NATIONAL FISH AND WILDLIFE FOUNDATION
PROJECT FUNDING AGREEMENT

Future of the Salt Marsh Harvest Mouse and other native wetland species in the San Francisco estuary: tracking an inevitable decline or guiding a resilient response? Phase 2
NFWF Project ID #8006.21.070713

This Project Funding Agreement ("Agreement") is made between the Suisun Resource Conservation District, ("Recipient"), with an address of 2544 Grizzly Island Road, Suisun City, CA 94585, and the National Fish and Wildlife Foundation ("NFWF"), located at 1133 15th Street, N.W., Suite 1000, Washington D.C. 20005, with a branch office at 90 New Montgomery Street, Suite 1010, San Francisco, CA 94105. (Recipient and NFWF each, a "Party," and together, the "Parties.")

1. **Purpose.** This Agreement pertains to Recipient's implementation of the project entitled "Future of the Salt Marsh Harvest Mouse and other native wetland species in the San Francisco estuary: tracking an inevitable decline or guiding a resilient response? Phase 2" (the "Project"). Under this Agreement, NFWF agrees to provide funds ("Funds") to Recipient in accordance with the terms hereof to pay costs associated with Recipient's implementation of the Project.

2. **Project to be Funded**. A detailed description of the Project, including but not limited to the Project purpose, schedule, Budget (as defined in Section 5 below), activities, outcomes, and deliverables (collectively, the "Project Description"), is included as Exhibit A hereto. Recipient hereby agrees to use the Funds it receives under this Agreement exclusively to pay the costs of the services, time, materials, equipment, and other items comprising the Project (collectively, the "Work"), all in accordance with the Project Description.

3. **Term**. The term ("Term") of this Agreement shall run from April 1, 2021, through March 31, 2023, (the "Termination Date"), unless otherwise terminated or amended as provided in this Agreement. However, all activities outlined in the Project Description shall be completed by December 31, 2022, (the "Completion Date"). Preparation, review, and approval of the Final Reports (as defined in Section 8 below) shall take place between the Completion Date and the Termination Date.

4. **Maximum Amount of Funding**. Unless agreed otherwise in writing by NFWF (acting in its sole discretion), the amount of Funds to be made available by NFWF to Recipient under this Agreement for purposes of paying the costs of the Work shall not exceed a maximum of One Hundred Ninety-Eight Thousand Three Hundred Fifty-Four Dollars and Seventeen Cents ($198,354.17) (the "Maximum Amount").

5. **Project Budget**. The budget for the Project from commencement through completion (the "Budget") is described in the Project Description and attached hereto as Exhibit B. The Parties expect that Recipient will conduct all the Work and complete the Project within the Budget and, accordingly, for a total amount of Funds equal to or less than the Maximum

Amount. If at any time during the term of this Agreement Recipient believes, based on the Work performed to date, that the aggregate costs to complete the Project are likely to exceed the Maximum Amount, Recipient shall so notify NFWF immediately in writing.

a. The Budget is comprised of cost type categories ("Budget Categories") which include the following: Personnel, Travel, Equipment, Materials and Supplies, Contractual Services, Other Direct Costs, and Indirect Costs. Budget Categories are further itemized into distinct line items ("Line Items").

b. Recipient shall conduct all the Work in conformance with the narrative descriptions thereof set forth in the Budget Categories. No Funds may be re-allocated between Budget Categories without the prior written consent of NFWF. Additionally, no new Budget Category may be added, nor an existing Budget Category deleted, without the prior written consent of NFWF.

c. The Recipient shall conduct all the Work substantially in conformance with the narrative descriptions thereof set forth in the Line Items. The Recipient may add, delete, or modify individual Line Items within a Budget Category, without obtaining the prior written consent of NFWF, if and to the extent that the applicable addition, deletion, or modification:

i. is determined by the Recipient to be necessary and appropriate for Recipient's implementation of the Work; and
ii. does not materially change the character of the Work to be conducted; and
iii. does not cause the aggregate dollar amount of changes made within the applicable Budget Category to exceed twenty percent (20%) of the total amount specified for such Budget Category in the most recent NFWF-approved Budget.

Recipient must obtain NFWF's prior written consent for any proposed addition, deletion, or modification of any individual Line Item that does not comply with items (i) through (iii) immediately above. NFWF expressly reserves the right to disallow any addition, deletion, or modification of a Line Item by Recipient pursuant to this Section (whether such disallowance occurs in the ordinary course during the term of this Agreement, in the course of an audit conducted by NFWF during or after the term of this Agreement, or otherwise) if NFWF determines that the applicable addition, deletion, or modification does not or did not comply with items (i) through (iii) immediately above.

6. **Payment for Project Costs**. Recipient may request payment of Funds hereunder for Work costs already paid or incurred by Recipient, or, with NFWF's prior written consent, Work costs to be paid or incurred imminently by Recipient (all such requests, "Payment Requests"). NFWF will pay to Recipient the amount of Funds properly requested and substantiated in a Payment Request within thirty (30) business days of NFWF's receipt of such Payment Request and all necessary supporting documentation (or, if applicable, within thirty (30) business days of NFWF's receipt of written approval of such Payment Request and all necessary supporting documentation by any necessary third-party governmental entity or funding partner). Recipient shall submit Payment Requests in accordance with the following procedures and subject to the

following terms and conditions:

a. Frequency and Minimum Amount. Recipient may submit Payment Requests no more frequently than once monthly and for no less than One Thousand Dollars ($1,000) in expenses during the term of this Agreement. To receive payment, Recipient must submit to NFWF a written request containing the total dollar amount of Funds being requested. If requested by NFWF, Recipient shall provide such other supporting documentation as NFWF deems reasonably necessary to evaluate the request.

b. Method of Submission. If specified by NFWF, Recipient shall submit Payment Requests through NFWF's electronic project management system; otherwise, Recipient may submit Payment Requests to NFWF via electronic mail, facsimile, or regular mail.

c. Duplicative Funding. If at any time Recipient receives payment or reimbursement from any other source for the same exact Work costs for which NFWF has provided payment or reimbursement hereunder, the Recipient shall so notify NFWF immediately in writing and shall cooperate with NFWF in remedying the duplicative funding, which may include returning to NFWF the amount of Funds received by Recipient as a result of such duplicate payment or reimbursement.

d. Ongoing Compliance. NFWF reserves the right to refuse to pay all or any part of the Funds requested in a Payment Request if at the time the request is submitted Recipient has failed to comply with any term or condition of this Agreement or has otherwise failed to perform the Work to date in accordance with the Project Description and Budget.

e. Final Payment after Completion of all Work. The term "Final Amount" shall mean the amount of Funds requested in the final Payment Request submitted by Recipient or an amount equal to ten percent (10%) of the Maximum Amount, whichever is greater. NFWF shall have no obligation to pay the Final Amount until such time as NFWF has (i) determined that Recipient has fully completed the Work; and (ii) received and approved all deliverables associated with the Work and this Agreement, including but not limited to the Final Reports required pursuant to Section 7 below. Within thirty (30) business days after NFWF's (and, if applicable, any necessary third-party governmental entity's or funding partner's) determination that the requirements of the immediately preceding items (i) and (ii) have been satisfied, NFWF shall disburse to Recipient the Final Amount.

7. **Reporting**. Recipient will submit periodic reports on the Project through NFWF's electronic project management system (unless otherwise specified by NFWF), all in accordance with the following schedule:

Report Due Dates

Reporting Task	Task Due Date
Annual Financial Report	October 31, 2021
Annual Programmatic Report	October 31, 2021
Annual Financial Report	October 31, 2022
Annual Programmatic Report	October 31, 2022
Final Financial Report	January 30, 2023
Final Programmatic Report	January 30, 2023

At NFWF's request, Recipient will respond to any inquiries regarding the status or progress of the Project made outside of the reporting schedule.

8. **Final Reports**. When Recipient believes that it has fully and completely performed all the Work, and in any event no more than thirty (30) days after the Completion Date, Recipient shall prepare and submit to NFWF (and if specified by NFWF, by uploading to NFWF's electronic project management system) a comprehensive report on the Work and the corresponding results (the "Final Programmatic Report") and a full accounting of the Funds disbursed to it hereunder (as well as any amount still due and owed to Recipient that has not yet been disbursed as a reimbursement) as compared against the Budget (the "Final Financial Report"). (The Final Programmatic Report and Final Financial Report are hereinafter referred to collectively as the "Final Reports.") As appropriate, the Final Programmatic Report should include copies of all publications, press releases, and other documents, materials, and products developed as part of the Project, including without limitation photographs, video footage, and other electronic representations of the Project and Work. The Final Reports shall be provided by Recipient to NFWF as soon as practicable after Recipient reaches a determination that it has fully and completely performed all the Work; in addition, in accordance with Section 6, NFWF's receipt and approval of the Final Reports is an express condition to NFWF's obligation to disburse to Recipient the Final Amount.

9. **Contact Information**.

NFWF Primary: Anne Butterfield
National Fish and Wildlife Foundation
Senior Manager, Impact-Directed Environmental Accounts (IDEA)
90 New Montgomery Street, Suite 1010
San Francisco, CA 94105
Telephone: 415-243-3106
Fax: 415-778-0998
E-mail: Anne.Butterfield@nfwf.org

NFWF Alternate: Eliza Braendel
National Fish and Wildlife Foundation
Manager, Impact-Directed Environmental Accounts (IDEA)
90 New Montgomery Street, Suite 1010
San Francisco, CA 94105

Telephone: 415-593-7628
Fax: 415-778-0998
E-mail: Eliza.Braendel@nfwf.org

Recipient: John Takekawa
Suisun Resource Conservation District
Operations Manager
2544 Grizzly Island Road
Suisun City, CA 94585
Telephone: 707-425-9302
Email: jtakekawa@suisunrcd.org

Each Party agrees to notify the other Party promptly in writing of any change in named representative, address, telephone, or other contact information. The Parties agree and acknowledge that any change to their respective named representative as set forth above shall not constitute an amendment to this Agreement and may be effected through written notice to the other Party.

10. **Incorporation of Project Description and Budget**. The Project Description and Budget are hereby expressly incorporated into this Agreement by this reference.

11. **Assignment**. Recipient may not assign this Agreement, in whole or in part, to any other individual or other legal entity without the prior written consent of NFWF.

12. **No Agency Between NFWF and Recipient or Sub-recipients**. Neither Recipient nor any contractor, subcontractor, or other recipient of Funds from Recipient (each, a "Sub-recipient") shall be deemed to be an agent, representative, employee, or servant of NFWF in connection with this Agreement. NFWF shall neither have the right to control, nor have any actual, potential or other control over, the methods and means by which Recipient or any of its agents, representatives, employees, or Sub-recipients conducts its business operations. Recipient shall not, in the performance of the Work, perform any act or make any representation to any person to the effect that Recipient or any of its agents, representatives, employees, or Sub-recipients is the agent, representative, employee, or servant of NFWF.

If Recipient makes or issues any award or subaward of Funds to any Sub-recipient for purposes of performing the Work, then Recipient will be deemed to have represented and warranted to NFWF at each such time, in connection with each such award or subaward, as follows:

a. in making such award or subaward of Funds, Recipient has complied with all applicable laws, regulations, rules, orders, and other governmental mandates, including, without limitation, those pertaining to procurement, acquisition, and other contracting actions by Recipient;

b. in making such award or subaward of Funds, Recipient has complied with its internal policies and procedures applicable to procurement, acquisition, or contracting actions;

c. each Sub-recipient is qualified to perform the applicable Work and is authorized to do business in each jurisdiction in which such Work is to be performed;

d. each Sub-recipient is required under its agreement with Recipient to perform the applicable Work within budgeted costs identified for such Work as provided in the Budget;

e. each Sub-recipient has agreed to conduct its activities related to the Work in compliance with all applicable laws, regulations, rules, orders, and other governmental mandates;

f. each Sub-recipient has agreed to obtain and maintain all appropriate insurance against liability for injury to persons or property from any and all activities undertaken by such Sub-recipient related to the Work; and

g. no Sub-recipient has any conflict of interest with respect to NFWF, Recipient, or the Project.

Recipient shall be responsible for supervising and directing the Work performed by all Sub-recipients and shall be responsible for all Sub-recipient activities as well as for coordinating all Sub-recipients' Work. As between Recipient and NFWF, Recipient shall bear sole responsibility for any and all liability caused or incurred by any Sub-recipient in performing Work. NFWF shall not be deemed by virtue of this Agreement to have any contractual obligation to, or relationship with, any Sub-recipient, and the Parties agree and acknowledge that as between NFWF and Recipient, all Work shall be deemed to be the responsibility of, and shall be performed by, Recipient.

13. **NFWF Right to Inspect Work; Access**. NFWF and its representatives and consultants shall, upon reasonable prior notice to Recipient, have access to inspect all Work hereunder; provided, however, that any inspection of the Work shall be conducted at a reasonable time and in a manner that does not delay or disrupt the Work. Notwithstanding any review or inspection by NFWF, Recipient shall not be relieved of its responsibility for performance of the Work or the submission of reports as expressly set forth in this Agreement solely by virtue of NFWF's inspection or review of the Work. Recipient shall provide NFWF and its representatives and consultants with the opportunity to participate in site inspections, meetings, and/or teleconferences, as appropriate, related to Recipient's performance of the Work and completion of the Project.

14. **Conflict of Interest**. During the term of this Agreement, Recipient will maintain in effect policies governing conflicts of interest and, with respect to its performance of the Work and Project, will adhere to such policies.

15. **Unexpended Funds**. Any Funds provided by NFWF and held by Recipient and not expended or obligated for Work on or before the Agreement's termination date will be returned by Recipient to NFWF within thirty (30) days after such termination date.

16. **Amendments**. Any amendment to this Agreement must be in writing and must be consented to in writing by both Parties. If required by NFWF, Recipient will submit amendment requests through NFWF's electronic project management system. Notwithstanding any provision of this Agreement to the contrary, any duly executed amendment of this Agreement to extend its term shall be deemed to automatically add or modify, as appropriate, reporting due dates pursuant to Sections 7 and 8 hereof such that the dates are commensurate with the extended term of this Agreement.

17. **Default and Termination**. In entering this Agreement and agreeing to provide Funds to Recipient for purposes of the Project, NFWF is expressly relying on the accuracy, validity, and completeness of the information provided by Recipient to NFWF, including but not limited to that contained in any application or proposal for Funds, in the Project Description, and in this Agreement. Any material misrepresentation or omission of information (as determined by NFWF in its reasonable discretion) made by Recipient to NFWF in connection with this Agreement or the Project shall constitute grounds for NFWF, in its sole discretion, to terminate this Agreement, effective immediately, by written notice delivered to Recipient. Failure by Recipient to comply (as determined by NFWF in its reasonable discretion) with any material term of this Agreement, including but not limited to any failure by Recipient to perform the Work in accordance with the Budget and schedule set forth in the Project Description, shall be deemed to be a default of this Agreement and shall constitute cause for NFWF to issue a written "Notice of Default" to Recipient. Any such Notice of Default shall describe in reasonable detail the basis for NFWF's determination of default and shall provide Recipient with a period of no less than ninety (90) days in which to cure such default (or, if such default is incapable of being cured within ninety (90) days, to commence a cure of such default). If Recipient has not cured or, as the case may be, commenced a cure of, any default within ninety (90) days of its receipt of a Notice of Default, NFWF may thereafter terminate this Agreement by a further written notice delivered to Recipient.

Recipient may terminate this Agreement by providing no less than thirty (30) days' prior written notice to NFWF.

In the event of termination of this Agreement prior to Recipient's expenditure or obligation of any Funds available hereunder, Recipient shall immediately (unless otherwise directed by NFWF in its notice if NFWF initiated the termination) undertake all reasonable steps to terminate any further expenditure or obligation of Funds, including but not limited to the following:

a. Stop work on any portion of the Work that is incomplete, and refrain from undertaking any further Work on the Project.

b. Place no further orders or enter into any further contracts or subcontracts for materials, facilities, or other aspects of the Work.

c. Terminate all pending orders, contracts, and subcontracts for Work that have not yet commenced.

d. Promptly take all other reasonable and feasible steps to minimize and/or mitigate any damages that may be caused by the failure to complete the Work, including but not limited to reasonable settlements of any outstanding claims arising out of termination of orders, contracts, and subcontracts related to the Work.

e. Deliver or make available to NFWF all data, drawings, specifications, reports, estimates, summaries, deliverables, and such other information and material as may have been accumulated by Recipient with respect to the Work, whether completed or in progress.

f. Return to NFWF any unobligated or unspent portion of the Funds then held by Recipient.

18. **Additional Support**. By entering into this Agreement, NFWF assumes no obligation to provide further funding or financial support to Recipient beyond the terms stated in this Agreement.

19. **Choice of Law**. This Agreement shall be subject to and interpreted by the laws of the District of Columbia, without regard to choice of law principles. By entering into this Agreement, Recipient agrees to submit to the jurisdiction of the courts of the District of Columbia.

20. **Compliance with Laws; Insurance; Indemnification**.

a. In conducting its activities relating to the Work and performing its obligations under this Agreement, Recipient agrees to conduct all such activities in compliance with all applicable Federal, State, and local laws, regulations, and ordinances; and to secure, and comply with, all appropriate and necessary public or private permits and consents.

b. Recipient agrees to obtain and maintain all appropriate insurance against liability for injury to persons or property from any and all activities undertaken by Recipient and associated with this Agreement in any way; will have NFWF named as an additional insured on all such policies; and will provide NFWF with appropriate Certificates of Insurance reflecting such additions within sixty (60) days after this Agreement is fully executed.

c. Recipient shall indemnify and hold harmless NFWF and its officers, directors, agents, representatives, and employees in respect of any and all claims, injuries, losses, diminution in value, damages, liabilities, whether or not currently due, and related expenses (including without limitation, settlement costs and any legal or other expenses for investigating or defending any actions or threatened actions) arising from or in connection with the Work or Recipient's performance under this Agreement, including but not limited to, environmental laws, regulations,

orders and decrees of whatever character or nature and damage or injury to persons or property.

d. The terms of the Section will survive termination of this Agreement.

21. **Publicity**. Recipient agrees to give appropriate credit to the "National Fish and Wildlife Foundation" for its financial support in any and all press releases, publications, annual reports, video credits, dedications, and other public communications regarding the Project that is receiving financial support under this Agreement or any of the deliverables associated with the Project, the Work, and/or this Agreement. Recipient hereby grants NFWF the right and authority to publicize NFWF's financial support for the Project and the Work in press releases, publications and other public communications. The Recipient must obtain prior NFWF approval for any use relating to the Project of the NFWF logo.

