Contra Costa County  
Fish and Wildlife Committee (FWC)  
Date: January 16, 2019  
Time: 3:00 p.m.  
Location: County Public Works Department Road Maintenance Division lunch room (squad room)  
2475 Waterbird Way, Martinez CA 94553  
(Map is attached.)

AGENDA

3:00 p.m. Convene meeting.

1) **Introductions and Statement of Conflict.** A member who has a conflict should, prior to consideration of the decision: (1) publicly identify in detail the financial interest that causes the conflict; (2) recuse himself/herself from discussing and voting on the matter; and (3) leave the room until after the decision has been made.

2) **Review/Approve minutes from the July 18, 2018 meeting.**

3) **Public comment.** Includes public comment on topics on the agenda and items not listed on the agenda. The FWC shall also accept public comment on agenda items at the time they are discussed.

4) **Updates and announcements from staff and FWC members.** Includes discussion of implementation of actions authorized previously, correspondence received, and upcoming meetings of interest to the FWC.

5) **Consider the following CONSENT items:**

   a) Review and accept the letter of appreciation from Lindsay Wildlife Experience for their 2018 “Physiologic Monitoring Equipment Needs in a Triage Wildlife Hospital” project.

   b) Review and accept the letter of appreciation from Golden Gate Audubon Society for their 2017 “Eco-Richmond/Bird Friendly Schools Program” project.

   c) Review and accept the progress report from The Watershed Project for their 2018 “Monitoring Water Quality in Contra Costa County Watersheds” project.

   d) Review and accept the progress report from Regional Parks Foundation for their 2018 “Kids Healthy Outdoors Challenge” project.

   e) Review and accept the final report from Marine Science Institute for their “2018 Delta Education Supplies” project.

   f) Review and accept the final report from Worth a Dam for their “Build a Beaver Pond project”.
6) Review and accept the progress report from Mills College on their 2017 “Ecology of Fear: What Stresses Out Wild Mammals?” project. Consider their request for an extension of time to complete the project.

7) Review and accept the final report from Earth Team for their 2017 “Research, education and habitat improvement on Marsh Creek” project. Consider their request to utilize $770 in remaining funds for travel and per diem expenses.

8) Review and accept the final report from UC Berkeley for their 2017 “Farming for Native Bees” project. Consider their request to utilize $500 in remaining travel funds for a bee taxonomist.

9) Review and consider a request from UC Berkeley for an extension of time to complete their 2018 “Native Bees in Urban Brentwood and Agricultural Brentwood” project. Consider their request to utilize approximately $1,761 in remaining travel funds for a bee taxonomist.

10) Discuss outcome of the September 13, 2018 Fall Forum and consider plans and potential speakers for next year.

11) Review and consider approving the draft 2018 work plan and annual report to the Board of Supervisors.

12) Consider the 13 Fish and Wildlife Propagation Fund applications submitted by January 7, 2019. Consider inviting one or more organizations to the following meeting if the Committee has further questions on their grant proposals.

13) Determine the agenda for the next meeting. The next meeting is February 20, 2019. Possible agenda items for upcoming meetings include:

- Continue review Fish and Wildlife Propagation Fund grant applications

Adjourn

The Committee Chair may alter the order of agenda items at the meeting.

Please contact Maureen Parkes at 925-674-7831 / maureen.parkes@dcd.cccounty.us (or Abigail Fateman at 925-674-7820 / abigail.fateman@dcd.cccounty.us) at the CCC Department of Conservation and Development if you have questions about the Fish & Wildlife Committee or desire materials related to this agenda. Any disclosable public records related to an open session item on a regular meeting agenda and distributed to a majority of the FWC members less than 72 hours before the meeting are available for public inspection at 30 Muir Road in Martinez during business hours. The FWC will provide reasonable accommodation for persons with disabilities planning to participate in this meeting who contact staff at least 72 hours before the meeting.
From Hwy 680:
1. Merge onto CA-4W
2. Continue with the directions from Hwy 4.

From Hwy 4:
1. Take the Pacheco Blvd exit.
2. Merge onto Pacheco Blvd.
3. Turn onto Blum Road (North past Police Department).
4. Turn right onto Imhoff Drive (a cemetery is at the corner of Blum and Imhoff).
5. Turn left onto Waterbird. (There is a Top Soil / Clean Dirt sign at the corner).
6. Turn left onto the Public Works Maintenance building after you pass County’s gas pumping station. Once you are in the parking lot, pass the building on your right. Park your car near the side entrance (not the front entrance). Enter through the side entrance.

Our meeting room is on your left once you enter the building. Please ask the receptionist to direct you if you have trouble finding the meeting room.
1) **Introductions and Statement of Conflict.** A member who has a conflict should, prior to consideration of the decision: (1) publicly identify in detail the financial interest that causes the conflict; (2) recuse himself/herself from discussing and voting on the matter; and (3) leave the room until after the decision has been made.

Judy Bendix, Clark Dawson, Roni Gehlke, Susan Heckly, Daniel Pellegrini, Heather Rosmarin and Jeff Skinner attended the meeting. Kathleen Jennings and Brett Morris provided advance notice that they would not be able to attend the meeting. Nicole Kozicki (California Department of Fish and Wildlife) and Officer Dustin Martinelli (East Bay Regional Park District Police Marine Unit) attended the meeting. Maureen Parkes (CCC Department of Conservation and Development) attended as staff.

2) **Review/Approve minutes from the February 21, 2018 and April 18, 2018 meetings.**

The meeting minutes were approved as written.

**February 21, 2018 Minutes**

Vote:  5 - 0
AYES:  Dawson, Gehlke, Heckly, Pellegrini, and Skinner
ABSENT:  Bendix, Jennings and Morris
ABSTAIN:  Rosmarin

**April 18, 2018 Minutes**

Vote:  6 - 0
AYES:  Dawson, Gehlke, Heckly, Pellegrini, Rosmarin and Skinner
ABSENT:  Bendix, Jennings and Morris
ABSTAIN:  None

3) **Public comment.** Includes public comment on topics on the agenda and items not listed on the agenda. The FWC shall also accept public comment on agenda items at the time they are discussed.

Nicole Kozicki advised the Committee that she will be retiring in September 2018 and that this would be her last meeting representing the California Department of Fish and Wildlife.

4) **Updates and announcements from staff and FWC members.** Includes discussion of implementation of actions authorized previously, correspondence received, and upcoming meetings of interest to the FWC.

Maureen Parkes informed the FWC of the following:

- Kathleen Jennings and Brett Morris provided advance notice that they would not be able to attend the meeting today.
- Membership Update:
  - Dawn Manley, the At-large Alternate, resigned effective July 13, 2018.
  - The At-large 1 and 2 seats will be expiring December 31, 2018.
  - A media release has been sent regarding the At-large 1, At-large 2 and At-large Alternate positions. Applications are due October 1 and interviews are expected to be held on October 8th.
Staff received emails expressing appreciation for recently awarded grant funds from Melanie Kimbel, Marine Science Institute; Heidi Perryman, Worth a Dam; Kelly Davidson, Mt. View Sanitary District; Allison Rofe, CCRCD, and Juliana Schirmer, Regional Parks Foundation.

Lindsay Wildlife Experience turned in their final report for the physiologic monitor. Since it wasn’t included on the agenda and the length of time before the next FWC meeting, staff reviewed the final report and the Board of Supervisors approved it for reimbursement on June 26, 2018.

Correspondence items forwarded to the Committee:
- Several notices from the Fish and Game Commission
- Several emails related to the IPM Committee
- April 20, 2018 email from Worth a Dam regarding beavers and an article in the next issue of Ranger Rick Magazine. https://rangerrick.org/ranger_rick/leave-it-to-beavers/
- April 23, 2018 email from John Muir Land Trust regarding Campaign to Save Almond Ranch
- May 4, 2018 and July 13, 2018 emails from Lindsay Wildlife Experience regarding their Conservation Icon speaker series
- June 1, 2018 email from League of Women Voters providing the June/July 2018 Bay Area Monitor
- June 11, 2018 email from Save Mount Diablo

Heather Rosmarin saw a muskrat in a Pleasant Hill creek. She also advised the FWC of the upcoming Contra Costa County Creek and Watershed Symposium.

Roni Gehlke informed the FWC that she is working on a white paper on Nutria, which is an invasive aquatic rodent that is a threat to the Delta and causes various kinds of damage including flood control levees to breach and severe erosion of soils.

5) Review the letter of appreciation from The Watershed Project for their 2018 Monitoring Water Quality in Contra Costa County Watersheds project. The Committee reviewed the letter.

6) Review the progress report from The Watershed Project for their 2017 Monitoring Water Quality in Contra Costa County Watersheds project; and consider approving their request for an extension of time to complete the project. The Committee reviewed The Watershed Project’s progress report and approved their request for an extension of time to complete the project.

Vote: 7 - 0
AYES: Bendix, Dawson, Gehlke, Heckly, Pellegrini, Rosmarin and Skinner
ABSENT: Jennings and Morris
ABSTAIN: None

7) Review and accept the final report from Save Mount Diablo on their 2017 Marsh Creek Habitat Restoration project. The Committee reviewed and accepted the final report.

Vote: 7 - 0
AYES: Bendix, Dawson, Gehlke, Heckly, Pellegrini, Rosmarin and Skinner
ABSENT: Jennings and Morris
ABSTAIN: None
8) Review and accept the final report from Friends of Alhambra Creek for their 2017 Alhambra Native Plant Trail project. The Committee reviewed and accepted the final report.

   **Vote:** 7 - 0
   - **AYES:** Bendix, Dawson, Gehlke, Heckly, Pellegrini, Rosmarin and Skinner
   - **ABSENT:** Jennings and Morris
   - **ABSTAIN:** None

9) Review and accept the final report from Golden Gate Audubon Society for their 2017 Eco-Richmond/Bird-Friendly Schools Program. The Committee reviewed and accepted the final report.

