally, use of eelgrss seeds, particularly in deeper depth transplant areas (Eriander et al. 2016), could be evaluated.

7 References

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