22. **Disclaimers**. Payments made to Recipient under this Agreement do not by direct reference or implication convey NFWF's endorsement of the Work or any deliverables provided pursuant to the Agreement. All information submitted by Recipient for formal publication under this Agreement shall carry the following disclaimer:

> "The views and conclusions contained in this document are those of the authors and should not be interpreted as representing the opinions, views, or policies of the National Fish and Wildlife Foundation. Nothing contained herein constitutes an endorsement in any respect by the National Fish and Wildlife Foundation."

23. **Website Links**. Recipient agrees to permit NFWF to post a link on any or all of NFWF's websites to descriptions of the Work, the Project, or this Agreement.

24. **Evaluation**. Recipient agrees to cooperate with NFWF by providing timely responses to all reasonable requests for information to assist in evaluating the accomplishments of the Project and this Agreement for a period of three (3) years after the date on which the Final Reports are provided. The terms of this Section will survive termination of this Agreement.

25. **Access to Records**. NFWF and any of its duly authorized representatives shall have access to any books, documents, papers and records of Recipient that are directly pertinent to this Agreement for purposes of making audits, examinations, excerpts, or transcription during the term of this Agreement and for a period of five (5) years after the date of delivery of the Final Reports under this Agreement. By executing this Agreement and accepting Funds hereunder, Recipient agrees, without limiting any other obligation under this Agreement, to produce, maintain, and retain such invoices, purchase orders, bills, time records, evidence of payment, and other documents as are necessary to permit NFWF to verify the proper use and expenditure of the Funds received by Recipient hereunder. The terms of this Section will survive termination of this Agreement.

26. **Use of Information**. If Recipient provides NFWF with any information Recipient

considers to be privileged, confidential, or otherwise protected from public disclosure, all such information must be clearly identified as such in writing by Recipient in order to be eligible for potential protection from public disclosure by NFWF. Recipient acknowledges and agrees that NFWF may, in NFWF's discretion, share with third parties and make public any and all information ("Information") provided by Recipient to NFWF in connection with the Project or pursuant to this Agreement, except such Information as (a) has been clearly identified by Recipient in writing as privileged, confidential, or otherwise protected from disclosure and (b) has been agreed by NFWF in writing to be entitled to protection from disclosure. Notwithstanding anything to the contrary set forth herein, all Information submitted to NFWF by Recipient is subject to potential disclosure to the United States federal government.

27. **Severability**. Each provision of this Agreement is distinct and severable from the others. If one or more provisions is or becomes invalid, unlawful, or unenforceable in whole or in part, the validity, lawfulness and enforceability of the remaining provisions (and of the same provision to the extent enforceable) will not be impaired, and the parties agree to substitute a provision as similar to the offending provision as possible without its being invalid, unlawful or unenforceable.

28. **Binding Obligation**. This Agreement has been duly executed by a representative of Recipient with full authority to execute this Agreement and bind Recipient to the terms hereof. After execution by the representative of Recipient named on the signature page hereto, this Agreement will represent the legal, valid, and binding obligation of Recipient, enforceable against Recipient in accordance with its terms.

IN WITNESS WHEREOF, both parties have signed this Agreement, intending to be bound legally.

Suisun Resource Conservation District

_____ Date: 12/14/20

Name: Jeff Chappell

Title: SRCD Executive Director

National Fish and Wildlife Foundation

Anne Butterfield on behalf of

Digitally signed by Anne Butterfield on behalf of
DN: cn=Anne Butterfield on behalf of, o=NFWF, ou=IDEA, email=Anne.Butterfield@nfwf.org, c=US
Date: 2020.12.15 13:35:01 -08'00'

Date: _____

Timothy J. DiCintio
Senior Vice President, Impact-Directed Environmental Accounts

Exhibit A
Project Description

EasyGrantsID: 70713

National Fish and Wildlife Foundation – San Francisco Bay Estuary Conservation Fund 2020, Full Proposal

Title: Future of the Salt Marsh Harvest Mouse and other native wetland species in the San Francisco estuary: tracking an inevitable decline or guiding a resilient response? Phase 2

Organization: Suisun Resource Conservation District

Grant Information

Title of Project

Future of the Salt Marsh Harvest Mouse and other native wetland species in the San Francisco estuary: tracking an inevitable decline or guiding a resilient response? Phase 2

Total Amount Requested	$ 198,354.17
Matching Contributions Proposed	$84,217.13
Proposed Grant Period	04/01/ 2021 - 12/31/ 2022

Project Description

This proposal will address the lack of comprehensive recovery information for the salt marsh harvest mouse and other small mammals through a unified assessment and survey approach. There is a critical need to fill this information gap in light of future land use and climate threats, and the project goal will be to coordinate a team of experts to conduct the first single-season, estuary-wide survey to determine which areas are most resilient. The findings will be summarized in population heat maps that will identify key areas to help us understand how and where we should focus recovery actions. The project will be undertaken in two phases. Phase 1 will include compilation of existing information, development of the approach, and a pilot test of coordinated surveys and methods including collection of genetic samples. Phase 2 will implement the coordinated survey, and the resulting data will be used to create heat maps of populations summarizing their likely resiliency.

Project Abstract

Restoration and enhancement of wetlands is a primary focus for estuary conservation. However, it is challenging to identify and prioritize areas that achieve the greatest multispecies benefits. Escalating climate and development threats have increased the urgency to determine which areas best support populations, but recent climate assessments suggest action in the next two decades will be critical for saving biodiversity. Earlier prioritization efforts supported maximizing connectivity, corridors, and large contiguous areas, but some endangered species may require a more detailed understanding. The Salt Marsh Harvest Mouse (SMHM) only exists in SF Bay and is a focus in the multispecies tidal marsh recovery plan. A crucial information gap is the lack of a comprehensive SMHM survey in a single season to document their full distribution. SMHM are sensitive to rapidly changing habitats, because they are unable to disperse quickly and avoid ecological traps created by sea-level rise. Recent studies demonstrate SMHM inhabit managed wetlands, and this project will provide estuary-wide habitat information on SMHM and several other small mammals. Identifying critical areas for SMHM survival will benefit conservation and development planning. We propose this study to proactively guide a resilient SMHM response rather than simply tracking an inevitable decline. Our results will support the ultimate goal of identifying priority areas for increasing SMHM resilience.

Organization and Primary Contact Information

Organization	Suisun Resource Conservation District
Organization Type	State or Local Government
City, State, Country	,,

Region (if international)

Primary Contact John Takekawa
Position/Title Operations Manager
Phone and E-mail 707-425-9302 x 2; jtakekawa@suisunrcd.org

Additional Contacts

Role	Name

Project Location Information

Project Location Description	San Francisco Bay estuary tidal and managed wetlands
Project Country(ies)	North America - United States
Project State(s)	California
Project Congressional District(s)	District 11 (CA) District 12 (CA) District 13 (CA) District 14 (CA) District 15 (CA) District 17 (CA) District 18 (CA) District 2 (CA) District 3 (CA) District 5 (CA)

Permits and Approvals

Permits/Approvals Description:	Capture and handling Section 10(a)(1)(A) permit or Section 6(c)cooperative agreement depending on group. This permit is in hand for principal team members.
Permits/Approvals Status:	Completed
Permits/Approvals Agency-Contact Person:	Karen Jensen
Permits/Approvals Submittal-Approval Date:	07/24/2020
Permits/Approvals Description:	California Department of Fish and Wildlife Incidental Take Permit and MOU for listed species. This permit is in hand for principal team members.
Permits/Approvals Status:	Completed

Permits/Approvals Agency-Contact Person: Scott Osborn

Permits/Approvals Submittal-Approval Date: 07/24/2020

I. PERSONNEL — $78,232.33

Staff Name	Position	Annual Salary	Project Hours	Hourly Rate	LOE (%)	Project Salary	% Fringe	$ Fringe	Total Personnel
John Takekawa	Operations Manager	$118,000.00	80.00	$56.73	4	$4,538.46	14.10	$639.92	$5,178.38
Adrian Rus	Wildlife Biologist Analyst	$45,917.00	2080.00	$22.08	100	$45,917.00	59.10	$27,136.95	$73,053.95
Totals						**$50,455.46**		**$27,776.87**	**$78,232.33**

II. TRAVEL — $986.00

Domestic Airfare – Per Flight

Purpose/Destination	Unit Cost	Quantity	Total Cost
SubTotal			**$0.00**

International Airfare – Per Flight

Purpose/Destination	Unit Cost	Quantity	Total Cost
SubTotal			**$0.00**

Train – Per Ticket

Purpose/Destination	Unit Cost	Quantity	Total Cost

SubTotal **$0.00**

Rental Car – Per Day

Purpose/Destination	Days/Duration	Unit Cost	Quantity	Total Cost

SubTotal **$0.00**

Taxis – Per Trip

Purpose/Destination	Unit Cost	Quantity	Total Cost

SubTotal **$0.00**

Mileage – Per Mile

Purpose/Destination	Unit Cost	Quantity	Total Cost
Fieldwork	$0.58	1700	$986.00

SubTotal **$986.00**

Gasoline – Per Gallon

Purpose/Destination	Unit Cost	Quantity	Total Cost

SubTotal **$0.00**

Per Diem (M&IE) – Per Day

Purpose/Destination	Days/Duration	Unit Cost	Quantity	Total Cost

SubTotal **$0.00**

Lodging – Per Night

Purpose/Destination	Days/Duration	Unit Cost	Quantity	Total Cost

SubTotal **$0.00**

Meals (no M&IE) – Per Meal

Purpose/Destination	Days/Duration	Unit Cost	Quantity	Total Cost

SubTotal **$0.00**

III. EQUIPMENT $0.00

Item Name	Description	Unit Cost	Quantity	Total Cost

IV. MATERIALS & SUPPLIES $3,698.34

Type	Purpose	Unit of Measure	Unit Cost	Quantity	Total Cost
Organic Raw Cotton Fiber - Natural Color - 10 Lbs	Bedding for trapping		$78.08	1	$78.08
Wagner's 52004 Classic Wild Bird Food, 20 lbs	Bait for trapping		$20.13	2	$40.26

Sherman Live Traps	Traps for capturing SMHM		$27.00	40	$1,080.00
Misc. Safety Supplies	Crew and Animal Safety		$500.00	1	$500.00
Genetic sampling supplies	genetics, sampling	each	$2,000.00	1	$2,000.00

V. CONTRACTUAL SERVICES **$103,000.00**

Subcontract/Contract – Per Agreement

Contractor Name	Description	Total Cost
WRA, Inc. Environmental Consultants	Subcontract for technical expertise	$75,000.00
UC Davis Mammalian Ecology and Conservation Unit	Subcontract for genetic sample analyses	$28,000.00

SubTotal **$103,000.00**

Subgrant – Per Agreement

Subrecipient	Description	Total Cost

SubTotal **$0.00**

VI. OTHER DIRECT COSTS **$0.00**

Type	Purpose	Unit of Measure	Unit Cost	Quantity	Total Cost

VII. TOTAL DIRECT COSTS **$185,916.67**

VIII. INDIRECT COSTS — $12,437.50

Explanation of Modified Total Direct Cost Base(MTDC)	Rate Type	NICRA Expiration	$MTDC	Rate(%)	Total Cost
The Suisun Resource Conservation District indirect cost rate is 30.19%. Here, SRCD will contribute 50% of the icr for a rate of 15%, and the technical expertise subcontract will be handled as 0% passthrough.	Provisional	7/1/2022	$82,916.67	15.00	$12,437.50

IX. TOTAL PROJECT COSTS — $198,354.17

Budget Narrative

Budget Narrative:

1. Personnel

Personnel -	Takekawa -- permanent employee, partial support from NFWF grant with matching funds from SRCD. Rus -- temporary employee supported for 1-year in this budget, responsible for conducting analyses of the project results.

2. Travel

Domestic Airfare - Per Flight -	
International Airfare - Per Flight -	
Train - Per Ticket -	
Rental Car - Per Day -	
Taxis - Per Trip -	
Mileage - Per Mile -	Mileage is included for fieldwork by Statham for genetic sampling. Other mileage will be contributed by the different team members.
Gasoline - Per Gallon -	
Per Diem (M&IE) - Per Day -	
Lodging - Per Night -	
Meals (No M&IE) - Per Meal -	

3. Equipment

Equipment -

4. Materials and Supplies

Materials and Supplies -	Includes trapping supplies with many other supplies provided by the different participating programs with experts in small mammal trapping. Genetic sampling supplies are included here for field sampling, while laboratory sampling supplies will be handled by UCD (Statham).

5. Contractual Services

Subcontract/Contract - Per Agreement -	WRA (Smith) recently finished her dissertation on SMHM and will lead much of the project analyses. She will coordinate the work with partnering experts and develop the agreements for coordinated captures. UCD (Statham) will handle the genetic sample analyses for the project, and an effort will be made to sample 50-100% of the captured specimens before they are released.
Subgrant - Per Agreement -	

6. Other Direct Costs

Other Direct Costs -

7. Indirect Costs

Indirect Costs -

Matching Contributions

Matching Contribution Amount:	$11,397.13
Type:	In-kind
Status:	Pledged
Source:	Suisun Resource Conservation District
Source Type:	Non-Federal
Description:	1:1 match salary costs for operations manager; 50% of indirect costs ($12,437.50)

Matching Contribution Amount:	$57,000.00
Type:	In-kind
Status:	Pledged
Source:	California Department of Fish and Wildlife
Source Type:	Non-Federal
Description:	Three environmental scientists at 15% time, scientific aides, fuel and equipment

Matching Contribution Amount:	$15,820.00
Type:	In-kind
Status:	Pledged
Source:	WRA, Inc.
Source Type:	Non-Federal
Description:	Support for preparing plan and implementing objectives, fuel and equipment.

Total Amount of Matching Contributions:	$84,217.13

EasyGrantsID: 70713

National Fish and Wildlife Foundation – San Francisco Bay Estuary Conservation Fund 2020, Full Proposal

Title: Future of the Salt Marsh Harvest Mouse and other native wetland species in the San Francisco estuary: tracking an inevitable decline or guiding a resilient response? Phase 2

Organization: Suisun Resource Conservation District

The following pages contain the uploaded documents, in the order shown below, as provided by the applicant:

Upload Type	File Name	Uploaded By	Uploaded Date
SF Bay Estuary Full Proposal Narrative	2020 Full Proposal Project Narrative SMHM 14 Aug 2020 changed section numbers no highlights 3Dec2020.docx	Takekawa, John	12/04/2020
Project Map	ProjectMap.jpg	Takekawa, John	08/14/2020
Letters of Support	Letters of Support Combined.pdf	Takekawa, John	08/13/2020
Resumes	Resumes.docx	Takekawa, John	08/14/2020
Board of Trustees, Directors, or equivalent	Board+of+Directors+--+Suisun+Resource+Conservation+District.pdf	Takekawa, John	08/13/2020
Statement of Litigation	Statement of Litigation -- Suisun Resource Conservation District.docx	Takekawa, John	08/13/2020
Other Documents	IRS 990 -- Suisun Resource Conservation District.docx	Takekawa, John	08/13/2020
Other Documents	Conflict of Interest Disclosure -- Suisun Resource Conservation District.docx	Takekawa, John	08/13/2020
Other Documents	Certificate of Good Standing -- Suisun Resource Conservation District.docx	Takekawa, John	08/13/2020
Other Documents	SRCD- Insurance Policy Cover pages.pdf	Takekawa, John	08/13/2020
Other Documents	All_Figs.pdf	Takekawa, John	08/14/2020
Other Documents	References.pdf	Takekawa, John	08/14/2020

The following uploads do not have the same headers and footers as the previous sections of this document in order to preserve the integrity of the actual files uploaded.

Full Proposal Project Narrative

Instructions: Save this document on your computer and complete the narrative in the format provided. The final narrative should not exceed eight (8) pages; do not delete the text provided below. Once complete, upload this document into the on-line application as instructed. For additional guidance on how to complete the narrative, reference the Application Information section of the RFP.

1. **Invitation:** Provide the name and contact information (phone number and email) for the representative of NFWF or the State or Federal agency that invited you to submit this proposal.

Anne Mankowski, Tidal Marsh Recovery Coordinator, U. S. Fish and Wildlife, 916-930-5673, anne_mankowski@fws.gov; Joy Albertson, Supervisory Biologist, San Francisco Bay National Wildlife Refuge Complex, 510-792-0222 x131, joy_albertson@fws.gov

2. **Project Goals and Objectives:** What are the purposes and objectives of the project? Describe how the project objectives benefit the Fund Area. What are the expected short-term net benefits to natural resources in the Fund Area and long-term measurable outcomes? How does the project measurably contribute to a priority natural resource outcome? If this project is a continuation or expansion of an existing project, describe the status and results/outcomes achieved to date. If the proposed work requests funding for an initial planning or design phase of a project, please describe any anticipated plans for project implementation and funding in the future.

Protections for the endangered salt marsh harvest mouse (SMHM: *Reithrodontomys raviventris*; see Fig. 1) and other estuary dependent wetland species strongly influence development decisions and restoration actions throughout the estuary. However, mouse populations are poorly documented in much of the estuary and existing surveys are not well-coordinated or comparable which remains a critical information gap. A comprehensive effort to survey and monitor the SMHM in a single year has never been undertaken (see Fig. 2). Small mammals such as SMHM are sensitive to effects of habitat degradation, such as those caused by sea-level rise. Regular surveys should document population declines from coastal squeeze effects of urban growth and sea-level rise that cause marsh drowning (Takekawa et al. 2006, Thorne et al. 2018). Our project will be directed at developing an estuary-wide small mammal survey with a focus on the SMHM that may be used to proactively guide a resilient response to management challenges into the future.

We are conducting this project in two phases. In Phase 1 of our project, we commenced upon three objectives to prepare for a range-wide SMHM survey. We have drafted a plan for implementing the survey including the protocols for collection of genetic material for identification and population delineation, spatial tools through ArcGIS online for digital data collection, a spatial dataset of all likely distinct SMHM populations throughout the species range, and first use of sophisticated capture-mark-recapture analyses to estimate SMHM densities and demographics (sensu Smith et al. 2020). We piloted capture efforts in areas that have never been trapped or have not been trapped in the last decade. We acquired a digital elevation model (DEM) from a 2018 LiDAR flight of Suisun Marsh which provided unique high-resolution surface elevations and vegetation structure (Buffington and Thorne 2019; Buffington et al. 2019; Fig. 3). We also obtained older LiDAR information to complete similar models for the South, Central, and San Pablo Bays, and with these datasets, we have initiated analyses to examine SMHM habitat selection. Finally, we requested or obtained information for all known SMHM datasets as a first step in developing a comprehensive summary of all capture histories, and centralized database of survey data.