   **Vote:** 7 - 0
   - **AYES:** Bendix, Dawson, Gehlke, Heckly, Pellegrini, Rosmarin and Skinner
   - **ABSENT:** Jennings and Morris
   - **ABSTAIN:** None

10) Review and accept the final report from Kids for the Bay for their 2017 Watershed Action Program project. The Committee reviewed and accepted the final report.

   **Vote:** 7 - 0
   - **AYES:** Bendix, Dawson, Gehlke, Heckly, Pellegrini, Rosmarin and Skinner
   - **ABSENT:** Jennings and Morris
   - **ABSTAIN:** None

11) Review and consider finalizing the draft 2018 Fish and Wildlife Committee Fall Forum agenda and discuss the budget, outreach and members’ tasks. Danny Pellegrini and his crew will prepare the meal. The Committee members will help with set-up and clean-up. The Committee approved the 2018 Fish and Wildlife Committee Fall Forum agenda.

   **Vote:** 7 - 0
   - **AYES:** Bendix, Dawson, Gehlke, Heckly, Pellegrini, Rosmarin and Skinner
   - **ABSENT:** Jennings and Morris
   - **ABSTAIN:** None

12) Review, update and consider approving the draft Fish and Wildlife Propagation Fund Grant Request for Proposals (RFP) for the 2019 grant cycle. Discuss additional public outreach regarding approved grants. The Committee discussed additional public outreach; and reviewed and approved the draft Fish and Wildlife Propagation Fund Request for Proposals (RFP).

   **Vote:** 7 - 0
   - **AYES:** Bendix, Dawson, Gehlke, Heckly, Pellegrini, Rosmarin and Skinner
   - **ABSENT:** Jennings and Morris
   - **ABSTAIN:** None

13) Review and discuss the draft 2018 work plan and annual report to the Board of Supervisors. The Committee reviewed and discussed the draft work plan and annual report.

14) Review FWC Procedural Guidelines regarding member attendance. The Committee reviewed the Procedural Guidelines regarding member attendance.

15) Update on the Fish and Wildlife Committee web page. Maureen Parkes updated the Committee on the status of the updates to the web page and the Committee discussed additional items to include.
16) **Determine the agenda for the next meeting.** The next meeting is November 28, 2018. Possible agenda items for upcoming meetings include:

- Discuss Outcome of Fall Forum
- Review and Finalize Draft Work Plan/Annual Report

**Adjourn**
September 6, 2018

Maureen Parkes  
Contra Costa County Fish and Wildlife  
Committee, Conservation & Development  
30 Muir Rd  
Martinez, CA 94553

Dear Ms. Parkes,

Thank you on behalf of everyone here at Lindsay Wildlife Experience. I would like to extend my most sincere gratitude to the committee for its generous gift of $7,811.49 to reimburse our costs for our physiologic monitoring equipment. We could not be more grateful for the committee’s partnership in our efforts.

This crucial support furthers Lindsay’s mission to connect people with wildlife to inspire responsibility and respect for the world we share. Your investment now could not be more important! As we position Lindsay to exert influence at the state and national levels, we care deeply grateful for your support of Lindsay’s greatest need.

Thank you for joining with us to create a better world for people and for wildlife.

Sincerely,

Cheryl M. McCormick, Ph.D.  
Executive Director

Your gift of $7,811.49 made by Business Check #G376445 on 8/27/2018, may be tax deductible. Please keep this letter for your tax records as a receipt for your contribution. Lindsay Wildlife Experience is a 501(c)(3) nonprofit organization (Federal Tax ID #94-6104179). No goods or services were received in connection with this donation.
October 05, 2018

Maureen Parkes, Contra County Costa Fish & Game
30 Muir Road
Martinez, CA 94553

Dear Maureen:

Thank you for your donation to Golden Gate Audubon in the amount of $2,988.76 \(^1\) on 09/26/2018.

We are so appreciative of friends like you who care passionately about Bay Area birds and wildlife. Your support enables GGAS staff and volunteers to advocate for Bay Area birds, restore critical wildlife habitat, and educate the next generation of conservation leaders, activities that have been central to GGAS since our start in 1917.

If you haven't had a chance recently to take part in one of our programs - free bird walks, volunteer work days, guest speakers and more - we hope you'll join us soon. Our events are listed on www.goldengateaudubon.org. If you're already a "regular", we'll see you in the field!

Thanks again for your support. Your generosity is helping conserve and protect the birds we all love.

Yours truly,

Cindy Margulis
Executive Director

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\(^1\) No goods or services were provided in exchange for this contribution. For tax purposes, our IRS tax ID number is 94-6086896. Golden Gate Audubon Society is a 501c3 nonprofit organization.
January 8, 2019

Contra Costa County Fish and Wildlife Committee
Contra Costa County Department of Conservation and Development
30 Muir Rd.
Martinez, CA 94553

Dear members of the Contra Costa County Fish and Wildlife Committee,

On April 19, 2018, the Contra Costa County Fish and Wildlife Committee generously awarded The Watershed Project $23,135 to continue our county-wide creek monitoring effort, which aims to standardize monitoring throughout the county. Since that time, we have:

- Hired and trained two new monitoring interns.
- Continued monitoring at 26 creek sites throughout the county (on San Pablo, Wildcat, Rheem, Walnut, Grayson, Alhambra, and Marsh Creeks), publishing our data here: [https://api.waterreporter.org/v2/map/459de41c](https://api.waterreporter.org/v2/map/459de41c).
- Conducted benthic macroinvertebrate (BMI) surveys in May 2018, sent the samples to a lab for identification, and analyzed the results.
- Run two educational monitoring events for an Environmental Sciences class at Diablo Valley College (DVC), working on Grayson Creek which runs through the campus.
- Collected data on stormwater during the first rain of the 2018-2019 water year, looking at heavy metals, nutrients, chlorine, alkalinity, and water hardness.

Still to come are an analysis of our stormwater data as well as sharing the data on our data portal; conducting further BMI surveys; holding two more events at DVC; and summarizing the results of our monthly monitoring for the 2018-2019 year.

We thank the Contra Costa County Fish and Wildlife Committee for your continued support of our creek monitoring program, which has been instrumental in allowing us to expand our water quality monitoring program and provide environmental education opportunities to volunteers of all ages.

Sincerely,

Helen Fitanides
Program Coordinator
The Watershed Project
INTRODUCTION
The Kids Healthy Outdoors Challenge was originally piloted in 2012 with the goal of promoting outdoor education while also supporting third grade curriculum content standards, which now include Common Core Standards) in Alameda and Contra Costa County school districts. The program is designed to be a complementary tool to support the delivery of required content in a fun and engaging way in an outdoor classroom.

The KHOC curriculum is aligned with the California Children’s Outdoor Bill of Rights, which states that before entering high school every child in California should have the opportunity to experience 10 key outdoor activities. In doing so, children who do these things are healthier, do better in school, have better social skills and self-image, and lead more fulfilled lives. These key activities are the basis for the KHOC lessons and include:

<table>
<thead>
<tr>
<th>California Children’s Outdoor Bill of Rights</th>
<th>Fundamental Experiences Before Entering High School</th>
</tr>
</thead>
<tbody>
<tr>
<td>Play in a safe place</td>
<td>Camp under the stars</td>
</tr>
<tr>
<td>Explore Nature</td>
<td>Ride a bike</td>
</tr>
<tr>
<td>Learn to swim</td>
<td>Go boating</td>
</tr>
<tr>
<td>Go fishing</td>
<td>Connect with the past</td>
</tr>
<tr>
<td>Follow a trail</td>
<td>Plant a seed</td>
</tr>
</tbody>
</table>

The 2017-2018 school-year was KHOC’s sixth year. For the program, each teacher was asked to use KHOC lesson activities and go on one class trip to an East Bay Regional Park District Park. Outcomes included:

- Increased comfort and skills teaching outdoors among participating teachers
- Diverse teacher supported in meeting third-grade curriculum content standards
- Increased use of EBRPD resources to support learning
- Increased level of physical activity outdoors, promoting health and well-being, and life-long parks use, among the teachers and their diverse students

RESULTS
During the 2017-2018 school year participation in KHOC continued to grow, with 152 invited teachers/classrooms, up from 135 in SY16-17 (13% increase). Between the two counties 78 field trips were taken with a total of 4,701 participants (including chaperones). The cost of providing transportation remained very low at approximately $12.00 per bus passenger and on average the buses carried 60 people.

Some parks are closer and more accessible than others, and the most popular are typically the parks where a naturalist guide is available to help with the field trip. In the 2017-18 school year these parks were
visited: Coyote Hills (16), Tilden Nature Area (11), Crab Cove (9), Black Diamond Mines (8), Big Break (6), Redwood (6), Shadow Cliffs (4), Del Valle (3), Martinez Shoreline (3), Ardenwood (2), Temescal (2), Garin (1).

Of the total field trips taken between the two counties, 21 of these were from schools in Contra Costa County with a total of 1,117 participants. The following are statistics from Contra Costa County.

![Graph showing SY 17-18 KHOC CCC Students Breakdown by Supervisorial District]

To-date $10,311.62 of the funds from the Propagation Fund have been spent with plans to spend the remaining balance of $9,688.38 during Spring 2019. The current school year (SY18-19) is shaping up to be another great year. In October KHOC was able to extend invitations to 183 teachers, which is an increase over SY17-18 of 20%, and in Contra Costa County six field trips have already been scheduled. Since the majority of field trips took place before the end of April last year, we anticipate that the remaining funds will easily be spent by the end of the grant cycle.