In Phase 2 of our project, the consortium of SMHM experts will conduct the first single-season, range-wide SMHM survey. We will collect genetic samples (see Fig. 4) from all animals to confirm

identification and contribute to a library of genetic samples for analysis of population variation. Hair samples will be collected for an assessment of methyl-mercury concentrations that will be analyzed by USGS (Ackerman, under separate funding). Finally, we will use newly developed analyses and databases developed during Phase 1 and 2 to create heat maps indicating the largest population centers and identifying genetically distinct groups. The findings from this study will provide information supporting several goals within the Tidal Marsh Recovery Plan (USFWS 2013) and will identify priority areas to increase resiliency of regional SMHM populations (Fig. 5) and populations of other species that use similar habitats. In addition, findings from this study will allow managers to better guide restoration and management actions to benefit SMHM and the entire small mammal community which also serve as prey for many predators in the estuary food web.

This work will be conducted by several governmental and nongovernmental partners including the Suisun Resource Conservation District, California Department of Fish and Wildlife, East Bay Regional Parks, U. S. Fish and Wildlife Service, and U. S. Geological Survey, University of California Davis, California State University San Marcos, and several nongovernmental groups led by WRA, Inc. with specialized expertise and permits for SMHM surveys. The proposed project is timely in providing critical information for adaptive management of estuarine wetland species that will influence the future of estuary development and restoration through the end of the century.

The primary objectives of Phase 2 are to:

1. Conduct the first comprehensive range-wide survey of the Salt Marsh Harvest Mouse (SMHM) and other small mammals in the San Francisco estuary.
2. Generate a genetic database of SMHM across their range to examine identification, metapopulation structure, and assess accuracy of viable habitat areas (VHAs) identified for their recovery.
3. Complete a comprehensive range-wide SMHM report including recommendations to inform the Tidal Marsh Recovery Plan and suggest a long-term monitoring strategy to guide conservation management to improve their resilience to effects of global change.

3. **Scope of Work:** Elaborate on the primary tasks and activities that will be employed through the project. Restoration and enhancement of wetlands is a primary focus for regional conservation in the San Francisco Bay estuary to benefit fish, wildlife, and habitats. However, it is a challenge for the environmental community to prioritize which areas should be restored or enhanced first to achieve the greatest multispecies benefits. The threat of escalating climate effects and increasing human development has increased the urgency of determining which areas should be prioritized for conservation action with the limited available funding. A recent regional assessment (Goals Project 2015) has suggested that actions in the next two decades will be a critical period to shape the future of the biodiversity of the estuary.

Earlier efforts to prioritize restoration actions have followed general principles of landscape ecology to maximize connectivity of wetland parcels, support habitat corridors, and create the largest contiguous areas to support the most resilient populations (Goals Project 1999). Results from this proposed project and previous similar analyses for the federally and state endangered California Ridgway's Rail (*Rallus obsoletus*: RIRA; Liu et al. 2012, Nur et al. 2016, Wood et al. 2016, Wood et al. 2017), and state endangered California Black Rail (*Laterallus jamaicensis*: CBR; Girard et al. 2010), and analyses currently underway for the federally endangered Soft bird's-beak (*Chloropyron molle* subsp. *molle*) and Suisun thistle (*Cirsium hydrophilum* var. *hydrophilum*) will help managers prioritize actions for multi-species benefits across the bay and estuary.

The lack of coordinated surveys has resulted in uncertainty about the key areas for conserving SMHM, as only about 30% of potential SMHM habitat has been surveyed with live trapping (Fig. 2), and data spanning more than 30 years indicated that most locations have not been regularly surveyed (Smith et al. 2018a). For example, SMHM have been considered obligate to tidal marsh habitats, but recent analyses clearly demonstrate that they are capable of inhabiting managed wetlands (Smith et al. 2019; Fig. 3). In addition, surveys to capture SMHM provide information on several other species including desirable native species (e.g. California vole: *Microtus californicus*) as well as non-native urban invasives (e.g. house mice, *Mus musculus*). Protection for the SMHM strongly influences development and restoration decisions throughout the estuary, but the lack of range-

wide surveys is a critical information gap to inform on-the-ground activities, as potential occupancy by SMHM is usually unknown (Smith et al. 2018b).

Rather than tracking an inevitable SMHM population decline expected with regional growth and marsh drowning with sea-level rise (Takekawa et al. 2006, Thorne et al. 2015, Thorne et al. 2018), we propose this work to proactively guide a resilient response. We are conducting this project in two phases. In the first phase, we have worked with a consortium of government, university, and nongovernmental SMHM permitted experts to develop the first comprehensive range-wide monitoring and assessment plan and pilot work in areas where captures have not been previously or recently undertaken. We have incorporated two recently developed digital elevation models (Fig. 3) that provide unique datasets of high-resolution surface elevations and vegetation structure (Buffington and Thorne 2019; Buffington et al. 2019) to examine SMHM habitat relationships.

This work is being conducted by a team of several governmental and nongovernmental partners including the Suisun Resource Conservation District, California Department of Fish and Wildlife, East Bay Regional Parks, U. S. Fish and Wildlife Service, and U. S. Geological Survey, colleges and universities, and consultants led by WRA, Inc. with specialists permitted for SMHM surveys. Phase 1 of this project is providing critical information for undertaking a comprehensive survey that will support adaptive management of estuarine wetland species influencing the future of estuary development and restoration through the end of the century, and Phase 2 will examine the SMHM and other small mammals in a range-wide approach that has never been done in the more than five decades since listing.

i. Provide a comprehensive narrative statement that describes the methodology that will be used to complete the Scope of Work. This methodology should detail and thoroughly describe the primary tasks, the activities and deliverables associated with each task, and how each task will address the objectives and target outcomes described above. If applicable, describe any planning, design/engineering, and permitting that will be required prior to beginning any project construction and how the project team will complete those necessary steps and obtain all relevant permits.

Procedures to Accomplish Obj. 1: Conduct first comprehensive range-wide survey of SMHM and other small mammals in the San Francisco estuary.

We will conduct surveys at different sites in the same season (Aug-Oct), and in doing so, we will reduce the effect of interannual variation. In this case, the first range-wide survey would provide critical information for mapping the distribution and relative size of SMHM populations. It will allow us to identify areas where the species is thriving as well as marshes where SMHM are rare or absent. Genetic samples will augment ongoing UC Davis genetic analyses (Statham; see Fig. 6), and hair samples will be taken to examine spatial variation in Hg concentrations and population health (Ackerman; USGS).

Results from mark-recapture sampling across and throughout the range of the species in a short period will provide an index of relative densities and indicate areas of strength for the species as well as areas that may not be sustainable in the future. Mark-recapture data will be used in a number of analyses including general demographic and population estimates (e.g., survival models using RMark in program R; Laake et al. 2013; Fig. 7), community occupancy modeling (e.g., single-season multi-species occupancy models, MacKenzie et al. 2006), and, when coupled with the genetic and LiDAR data, landscape-metapopulation dynamics (e.g., spatially explicit metapopulation models; Howell et al. 2018).

Although habitat use and preferences of SMHM have been investigated at small, individual sites relatively extensively (most recently in Marcot et al 2020), there has never been an effort to perform this kind of assessment at a regional scale. A regional approach is vital in the SF Bay estuary where habitats range from highly saline pickleweed and cordgrass marshes in the South Bay to almost-fresh marshes dominated by highly diverse brackish plant assemblages in the upper estuary. A regional approach is especially important in light of new data that indicates that winter precipitation levels and patterns may have a strong effect on annual populations (Smith and Barthman Thompson; pers. comm.); thus, comparing habitat studies across sites and years is challenging.

By understanding which marshes support large, resilient populations of SMHM, as well as marshes where populations are struggling or absent, we will be able to identify landscape characteristics that do or do not support SMHM and incorporate this knowledge into future recovery efforts. Also, knowing where suitable but unoccupied marshes exist may allow managers to prioritize implementation of conservation actions for these potentially important areas. This is especially important in the South Bay,

where populations are already small, isolated, and genetically depressed. Maximizing the number of evolutionary distinct populations (even if they are smaller) to maintain resilience should be prioritized alongside protecting existing large populations.

Procedures to Accomplish Obj. 2: Generate a genetic database of SMHM across their range to examine identification, metapopulation structure, and assess accuracy of viable habitat areas (VHAs) identified for their recovery;

Genetic analyses that span the breadth of the species range will help to identify genetically distinct populations, as well as the degree of connectivity and gene flow (Fig. 6) will be undertaken under the guidance of Dr. Statham. We will include genetic analyses of SMHM from relic wetlands that have not been sampled recently or have never been sampled, especially in the Central Bay, where the putative subspecies dividing line occurs.

A major component of this research will be an accurate assessment of the species range within the estuary. Recent genetic research found low accuracy (50.9%) in differentiation of SMHM from sympatric western harvest mouse (*R. megalotis*) from surveys in the southern part of the range (Statham et al. 2016), thus highlighting the need for genetic identification to species, especially within the range of the southern SMHM. A database of the individual and population genetics will be generated, and spatial analysis of the genetic diversity will be compared to the boundaries of the VHAs identified in the recovery plan (USFWS 2013) to determine if the putative 150-acre threshold for a self-sustaining population is supportable. Genetic analysis of metapopulation structure will allow for accurate identification of effective barriers to dispersal which in turn will allow managers to implement habitat enhancement or restoration to facilitate population connectivity.

Procedures to Accomplish Obj. 3: Complete a comprehensive range-wide Survey and Monitoring Assessment Report including recommendations to inform the Tidal Marsh Recovery Plan and suggest a long-term monitoring strategy to guide conservation management and improve their resilience to effects of global change.

The mark-recapture and genetic samples will allow for prioritized implementation of Tidal Marsh Recovery Plan actions, restoration planning, and other activities that focus resources on genetic segments which conserve unique genetic diversity and to identify where effective population size may be adequate to prevent local extirpation. Combined with results from habitat and elevation studies (Phase 1, Obj. 2), we will discuss the benefit of specific actions to increase resiliency including thin-layer placement, erosion control, levee management, habitat refugia elements, and upland enhancements (Goals Project 2015, Thorne et al. 2019).

The resulting Survey and Monitoring Assessment Report also will inform multi-species management through synthesis with existing efforts for other species incorporating the vulnerability of marshes to climate change. For example, abundance estimates (Liu et al. 2012, Nur et al. 2016, Wood et al. 2016) and genetic analyses (Wood et al. 2017) for California Ridgway's Rail may indicate in which marshes sustainable populations of SMHM and California Ridgway Rail coexist, focusing conservation efforts to those wetlands where both species will benefit. Similarly, studies of genetic diversity in California Black Rail (Girard et al. 2010) have revealed population differences in separate areas of the estuary, and SMHM may be found to have distinct populations in the same areas.

Recent projections from climate change studies suggest that the next 1-2 decades will be a critical period for determining the fate of many ecosystems and species (see Goals Project 2015). However, recovery actions and planning units, such as VHAs, were established for SMHM in the absence of a full understanding of the range-wide health (demographic and genetic) and ecology of the species, a research need that is relatively straight-forward for a species that occurs in only a single estuary. Speculation that 150 acres was necessary to sustain a population of SMHM is the basis of the VHA concept, although this assumption has never been scientifically verified (USFWS 2013). The rudimentary information currently available for the SMHM prevents strategic planning to identify and manage for the populations that are most likely to persist into the future. The Survey and Monitoring Assessment Report will guide future research and monitoring, and inform regulatory documents and actions such as the upcoming 5-year review and planned restoration projects.

ii. Provide a comprehensive narrative statement that describes how the activities and deliverables associated with each task in the Scope of Work relate to established plans (management, conservation, recovery, etc.) and priority conservation needs in the specific project location.

USFWS Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California: SMHM are one of five federally listed focal species addressed in the USFWS Tidal Marsh Recovery Plan (USFWS 2013) which addresses recovery of tidal marsh habitat relative to all five federally listed species and considers multiple non-focal species. The Survey and Monitoring Assessment Report will inform 5-year updates of the Tidal Marsh Recovery Plan and any SMHM survey plan for recovery (see USGS, UCD, and CDFW support letters).

Suisun Marsh Habitat Management, Preservation, and Restoration Plan (SMP): the SMP was completed in 2014. Implementation will occur over a 30-year period and is intended to balance benefits of tidal wetland restoration (5,000-7,000 ac) and managed wetland enhancements (50,000 ac), maintain heritage of waterfowl hunting, improving water quality for fish and wildlife habitat, and providing other recreational opportunities. Data from the Survey and Monitoring Assessment Report will be used to update the SMP Adaptive Management Plan and inform ongoing restoration. (See SRCD support letter).

Baylands Ecosystem Habitat Goals Project Update (BEHGU): the Baylands Ecosystem Habitat Goals Project serves as a guiding document for restoration and preservation of the diverse aquatic tidal habitats of San Francisco Bay and provides an overview of challenges for tidal habitats and establishes acreage goals for wetland restoration. The Survey and Monitoring Assessment Report will provide critical information useful as a foundation for future program updates. (See SFBJV and WRA support letters)

Bay Conservation and Development Commission (BCDC) Suisun Marsh Protection Plan (SMPP): the objectives of the SMPP are to preserve and enhance the quality and diversity of the Suisun Marsh aquatic and wildlife habitats and retain adjacent upland areas in uses compatible with its protection and address local management plans and concerns. The Survey and Monitoring Assessment Report will inform the upcoming update of the SMPP and all local protection plans.

BCDC San Francisco Bay Plan (SFBP): their mission is to protect and enhance San Francisco Bay and to encourage responsible and productive use for this and future generations. The Survey and Monitoring Assessment Report will inform the upcoming update of the SFBP and all associated local protection plans with respect to future land use and climate change.

San Francisco Bay Joint Venture (SFBJV): work to ensure the existence of the diverse habitats necessary to sustain migratory bird populations for the benefit of those species, resident wildlife and the public. The information obtained in this project will support the restoration goals of the SFBJV including the recent update to the implementation plan. It provides information that will help in prioritization of proposed restoration projects (see SFBV Coordinator and Board support letters).

South Bay Salt Pond (SBSP) Long-Term Restoration Project: Mission, Goals, Guiding Principles, and Objectives: South Bay Salt Pond Restoration Project is the largest wetland restoration project on the west coast. The outcomes of this study can guide restoration priorities and design elements to benefit wildlife population diversity and repopulation of restored tidal marshes.

4. **Project Schedule:** The project schedule should be detailed and should describe the primary tasks, deliverables, and milestones, as well as the planned project completion date.

This project was designed to be undertaken in 2 Phases, where completion of development in Phase 1 will be followed by the range-wide survey in Phase 2. In Phase 2, the single-season, estuary-wide coordinated survey will be conducted followed by analyses of the new and historic datasets with genetic and population information. Analysis will include habitat analyses to assess sea-level rise threats and population resiliency through assessment of habitat occupancy and population size.

Phase 2: 1 Apr 2021 – 30 Sep 2022 (prep Apr-Jul; baywide survey—Aug-Oct; analysis Nov-Sep)

Schedule of Phase 2 Tasks by Objective (4/1/21 - 9/30/22)	**Q1** 4/21-7/21	**Q2** 7/21-10/21	**Q3** 10/21-1/22	**Q4** 1/22-3/22	**Q5** 4/22-6/22	**Q6** 7/22-9/22
Obj 1, Task 1: Amend Existing NFWF Contract with SRCD to add Phase 2	X	X				
Obj 1, Task 2: Conduct Coordination Mtgs	X	X	X	X	X	
Obj 1, Task 3: Provide Funding Agreements for Consortium Members	X	X				
Obj 1, Task 4: Conduct Range-wide Survey	X	X				
Obj 1, Task 5: Collate Survey Datasets			X	X	X	
Obj 1, Task 6: Analyze all Survey Data				X	X	X
Obj 2, Task 1: Collect Genetic Samples	X	X				
Obj 2, Task 2: Analyze Genetic Samples		X	X	X		
Obj 2, Task 3: Summarize Genetic Analyses, and Complete Report			X	X	X	
Obj 3, Task 1: Examine viable habitat areas with population and genetic data			X	X	X	X
Obj 3, Task 2: Complete Recommendations for Long-term SMHM Management			X	X	X	X
Obj 3, Task 3: Complete Comprehensive Report/Publication, Disseminate Results					X	X

The Phase 2 work will be initiated in April 2021 with final preparation for the comprehensive range-wide survey. Quarterly updates will be provided to the Tidal Marsh Recovery Plan liaison.

5. **Project Monitoring:** Project proposals are encouraged to include means of measuring, as appropriate, the effectiveness of the project (as against baseline conditions, etc.) in providing net benefits to the Fund Area. Proposals should address the manner in which the project is expected to deliver additive or net benefits to the Fund Area, including measurement of those benefits. Costs associated with collecting the data necessary to complete measurement and/or monitoring requirement may be included in the overall project budget, as appropriate. Applicants are encouraged to utilize standard monitoring protocols adopted by governmental resource agencies to facilitate integration of project results with larger ecosystem conservation efforts in the Fund Area.

For Phase 2 of our study (1 April 2021 to 30 September 2022), the following project monitoring and tracking metrics will be followed to determine if the goals of this project have been achieved.

Obj 1, Task 1: Amend existing NFWF - SRCD Contract: SRCD will work with the NFWF coordinator to modify the existing contract, successfully adding support to complete Phase 2.

Obj 1, Task 2: Coordination Meetings: coordination meetings will be held monthly online for team members with two or more coordination meetings with all SMHM experts and partners in person or online.

Obj 1, Task 3: Provide Funding Agreements for Consortium Members: agreements will be completed with ~5-10 permitted individuals to assist with conducting the range-wide survey.

Obj 1, Task 4: Conduct Range-wide Survey: fieldwork will be conducted at least 6 selected sites per month and include collecting genetic and contaminant samples.

Obj 1, Task 5: Collate Survey Datasets: survey data will be collected, edited, and input into a centralized database. At the end of each month, data will be summarized, reviewed, and edited as necessary.

Obj 1, Task 6: Analyze all Survey Data: mark-recapture data from the range-wide survey will be reviewed and summarized and when feasible, compiled and analyzed with the larger existing datasets. Analyses will include population estimates, calculations of demographic parameters, and occupancy modeling.

Obj 2, Task 1: Collect Genetic Samples During Range-wide Survey: permitted individuals will accompany survey teams to collect genetic samples during surveys at each location. At least 50% of captured animals will be sampled with a goal of sampling 100% of captured animals.

Obj 2, Task 2: Analyze Genetic Samples: following surveys, Dr. Mark Statham (UC Davis Mammalian Ecology and Conservation Unit) will analyze samples in his genetics laboratory to confirm species identification and to determine genetic connectivity among populations.

Obj 2, Task 3: Summarize Genetic Library and Complete Report: with the assistance of the SRCD analyst, Dr. Statham will prepare a genetic database of SMHM throughout its range and a report explaining the results relating the findings to conservation and recovery of the species. The analyses will be presented periodically to the SMHM Workgroup to consider its use in management and recovery actions.

Obj 3, Task 1: Examine the Accuracy of Viable Habitat Areas with Population and Genetic Data: genetic data will be used to verify and refine boundaries between populations and investigate true minimum acreage for a VHA to support a genetically and demographically healthy SMHM population. Analyses will be periodically discussed with the Tidal Marsh Recovery Team to consider its utility for recovery actions.

Obj 3, Task 2: Complete Recommendations for Long-term SMHM Management: results from Phase 2 of the project will be synthesized into a report to support species recovery and habitat restoration and enhancement recommendations of the U.S. Fish and Wildlife Service. The Salt Marsh Harvest Mouse Workgroup will be consulted periodically during the project to discuss their needs for recovery actions.

Obj 3 Task 3: Complete Comprehensive Monitoring Plan/Report/Publication, Disseminate Results: a long-term monitoring plan will be created in Phase 2 from the systematically sampled SMHM populations to effectively track local population decline or extirpation of populations, colonization of uninhabited or restored habitat patches, and assessment of genetic health. This monitoring plan will also be prepared as an outward facing report to be disseminated to practitioners throughout the estuary. It will be published in the San Francisco Estuary and Watershed Science or other searchable scientific journal so it is readily available. Results will be presented at 2 or more regional conferences, symposia, and meetings (see meetings below).

6. **Research/Management Implications:** Describe how the project results will be used to help protect, enhance or restore natural resources in the Fund Area. If the project is part of a larger program, please describe the larger program and how this component is integrated.

This project will undertake the first comprehensive range-wide survey for the SMHM in a single year. It will establish a standard protocol to collect comparable data on the diverse small mammal surveys throughout estuary tidal wetlands and will improve estuary coordination between participating researchers and managers for fostering creative solutions. It will complete an ongoing genetic catalog across the range and will allow for examination of population genetic differences. It will provide a baseline for small mammals in the estuary, and it may be used to identify areas most threatened by climate change effects and coastal squeeze. This project was invited by and coordinated with the USFWS tidal marsh recovery coordinator, and the findings will support several goals in the Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California (USFWS 2013) including improved monitoring (Sections 3.0, 3.1.1, 3.1.2.6, 3.2.1), implementing ecological studies (4.2.7), genetic research (4.3), climate change effects (4.4.7), and contaminants (4.5.2). The results will support a resilient response by area and development of a better estimate of the overall population. It will identify metapopulation segments and priority areas to increase resiliency including the potential for translocation or reintroduction. It will reveal those segments and areas which will be most influential for sustaining the overall population into the future, and outreach efforts will bring the species to the attention of the public.

7. **Dissemination/Community Involvement:** Describe in detail your strategy for communicating project results. Describe any benefits to local communities, including educational values and stewardship benefits, of the project.

Results will be regularly shared with the Salt Marsh Harvest Mouse Workgroup, USFWS Tidal Marsh Recovery Plan Recovery Implementation Team, CDFW, SMP, SFJV, SBSP, BEHGU, BCDC, and other interested parties. We will present at regional meetings including the biennial Bay-Delta Science Conference and the State of the Estuary Conference. In addition, we will hold brown bag presentations at State and Federal offices, and other agencies at their request. Survey results will be shared with the CDFW California Natural Diversity Database and the USFWS Tidal Marsh Recovery Plan.

To inform and engage the public, a website (http://saltmarshharvestmouse.org; Fig. 8) is being developed to provide popular science content for the public, including literature and worksheets aligning with California public education curriculum for elementary and high schools, as well as literature written for adults who wish to be informed about the SMHM, its community, and its habitat. The website will also feature more technical content for undergraduate and graduate level students, other academic researchers, managers, environmental consultants, and other entities. Technical

content will include an annotated bibliography, a fact sheet prepared by the interagency SMHM Workgroup, and other professional level resources. This information and photos will also be available for public trails and kiosks.

8. **Project Team:** What organizations, entities, or subcontractors comprise the project team? What is the expertise and prior experience of the project team in accomplishing similar projects? The names of the project manager, subcontractors and/or those providing technical guidance, along with their qualifications for involvement in the project, must be stated. Provide an organizational chart that identifies the individuals responsible for the completion of each task of the Scope of Work and illustrates lines of authority.

Josh Ackerman, PhD - contaminant lead >20 yrs on SF Bay contaminants; USGS WERC, res. biol.
Joy Albertson, MS - refuge coordinator >20 years SMHM experience; SF Bay NWRC, supervisory biologist.
Laureen Barthman-Thompson, BS - capture and CDFW area lead with >20 years SMHM capture experience in Suisun Marsh; DFW Suisun Marsh Compliance & Monitoring Unit environmental scientist.
Chase Freeman, MS - mammal biologist analyst, > 10 years experience; USGS WERC, biologist.
Anne Mankowski, MS - project liaison with more than 25 years of recovery experience; USFWS Bay-Delta Fish and Wildlife Office, USFWS tidal marsh recovery coordinator.
Adrian Rus, PhD (2020) – wildlife biologist analyst, expert in GIS and R-coding for population analysis.
Katie Smith, PhD - project coordinator with UCD SMHM dissertation; WRA, Inc., wildlife biologist.
Mark J. Statham, PhD - genetics lead, 18 years in population genetics; UCD associate researcher.
John Y. Takekawa, PhD - admin lead with >35 yrs experience on applied studies in SF estuary; Suisun Resource Conservation District, operations manager.
Karen M. Thorne, PhD - climate lead with >10 years studies and publications on climate effects, USGS Western Ecological Research Center, supervisory research biologist.

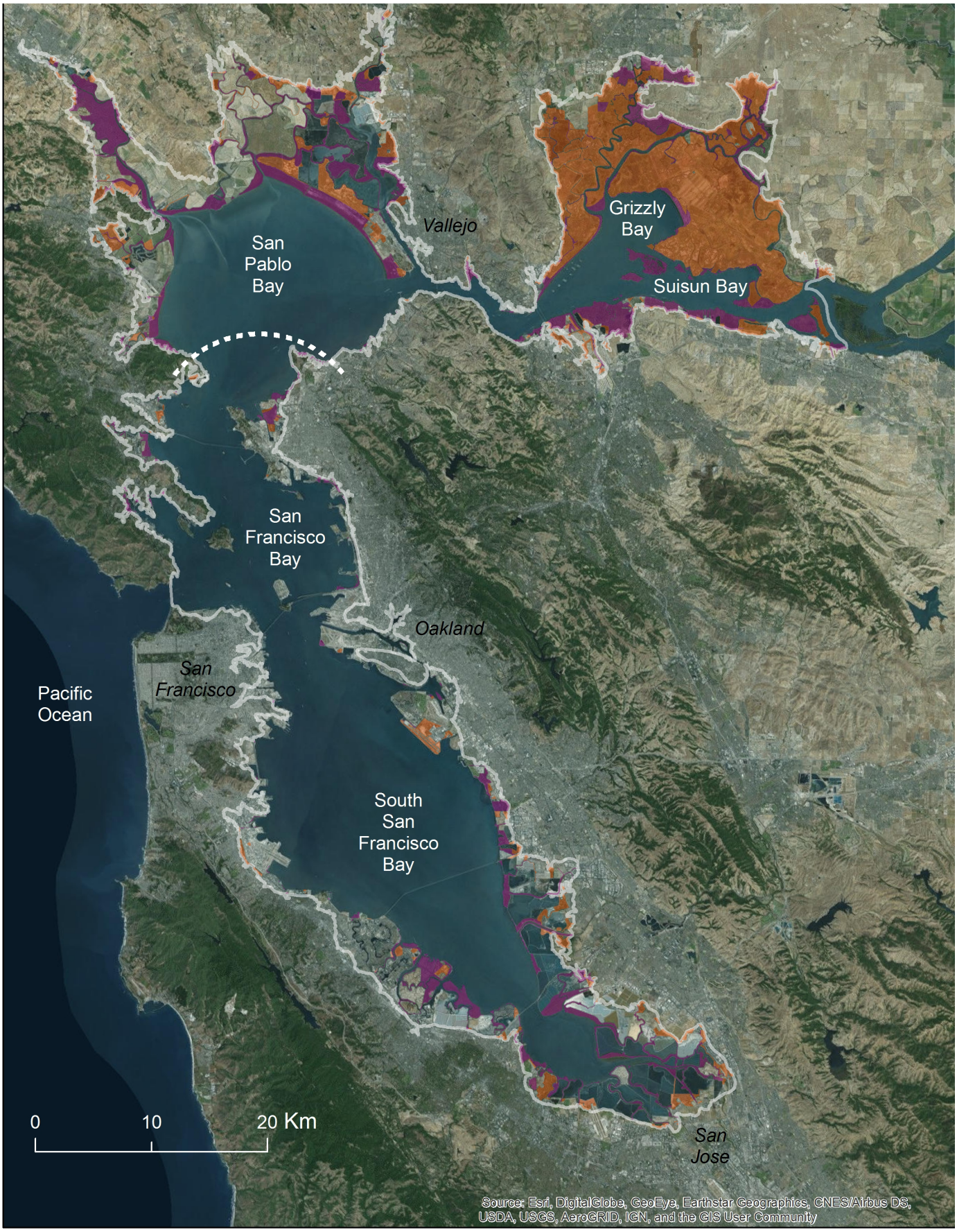
Team Roles: Takekawa (SRCD) will have the role of administering the project; Barthman-Thompson (DFW) and Smith (WRA) will lead the fieldwork; Mankowski and Albertson (USFWS) will support agency coordination; Smith (WRA) will lead population analyses with analyst Rus (SRCD); Thorne and Freeman (USGS) will study climate effects; Statham (U. C. Davis) will assess genetics, and Ackerman (USGS) will lead contaminant analyses. Team coordination meetings will be held every 1-3 months during the project.

9. **Partnerships:** If the project is a cooperative effort with other agencies or organizations, please identify the other partners and describe their role in the project. Also, define the degree of funding participation by partners in the overall project, what the level of responsibility will be for the SF Bay Fund's component, and whether/how the other components may impact successful completion of the SF Bay Fund's portion of the comprehensive effort.

Cliff Feldheim, Branch Chief, Suisun Marsh Program, Department of Water Resources; DWR coordination
Rachel Tertes, USFWS (Don Edwards SFB NWR), South Bay refuge fieldwork.
Meg Marriott, USFWS (USFWS, San Pablo Bay & Marin Islands NWRs), North Bay refuge fieldwork
Karen Taylor, CDFW (Napa-Sonoma Marshes Wildlife Area), North Bay CDFW fieldwork
John Krause, CDFW (Eden Landing Ecological Reserve), Central Bay CDFW fieldwork
Dave Riensche, East Bay Regional Parks, Central Bay fieldwork
Melissa Riley, CDFW, Suisun Marsh, Suisun Marsh fieldwork
Diego Sustaita, CSU San Marcos, behavioral ecology
Isa Woo, USGS Western Ecological Research Center (WERC), North Bay fieldwork
Mike Casazza, USGS WERC, Tidal Marsh Recovery Plan recovery implementation team leader
Sarah Estrella, CDFW, Suisun Marsh, Suisun Marsh fieldwork
Steve Chappell, SRCD, Executive Director, Suisun Marsh coordination

10. **Other (Optional):** Provide any further information important for the review of this proposal.

The NFWF SF Bay Estuary Conservation Fund is one of the only funding sources that is suitable for supporting this critical project, so we are pleased to work with the program coordinator to develop the 2-phase approach. Since its inception, the project was designed to be conducted in 2 steps: Phase 1 would develop the survey design protocol, coordinating pilot trapping efforts to capture in new areas, analyzing capture information with new elevation and habitat structure data, and synthesizing older results collated in a comprehensive database to develop heat maps highlighting areas of strength or vulnerability (source-sink areas). Phase 2 would conduct the survey, collect genetic data and contaminant information, and analyze the results to establish a baseline for future regular surveys and to support recovery and management. Undertaking the work in Phase 1 proved that the project was feasible, and Phase 2 work was designed to build upon its results. The overall result from Phase 1 and Phase 2 will be to provide the first range-wide survey for SMHM, develop a genetic database across their range, and complete a range-wide SMHM and small mammal report. It will be a critical source of information to support the Tidal Marsh Recovery Plan and other conservation efforts in the estuary.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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS,
USDA, USGS, AeroGRID, IGN, and the GIS User Community

SAN FRANCISCO BAY JOINT VENTURE

4200 Park Blvd #143
Oakland, CA 94602
415-699-3586

August 3, 2020

Ms. Anne Butterfield, Senior Manager
San Francisco Bay Estuary Conservation Fund
National Fish and Wildlife Foundation
90 New Montgomery Street, Suite 1010
San Francisco, CA 94105

Re: Letter of Support for proposal "Future of the Salt Marsh Harvest Mouse and other native wetland species in the San Francisco estuary: tracking an inevitable decline or guiding a resilient response?"

Dear Ms. Butterfield,

I am writing this letter in support of the proposal entitled "Future of the Salt Marsh Harvest Mouse and other native wetland species in the San Francisco estuary: tracking an inevitable decline or guiding a resilient response?" submitted to the National Fish and Wildlife Foundation San Francisco Bay Estuary Conservation Fund. The San Francisco Bay Joint Venture strongly supports the proposed study to develop a monitoring and assessment program for the salt marsh harvest mouse and other secretive tidal marsh wildlife species. Protections for the mouse and other estuary wetland species strongly influence development decisions and restoration actions throughout the estuary. However, mouse populations are poorly documented in much of the estuary and existing surveys are not well-coordinated which remains a critical information gap.

The SFBJV is a partnership of non-governmental organizations, utilities, landowners and non-voting agencies with a goal to acquire, restore and enhance all types of wetlands, which provide benefits to birds, fish, and other wildlife in the San Francisco Bay Area. The SFBJV is one of twenty-two federally-sponsored habitat Joint Ventures to implement the North American Wetlands Conservation Act and federal bird conservation plans. The SFBJV Implementation Plan, *Restoring the Estuary* targets nearly 200,000 acres of wetlands, subtidal habitats, seasonal wetlands, and riparian habitats for protection, restoration, or enhancement through our partners' funding and expertise. The SFBJV Management Board consists of 26 agencies and private organizations whose members agree to promote the goals and objectives of SFBJV and who represent the diversity of wetland interests found in the San Francisco Bay region. The SFBJV has been involved in the Tidal Marsh Recovery Plan Implementation Team since its inception. Regional habitat and wildlife monitoring and assessment, are among the highest priorities of the SFBJV partnership because of their importance in informing management and conservation actions.

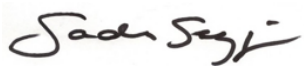
This proposal represents the first effort of government and non-government partners to work together and address the lack of comprehensive information about the mouse and other similar species through a unified assessment and survey approach. The overall goal of the project is to develop a map of current population hotspots

and conduct a coordinated estuary-wide survey to determine which areas are most resilient to the dual estuary threats of urban development and a changing climate. These findings should identify key areas for future conservation and to help us understand how and where we can respond.

The project has been designed to be completed in two phases. In Phase 1, work was initiated to include compilation and analysis of existing population and habitat information, development of the estuary-wide survey approach, and test of a coordinated survey including collection of genetic samples. In Phase 2 which will be covered in this proposal, the first coordinated range-wide survey will be conducted, and the data from the surveys will be used to create a hotspot map of population centers that are most at risk or resilient from the survey and genetic sample data. This work will be conducted by the public and private partners including the Suisun Resource Conservation District, California Department of Fish and Wildlife, East Bay Regional Parks, U. S. Fish and Wildlife Service, and U. S. Geological Survey, colleges and universities, and consultants led by WRA, Inc. with specialized expertise permitted for surveys.

The proposed project is timely in providing critical information for adaptive management of estuarine wetland species that will influence the future of estuary development and restoration for several decades. Thus, I offer our support for this project and would appreciate your full consideration in funding the proposal. Please contact me if I can provide further information in support of the proposal.

Sincerely,



Sandra Scoggin
SFBJV Coordinator
sscoggin@sfbayjv.org

USGS
science for a changing world

U.S. Department of the Interior
U.S. GEOLOGICAL SURVEY

WESTERN ECOLOGICAL RESEARCH CENTER
Dixon Field Station
800 Business Park Drive, Suite D
Dixon, California 95620
August 1, 2020

Ms. Anne Butterfield, Senior Manager
San Francisco Bay Estuary Conservation Fund
National Fish and Wildlife Foundation
90 New Montgomery Street, Suite 1010
San Francisco, CA 94105

Dear Anne,

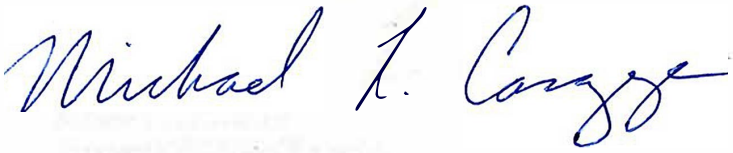
I am writing this letter in support of the Phase 2 proposal for the project entitled "Future of the Salt Marsh Harvest Mouse and other native wetland species in the San Francisco estuary: tracking an inevitable decline or guiding a resilient response?" submitted to the National Fish and Wildlife Foundation San Francisco Bay Estuary Conservation Fund. Our team at the U.S. Geological Survey strongly supports the proposed study to develop a monitoring and assessment program for the salt marsh harvest mouse and other secretive tidal marsh wildlife species. Protections for the mouse and other estuary wetland species strongly influence development decisions and restoration actions throughout the estuary. However, mouse populations are poorly documented in much of the estuary and existing surveys are not well-coordinated which remains a critical information gap.

This proposal represents the first effort of government and non-government partners to work together and address the lack of comprehensive information about the mouse and other similar species through a unified assessment and survey approach. The overall goal of the project is to develop a map of current population hotspots and conduct a coordinated estuary-wide survey to determine which areas are most resilient to the dual estuary threats of urban development and a changing climate. These findings should identify key areas for future conservation and to help us understand how and where we can respond. The results of this work will provide invaluable information relevant to the future recovery of these species as outlined in the "Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California".

The project has been undertaken in two phases. In Phase 1, work has included compilation and analysis of existing population and habitat information, development of the estuary-wide survey approach, and a succesful test of a coordinated survey including collection of genetic samples. In Phase 2, the first full coordinated survey will be conducted, and the data from the project will be used to create a hotspot map to identify parcels at risk or resilient to change including extensive new genetic data to inform the library available for the mouse. This work will be conducted by the public and private partners including the Suisun Resource Conservation District, California Department of Fish and Wildlife, East Bay Regional Parks, U. S. Fish and Wildlife Service, and U. S. Geological Survey, colleges and universities, and consultants led by WRA, Inc. with specialized expertise permitted for surveys.

The proposed project is timely in providing critical information for adaptive management of estuarine wetland species that will influence the future of estuary development and restoration for several decades. Thus, I offer my strong support for this project and would appreciate your full consideration in funding the Phase 2 proposal. Please contact me if I can provide further information in support of the Phase 2 proposal for the range-wide survey.