- 14-Feb Harding Elementary, El Cerrito
- 12-Apr Lupine Hills, Hercules (multiple classrooms)
- 28-Mar Washington Elementary, Richmond (multiple classrooms)
- 1-Mar Montalvin Elementary

### KHOC Spending Report
(as of January 9, 2019)

<table>
<thead>
<tr>
<th>Item &amp; Description</th>
<th>Propagation Fund Award</th>
<th>Funds Spent To-Date</th>
<th>Remaining Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus Transportation</td>
<td>20,000</td>
<td>$10,311.62</td>
<td>$9,688.38</td>
</tr>
<tr>
<td><strong>Fieldtrips to Regional Parks for low-income schools on average $12.00 per child</strong></td>
<td>$20,000</td>
<td>$10,311.62</td>
<td>$9,688.38</td>
</tr>
<tr>
<td><strong>TOTAL PROJECT COST</strong></td>
<td><strong>20,000</strong></td>
<td><strong>$10,311.62</strong></td>
<td><strong>$9,688.38</strong></td>
</tr>
</tbody>
</table>
Final Report Narrative to the Contra Costa County Fish and Wildlife Committee

2018 Delta Education Supplies

Grantee: Marine Science Institute (MSI)
Name of Project: 2018 Delta Education Supplies
Grant Amount: $7,739.63
Date of Grant: 4/19/2018
Date of Report: 1/7/2019
Primary Contact: Marilou Seiff, Executive Director; (650) 364-2760 x11, marilou@sfbaymsi.org

SUMMARY OF PROGRESS TOWARD GOAL

The goal for the 2018 Delta Education Supplies project was to replace many of the weather-destroyed supplies that are essential to the full implementation of the Delta Discovery Voyage Program during January and February 2018. The supplies to be replaced were:

- Student Raincoats
- Survival Suits
- Life Vests
- Delta Maps
- Delta Fish Keys

By the end of the grant period, we met the stated goal by replacing these supplies, and we fully expended the $7,739.63 grant.

MOST SIGNIFICANT RESULT ATTRIBUTED TO CCCFWC FUNDING

The most significant result that can be attributed to the CCCFWC funding is that you funded the replacement of our critical safety supplies and our Delta education supplies. We were able to deliver marine science education via our Delta Discovery Voyages to 3,820 fifth grade Contra Costa County students in 2018. Your funding allowed us to do this safely and without interruptions throughout the season, and will be used for many more years.

See next pages for 2018 Delta Education Supplies accounting, receipts and invoice.
# 2018 Delta Education Supplies Accounting

<table>
<thead>
<tr>
<th>SUPPLIES TO BE REPLACED</th>
<th>Projected Budget</th>
<th>Supplies Purchased</th>
<th>Project Actuals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Student Raincoats</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coleman Industrial 30mm PVC Raincoat</td>
<td>$445.80</td>
<td>Rain Slickers</td>
<td>$1,409.27</td>
</tr>
<tr>
<td>Boss PVC Raincoat 35 Mil_48 Long</td>
<td>$620.70</td>
<td>Raincoats/Rainpants/ Buckets</td>
<td>$1,606.88</td>
</tr>
<tr>
<td>CLC Rain Wear R105M .35 MM PVC Trench Coat</td>
<td>$418.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safety riding slicker-long</td>
<td>$599.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Raincoat Replacement</strong></td>
<td>$2,084.00</td>
<td>Includes sales tax</td>
<td>$3,016.15</td>
</tr>
<tr>
<td><strong>Survival Suits</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Mustang Survival Catalyst Flotation Coat</td>
<td>$717.80</td>
<td>Includes sales tax</td>
<td>$751.14</td>
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<tr>
<td><strong>Life Vests</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>West Marine Life Jacket_USCG Approval Type III</td>
<td>$2,499.50</td>
<td>Includes sales tax</td>
<td>$2,457.13</td>
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<tr>
<td><strong>Delta Maps</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Maps on vinyl poster</td>
<td>$220.00</td>
<td></td>
<td>$235.78</td>
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<tr>
<td>Maps on DiBond</td>
<td>$312.00</td>
<td></td>
<td>$417.49</td>
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<tr>
<td><strong>Total Map Replacement</strong></td>
<td>$532.00</td>
<td>Includes sales tax</td>
<td>$653.27</td>
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<tr>
<td><strong>Delta Fish Keys</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Books</td>
<td>$1,300.00</td>
<td>Includes sales tax</td>
<td>$760.00</td>
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<tr>
<td><strong>Subtotal</strong></td>
<td>$7,133.30</td>
<td></td>
<td>$7,637.69</td>
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<tr>
<td><strong>Additional Supplies purchased</strong></td>
<td></td>
<td></td>
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<tr>
<td>Delta Plankton Nets - includes sales tax</td>
<td>$212.45</td>
<td></td>
<td></td>
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<tr>
<td><strong>Sales Tax = 8.75%</strong></td>
<td>$606.33</td>
<td></td>
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<tr>
<td><strong>TOTAL EXPENDITURE</strong></td>
<td>$7,739.63</td>
<td></td>
<td>$7,850.14</td>
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<tr>
<td><strong>Project Surplus (Deficit)</strong></td>
<td></td>
<td></td>
<td>($110.51)</td>
</tr>
</tbody>
</table>

**Explanations:**

- **A:** This line item is significantly different in the final budget report than it appears in the original proposal. This is because sales tax in the original budget proposal was estimated and included a single budget item. Sales tax in the final budget report is included within the total of each budget line item.
- **B:** We were able to get a significantly better price from a second vendor than what we were quoted from the first vendor.
- **C:** Because we saved significant cost on the Delta Fish Keys, we identified two supply items (not included in the original proposal) that were in great need of replacing. The two items are the fish observation buckets and the plankton nets.
- **D:** After purchasing the much-needed additional items, we realized that we were over-budget. We solicited a donor who gave a gift to cover the remainder of the cost.
## CCCF-WPF grant spending overview

<table>
<thead>
<tr>
<th>Item</th>
<th>Store</th>
<th>#</th>
<th>Cost</th>
<th>Total</th>
<th>Grant Amt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maps on Vinyl</td>
<td>FastSigns</td>
<td>2</td>
<td>217</td>
<td></td>
<td></td>
</tr>
<tr>
<td>maps on DiBond</td>
<td>FastSigns</td>
<td>2</td>
<td>$417.49</td>
<td></td>
<td></td>
</tr>
<tr>
<td>XS work vest</td>
<td>Overton's</td>
<td>16</td>
<td>$330.08</td>
<td></td>
<td></td>
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<tr>
<td>S/M work vest</td>
<td>Peter Glenn</td>
<td>20</td>
<td>599.8</td>
<td></td>
<td></td>
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<tr>
<td>L/XL work vest</td>
<td>Peter Glenn</td>
<td>27</td>
<td>809.73</td>
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<tr>
<td>L/XL &amp; XL+ work vest</td>
<td>The House</td>
<td>22</td>
<td>717.52</td>
<td></td>
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</tr>
<tr>
<td>Delta fish guides</td>
<td>Plasti-Print</td>
<td>20</td>
<td>760</td>
<td></td>
<td></td>
</tr>
<tr>
<td>student rain slickers</td>
<td>Amazon</td>
<td>126</td>
<td>1409.27</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Floatation coat M &amp; L</td>
<td>amazon</td>
<td>2</td>
<td>751.14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Raincoat/blankets/stickers</td>
<td>Amazon</td>
<td>12/18/24</td>
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Invoice Date: 01/07/19

Customer: Contra Costa County Fish and Wildlife Committee
30 Muir Road
Martinez, CA 94553
Attn: Maureen Parkes

Remit payment to: Marine Science Institute
500 Discovery Parkway
Redwood City, CA 94063-4746
Phone: (650) 364-2760 Fax: (650) 364-0416

For 2018 Delta Education Supplies

Total Due: $7,739.63

Thank you very much for your support!
The more you know about water—where it comes from and where it goes—the more you can wisely use and conserve this important resource.
The Dish on the Delta

Flowing south, the mighty Sacramento River meets the north-bound San Joaquin River just south of Sacramento in an area called the Delta. Here the two rivers mingle with smaller tributaries to form a maze of waterways surrounding many islands. The rivers’ fresh water rolls west through a narrow break in the Coast Range and meets salt water of the San Francisco Bay. The Bay-Delta Estuary is the largest estuary on the West Coast of North America, where the mix of fresh and salt water provides an environment that supports many types of plants and animals.

Originally, the marshy lands of the Delta were a haven for trappers due to the abundant wildlife. After gold was discovered in California, farmers started planting in the fertile soil of the Delta to provide food to the miners. These farmers began building levees to drain the marshy land. The drained areas were transformed into productive island farms. The Delta farms are still important today.

Water from the Delta is pumped and transported throughout the State. Canals and aqueducts take water from the Delta to cities around the Bay Area, to millions of acres of farmland in the San Joaquin Valley and to 15 million people in southern California.

The Delta is also the state’s most important fish habitat. However the populations of many native species of fish have declined. Many things could be contributing to the decline including drought, poor water quality, water diversions and the presence of non-native species that compete for food.

Students Seek Truth

This year fifth grade students from across Contra Costa County will embark upon a journey to discover the truth about the Sacramento-San Joaquin Delta. They plan a period of intense classroom study, combined with an exciting field trip aboard the Research Vessel Brownlee, to determine how they can be good stewards of the Delta environment.

They will discover how people depend upon the Delta for drinking water, farming, industry, and recreation and how fish and wildlife need a healthy Delta to survive.

Word Roots

A delta is the place where rivers fan-out just before emptying into the sea. Technically, deltas are called “alluvial fans.” Alluvial comes from the Latin word “Alluere,” meaning “to wash against.” Alluvial fans have been made of land that has been deposited or left by water. The Greeks coined the word “delta” because the fan-like shape reminded them of the triangular shape of the letter they called “delta,” which became our letter “D.”

Does anyone in your class know the Spanish noun for rain? If so, do you see any similarities to the word “alluvial”? **

No New Water!!

Studies of the world’s water have concluded there is no new water for the world’s growing population. Evidently the same water has been getting used over and over for millions of years.