Sincerely yours,



Michael L. Casazza
Research Wildlife Biologist
U.S. Geological Survey

State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Wildlife Branch
P.O. Box 944209
Sacramento, CA 94244-2090
www.wildlife.ca.gov

GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

August 3, 2020

Anne Butterfield
San Francisco Bay Estuary Conservation Fund
National Fish and Wildlife Foundation
90 New Montgomery Street, Suite 1010
San Francisco, CA 94105

SUBJECT: SUPPORT FOR SALT MARSH HARVEST MOUSE PROPOSAL

Dear Ms. Butterfield,

With this letter of support, I express my strong support for the proposal entitled "Future of the Salt Marsh Harvest Mouse and other native wetland species in the San Francisco estuary: tracking an inevitable decline or guiding a resilient response?" submitted to the National Fish and Wildlife Foundation San Francisco Bay Estuary Conservation Fund. This proposal brings together agency and non-governmental partners, including the California Department of Fish and Wildlife (Department) to work together on gathering comprehensive information on the salt marsh harvest mouse and native wetland species through a unified assessment and survey approach. This work would address a critical information gap and identify key areas for future conservation efforts.

California's native wetland species and their habitats are vulnerable to many threats, including urban development and a changing climate. The salt marsh harvest mouse was listed as endangered under the California Endangered Species Act in 1971 and is designated as Fully Protected Species under California law. The lack of knowledge about the species' current distribution throughout its range is a major impediment to evaluating conservation concerns and targeting needed on-the-ground conservation action to help recover the species. The overall goal of the project is to develop a map of current population hotspots and conduct a coordinated estuary-wide survey to determine which areas are most resilient to the dual estuary threats of urban development and a changing climate.

The project was designed in two phases. In Phase 1, work was initiated to compile and analyze existing population and habitat information, develop an estuary-wide survey approach, and test a coordinated survey, including collection of genetic samples. Under Phase 2, covered in this proposal, work will include a coordinated range-wide survey, and, utilizing the survey and genetic data, create a hotspot map of population centers that are most at risk or resilient. This work will be conducted by the public and private partners including the Department, the Suisun Resource Conservation District, East Bay Regional Parks, U.S. Fish and Wildlife Service, and U.S. Geological Survey, colleges and universities, and consultants led by WRA, Inc. with specialized expertise permitted for surveys.

The proposed project is timely in providing critical information for adaptive management of native wetland species of conservation concern that will influence the future of estuary development and restoration for several decades. Thus, I offer strong support for this project and would appreciate your full consideration in funding the proposal. For further information in support of this proposal, please contact me by e-mail at Scott.Gardner@wildlife.ca.gov or by phone at (916) 801-6257.

Sincerely,

DocuSigned by:
Scott Gardner
7543E85CBE88445...

Scott Gardner, Chief
Wildlife Branch

East Bay Regional Park District
Healthy Parks Healthy People

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July 24, 2020

Ms. Anne Butterfield, Senior Manager
San Francisco Bay Estuary Conservation Fund
National Fish and Wildlife Foundation
90 New Montgomery Street, Suite 1010
San Francisco, CA 94105

Dear Anne,

I am writing this letter in support of the proposal entitled "Future of the Salt Marsh Harvest Mouse and other native wetland species in the San Francisco estuary: tracking an inevitable decline or guiding a resilient response?" submitted to the National Fish and Wildlife Foundation San Francisco Bay Estuary Conservation Fund. The East Bay Regional Park District strongly supports the proposed study to develop a monitoring and assessment program for the salt marsh harvest mouse and other secretive tidal marsh wildlife species.

The East Bay Regional Park District manages 40 miles of shoreline, which includes viable Salt Marsh Harvest Mouse habitat. Human activities have resulted in a greater than 80% loss of tidal marsh habitat in the San Francisco Bay area. This remaining habitat is particularly vulnerable to the effects of climate change, sea level rise, and extreme storm and flood events. The mouse populations are poorly documented in much of the estuary and existing surveys are not well-coordinated which remains a critical information gap.

This proposal represents the first effort of government and non-government partners to work together and address the lack of comprehensive information about the mouse and other similar species through a unified assessment and survey approach. The overall goal of the project is to develop a map of current population hotspots and conduct a coordinated estuary-wide survey to determine which areas are most resilient to the dual estuary threats of urban development and a changing climate. These findings should identify key areas for future conservation and to help us understand how and where we can respond.

The project has been designed to be completed in two phases. In Phase 1, work was initiated to include compilation and analysis of existing population and habitat information, development of the estuary-wide survey approach, and test of a coordinated survey including collection of genetic samples. In Phase 2 which will be covered in this proposal, the first coordinated range-wide survey will be conducted, and the data from the surveys will be used to create a hotspot map of population centers that are most at risk or resilient from the survey and genetic sample data. This work will be conducted by the public and private partners including the Suisun Resource Conservation District, California Department of Fish and Wildlife, East Bay Regional Parks, U. S. Fish and Wildlife Service, and U. S. Geological Survey, colleges and universities, and consultants led by WRA, Inc. with specialized expertise permitted for surveys.

The proposed project is timely in providing critical information for adaptive management of estuarine wetland species that will influence the future of estuary development and restoration. Thus, I offer our support for this project and would appreciate your full consideration in funding the proposal. Please contact me if I can provide further information.

Sincerely yours,
David "Doc Quack" Riensche

David "Doc Quack" Riensche
Wildlife Biologist II, Certified Wildlife Biologist®
East Bay Regional Park District
T: 510-544-2319 / driensche@ebparks.org

SUISUN RESOURCE CONSERVATION DISTRICT

2544 Grizzly Island Road
Suisun City, CA 94585-9539
(707) 425-9302
(707) 425-4402 FAX
srcd@suisunrcd.org
www.suisunrcd.org

August 1, 2020

Ms. Anne Butterfield, Senior Manager
San Francisco Bay Estuary Conservation Fund
National Fish and Wildlife Foundation
90 New Montgomery Street, Suite 1010
San Francisco, CA 94105

Dear Ms. Butterfield,

I am writing this letter in support of the proposal entitled "Future of the Salt Marsh Harvest Mouse and other native wetland species in the San Francisco estuary: tracking an inevitable decline or guiding a resilient response?" submitted to the National Fish and Wildlife Foundation San Francisco Bay Estuary Conservation Fund. The Suisun Resource Conservation District strongly supports the proposed study to develop an estuary-wide monitoring and assessment program for the salt marsh harvest mouse and other secretive tidal marsh wildlife species. Protections for the mouse and other estuary wetland species strongly influence development decisions, restoration actions, and adaptive management to counter future climate change throughout the estuary. However, mouse populations are poorly documented in much of the estuary and existing surveys are not well-coordinated. The lack of information is a critical information shortcoming for long-term conservation of the species.

This proposal represents the first effort of government and non-government partners to work together and address the lack of comprehensive information about the mouse and other similar species through a unified assessment and survey approach. The overall goal of the project is to develop a map of current population hotspots and conduct a coordinated estuary-wide survey to determine which areas are most resilient to the estuary threats of urban development, a changing climate, and existing habitat loss. These findings should identify key areas for future conservation and to help us understand how and where we can respond.

The project will be undertaken in two phases. In Phase 1, work was initiated in 2019 to compile and analyze existing population and habitat information, develop the estuary-wide survey approach, and test a coordinated survey on select locations including collection of genetic samples. In Phase 2 which will be covered in this proposal, the first full coordinated survey will be conducted, and the data from the surveys will be used to create a hotspot map of population centers that are most at risk or are otherwise resilient to climate effects on the basis of the surveys and genetic sample data. This work will be conducted by the public and private partners including the Suisun Resource Conservation District, California Department of Fish and Wildlife, East Bay Regional

Parks, U. S. Fish and Wildlife Service, and U. S. Geological Survey, colleges and universities, and consultants led by WRA, Inc. with specialized expertise permitted for surveys.

The proposed project is timely in providing critical information for adaptive management of estuarine wetland species that will influence the future of estuary development and restoration for several decades. In order to facilitate the project, SRCD has agreed to administer the work, as well as contributing significant support in terms of reduced indirect costs for the work and contributions of staff time. Thus, I offer my strong support for this project and would appreciate your full consideration in funding the proposal. Please contact me if I can provide further information in support of the proposal.

Sincerely yours,

Steven Chappell
Executive Director

ENVIRONMENTAL CONSULTANTS

Ms. Anne Butterfield, Senior Manager
San Francisco Bay Estuary Conservation Fund
National Fish and Wildlife Foundation
90 New Montgomery Street, Suite 1010
San Francisco, CA 94105

Dear Anne,

I am writing this letter in support of the proposal entitled "Future of the Salt Marsh Harvest Mouse and other native wetland species in the San Francisco estuary: tracking an inevitable decline or guiding a resilient response?" submitted to the National Fish and Wildlife Foundation San Francisco Bay Estuary Conservation Fund. WRA strongly supports the proposed study to develop a monitoring and assessment program for the salt marsh harvest mouse and other secretive tidal marsh wildlife species. Protections for the mouse and other estuary wetland species strongly influence development decisions and restoration actions throughout the estuary. However, mouse populations are poorly documented in much of the estuary and existing surveys are not well-coordinated which remains a critical information gap.

This proposal represents the first effort of government and non-government partners to work together and address the lack of comprehensive information about the mouse and other similar species through a unified assessment and survey approach. The overall goal of the project is to develop a map of current population hotspots and conduct a coordinated estuary-wide survey to determine which areas are most resilient to the dual estuary threats of urban development and a changing climate. These findings should identify key areas for future conservation and to help us understand how and where we can respond.

The project has been designed to be completed in two phases. In Phase 1, work was initiated to include compilation and analysis of existing population and habitat information, development of the estuary-wide survey approach, and test of a coordinated survey including collection of genetic samples. In Phase 2 which will be covered in this proposal, the first coordinated range-wide survey will be conducted, and the data from the surveys will be used to create a hotspot map of population centers that are most at risk or resilient from the survey and genetic sample data. This work will be conducted by the public and private partners including the Suisun Resource Conservation District, California Department of Fish and Wildlife, East Bay Regional Parks, U. S. Fish and Wildlife Service, and U. S. Geological Survey, colleges and universities, and consultants led by WRA, Inc. with specialized expertise permitted for surveys.

The proposed project is timely in providing critical information for adaptive management of estuarine wetland species that will influence the future of estuary development and restoration for several decades. Thus, I offer our support for this project and would appreciate your full consideration in funding the proposal. Please contact me if I can provide further information in support of the proposal.

Sincerely yours,

Justin Semion
Technical Services Director
WRA, Inc.

UNIVERSITY OF CALIFORNIA, DAVIS

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Mark Statham, PhD
Mammalian Ecology and Conservation Unit
Veterinary Genetics Laboratory
University of California, Davis
One Shields Avenue
Davis, California 95616-8744

Tel: +1-530-754-7932
Fax: +1-530-752-3556
Email: Statham@ucdavis.edu

1st August 2020

Ms. Anne Butterfield, Senior Manager
San Francisco Bay Estuary Conservation Fund
National Fish and Wildlife Foundation
90 New Montgomery Street, Suite 1010
San Francisco, CA 94105

Dear Anne,

I am writing this letter in support of the Phase 2 proposal for the project ntitled "Future of the Salt Marsh Harvest Mouse and other native wetland species in the San Francisco estuary: tracking an inevitable decline or guiding a resilient response?" submitted to the National Fish and Wildlife Foundation San Francisco Bay Estuary Conservation Fund. The Mammalian Ecology and Conservation group at UC Davis strongly supports the proposed study to develop a monitoring and assessment program for the salt marsh harvest mouse and other secretive tidal marsh wildlife species. Protections for the mouse and other estuary wetland species strongly influence development decisions and restoration actions throughout the estuary. However, mouse populations are poorly documented in much of the estuary and existing surveys are not well-coordinated which remains a critical information gap.

The proposed project would complement my ongoing research investigating the population genetics and taxonomy of the species. The proposed project would survey and take SMHM genetic samples from a diversity of locations, which would facilitate a broader assessment of the species diversity and population substructure than currently possible. The identification of discrete populations and taxonomic units is a necessary step to aid managers enact the recovery of the species through the preservation of its diversity and evolutionary potential.

This proposal represents the first effort of government and non-government partners to work together and address the lack of comprehensive information about the mouse and other similar species through a unified assessment and survey approach. The overall goal of the project is to develop a map of current population hotspots and conduct a coordinated estuary-wide survey to determine which areas are most resilient to the dual estuary threats of urban development and a changing climate. The coordinated survey will contribute to a library of genetic samples to help better define the uniqueness of different mouse populations across the estuary. These findings should identify key areas for future conservation and to help us understand how and where we can respond.

The project is being undertaken in two phases. In Phase 1, work has been completed including compilation and analysis of existing population and habitat information, development of the estuary-wide survey approach, and test of a coordinated survey including collection of genetic samples. In Phase 2 which is covered under this proposal, the first full coordinated survey will be conducted, and the data from the surveys will be used to create a hotspot map of population centers that are most at risk or resilient from the survey and will add to a genetic sample library for better understanding of distinctiveness of different populations. This work will be conducted by the public and private partners including the Suisun Resource Conservation District, California Department of Fish and Wildlife, East Bay Regional Parks, U. S. Fish and Wildlife Service, and U. S. Geological Survey, colleges and universities, and consultants led by WRA, Inc. with specialized expertise permitted for surveys.

The proposed project is timely in providing critical information for adaptive management of estuarine wetland species that will influence the future of estuary development and restoration for several decades. Thus, I offer my strong support for this project and would appreciate your full consideration in funding the proposal. Please contact me if I can provide further information in support of the proposal.

Sincerely yours,

Regards,

Mark Statham, Ph.D.

University of California, Davis

4200 Park Blvd #143
Oakland, CA 94602
415-699-3586

August 1, 2020

Ms. Anne Butterfield, Senior Manager
San Francisco Bay Estuary Conservation Fund
National Fish and Wildlife Foundation
90 New Montgomery Street, Suite 1010
San Francisco, CA 94105

Re: Letter of Support for proposal "Future of the Salt Marsh Harvest Mouse and other native wetland species in the San Francisco estuary: tracking an inevitable decline or guiding a resilient response?"

Dear Ms. Butterfield,

As a member of the Recovery Implementation Team, the San Francisco Bay Joint Venture (SFBJV) supports the proposed study to develop a monitoring and assessment program for the salt marsh harvest mouse and other secretive tidal marsh wildlife species. Protections for the mouse and other estuary wetland species strongly influence development decisions and restoration actions throughout the estuary. However, mouse populations are poorly documented in much of the estuary and existing surveys are not well-coordinated which remains a critical information gap.

The SFBJV is a partnership of non-governmental organizations, utilities, landowners and non-voting agencies with a goal to acquire, restore and enhance all types of wetlands, which provide benefits to birds, fish, and other wildlife in the San Francisco Bay Area. The SFBJV is one of the eighteen federally-sponsored habitat Joint Ventures to implement the North American Wetlands Conservation Act and federal bird conservation plans. The SFBJV Implementation Plan, *Restoring the Estuary* targets nearly 200,000 acres of wetlands, subtidal habitats, seasonal wetlands, and riparian habitats for protection, restoration, or enhancement through our partners' funding and expertise. The SFBJV Management Board consists of 27 agencies and private organizations whose members agree to promote the goals and objectives of SFBJV and who represent the diversity of wetland interests found in the San Francisco Bay region. The SFBJV has been involved in the Tidal Marsh Recovery Plan Implementation Team since its inception.

This proposal represents the first effort of government and non-government partners to work together and address the lack of comprehensive information about the mouse and other similar species through a unified assessment and survey approach. The overall goal of the project is to develop a map of current population hotspots and conduct a coordinated estuary-wide survey to determine which areas are most resilient to the dual estuary threats of urban development and a changing climate. These findings should identify key areas for future conservation and to help us understand how and where we can respond.

We endorsed Phase 1 of this project and appreciate the support provided by the NFWF San Francisco Bay Conservation Fund to initiate the work last year. The initial work was completed to establish the summarize the existing data, develop the survey methodology, and initiate pilot capture surveys to verify the methods and areas that should be covered. In order to complete the project as proposed, Phase 2 is set to follow immediately after Phase 1 this year, now that the survey teams and survey areas have been identified and carefully coordinated. The proposed project is timely in providing critical information for adaptive management of estuarine wetland species that will influence the future of estuary development and restoration for several decades with the impending challenge of climate change effects.

The SFBJV offers its support for this project and would appreciate your full consideration in funding the proposal. If you have further questions about the SFBJV support for this project, please contact our Coordinator, Sandra Scoggin.

Sincerely,

Jeff McCreary, Chair

Josh T. Ackerman
U.S. Geological Survey, Western Ecological Research Center

I am a Principal Investigator with the US Geological Survey, Western Ecological Research Center, at the University of California, Davis. My expertise is in avian ecology and ecotoxicology, and my research program focuses on the demography of breeding birds (particularly waterfowl), the ecology and management of migratory birds, contaminant exposure and effects on avian reproduction, and mercury cycling and bioaccumulation in aquatic ecosystems. I have authored two peer-reviewed publications. I have B.S. (Magna Cum Laude) in Wildlife, Fish, and Conservation Biology from the University of California, Davis (1997 and Ph.D. in Ecology from the University of California, Davis (2002).

Joy Albertson
Supervisory Wildlife Biologist
U.S. Fish and Wildlife Service
San Francisco Bay NWR Complex

I have worked for over 30 years as a wildlife biologist with the U.S. Fish and Wildlife Service in the San Francisco Bay Estuary. For the past 10 years, I have supervised staff biologists and lead the biological program for the San Francisco Bay National Wildlife Refuge Complex, which includes seven biologically diverse National Wildlife Refuges and spans over 50,000 acres in San Francisco Bay, Monterey Bay, and offshore Pacific island habitats. My experience includes planning and conducting studies for wildlife and plants in tidal marshes of the San Francisco estuary, including the salt marsh harvest mouse and California Ridgway's rail. I have worked on regional restoration planning efforts with multiple federal, state, local and private partners to plan, implement and monitor success of restoration projects, such as the South Bay Salt Pond Restoration Project. In my role as a U.S. Fish and Wildlife Service biologist, I am involved in recovery efforts for multiple species under the Tidal Marsh Recovery Plan. I have a B.S. in Zoology (1988) from North Dakota State University and an M.S. in Conservation Ecology from San Francisco State University (1995).

Laureen Barthman-Thompson
Environmental Scientist
California Department of Fish and Wildlife, Bay Delta Region

My experience includes over 25 years of technical and practical experience with the identification, management and collection of ecological data associated with avian, mammal and fish species. I am skilled in performing terrestrial wildlife inventories, and my job experience includes working as a field biologist for the Department of Fish and Wildlife and the non-profit sector implementing wildlife surveys, inventories, and scientific research projects. I have spent the last 20 years working on the salt marsh harvest mouse and other endangered species in the Suisun Marsh. I am the co-lead for the multiagency working group on the endangered salt marsh harvest mouse and participated in numerous multi-agency workgroups for Suisun Marsh planning, permitting and monitoring. I have coauthored 7 peer-reviewed papers, presented several professional talks and contributed to several collaborations. In addition I have managed and directed five research grants totaling over $600,000 in funding. I have a B.S. in Wildlife and Fisheries Biology from the University of California Davis (1990).

Michael L. Casazza
Research Wildlife Biologist
U.S. Geological Survey, Western Ecological Research

My current research program at the Dixon Field Station centers on the ecology and management of waterfowl in the Pacific Flyway. A primary focus of this work includes the study of waterfowl movement across multiple species using cutting edge tracking devices. Currently we are tracking hundreds of individually marked waterfowl across multiple species (10+). Understanding waterfowl migration, movement patterns, distribution and habitat use can inform management from the local to the Flyway level as well as provide critical information

related to the potential spread of influenza virus. My research team has targeted studies which provide species information to land managers responsible for maintaining diverse and healthy wildlife populations while trying to help recover special status species. Understanding key life history traits of special status species can lead to management options promoting species recovery. In addition to waterfowl, my research program has focused on ecological research on the greater sage-grouse, endangered California Clapper Rail (now Ridgway's Rail) in SF Bay, the endangered San Francisco Garter snake, the threatened Giant Garter snake in the Central Valley of California, and the California state-listed Greater Sandhill Crane. I am currently the chair of the Tidal Marsh Recovery Plan Implementation Team for the San Francisco Bay Region. I have authored or co-authored over 25 scientific publications regarding our teams work since 2015 and over 100 since becoming a research biologist. In addition I have managed and directed several large research grants totaling in excess of over $20 million in funding.

Steve Chappell
Executive Director
Suisun Resource Conservation District

I have worked in the Suisun Marsh for over 22 years assisting private landowner in wetland habitat management, wetland enhancement and protection. As the Executive Director of SRCD I oversee the daily duties of the District including grant administration, coordination with local landowners, Agencies, and stakeholder groups, and the implementation of monitoring and scientific studies. I have participated in numerous Suisun Marsh planning and regulatory programs including annual U.S. Army Corp's of Engineers wetland permitting activities, the Baylands Ecosystem Goals Project and the 2015 update for Climate Change, the Suisun Ecological Workshop, Suisun Marsh Environmental Coordination Advisory Team, and Delta Vision Process, and currently serves as a liaison adviser to the Delta Conservancy. I was a negotiator of the Suisun Marsh Preservation Agreement and was an Agency Principal in preparation of the 30 year Suisun Marsh Management, Preservation, and Restoration Plan (PEIR/ EIS). I have a B.S. in Biological Science with a minor in chemistry and concentration in zoology from California State University Stanislaus.

Douglas A. Kelt, PhD
Professor of Wildlife Ecology
University of California Davis

I have studied the ecology and dynamics of small mammals in both North America (California, New Mexico, Illinois, Oregon) and South America (mostly Chile, but also Bolivia, Argentina, Ecuador) for about 40 years, including both basic and applied ecology. As a professor of wildlife ecology since 1995 I have worked extensively in California, and am currently at the University of California, Davis support multiple students and postdoctoral associates whose research emphasizes the ecology of the salt marsh harvest mouse. My interests emphasize both basic questions in ecology and biogeography as well as applied questions in conservation and management of threatened species.

Adrian Rus, PhD (2020)
Wildlife Biologist Analyst
Suisun Resource Conservation District

I am proficient in the use of ArcGIS, Python, C++, and R statistical software for performing statistical analysis and modeling. I completed my doctoral dissertation research on landscape and habitat ecology of koalas in Australia, and I have conducted movement ecology analyses on satellite-marked Golden Eagles. I have experience in publishing peer-reviwed articles, and I've presented my research at international and regional scientific conferences.

Katherine Smith, PhD
Wildlife Biologist, UC Davis Post Doc
WRA, Inc.

I have over 10 years of technical and practical experience with the identification, management and collection of ecological data associated with avian, mammal and fish species, with a strong emphasis on the small mammals of the San Francisco Bay. I am an expert in small mammals mark-recapture surveys, as well as analysis of population data. I have spent the last decade collecting data for, and completing my graduate work, exploring the relative value of different types of wetlands for the salt marsh harvest mouse. I have worked collaboratively with academic, agency, non-profit and private entities on research endeavors. Having worked in the state, academic, non-profit, and private fields, I understand the diversity of perspectives and operations considerations that contribute to conservation efforts. I have presented dozens of oral and poster presentations at meetings ranging from regional groups, to international organizations. In addition to my thesis and dissertation, I have authored 5 publications, 4 successful fellowship proposals, and popular content on a variety of platforms. I organized a salt marsh harvest mouse symposium with the Sacramento-Shasta Chapter of the Wildlife Society in May 2017 and have been asked to present at two additional workshops. I am an active participant with the salt marsh harvest mouse workgroup, and am frequently asked to contribute my expertise and perspective at regional meetings and workshops.

Mark Statham PhD.
Associate Researcher,
Mammalian Ecology and Conservation Unit,
Veterinary Genetics, University of California, Davis

I have over 18 years of experience in the field of wildlife population research. I use genetics as an integral component of my research to ask evolutionary and conservation focused questions, on species as varied as the widely distributed red fox to endemic endangered salt marsh harvest mouse. My experience includes a PhD in Ireland, Postdoctoral positions at Kansas State University and UC Davis, followed by a Research Faculty position at UC Davis. I am a member of the multiagency working groups for the Sierra Nevada red fox and for the salt marsh harvest mouse. I have co-authored >35 peer reviewed publications on a variety of biological systems, including two publications on the salt marsh harvest mouse. I am the PI on a number of past or on-going projects on the salt marsh harvest mouse.

Diego Sustaita, Ph.D.
Assistant Professor, Department of Biological Sciences
California State University, San Marcos

I have worked in the realm of wildlife ecology for 18 years, in both academic and applied sectors. I started my applied career shortly after obtaining a B.S. in Environmental Biology at California State University Northridge (2000). Since 2001, as a Wildlife Biologist (and later Environmental Scientist) with the Bay Delta Region of the California Department of Fish and Wildlife, I worked to design and implement long-term studies of salt marsh harvest mouse habitat use, demography, and species identification; two have been published thus far. My graduate studies–MSc. Biology, California State University Northridge (2005) and Ph.D., Ecology & Evolutionary Biology, University of Connecticut (2013)–were at the intersection of organismal morphology, behavior, and ecology. Following a 3-year postdoc position at Brown University, I began my current position as an Assistant Professor at CSU San Marcos in 2016, where my research focuses broadly on how organisms physically interface with their environments. I have authored/coauthored 12 peer-reviewed scientific journal publications, 2 book chapters, 37 conference presentations, and have served as a reviewer for 36 different professional scientific journals. In addition to my regular teaching duties, I have supervised 10 undergraduate and 2 graduate (master's level) research students.

John Takekawa, PhD

Operations Manager
Suisun Resource Conservation District

I worked for 33 years leading waterbird and wetland projects years as a supervisory research biologist of the U. S. Geological Survey and U. S. Fish and Wildlife Service from 1986-2014. In 1995, I founded the USGS San Francisco Bay Estuary Field Station which focused on San Francisco Bay waterbirds and their habitats. I was responsible for developing the program that grew to support 30 full-time staff as well as numerous graduate students. I also worked on avian conservation projects for the National Audubon Society from 2014-2017. I was inducted into the California Waterfowler's Hall of Fame in 2017, and I have coauthored more than 230 peer-reviewed papers (RG Score 40.05; h-index 34). My projects have ranged from the Pacific coast partnerships to international cooperative efforts. I have B.S. Forestry and Wildlife Science from the University of Washington (1979), an M.S. in Wildlife Ecology from the University of Idaho (1982), and a Ph.D. in Animal Ecology from Iowa State University (1987).

Karen M. Thorne, PhD
Research Ecologist
Western Ecological Research Center, U.S. Geological Survey

I have worked in San Francisco Bay-Delta for 13 years on wetland process and informing management decisions. My research experience includes wetland ecology, restoration and in particular how changing ocean and ambient conditions, drought, and sea-level rise impact these ecosystems. My recent work has focused on how abiotic drivers relates to wildlife management, restoration, biogeomorphic processes, and ecological process in wetland systems. I have studies sites along the Pacific coast spanning from Pudget Sound, WA to southern CA with a focus on estuaries with important management concerns. I have B.S. Wildlife Fish and Conservation Biology from the University of California Davis (2000), an M.S. in Global Change, Geography from the University of California Davis (2000), and a Ph.D. in Physical Geography from the University of California Davis (2012)

Isa Woo, MS
Biologist
US Geological Survey

I have over15 years of technical and applied research experience in wetland ecosystems and the wildlife that are dependent upon these systems. I regularly integrate cross-boundary and innovative research and management approaches for the advancement of conservation goals. I have close working relationships with Federal, State, local and Tribal land managers who rely on a solid science foundation in support of management options. My projects range from applied restoration monitoring to research on tidal marsh contaminants, tidal marsh endemics, the endangered salt marsh harvest mouse (*Reithrodontomys raviventris*), food webs, restoration effectiveness for juvenile Chinook, invertebrate productivity, and invasive plant species. I have coauthored ~40 peer reviewed papers and one of my manuscripts was selected as one of the top 30 papers in the past 30 years in the international journal Wetlands. I have conducted research from the Alaskan tundra, forest ecosystems, tropical island marshes, lacustrine marshes, and tidal wetlands and mudflats in San Francisco Bay and Puget Sound. I have B.A. Integrative Biology with a minor in Forestry from the University of California-Berkeley (1997), an M.S. in Botany with a restoration focus from the University of Wisconsin-Madison (2000).

National Fish and Wildlife Foundation
San Francisco Bay Estuary Conservation Fund
Applicant: Suisun Resource Conservation District
Title: Future of the Salt Marsh Harvest Mouse and other native wetland species in the San Francisco estuary: tracking an inevitable decline or guiding a resilient response? Phase 2

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National Fish and Wildlife Foundation
San Francisco Bay Conservation Fund
Applicant: Suisun Resource Conservation District
Title: Future of the Salt Marsh Harvest Mouse and other native wetland species in the San Francisco estuary: tracking an inevitable decline or guiding a resilient response? Phase 2

We are unaware of any litigation involving the Suisun Resource Conservation District, a department of the state of California, relevant to this grant proposal application.

National Fish and Wildlife Foundation
San Francisco Bay Estuary Conservation Fund
Applicant: Suisun Resource Conservation District
Title: Future of the Salt Marsh Harvest Mouse and other native wetland species in the San Francisco estuary: tracking an inevitable decline or guiding a resilient response? Phase 2

Suisun Resource Conservation District is a state government organization. Financial statements are available here: https://districts.bythenumbers.sco.ca.gov/#!/year/default

National Fish and Wildlife Foundation
San Francisco Bay Conservation Fund
Applicant: Suisun Resource Conservation District
Title: Future of the Salt Marsh Harvest Mouse and other native wetland species in the San Francisco estuary: tracking an inevitable decline or guiding a resilient response? Phase 2.

Suisun Resource Conservation District and the organizations associated with the applicant do not have any conflict of interest with respect to NFWF, the Scope of Work, or the subject matter of the RFP.

National Fish and Wildlife Foundation
San Francisco Bay Estuary Conservation Fund
Applicant: Suisun Resource Conservation District
Title: Future of the Salt Marsh Harvest Mouse and other native wetland species in the San Francisco estuary: tracking an inevitable decline or guiding a resilient response? Phase 2

The applicant is Suisun Resource Conservation District, a special district of the state of California and a state government organization in good standing.

Portfolio of Coverages

Especially Designed For:

SUISUN RESOURCE CONSERVATION DISTRICT
2544 GRIZZLY ISLAND ROAD
SUISUN, CA 94585-0000

CALIFORNIA RURAL WATER ASSOCIATION

MEMBERGUARD℠

Serviced by **Glatfelter Public Practice**

Underwritten by
California Rural Water Risk Management Authority

CALIFORNIA RURAL WATER ASSOCIATION

MEMBERGUARD℠

Serviced by **Glatfelter Public Practice**

RISK CONTROL MEMBER NOTICE

Dear Authority Member,

Safety and health is a major concern in organizations today. These issues are important because of the major impact that accidents can have on an organization. Morale can often be affected as well as an organization's finances. Coverage rarely contemplates all the expenses associated with accidents. There are often hidden costs that the organization must bear such as time spent reporting, documenting and investigating the accident.

Risk Control Guidelines and Programs

As a valuable service to you, MemberGuard, in partnership with Glatfelter Insurance Services, provides risk control guidelines and programs to your organization in an effort to help you prevent and/or reduce the impact of accidents. Implementing MemberGuard risk control measures could benefit your organization by reducing or eliminating the hidden costs of accidents while helping your organization to continue to serve your community.

MemberGuard provides a number of programs and services to help you in your risk control effort. While most of these services are available to our clients at no additional cost, some may require a fee based on the scope of the service requested. Some of the services and programs that we provide to our clients include:

- On-site risk control consultations
- Recommendations to control identifiable hazards
- Loss experience analysis
- Consultation on specific risk control-related problems
- Sample standard operating guidelines for vehicle operations
- Accident investigation procedures and forms

Risk Control Publications

MemberGuard has many resources that you can access at no charge on our Web site. These include Communiqués, which are a one-page fact sheet, that presents a specific hazard and provides procedures for controlling the hazard. MemberGuard also provides numerous training programs that you can access through our Risk Control Services. Please visit MyMemberGuard.com to view and order these resources.

Inquire About Our Risk Control Services

If you would like information about some of the above services and publications, please call MemberGuard Risk Control at 800.233.1957.

California Rural Water Risk Management Authority

Administrative Office: 1750 Creekside Oaks Dr., Suite 200 | Sacramento, CA 95833

Administered by: Glatfelter Insurance Services, Inc.
183 Leader Heights Road | York, PA 17402
800.233.1957 | MyMemberGuard.com

CALIFORNIA RURAL WATER ASSOCIATION
MEMBERGUARD℠
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MEMORANDUM OF COVERAGE
COMMON DECLARATIONS

Authority Member and Mailing Address:

SUISUN RESOURCE CONSERVATION DISTRICT
2544 GRIZZLY ISLAND ROAD
SUISUN, CA 94585-0000

Memorandum of Coverage Number:

CRWA-JP-0011219-00/000

Coverage Period: From 04-01-2020
To 04-01-2021
12:01 AM Standard Time at your mailing address shown above.

This memorandum of coverage consists of the following coverage parts:

Property	INCLUDED
General Liability	INCLUDED
Crime	INCLUDED
Inland Marine	INCLUDED
Public Officials and Management Liability	INCLUDED
Auto	INCLUDED
Excess Liability	INCLUDED
Total Contribution:	$13,875.00

The contribution is payable on the dates and in the amounts shown below:

04-01-2020 $13,875.00

Authority Member:
SUISUN RESOURCE CONSERVATION DISTRICT

Memorandum of Coverage Number: CRWA-JP-0011219-00/000

Coverage Period: From 04-01-2020 To 04-01-2021

COMMON FORMS

See Schedule of Forms and Endorsements

In return for payment of the contribution, and subject to all the terms, conditions and exclusions of this "memorandum of coverage", the California Rural Water Risk Management Authority agrees to provide the coverage as stated in this "memorandum of coverage". The "memorandum of coverage" consists of the coverage parts shown as included on page 1 of these Common Declarations. In addition to any common forms, each coverage part consists of a Coverage Part Declarations and any coverage forms and endorsements listed on the Coverage Part Declarations or elsewhere in the coverage.

The California Rural Water Risk Management Authority has caused this "memorandum of coverage" to be signed by its authorized representative.

Authorized representative

03-31-2020
Date

Authority Member:
SUISUN RESOURCE CONSERVATION DISTRICT

Memorandum of Coverage Number:
CRWA-JP-0011219-00/000

Coverage Period: From 04-01-2020
To 04-01-2021

SCHEDULE OF FORMS AND ENDORSEMENTS

Common Forms and Endorsements

118477	03-15	POLICYHOLDER NOTICE TAXES, ASSESSMENTS
91222	09-16	POLICYHOLDER NOTICE
MG89644	04-19	ECONOMIC SANCTIONS ENDORSEMENT
MGCO300	04-16	GENERAL CONDITIONS
MGIL0021	04-16	NUCLEAR ENERGY LIABILITY EXCLUSION ENDT

Property Forms and Endorsements

MGPR101	04-18	PROPERTY COVERAGE FORM
MGPR407	04-16	LOSS PAYABLE PROVISIONS
MGPR427	04-16	AMENDMENT OF COVERAGE POLLUTION REMEDIAT
MGPR428	04-16	AMDMT OF COV UNDRGRD PIPING/FLUES/DRAINS
MGPR440	04-17	CRISIS INCIDENT RESPONSE COVERAGE

Crime Forms and Endorsements

MGCR102	04-17	GOVERNMENT CRIME COVERAGE FORM (LOSS SUS

Inland Marine Forms and Endorsements

MGIM101	04-17	INLAND MARINE COVERAGE FORM

Auto Forms and Endorsements

MGCA0001	04-16	BUSINESS AUTO COVERAGE FORM
MGCA0424	04-16	AUTO MEDICAL PAYMENTS COVERAGE
MGCA0444	04-16	WAIVER OF TRANSFER OF RIGHTS OF RECOVERY
MGCA2154	04-16	UNINSURED MOTORISTS COV - BODILY INJURY

General Liability Forms and Endorsements

MGGL101	04-17	GENERAL LIABILITY COVERAGE FORM
MGGL224	04-19	EXCLUSION ELECTRONIC INFORMATION SECURIT
MGGL301	04-16	ADD COV-DESGNATED PERSON OR ORGANIZATION
MGGL407	04-16	WAIVER OF TRANSFER OF RIGHTS OF RECOVERY

Public Officials and Management Liability Forms and Endorsements

MGML102	04-17	PUBLIC OFFICIALS AND MANAGEMENT LIABILIT
MGML204	04-16	PUB USE OF PROP EXCL W/INVRS CONDEM EXCP
MGML404	04-18	CYBER LIABILITY AND PRIVACY CRISIS MANAG

Excess Liability Forms and Endorsements

MGCO400	04-16	CHANGE ENDORSEMENT
MGEX0001	04-17	EXCESS LIABILITY COVERAGE FORM
MGEX0329	04-17	UNMANNED AIRCRAFT LIABILITY COVERAGE SUB
MGEX2700	04-16	UNDERLYING CLAIMS-MADE COVERAGE

Figure 1. The endangered Salt Marsh Harvest Mouse (*Reithrodontomys raviventris*) in the San Francisco estuary. The proposed project will conduct the first single-season, estuary-wide survey in the 50 years since listing and include comprehensive genetic and contaminant sampling.