An expert in the field, Dr. H. Tuoh, said: “My research indicates that if it wasn’t for the water cycle we would really be out of luck. We have got to do better with the limited fresh water we have on the earth.”
Pollutants, like mercury, are released into the Delta from industry and household chemicals. Plants and animals living in contaminated areas absorb mercury simply by being around it! Having toxins, like mercury, in their bodies can make having healthy babies, catching food, and even moving, difficult!

Bioaccumulation & Biomagnification

When animals who have absorbed toxins from their environment (bioaccumulation) are eaten by predators, the predators may then absorb some of the toxins from their prey. The mercury is passed from prey to predator. Often, large, “top” predators have very high levels of mercury because as it is passed along the food chain, mercury concentrates in the top predators’ bodies. These levels can be dangerous to their health. Can you name any fish that are “top” predators that you might eat?

How can you help? By taking chemicals to the Household Hazardous Waste Collection Facility we can keep toxins OUT of the Delta’s wildlife, and out of you!

Bio-Math: Striped Bass & Mercury

If a striped bass is 12 years old and has a concentration of 0.9 ppm (parts per million) of mercury in its blood, how much mercury (in ppm) has it been absorbing yearly, on average?

1. \[ \frac{0.9 \text{ ppm}}{12 \text{ years}} = \text{ ppm of mercury per year} \]

Using your answer from #1, how many years does it take for a striped bass to reach 0.45 ppm of mercury in its blood?

2. \[ \text{ppm of mercury per year} \times \text{ years} = 0.45 \text{ ppm of mercury in its blood} \]

If each plankton a striped bass eats has absorbed 4 units of mercury from its habitat, and the bass loses half (or 0.5) of the mercury it eats back into the habitat, how many plankton does it have to eat before it has 600 mercury units in its body? 256 mercury units? 50 units?

3. \[ 4 \text{ units of mercury} \times \frac{1}{2} \text{ or } 0.5 \text{ mercury lost} \times \text{ number of plankton} = 600 \text{ mercury units in its body} \]
ACROSS
2. An organism that makes food (green plants are an example).
5. Area in which an organism normally lives.
6. An embankment built to prevent a river from overflowing.
8. Harmful impact on the environment resulting from human activities.
10. Drifting aquatic animals and plants.
13. The amount of salt in the water.
15. Organisms in an ecosystem, shows who eats whom.
17. An animal lacking a true backbone.
19. Where the water falling to earth drains into a common source.
20. The process by which plants make food.

DOWN
1. Modification of an organism in order to survive in its habitat.
3. The study of fish.
4. The study of water.
7. The study of relationships between organisms and their environment.
9. Rising and falling of seas.
11. Where the Sacramento and San Joaquin join.
12. The bottom dwelling community.
16. Dead plant and animal material, and the bacteria decomposing them.
18. An organism that eats plants and/or animals.

TRY THESE VOCABULARY WORDS:
- Adaptation
- Benthos
- Consumer
- Delta
- Detritus
- Ecology
- Food Web
- Hydrology
- Habitats
- Ichthyology
- Invertebrate
- Levee
- Photosynthesis
- Plankton
- Pollution
- Producer
- Salinity
- Tides
- Vertebrate
- Watershed
California Water Facts:
- Water is the only substance on earth that naturally occurs in all three states of matter (solid, liquid, and gas)
- There is no “new” water - the same water continuously goes through the water cycle (evaporation, transpiration, condensation, and precipitation.)
- Although the Delta comprises just 1% of California's total area, 40% of the state is in the Sacramento - San Joaquin River Delta watershed.
- 2/3 of all Californians depend upon the Delta for at least part of their water supply.
- The population of California continues to grow, but the amount of available fresh water remains the same. Cities, farmers, industry, and the environment all depend upon this limited supply.

There are some great websites on the Internet where you can find out more about your water and the environment. Here are a few suggestions:
Contra Costa Water District:  www.ccwater.com/education  (look at the online resources and water related links)
Central Contra Costa Sanitary District: www.centralesan.org  
Delta Diablo Sanitation District: www.DDSD.org
United States Geologic Society: http://ga.water.usgs.gov/edu  
Environmental Protection Agency:  www.epa/water/kids.html
1. Where does your water go?
   
   **Draw a line** to follow the path of dirty water from the house to the treatment plant. Then draw a line to follow the path of clean water to the Bay.

2. Find and circle 4 places where water could be polluted with oil or chemicals that might harm our creeks, the Delta, or the Bay.
Understanding how you affect the environment is the first step in taking good care of it. What you do at home can affect the water in creeks and the Delta. You can help save resources by reducing, reusing, and recycling.

3. Find and list 3 things that can be hazardous waste if not used up or disposed of properly.

__________________________
__________________________
__________________________

4. Find and mark an X on the place where you can take leftover paint, oil, fluorescent lights, or other household wastes to be recycled, reused, or disposed of safely.

5. Draw a drop of water where:
   - water is being wasted
   - water is being reused
Have you ever seen a sign like this stenciled onto the ground near a storm drain on a street?

Storm drains are designed to take storm runoff back to local creeks and then out to the Delta. Water that goes down the storm drain does not get treated before it ends up in the creeks, streams and Delta. Anything that gets washed into the storm drain also ends up in the Delta.

Here are some simple ways you and your family can help keep the Delta clean:

- Dispose of household waste properly.
- Clean up after your pets.
- Use yard chemicals like fertilizer and pesticides sparingly.
- Move vehicles for street sweeping.

A Few Questions for Discussion

1. You know that water on earth is naturally recycled. This process is called the water cycle. Discuss what would be different about the earth if there was no natural water cycle.
2. Describe how snow in the mountains ends up as the water we drink in our homes.
3. What is meant by the saying “Everyone lives downstream from somebody else” - Why is that important to us?
There are 25 words about keeping water clean hidden in this word puzzle. Words may be written up and down, or from left to right.

Can you find and circle the following 25 hidden words?

Bacteria
Bay
Biodegradable
Central San
Conserve
Delta Diablo
Environment
Estuary
Filter
Hazardous
Mercury
Pollution
Protect
Recycle
Reuse
River
Sewer
Sludge
Storm drain
Test
Toxic
Treatment
Wastewater
Water District
Watershed
1. What two major California rivers form the Delta?

2. The water in the Delta is saltier in the fall than in the spring. Why do you think this is?

How is the Delta important to:
3. People who live in cities?
4. Fish and wildlife?
5. Farmers?
6. Name some recreational activities people do in the Delta.

Unscramble these words:

fghnisif bingoat mmingsiw

True or False

7. Most of the water in the Delta originates as snow in the Sierra Nevada Mountains.

8. When it rains, the water that drains off my driveway and into the street is cleaned of pollution and chemicals before it empties into the Delta.

9. The water we drink has never been used before.

10. I can make a difference in the quality of water we drink and in the quality of water available for fish and other wildlife.

11. The water we drink has never been used before.

12. I can make a difference in the quality of water we drink and in the quality of water available for fish and other wildlife.

13. The water we drink has never been used before.
Post-Trip Report

Draw and describe what you did at each station aboard the R/V Brownlee

Benthic

Ichthyology

Plankton

Hydrology

What 3 things will you share with your family and friends about this trip?

What did you like most about this trip?

__________________________
__________________________
__________________________
__________________________
__________________________
__________________________

Agenda Item 5e
Communities eligible to use the HHW facility include: Alamo, Clayton, Clyde, Concord, Danville, Lafayette, Martinez, Moraga, Orinda, Pacheco, Pleasant Hill, San Ramon, Walnut Creek, and other unincorporated central county areas.

Dear Parent: Please help your child complete this survey to identify products in your home that can contribute to water pollution.

1) Check off any of the household hazardous wastes (HHW) that you have at home.

2) Carefully store leftover products for a trip to the HHW Collection Facility (see below).

3) Remember to recycle used motor oil by taking it to the HHW Collection Facility.

Central County
Location
Central Contra Costa Sanitary District
4797 Imhoff Place
Martinez, CA 94553

Hours
Monday - Saturday, 9 a.m. - 4 p.m.
Call for Holiday closures
Call 1-800-646-1431
www.centralsan.org

Communities eligible to use the HHW facility include: Alamo, Clayton, Clyde, Concord, Danville, Lafayette, Martinez, Moraga, Orinda, Pacheco, Pleasant Hill, San Ramon, Walnut Creek, and other unincorporated central county areas.

East County*
Location
Delta Diablo
2550 Pittsburg-Antioch Hwy,
Pittsburg, CA 94509
(between Loveridge & Somersville)

Hours
Thursday - Saturday, 9 a.m. - 4 p.m.
Call for Holiday closures
Call 925-756-1990
www.ddsd.org

Antioch, Bay Point, Bethel Island, Brentwood Byron, Discovery Bay, Knightsen, Oakley and Pittsburg.

Free HHW Collection Facilities

Household Products
- Batteries
- Fluorescent bulbs & compact fluorescent lights (CFLs)
- Bleach, ammonia, cleaners
- Furniture polishes

Paint Products
- Latex & oil-based paints
- Wood stain & varnishes
- Paint remover/paint thinner & solvents

Personal Care Products
- Mercury fever thermometers
- Fingernail polish & remover
- Hair care, perfumes & colognes

Automotive Products
- Motor oil, gasoline, antifreeze
- Brake & transmission fluid
- Car batteries

Garden and pest-control products
- Pesticides, herbicides, fertilizers

Miscellaneous
- Cooking oils & grease (large quantities, as from a turkey fryer)
- Chemicals
- Other products labeled with caution, danger, poison, toxic, etc. What did you find?

Pharmaceutical Disposal
CCCSD’s HHW Collection Facility does not accept pharmaceuticals. For a list of locations for free, safe disposal, go to www.centralsan.org and click on the link in the bottom right corner.

*Also includes e-waste & sharps
Summary of Grant Use for Beaver Festival 2018

Even though this event was held in a new park, at a new time, it was still widely attended and successful. For the first time ever we had more than 50 nature exhibits join us, including the EBRP fish mobile, the Mt Diablo Beekeepers Association and NOAA Fisheries. Perhaps because of the time of year there were slightly fewer child participants, and more interested adults than previous years. Having an artist live chalking the focal beaver pond in the center of the plaza was a huge added bonus, for two days folks gathered around to watch her create.

The Build-A-Beaver Pond activity was very popular with our participants, and since we had fewer children than usual we allowed adults to participate in the afternoon. The explanation side of the card (enclosed) was very well received and children referred to it throughout the day. The 15 exhibitors helped children earn wildlife stickers and most filled up their cards. A touching exception came from one young girl that collected all the stickers but wanted to take everything home with her to place the stickers carefully in private later on.

After concluding the activity 28 children completed the post test and 19 of those received perfect results. The difficult concept for many children this year was thinking of humans as a kind of ‘animal’ which we had expected. Two beaver puppets were awarded to the winners, a Martinez resident and one from a neighboring city. Because two additional large stuffed beaver toys were donated to us this year we decided to expand the post-test to include a quiz about the correct way to protect trees from beavers (see enclosed ticket) and nearly 100 families participated. After soliciting entries, two beaver-supporting children explained the correct answers on stage noting that damage to trees was the number one conflict that beavers caused.

Because we were able to negotiate lower prices on the stickers and postcard, we used the remaining funds to include three vinyl banners for children to draw wildlife so they could be hung from the lamp posts in the park. (photo) This turned out to be an excellent way for children to feel personally involved and connected to the event, and we can reuse them at future festivals every year.

The mood of the festival this year seemed less ‘school fieldtrip’ and more of a gathering of naturalists. This was augmented by Amy’s incredible artwork and author Ben Goldfarb reading from his new book “Eager: The Secret Surprising lives of Beavers and why they Matter” on stage – including excerpts from his chapter on the Martinez beavers. All in all it was an enormous success and we were supremely grateful for the help your grant afforded us.

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1029.45
ABOUT THE ARTIST

Amy Gallaher Hall is a graphic designer based in Napa, California. We're especially lucky she has a lifelong appreciation of beavers. Make sure you stop by to see this particular beaver pond come to life.

WORTH A DAM PRESENTS

THE ANNUAL BEAVER FESTIVAL XI

WE HAVE MOVED!

SUSANA PARK

A special thank you to John Reza of J.R. HOGO & Partners for amplification services. Cover illustration and brochure by Amelia Hunter, www.ArtbyAmelia.com

WORTH A DAM THANKS THE FOLLOWING:

MartinezBeavers.org

SUSANA PARK

SATURDAY

2018

June 30

11 AM TO 4 PM

IN

Susana Park
**CHALK WALK**

All Day, Booth #5
Decorate the sidewalk beaver pond mural with your own creations.

**ART PROJECT**

All Day, Booth #1
Help our artists paint a beaver pond on fabric curtains!

**BUILD A BEAVER POND**

With stickers! Start at Booth #24.
Get your 'empty' beaver pond, then learn how beaver ponds help other wildlife while you earn stickers from booths 4, 8, 11, 14, 18, 22, 24, 26, 28, 30, 32, 35, 37, 43, 48 and 50. Can you collect them all? While supplies last.

**MUSIC**

11:00 Alhambra Valley Band Bluegrass
Noon Children's parade led by Bagpiper Dave Kwinter of the Piedmont Highlanders. Calling all children! Join the parade to display the beaver banner.
12:30 Esteban Reyes Traditional
1:30 Ben Goldfarb "Eagles" The Secret lives of beavers and why they matter
1:50 Think like a Beaver Raffle Drawing
2:00 Split of '29 Old Time Jazz
3:00 The UnConcord Americana

**Silent Auction**

All Day, Booth #41
Please help support this festival by visiting our unique silent auction.
11:00 Bidding Starts
3:30 Bidding Closes
3:30-4:00 Pick Up Winnings

AFRICAN SAFARI in Santa Rosa

SONOMA RACEWAY
Six Flags Berkeley Rep

42. Save the Snakes
43. International Bird Rescue
44. PLAN Save the Badgers
45. East Bay Herbals
46. Rising Sun Energy Center
47. CA Bluebird Association
48. Mt. Diablo Audubon Society
49. Wild Birds Unlimited
50. The Naturalist
51. East Bay Sewing Guild
52. Worth A Dam Think Like a Beaver Raffle
BEAVER PONDS HELP EVERYONE!

A safe place to nest

Flying insects mean dinner for me

I'm here for the bugs

YOU'RE WELCOME

mmm...plants

MORE BUGS MEAN MORE FISH FOR ME

We love the little fish

Little fish eat bugs

Frog food

Crawdads for me

Big fish eat little fish

WORTH A DAM?
draw a line between the beaver and the animals it helps

your name
contact number
November 14, 2018

Contra Costa Fish and Wildlife Committee  
Contra Costa County Department of Conservation and Development  
30 Muir Rd., Martinez, CA 94553

RE: Ecology of fear: What stresses out wild mammals?

Dear Fish and Wildlife Committee Members:

I am writing to request an extension for our project, “Ecology of fear: What stresses out wild mammals?” on behalf of Mills College. On behalf of my students (a.k.a., “Team Squirrel”), Mills College is incredibly grateful for your Contra Costa County Fish and Wildlife Propagation Grant of $9,430.75. With your generous support, we have made considerable progress on this project. To date, this grant allowed for us to purchase the necessary consumable supplies to extract hormones from fecal samples collected for marked individual as part of Briones Long-Term Study of California Ground Squirrels in Contra Costa County.

This project is important in that it is offering new insights into the ways that contact with humans and other factors in the environment are shaping the stress physiology of these wild mammals.

My team of undergraduates and myself have now extracted 1,765 of our 2,185 samples using a freeze-dryer and extraction process. This process stabilizes the “stress” hormone metabolites and results in a standardized volume of methanol containing the hormone metabolites. We aim to complete this extraction process by January 2019.

Our final step to complete this project will be to purchase ELISA kits from Cayman Chemicals. An ELISA (enzyme-linked immunosorbent assays) is a plate-based assay technique designed for detecting and quantifying substances, such as hormones. Running ELISAs is the most expensive part of the project and are time-sensitive with respect to when they must be used after their purchase. Moreover, the kit requires an overnight incubation period of the assay plate. This part of the project is therefore challenging to run given my heavy teaching load during the academic semesters and my intensive field work with undergraduates during the summer months.

Starting in January, Mills College has offered me a local sabbatical so that I may fully-devote myself to research during the Spring semester. I request an extension so that we may perform the ELISAs in Spring 2019 and, once fully trained, a top student of mine will continue to conduct these assays into Summer 2019. We this revised schedule, we should be in an excellent position to submit our final report by September 15th, 2019.
My students and I have now presented our preliminary results from this work at two of the Fall Annual Picnic. We also engaged in outreach with the Contra Costa community to inform the public about our research, the value of wildlife conservation and distributed wildlife in your background pamphlets at several Discovery Day Events in the region.

We thank the committee for considering our request to extend this project so that we may fully support its scientific and educational goals. We appreciate your continued support for this incredible educational experience for my students and for supporting the scientific study of wildlife in Contra Costa County. Several members of my current and previous research team are shown in this photo at a recent undergraduate research symposium we hosted at Mills College.

In addition to making this request, I also attach a major paper that we just published in a top, peer-reviewed journal with an international reputation on our first grant supported by your committee. This publication was co-authored by five of my female undergraduates, including three first-generation Latina women. This work would have been impossible without your generous support. If you have any questions about my extension request or our research findings to date, please do not hesitate to contact me.

Sincerely,

Jennifer E. Smith, Associate Professor of Biology
Website: www.JenniferElaineSmith.com, Email: jesmith@mills.edu
Mills College Biology Professor Coauthors Research on the Social Personalities of California Ground Squirrels

Oakland, CA—July 2, 2018

Mills College Professor of Biology Jennifer E. Smith, a team of five undergraduate students, and collaborator and coauthor Andy Sih at the University of California Davis recently examined the effects of architecture and personality on the social behavior of ground squirrels.

The team’s findings were published today in Philosophical Transactions of the Royal Society B. The peer-reviewed science journal publishes high quality theme issues on topics of current importance and general interest within the life sciences.

The study, titled Split between two worlds: automated sensing reveals links between above- and belowground social networks in a free-living mammal provides some important revelations about the ways that architecture shapes collective behavior.

Most people split their time between two or more major environments – living with family or friends within confined housing conditions, and interacting with others outside of the home in a relatively open and free manner. Like humans, many other mammals split their time between two worlds.

Using an automated detection system, Smith and her team observed California ground squirrels aboveground where space is relatively open, and belowground within a relatively constrained burrow architecture. This allowed them to examine the effects of architecture and personality on the social behavior of squirrels, uncovering their secret, belowground social lives.

Analysis by the science team found that these wild animals seek shelter in defined burrow systems but also interact with group-mates above ground. The study further
revealed that belowground social structure predicts collective behaviours above ground, and that adults and juveniles associate most often. Females are key in connecting networks belowground.

More importantly, highly connected individuals belowground were also highly connected aboveground. These patterns were consistent across years.

“Basically, our study shows that socially-connected squirrels are consistently social in multiple situations,” says Professor Smith.

This is important because superspreaders may be key in determining whether diseases become epidemics. “Although the animals in this study are remarkably healthy, the parasites of California grounds squirrels may carry diseases, including plague.”

This research has potential implications for disease and information transmission for other social animals, including humans, who vary in their social network connections.

“Our findings that squirrels have consistent social personalities across major situations and time is really exciting,” Smith adds. “Key, highly social individuals likely may act as hot spots for transmission.”

The project was sponsored by the National Science Foundation, the Barrett Foundation and Contra Costa County Fish and Wildlife Propagation Fund.