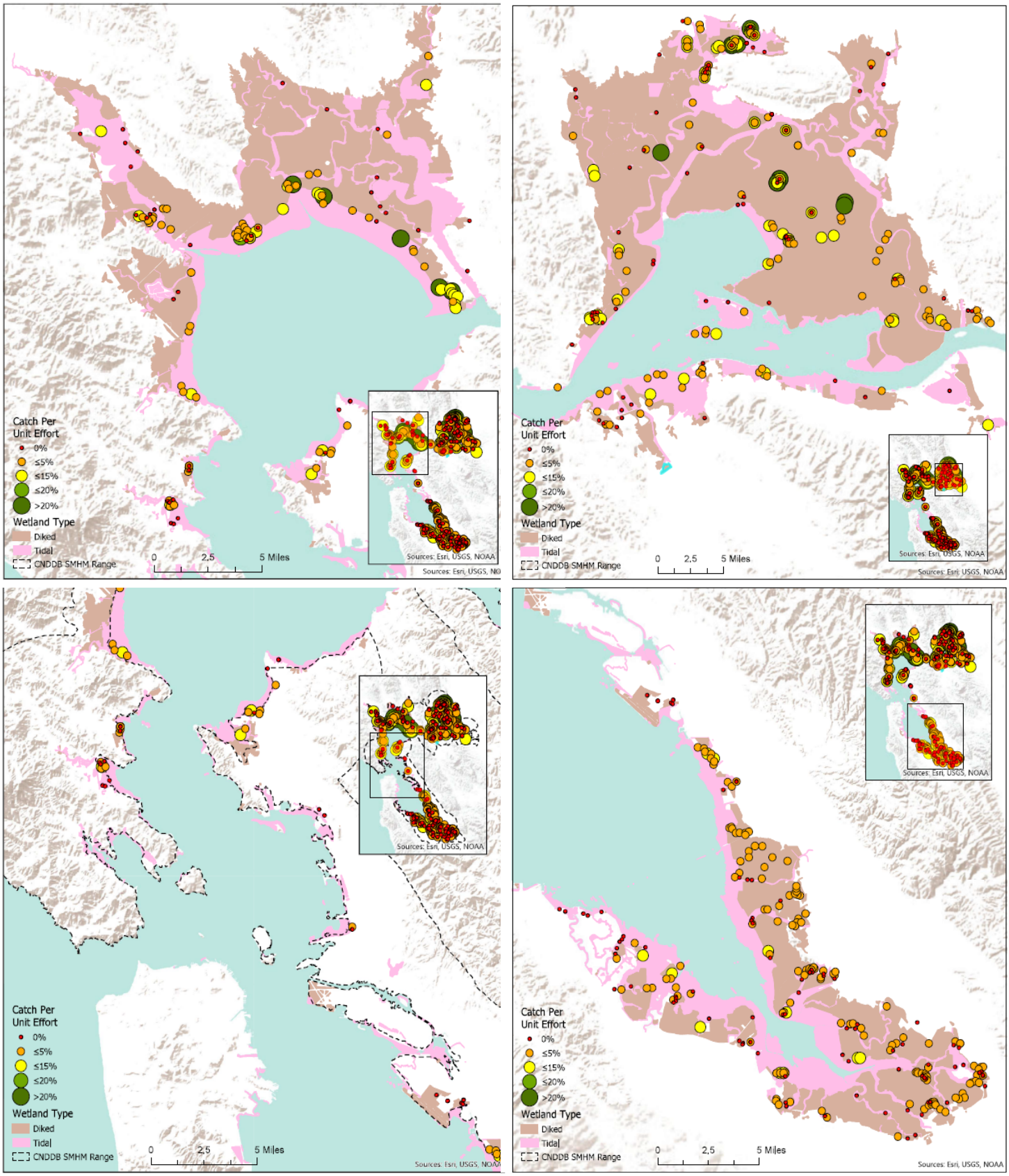


Figure 2. Salt marsh harvest mouse survey locations in North Bay, Suisun and Grizzly Bays, Central Bay, and South Bay spanning 1971 through 2005. Color and size of points indicating survey locations illustrate catch per unit effort (individuals/trap nights) by trapping session. This only represents a snapshot of historical efforts through 2005, and most occurred before modern genetic identification methods, so results should be interpreted with caution.

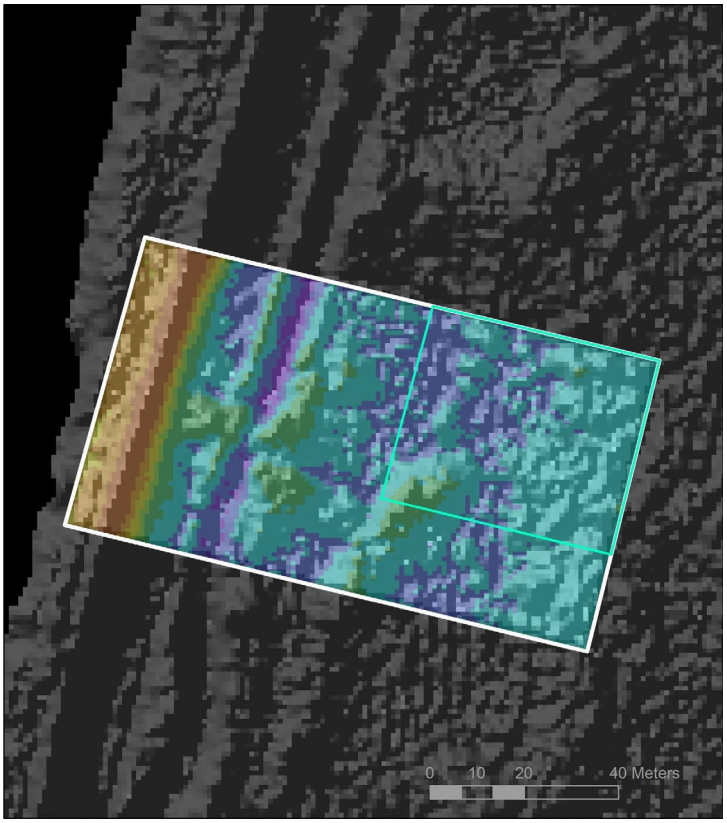


Fig. 3a) Surface elevation of Joice Island managed wetland site.

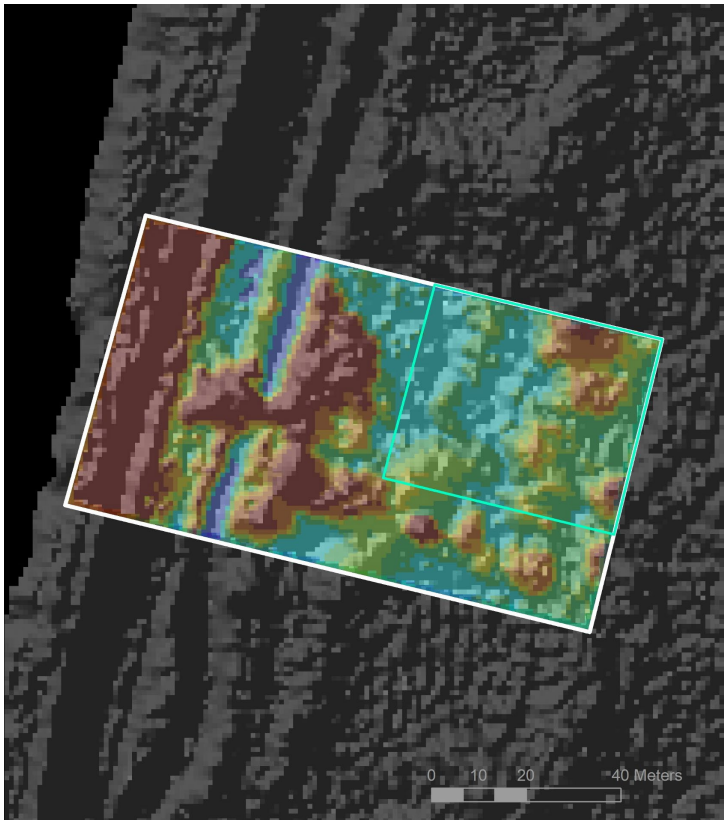


Fig. 3b) Vegetation structure of Joice Island managed wetland site.

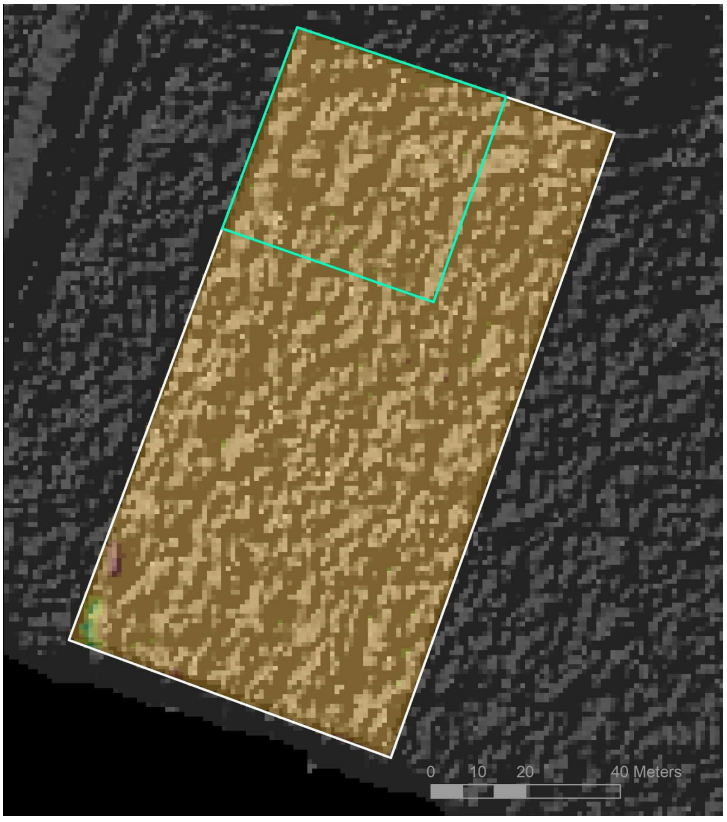


Fig. 3c) Surface elevation of Joice Island tidal site.

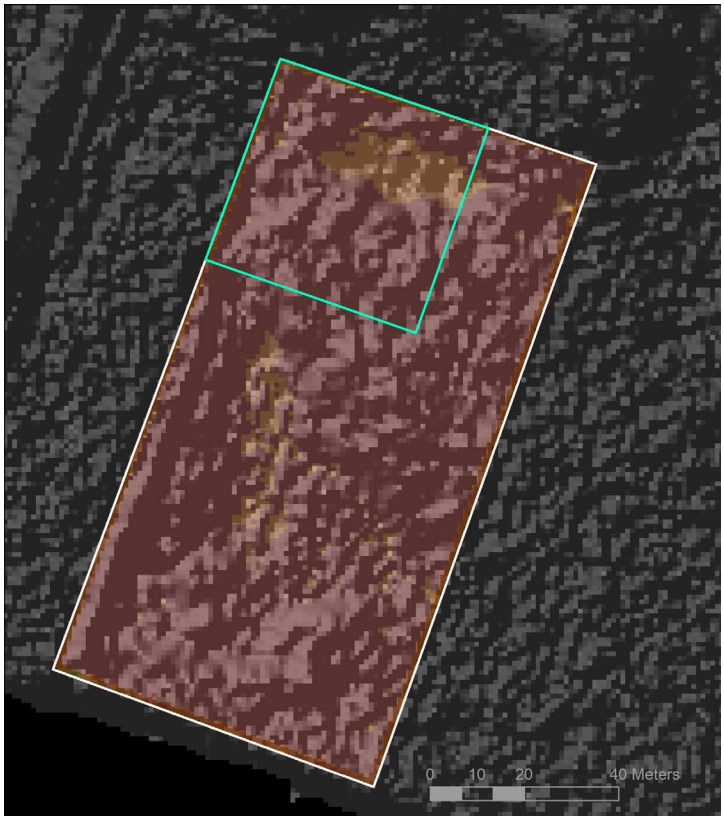


Fig. 3d) Vegetation structure of Joice Island tidal site.

Elevation (NAVD88 feet)

Below 0	2.1 - 3.0	5.1 - 6.0	8.1+
0 - 1.0	3.1 - 4.0	6.1 - 7.0	
1.1 - 2.0	4.1 - 5.0	7.1 - 8.0	

Suisun Resource Conservation District

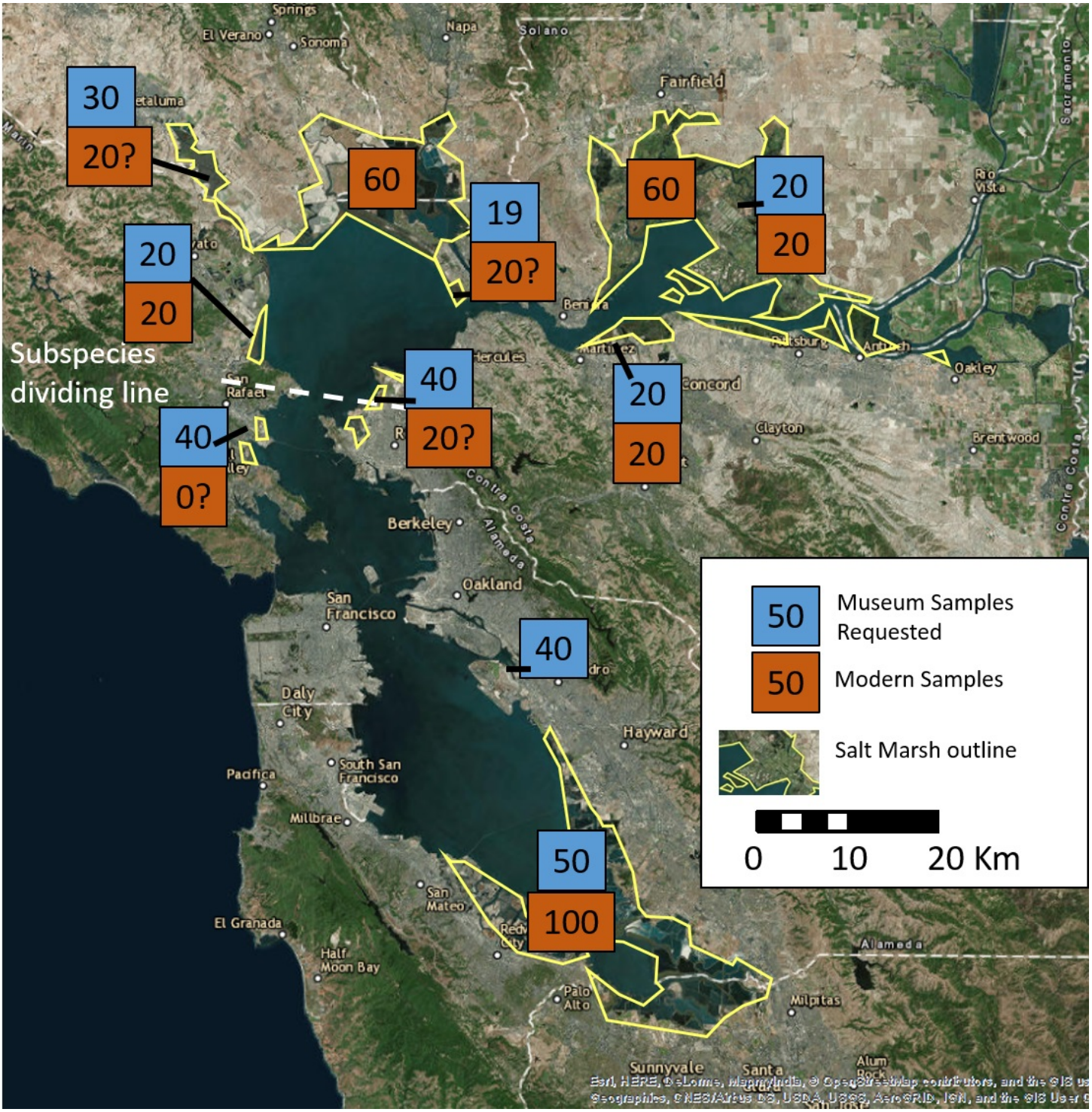


Figure 4. Genetic samples and museum specimens collected previously for examining variation in genetics of the Salt Marsh Harvest Mouse (Statham, UC Davis). The proposed study would augment this sample in areas where genetic variation remains poorly known or unsampled.

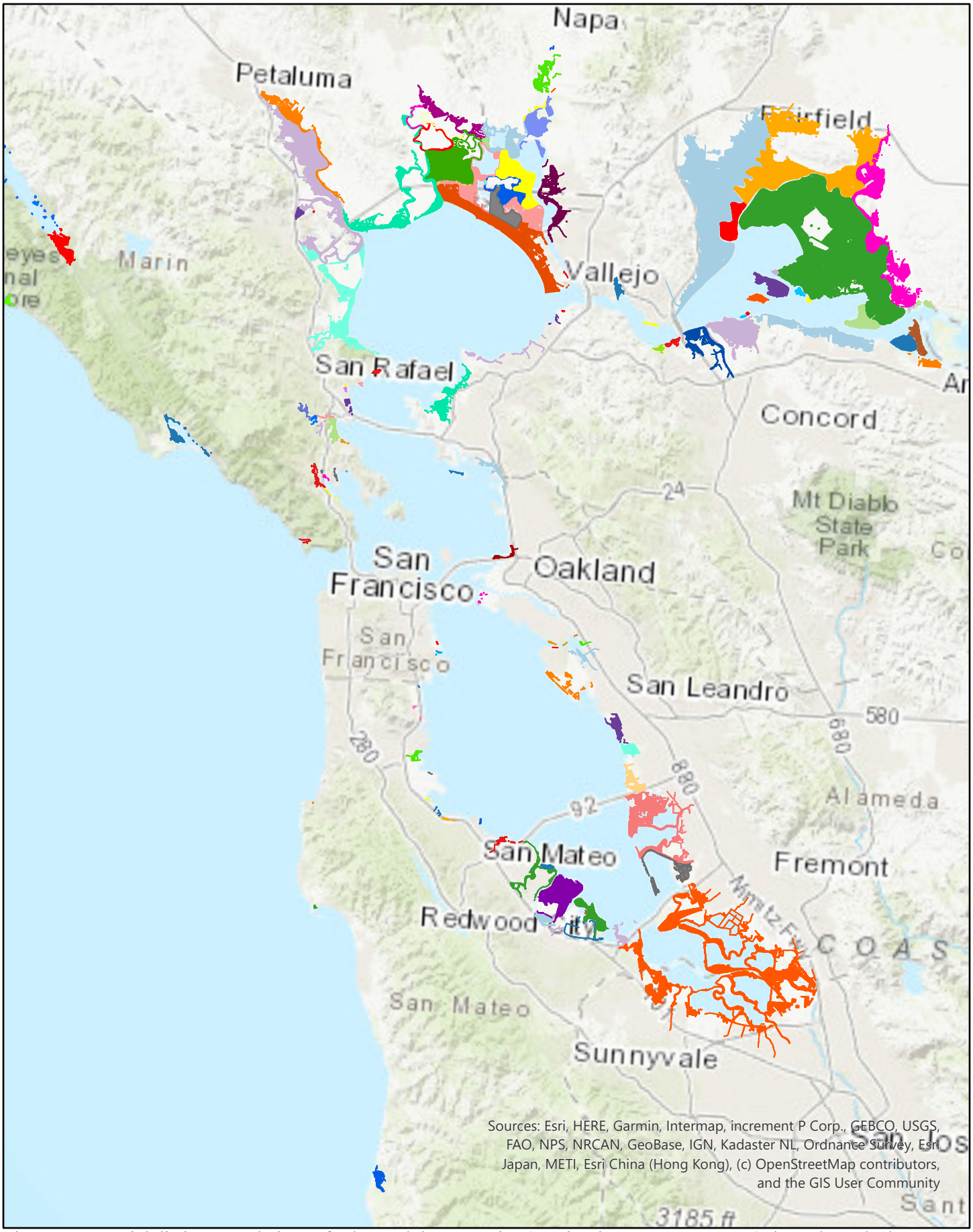


Figure 5. Potential distinct populations of salt marsh harvest mice (*Reithrodontomys raviventris*) throughout the known species range, as well as areas of potentially suitable habitat outside of the currently accepted range. Genetic samples collected during Phase 2 of this project could confirm or refute these potential population divisions.