**About Mills College**

Located in Oakland, California, in the heart of the San Francisco Bay Area, Mills College is a nationally renowned independent liberal arts college for women with graduate programs for women and men. Ranked one of the top-tier regional universities in the West by *U.S. News & World Report*, Mills is also recognized as one of *The Best 382 Colleges* in the nation by The Princeton Review. Since 1852, we’ve been empowering students to become creative, independent thinkers who take and inspire action. For more information, visit [www.mills.edu](http://www.mills.edu).
Split between two worlds: automated sensing reveals links between above- and belowground social networks in a free-living mammal

Jennifer E. Smith1, Denisse A. Gamboa1, Julia M. Spencer1, Sarah J. Travenick1, Chelsea A. Ortiz2, Riana D. Hunter1 and Andy Sih2

1Biology Department, Mills College, 5000 MacArthur Blvd., Oakland, CA, 94631, USA
2Department of Environmental Science and Policy, University of California Davis, One Shields Avenue, Davis, CA 95616, USA

Many animals socialize in two or more major ecological contexts. In nature, these contexts often involve one situation in which space is more constrained (e.g. shared refuges, sleeping cliffs, nests, dens or burrows) and another situation in which animal movements are relatively free (e.g. in open spaces lacking architectural constraints). Although it is widely recognized that an individual's characteristics may shape its social life, the extent to which architecture constrains social decisions within and between habitats remains poorly understood. Here we developed a novel, automated-monitoring system to study the effects of personality, life-history stage and sex on the social network structure of a facultatively social mammal, the California ground squirrel (Otospermophilus beecheyi) in two distinct contexts: above-ground where space is relatively open and belowground where it is relatively constrained by burrow architecture. Aboveground networks reflected affiliative social interactions whereas belowground networks reflected burrow associations. Network structure in one context (belowground), along with preferential juvenile–adult associations, predicted structure in a second context (aboveground). Network positions of individuals were generally consistent across years (within contexts) and between ecological contexts (within years), suggesting that individual personalities and behavioural syndromes, respectively, contribute to the social network structure of these free-living mammals. Direct ties (strength) tended to be stronger in belowground networks whereas more indirect paths (between-ness centrality) flowed through individuals in aboveground networks. Belowground, females fostered significantly more indirect paths than did males. Our findings have important potential implications for disease and information transmission, offering new insights into the multiple factors contributing to social structures across ecological contexts.

This article is part of the theme issue ‘Interdisciplinary approaches for uncovering the impacts of architecture on collective behaviour’.

1. Introduction

Behavioural ecologists have long understood that social decisions have important fitness consequences for individuals, shaping key processes including foraging decisions, information flow, disease transmission and reproduction [1]. It has become increasingly clear that who-meets-whom within animal societies is rarely random [2] and that social structure is often produced by individual variation in social preferences within groups [3,4]. Social network theory offers useful tools for quantifying and understanding how this variation contributes to social structure [5–7]. This framework formalizes the classical
view that repeated pairwise interactions give rise to social relationships that in turn contribute to emergent social structures [8]. Importantly, network analysis extends traditional approaches by offering well-defined, standardized metrics for characterizing the effect of an individual’s characteristics on direct and indirect social connections [9–11]. Network metrics are, therefore, offering new insights into the ways that individual characteristics (e.g. life-history stage, sex), preferential relationships (e.g. coalition partners) and the presence of key individuals shape group stability and structure [3,12–18].

A parallel, but largely distinct, literature has emerged showing that many animals exhibit ‘personalities’ [19], defined as consistent individual differences in behaviour; e.g. in aggressiveness, boldness or sociability. Only a handful of studies have explicitly linked personality traits to animal social networks [20–24]. A closely related literature examines behavioural syndromes, defined as consistent and/or correlated behaviour across two or more situations [19,25,26]. In nature, the two situations for animals often involve one situation where space is more constrained (e.g. shared use of refuges, sleeping cliffs, nests, or burrows) and another situation in which movements are relatively free (e.g. in open spaces lacking architectural constraints). The latter may, therefore, permit a richer range of social behaviours and interactions.

Interestingly, although most animals live in two or more distinct habitats or major situations, most social network studies are limited to a single context or rely upon combined data without explicit considerations of ecological context [27]. Thus, despite definitive evidence that individuals in different situations often differ in their patterns of space use [28,29] and sociality [30], and this notion being discussed extensively in review articles [7,10,31], very few empirical studies explicitly examine links between social networks derived from different situations [27]. This is unfortunate because connectivity may contribute to important processes such as disease and information transfer [32–34]. For example, understanding whether networks are more connected in one habitat than the other may offer insights into contexts as a ‘hot spot’ of transmission [35–37]. Moreover, partitioning the differences in social network metrics between contexts for individuals of different life-history stages and sexes will likely provide insights into how social rules (e.g. for juveniles versus adults [3,38]) vary or remain consistent across situations. Thus, although data collected using different sampling methods are inherently challenging to compare [39], efforts to assess the effects of life-history stage and sex on context-specific social metrics for individuals should provide an enhanced understanding of mechanisms contributing to social structure [2].

Within a social network framework, three major, non-mutually-exclusive mechanisms may generate social structure: ‘movement rules’, ‘social interaction rules’ and ‘individual characteristics’ [3,6,40]. First, movement rules refer to the ways that daily patterns of travel to and from limited resources, such as a shared refuge or a clumped food source, can produce repeated spatial associations even in the absence of social preference [41]. For individuals that travel away from refuges each day to search for food, movement rules predict that animals sharing similar refuges will be most likely to socialize due to increased encounter rates. Second, social interaction rules describe the extent to which social partner choice drives social structure [6]. These rules emphasize factors such as homophily [42], the tendency for similar individuals (e.g. same life-history stage, same sex) to preferentially interact. For example, homophily occurs among juveniles during play [43,44] or among adult females with enduring social bonds [45]. Finally, individual characteristics, such as personality, life-history stage or sex of an individual may predict social network metrics within a context [3,31,38]. An individual’s network position may also remain consistent across contexts, indicating a behavioural syndrome, or vary between contexts if individuals engage in context-specific social roles.

Here we studied a semi-fossorial mammal, the California ground squirrel, Otospermophilus beecheyi, to gain insights into the factors contributing to social network structures of free-living mammals who split their lives between two major contexts: above- and belowground. This is important because very few studies simultaneously seek to explain the ecological aspects of above- and belowground behaviours in semi-fossorial mammals; for notable exceptions, see [46,47]. California ground squirrels are facultatively social rodents that offer an interesting mammalian system for elucidating the extent to which movement rules, social interaction rules, and/or individual characteristics (e.g. personality, behavioural syndromes, life stage, sex) predict social structure. Individuals reside at distinct geographical sites, called colonies, at which group members regularly socialize, forage and collectively mob predators aboveground, but also seek refuge belowground in communal burrow systems for protection from predation and harsh weather [48–50].

Our current study capitalized upon the natural history of these animals to examine the mechanisms promoting social structure in two distinct contexts: above- and belowground. First, movement rules predict that because burrows are refuges limited in their size capacity as well as in their spatial distribution and abundance across the landscape, individuals that share burrows may also socialize to the greatest extent aboveground due to their increased tendency to interact as they travel to and from the same location (burrow) each day to forage aboveground. Specifically, if movements away from refuges spatially constrain opportunities for aboveground social exchanges, then social network structure in one context (belowground) should predict that in a second context (aboveground). Second, social interaction rules predict that if individuals exhibit social preferences based on homophily, then they should associate most often with others of the same stage and sex. Finally, we investigated how individual characteristics shape direct and indirect social connectivity within above- and belowground social networks. If networks reflect animal personalities and/or behavioural syndromes, then the relative network positions of individuals should be consistent over time (between years) and between contexts (aboveground versus belowground), respectively [31,51]. Beyond the effects of individual identity, we also predicted that juveniles of both sexes and adult females should be the most connected within their social networks. Although surprisingly little is known about kinship and dispersal patterns for the California ground squirrel [50], groups are likely matrilineal (female-based kin structure) with male-biased dispersal, as seen across the ground squirrel lineage [52]. If this is the case, then adult females and their immature offspring should promote connectivity, as seen in other matrilineal mammals [3,53,54].
2. Material and methods

(a) Field site and study subjects
We studied free-living California ground squirrels at Briones Regional Park in Contra Costa County, California (37.9377014 N, 122.1388542 W). At this field site, at least some members of the population remain active aboveground all year [55]. Breeding largely occurs from mid-February to April, with females typically only producing a single litter per year [55]. Adult females rear young in burrows until offspring emerge as fully weaned young (age: 45–60 days), after which young of the year spend the remainder of their first year as juveniles (61–364 days) before maturing into reproductive adults (older than 364 days) [55,56]. We focused on juveniles and adults in the current study because these individuals are regularly observed socializing aboveground and, thus, have ample opportunities to visit burrows belowground and to affiliate with colony members aboveground.

The precise connectivity of California ground squirrel burrow complexes is largely unknown [50]. Although most burrows are presumed to lack connections with multiple openings (e.g. 6–20 openings) at the surface [55]. Most tunnels are 4.6 m long, but extreme cases report tunnels of up to 70 m [55,57]. Regardless of the precise interconnectivity or length of burrow systems, individuals that share any burrow opening on a given day have opportunities to socialize, share space and exchange parasites [58].

(b) Live trapping of free-living individuals
The current study was part of a long-term study at our main colony site (Crow). Since 2013, we have live-trapped, marked and released California ground squirrels using squirrel traps (Tomahawk Live-Trap Company, Hazelhurst, Wisconsin, USA) baited with black oil sunflower seeds and peanut butter at and around burrow entrances. This is primarily done during the summer months, from late May to early August (figure 1a). Traps were covered with pieces of cardboard for shade and checked at intervals of <30 min. While safely contained in a cone-shaped, cloth handling bag [59], we noted the individual’s weight, sex, anogenital distance and reproductive status and then released each individual at its site of capture. We used this information to assign the life-history stage and sex to each individual for each year of the study.

Upon first capture, individuals were given three types of identification (figure 1). First, a Monel metal ear tag (National Band and Tag Co., Newport, Kentucky, USA) was attached to one pinna for permanent identification. Second, a unique Nyanzol cattle dye mark (Greenville colorants: New Jersey) was applied to the back for visual identification during social observations. Third, we inserted a unique passive integrated transponder (PIT) tag (Biomark, Inc., Boise Idaho) beneath the skin as a reliable ‘lifetime’ barcode [60]. In 2016 and 2017, respectively, we live-trapped and monitored a total of 131 and 158 marked individuals across the entire colony site.

(c) Automated sensing of belowground activity
Automated tracking offers exciting opportunities for the study of animal social networks [61]. Because the social lives of subterranean animals are largely hidden from researchers due to the small size of the openings to belowground refuges [62,63], we developed a new method for monitoring belowground activity of burrowing animals reliant upon radio-frequency identification to detect small (less than 1 g) and inexpensive PIT tags. We stored information from each burrow complex on an external data logger powered by a single 6 V rechargeable battery (Model DC224-6 AGM, Full River Battery, USA). A single battery powered each system for two weeks. This approach offers advantages over other reality-mining approaches because of its low cost, extended battery life and low disturbance to subjects [61].
Starting April 2016, we deployed data loggers (Biomark, Inc., Boise Idaho, figure 1a–c) at two distinct data monitoring stations within the colony site. The first station covered an area of 15.0 × 14.8 m² (‘Logs’ area), whereas the second station covered an area of 17.8 × 7.7 m² (‘580’ area). The two areas were separated by 86 m and squirrels were regularly observed travelling aboveground between them. A total of 12 antennae loops were attached to each data logger at each station. Each loop was placed at an active burrow entrance and detected movements by scanning the unique PIT tags of visitors (figure 1b). We validated that each loop accurately detected PIT tags by scanning tags in and out of loops and confirming that their time–date stamps were accurately stored on the SD card at each station. These 12 loops provided substantial coverage of active openings, covering roughly 90% of active burrow entrances at each burrow complex. We secured each antennae loop at a single burrow entrance with 10 cm × 2.5 cm Fabric & Garden Staples (Easy Gardener Products, Inc., Waco, TX). Staples were placed into the dirt using a mallet without damaging the burrow architecture, obstructing the ability for the antenna to effectively read the PIT tag, or jeopardizing animal safety as squirrels passed through the antennae (figure 1b). The data logger recorded the specific time, date and unique PIT tag number each time a tagged individual passed in or out of an antenna’s loop (figure 1c). Each data logger and battery were hidden under their own 24” × 12” × 3” artificial rocks ( Orbit granite valve box cover, Model # 53016) to protect equipment from weather and other disturbances. Squirrels adjusted quickly to the equipment; we detected the first squirrel entering a loop within 20 min. of deploying it. The automated-sensing system remains on-site and currently records data year-round. Loops are monitored weekly and reinforced with additional staples or repaired with electrical tape as needed. On rare occasions, we moved antennae from previously active burrows to newly active ones to ensure continuous coverage of most burrows; most changes occurred outside of our summer sampling periods, such as after a winter rainstorm or juveniles emerged at the start of the summer.

(d) Behavioural observations at field site

Social observations were conducted from 27 May to 27 July in two separate years: 2016 and 2017. Whereas the field site experienced a severe drought in 2016, rainfall returned to typical regional levels in 2017 (http://cedc.water.ca.gov/index.html). Most juveniles and adults of the year were marked during these entire periods and, thus, were easily observed during social observations and detected by the data loggers. We recognized animals aboveground in daylight within open grasslands by the unique fur marks we gave them. Animals were also detected belowground by their unique PIT tags at the two focal burrow complexes with consistently high antennae coverage. The diurnal lifestyles of these animals make them particularly straightforward to observe aboveground [48,50]. Trained observers monitored the study colony primarily in the mornings (0800 to 1200 h) and some afternoons (1200 to 1400 h); most affiliative interactions occurred between 0900 and 1100 h. Observers sat at a distance (≥20 m) to avoid influencing behaviour. Observers monitored multiple areas within the study colony each observation day of this study; at least two groups of observers simultaneously collected social data from each of the two areas being monitored belowground. Thus, these data provided excellent knowledge of affiliative interactions for animals observed at, between, or surrounding the two belowground monitoring stations.

We recorded all occurrences [64] of affiliative behaviours (socio-positive interactions) including greetings, proximity maintenance, social foraging and playing (for details, see ethogram [48,50]) using 10 × 14 binoculars (Eagle Optics Ranger Extra-Low Dispersion Middleton, WI). Briefly, greetings involved two individuals meeting head-on and touching noses, one individual rubbing its cheek on that of another squirrel, or one individual approaching a second head-on and rubbing its nose near the corner of the receiver’s mouth [48,50]. Proximity maintenance occurred when one individual approached a second and sat in direct body contact or within less than 1 m of the second individual [50]. Individuals foraged socially when they consumed seeds, grass or other forage within less than 1 m [50]. Each unique play bout started with one individual initiating play slapping, boxing, chasing, mounting, pouncing or wrestling with a second individual and ended when one of the two individuals moved apart from the other [50].

(e) Above- and belowground social network parameters

Networks are comprised of individuals (nodes) connected to each other (by ‘ties’ or ‘edges’). In this study, nodes represented individual squirrels and ties represented weighted, symmetric connections between them. We selected colony-year as the unit of analysis to account for annual changes in colony composition attributed to births, deaths and dispersal [65]. We therefore constructed a total of four separate networks—two belowground network and one aboveground network for each year.

Ties within a network reflected the proportion of days each pair, A and B, were detected at the same burrow reader (belowground) or exchanged affiliative behaviours (aboveground). We elected to use the same sampling period (day) for both contexts to minimize differences in network construction. Day was used as the sampling period for two reasons. First, although recording the precise amount of time pairs of semi-fossorial rodents are simultaneously aboveground is challenging, measures of daily rates of behaviour offer robust measures of affiliation [65]. Second, because the precise connectivity of burrow entrances and exits is unknown, this measure captures daily overlap within a burrow opening regardless of whether pairs shared the burrow at the same time for a given day. We calculated simple association indices to measure the daily rates of pairwise associations in each context [2,66]. This index was appropriate for our study because all subjects in the current study were equally likely to be detected in both contexts [2,66].

Belowground associations were calculated as: (the number of days A and B were detected using the same burrow)/(the number of days A and/or B were detected at one or more burrows). Aboveground associations were also calculated as: (the number of days A and B exchanged affiliative interactions)/(the number of days A and/or B were observed engaging in at least one affiliative interaction). Because even weak associations are potentially important for the maintenance of social structure, we analysed weighted, unfiltered networks based on all associations [67]. However, an individual had to be logged (via its PIT tag) at least once and observed engaging in at least one affiliative interaction aboveground to be included in the final aboveground and belowground networks for a given year. This was done to avoid spurious correlations between empty cells and to ensure that each pair had the opportunity to associate in both contexts [68].

We constructed each of the four networks using the package ‘igraph’ [69]. For each network, we calculated two different node-based metrics. First, we calculated the ‘strength’, the weighted equivalent to degree in binary networks, as the sum of its association indices with all colony-mates divided by the number of other potential actors (minus the focal individual) [70]. This standardized metric corrects for the number of nodes in the network to measure the extent to which each individual node directly associates with all potential actors in the network. Second, we calculated ‘betweenness centrality’, defined as a count of the
number of shortest paths through a node. This indirect metric reflects how important a node is for connecting disparate parts of the network, offering insights into the roles that key individuals may play in the spread of disease or information transmission across networks [6,31,32]. Because investigating the distributions of metrics (e.g., degree distribution for binary networks) is the preferred method for comparing node-based metrics between networks [2], we plotted cumulative distributions for metrics derived from above- and belowground networks to describe their relative properties.

(f) Statistical analyses
All statistical tests were conducted in R v. 3.4.1 [71]. To account for the non-independence in our data, we implemented permutation tests when using relational data (dyads within social networks) to test hypotheses [67,72] and included random effects in generalized linear mixed effects models (GLMMs) to account for repeated measures [3].

First, to test the predictions of movement and social interaction rules, we implemented multiple regression quadratic assignment procedures (MRQAPs) to assess the extent to which belowground network structure (predicted by movement constraints) and/or trait similarity (predicted by the social interaction rule of homophily) predicted aboveground network structure. This regression framework was superior to the univariate quadratic assignment procedure (QAP) because it allowed us to simultaneously test for the effects of multiple predictor matrices on the aboveground affiliative association matrix. For each year, we constructed a model in which we regressed three predictor matrices: (i) belowground association matrix, (ii) stage similarity (juvenile–juvenile = 1, juvenile–adult = 0, adult–adult = 1), (iii) sex similarity (male–male = 1, female–male = 0, female–female = 1) on the response matrix: aboveground affiliative associations. Permutation tests used the ‘double-semi-partialling’ method [73] developed in the mrmqap.dsp function from the R package ‘aspiine’, each with 10 000 permutations [74]. We deemed P-values of less than 0.05 to be statistically significant.

Second, we tested for the effects of individual characteristics. To examine the potential for individual consistency in network position across contexts and years, we implemented consistency tests designed to compare the ranks of node-based metrics derived from different networks [51]. We therefore compared ranked values for a single metric (e.g. strength, betweenness) for each test [51]. First, to examine the effects of individual identity across contexts, we conducted a single test for individual consistency of each node-based metric (strength or betweenness) between ecological contexts (above- or belowground network) within a year. Second, we evaluated individual consistency across time by comparing each node-based metric (strength or betweenness) within an ecological context (above- or belowground network) between the two years of study.