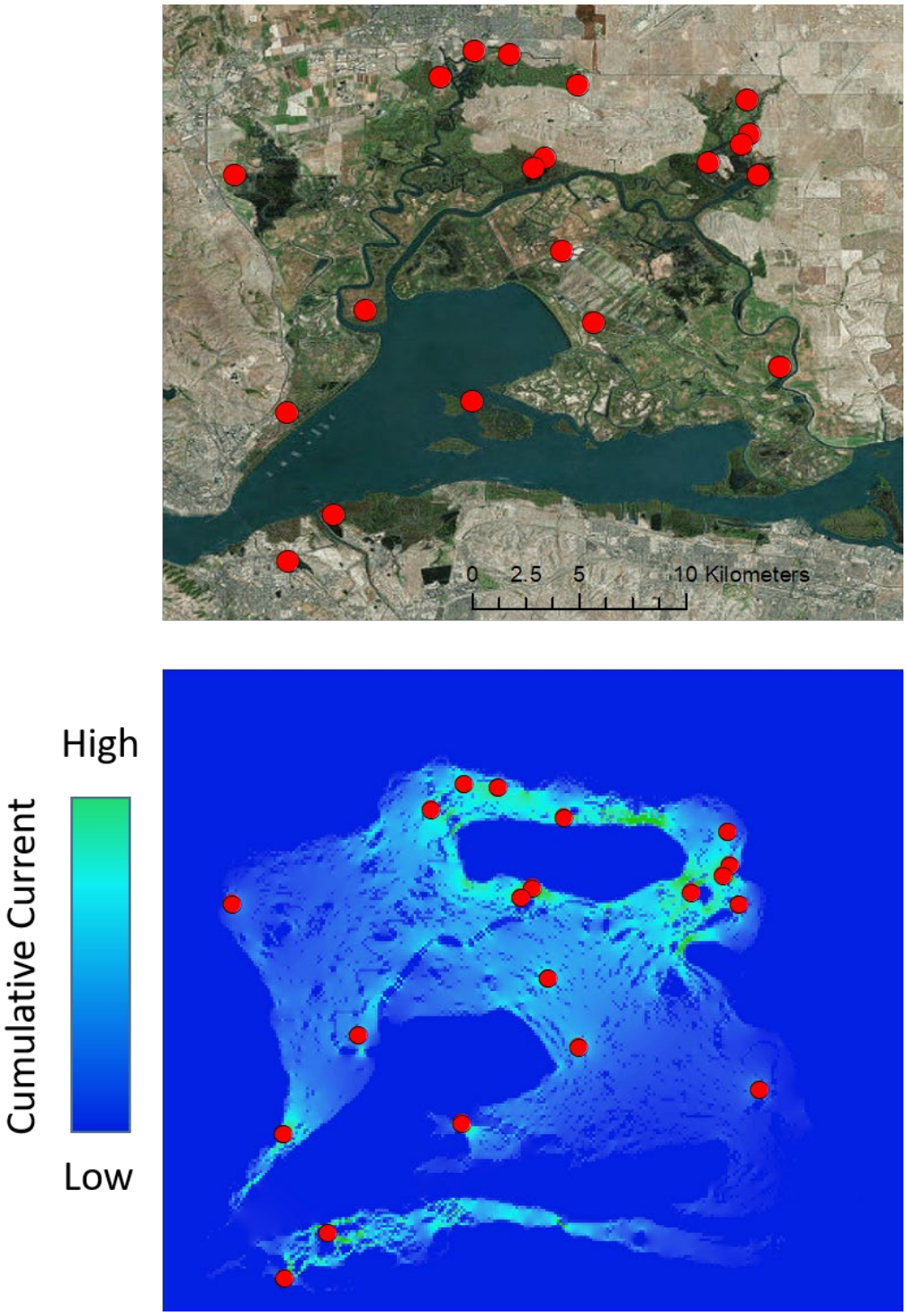


Figure 6. Cumulative current map modeling connectivity among 20 salt marsh harvest mouse (*Reithrodontomys raviventris*) trapping locations within Suisun Bay Area recovery Unit from the the 2013 recovery plan. Similar analyses will be used to utilize the genetic library to model population connectivity throughout the range of the species (Object 2, Task 2).

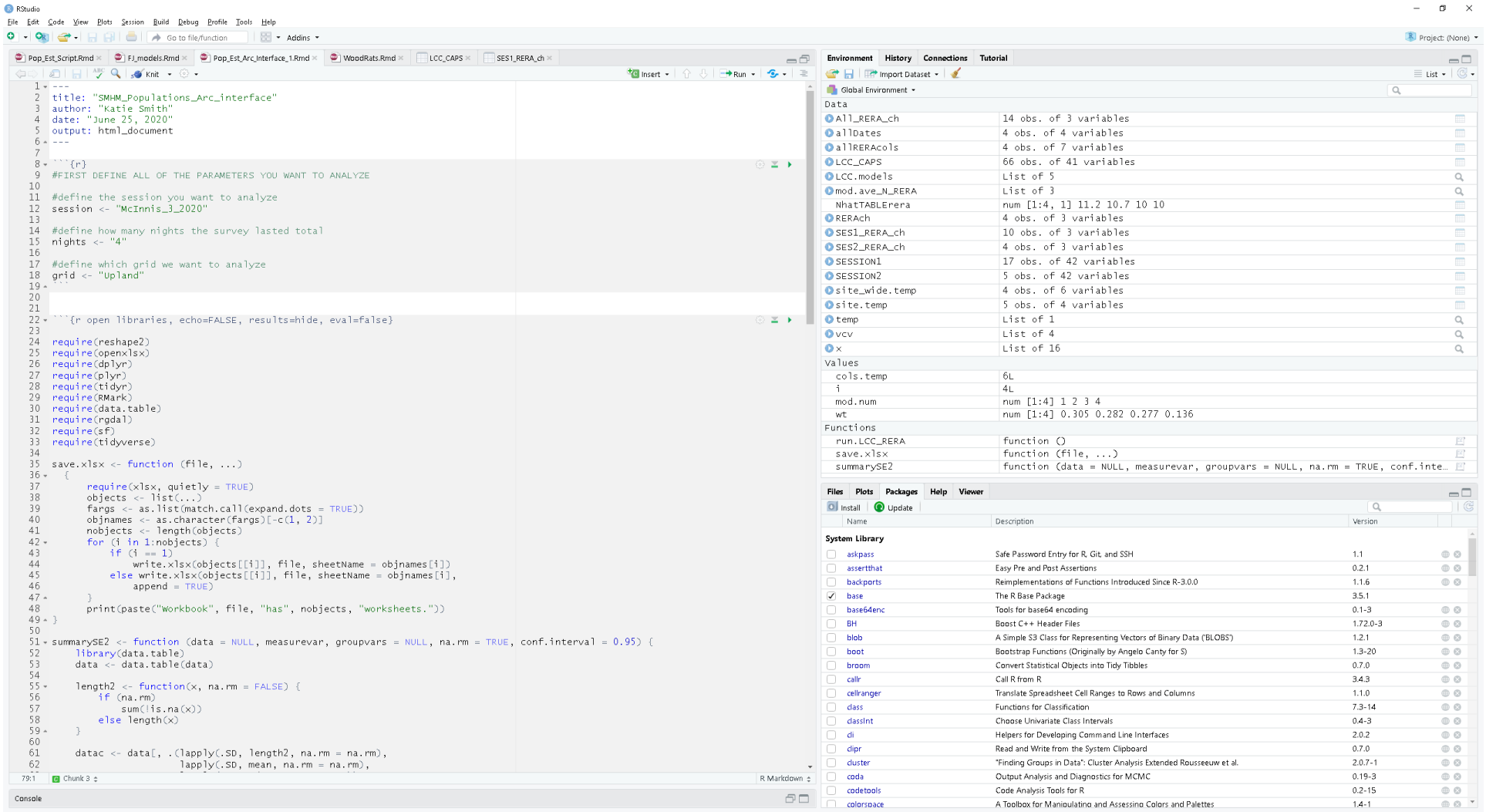
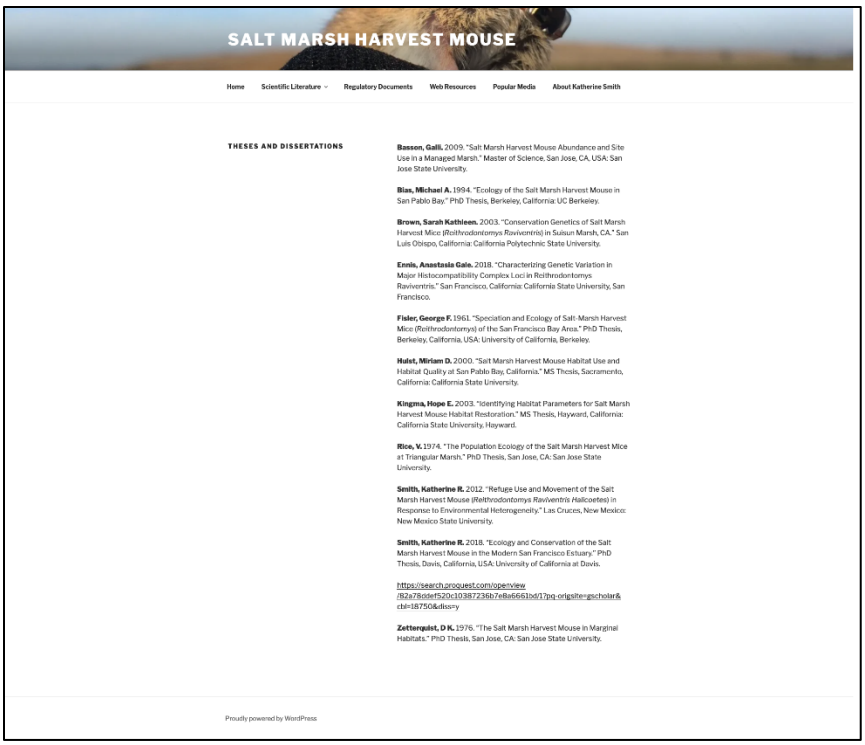


Fig. 7. Screen shot of capture-mark-recapture analysis code that has been prepared and piloted during Phase 1. This code will be used to estimate populations and demographics of salt marsh harvest mouse (*Reithrodontomys raviventris*) throughout the range of the species following the range wide survey. This is code is designed to interface with ArcGIS.



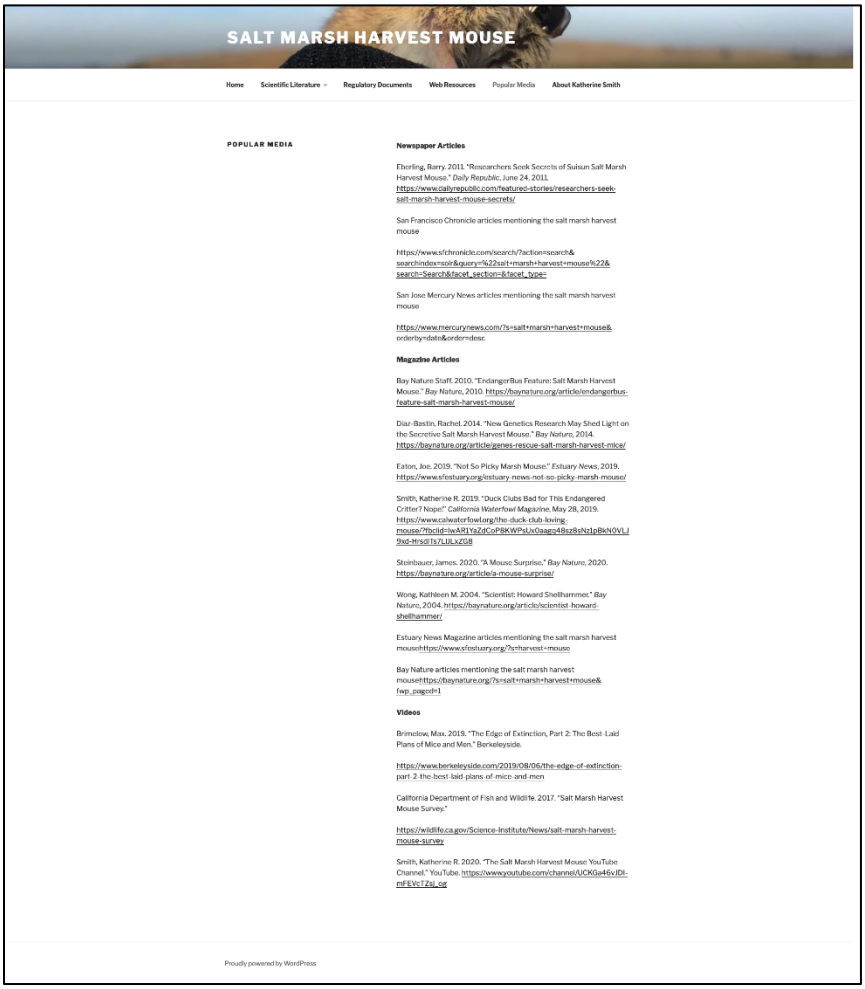


Fig. 8. Screen shots from saltmarshharvestmouse.org, the web page (that is being prepared to fulfill Objective 3, Task 3 of the Phase 1 NFWF grant) to disseminate information about the salt marsh harvest mouse (*Reithrodontomys raviventris*) to the general public, students, and researchers. This medium can also be use to publish and promote project results.

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Exhibit B
Budget

I. PERSONNEL — $78,232.33

Staff Name	Position	Annual Salary	Project Hours	Hourly Rate	LOE (%)	Project Salary	% Fringe	$ Fringe	Total Personnel
John Takekawa	Operations Manager	$118,000.00	80.00	$56.73	4	$4,538.46	14.10	$639.92	$5,178.38
Adrian Rus	Wildlife Biologist Analyst	$45,917.00	2080.00	$22.08	100	$45,917.00	59.10	$27,136.95	$73,053.95
Totals						**$50,455.46**		**$27,776.87**	**$78,232.33**

II. TRAVEL — $986.00

Domestic Airfare – Per Flight

Purpose/Destination	Unit Cost	Quantity	Total Cost
SubTotal			**$0.00**

International Airfare – Per Flight

Purpose/Destination	Unit Cost	Quantity	Total Cost
SubTotal			**$0.00**

Train – Per Ticket

Purpose/Destination	Unit Cost	Quantity	Total Cost

SubTotal **$0.00**

Rental Car – Per Day

Purpose/Destination	Days/Duration	Unit Cost	Quantity	Total Cost

SubTotal **$0.00**

Taxis – Per Trip

Purpose/Destination	Unit Cost	Quantity	Total Cost

SubTotal **$0.00**

Mileage – Per Mile

Purpose/Destination	Unit Cost	Quantity	Total Cost
Fieldwork	$0.58	1700	$986.00

SubTotal **$986.00**

Gasoline – Per Gallon

Purpose/Destination	Unit Cost	Quantity	Total Cost

SubTotal **$0.00**

Per Diem (M&IE) – Per Day

Purpose/Destination	Days/Duration	Unit Cost	Quantity	Total Cost

SubTotal **$0.00**

Lodging – Per Night

Purpose/Destination	Days/Duration	Unit Cost	Quantity	Total Cost

SubTotal **$0.00**

Meals (no M&IE) – Per Meal

Purpose/Destination	Days/Duration	Unit Cost	Quantity	Total Cost

SubTotal **$0.00**

III. EQUIPMENT $0.00

Item Name	Description	Unit Cost	Quantity	Total Cost

IV. MATERIALS & SUPPLIES $3,698.34

Type	Purpose	Unit of Measure	Unit Cost	Quantity	Total Cost
Organic Raw Cotton Fiber - Natural Color - 10 Lbs	Bedding for trapping		$78.08	1	$78.08
Wagner's 52004 Classic Wild Bird Food, 20 lbs	Bait for trapping		$20.13	2	$40.26

Sherman Live Traps	Traps for capturing SMHM		$27.00	40	$1,080.00
Misc. Safety Supplies	Crew and Animal Safety		$500.00	1	$500.00
Genetic sampling supplies	genetics, sampling	each	$2,000.00	1	$2,000.00

V. CONTRACTUAL SERVICES **$103,000.00**

Subcontract/Contract – Per Agreement

Contractor Name	Description	Total Cost
WRA, Inc. Environmental Consultants	Subcontract for technical expertise	$75,000.00
UC Davis Mammalian Ecology and Conservation Unit	Subcontract for genetic sample analyses	$28,000.00

SubTotal **$103,000.00**

Subgrant – Per Agreement

Subrecipient	Description	Total Cost

SubTotal **$0.00**

VI. OTHER DIRECT COSTS **$0.00**

Type	Purpose	Unit of Measure	Unit Cost	Quantity	Total Cost

VII. TOTAL DIRECT COSTS **$185,916.67**

VIII. INDIRECT COSTS — $12,437.50

Explanation of Modified Total Direct Cost Base(MTDC)	Rate Type	NICRA Expiration	$MTDC	Rate(%)	Total Cost
The Suisun Resource Conservation District indirect cost rate is 30.19%. Here, SRCD will contribute 50% of the icr for a rate of 15%, and the technical expertise subcontract will be handled as 0% passthrough.	Provisional	7/1/2022	$82,916.67	15.00	$12,437.50

IX. TOTAL PROJECT COSTS — $198,354.17