We also tested whether the fixed effects of an individual’s life-history stage and sex were significantly associated with the node-based metrics (strength or betweenness) within each ecological context using randomized network permutations. To account for the non-independence of relational data, we permuted the nodes (individuals) of networks (while holding the edges constant) to create a set of 10 000 randomized networks for each year within each ecological context [72,75]. We then calculated the node-based metrics based on each of the four sets of permuted data. From the observed data, we constructed separate models to explain the following predictor variables: (i) strength belowground, (ii) strength aboveground, (iii) betweenness belowground and (iv) betweenness aboveground. That is, we calculated the estimates (slopes) for the fixed effects of stage and sex on each context-specific node-based metric using GLMMs in lme4 [76] with a restricted maximum likelihood method, Gaussian distributions and the random effects of identity and year for the observed data. We also extracted 10 000 model estimates from GLMMs run on the 10 000 permuted values of the fixed effects of stage or sex on each metric within an ecological context. We tested the statistical significance of the effects of stage and sex for each model by comparing the parameter estimates from the observed data to randomizations of each dependent variable. In electronic supplementary material, S1, we compared the estimates from our observed dataset (blue lines) to the distribution of randomly generated estimates and considered those effects falling outside of the 95% confidence interval (within the areas with red bars at the tails of each distribution) to be statistically significant.

3. Results
From 27 May to 27 July, we monitored a total of 101 (2016) and 119 (2017) individuals aboveground during social observations and 98 (2016) and 89 (2017) individuals belowground. Aboveground, we recorded a total of 10 975 affiliative social interactions over 297 observation hours (2016: N = 5662; 2017: N = 5313 affiliative interactions). Of these, both identities were known for 8754 affiliative interactions (table 1). We also collected 17 726 recordings of individuals moving in or out of burrows. On average, each loop detected 2.0 ± 0.3 (2016) and 2.3 ± 0.1 (2017) unique squirrel visitors per day (range: 0 to 16 squirrels per loop per day). We detected belowground movements for juveniles (2016: Nf = 28, Nm = 28; 2017: Nf = 22, Nm = 15) and adults (2016: Nf = 29, Nm = 13; 2017: Nf = 35, Nm = 17). In 2016 and 2017, only 16% (N = 16) and 18% (N = 16) of these individuals, respectively, were detected at both monitoring stations within the same summer; this suggests that a small proportion of individuals bridged connections in belowground networks.
Distributions of node-based metrics in two ecological contexts

Overall, the direct metric of network connections (strength) was generally higher for nodes within below- (figure 2a,b) than aboveground networks (figure 2c,d), a pattern reflected by comparing the cumulative distributions of strength for each network (figure 3). In 2016, strength belowground was roughly twice as high (mean ± s.e.: 0.039 ± 0.004, range: 0.00 to 0.137) as aboveground (0.020 ± 0.002, range: 0.00 to 0.060, N = 60 individuals). In 2017, strength was roughly four times higher below- (0.063 ± 0.006, range:
Figure 3. Cumulative distribution of node-level network measures. (a) Standardized strength: average level of association for each node, a weighted measure equivalent to node degree in binary networks. (b) Betweenness centrality: number of unique path lengths that flow through each individual node. Measurements are plotted for spatial and social networks in 2016 and 2017. (Online version in colour.)

(b) Belowground networks, but not homophily, predict aboveground social networks

For both years, the full models including all three predictor matrices (belowground associations, stage similarity and sex similarity) captured a statistically significant amount of variation contributing to aboveground affiliative networks (MRQAP: 2016: \( F_{3,1765} = 58.37, p < 0.0001 \); 2017: \( F_{3,1825} = 55.78, p < 0.0001 \)). Despite their statistical significance and, thus, statistical support of our predictions, these models only captured a small portion of the variability of the aboveground networks (adjusted \( R^2 = 0.089 \) in 2016 and 0.082 in 2017).

As predicted by movement rules, the structure of belowground networks (figure 2a,b) was positively correlated with that of aboveground affiliative networks (MRQAP: \( R = 0.228 \) in 2016; \( R = 0.130 \) in 2017; \( p < 0.0001 \) for both years, figure 2c,d). That is, pairs that occupied burrows at the same location on the same days were significantly more likely to exchange affiliative behaviours aboveground than were pairs that rarely visited similar burrows. This finding is consistent with the notion of movement rules because individuals seeking safety at similar burrow complexes (home bases) were presumably also most likely to encounter each other aboveground as they moved towards or away from these refuges. Beyond these effects, stage similarity negatively predicted aboveground networks such that juvenile–adult dyads tended to socialize most often aboveground (figure 2). These effects were statistically significant in 2016 \( (R = -0.008, p = 0.001) \) but not in 2017 \( (R = -0.003, p = 0.184) \). Although consistent with the notion that social interaction rules matter, our finding that individuals tended to associate most often with individuals belonging to a life-history stage different from their own is in direct contrast to the prediction of homophily. Sex similarity, however, failed to predict aboveground networks \( (2016: R = -0.001, p = 0.807; 2017: R = -0.001, p = 0.836) \).

(c) Node-based metrics consistent for individuals between contexts

Within a year, an individual’s strength in its social network was consistent between above- and belowground ecological contexts (consistency permutation tests: 2016: \( N = 60, p = 0.001 \); 2017: \( N = 61, p < 0.0001 \)). This confirms that individuals highly connected belowground are also the most socially connected aboveground. Moreover, an individual’s metric of betweenness within a year was generally consistent between above- and belowground contexts; betweenness was significantly consistent for individuals between contexts during the summer with typical rainfall \( (2017: N = 61, p = 0.031) \) but not in the summer during a drought year \( (2016: N = 60, p = 0.311) \).

(d) Node-based metrics only consistent between years belowground

To test for consistency between years, we applied consistency tests to data for the subset of individuals \( (N = 19) \) monitored in both years. Belowground, an individual’s strength \( (p = 0.033) \) and betweenness \( (p = 0.033) \) were consistent between years. However, individuals were not statistically consistent across years in their aboveground strength \( (p = 0.073) \) or betweenness \( (p = 0.098) \).

(e) Females important in fostering indirect connectivity belowground

After accounting for variation attributed to the random effects of individual identity and year, life-history stage and sex had limited effects on node-based metrics (see electronic supplementary material, S1). Life-history stage failed to significantly predict either the direct metric of strength or indirect metric of betweenness above- or belowground \( (p > 0.05) \) for all comparisons with null models; for details, see
4. Discussion

(a) Social selectivity in networks across ecological contexts

Our study uncovers new linkages between belowground architecture and the patterns of aboveground sociality for subterranean mammals, suggesting that social interactions belowground are generally correlated with (and likely constrain) those occurring aboveground. Consistent with movement constraints, belowground associations predicted aboveground affiliative networks, but social interaction rules were also important because we found preferential juvenile–adult associations (regardless of the sexes involved). These relationships persist despite the inherent challenges of comparing data collected using different methods. The unexplained variation between our networks might be attributed to methodological and/or ecological differences. Individual characteristics also contributed to social structure. Although the explanatory value of life-history stage and sex on social structure was generally low, females had the highest betweenness belowground, fostering more indirect connections than males. Beyond this, social structure was generally consistent for individuals over time (suggesting personalities) and between two major ecological contexts (behavioural syndromes) [18,92,93]. First, preferential aboveground connections between juveniles and adults suggest that parent–offspring bonds likely persist after weaning; pedigree information is required to confirm this and is not yet established for our subjects. Second, juvenile–adult preferential connections are also largely expected; juveniles often associate with adults to reduce predation risk [43,44]. Finally, females likely reside at their natal burrows, fostering indirect links with other members of the social group. Kinship explains social network structures in many mammalian societies (e.g. [3,14,94–96]). Studying its effects on California ground squirrel networks should prove fruitful after a pedigree is established.

(b) Movement rules and social partner choice influence network structure

Although aboveground networks are relatively open and free compared to those occurring inside the confines of belowground tunnels, our finding of correlated network structures is consistent with the notion that movements away from burrows influence aboveground behaviours. Access to limited refuges is likely a major factor shaping movements, and thus, patterns of social behaviour, as occurs in other species of mammals [14,78,79] as well as in birds [17,80], reptiles [40] and insects [81,82]. Ground squirrel burrows are limited refuges that offer protection from weather, safety from predators, and a place for hoarding food or rearing offspring [50,57,83]. Whereas social partners may simply interact most often with those they encounter near shared burrows, individuals may alternatively actively seek associations with the same partners aboveground independent of burrow preferences [84,85]. Distinguishing between these factors is important because models of social evolution, regardless of whether behaviours are favoured by direct or indirect fitness benefits, often require viscosity, defined as environmental restrictions on movements [4,86,87]. Empirical data such as ours are important because game-theoretic models often make opposing predictions, predicting that spatial constraints may either promote [88,89] or inhibit [90] the emergence of socio-positive behaviours, both of which may be shaped by the animal’s built environment [62,91].

Social interaction rules explained network structure. We documented preferential direct associations between juveniles and adults as well as the importance of indirect connectivity by females in belowground networks. These findings are consistent with the presumed matrilineal structure for this species [50] and what is known about other mammalian species living in matrilineal societies [18,92,93]. First, preferential aboveground connections between juveniles and adults suggest that parent–offspring bonds likely persist after weaning; pedigree information is required to confirm this and is not yet established for our subjects. Second, juvenile–adult preferential connections are also largely expected; juveniles often associate with adults to reduce predation risk [65] and sometimes initiate play with adults [43,44]. Finally, females likely reside at their natal burrows, fostering indirect links with other members of the social group. Kinship explains social network structures in many mammalian societies (e.g. [3,14,94–96]). Studying its effects on California ground squirrel networks should prove fruitful after a pedigree is established.

(c) Individual consistency in network position

Our finding that some individuals consistently occupied key positions in social networks across time (personalities) and major ecological contexts (behavioural syndromes) extends previous studies documenting consistent personality traits across time, seasons and/or behavioural categories [22,97]. These traits likely have fitness consequences for individuals [51] and may predict patterns of group-level behaviour [31], such as mobbing of predators [98] or policing of social conflicts [12]. Our results should inform our understanding of how connectivity by key individuals shapes the transmission of disease, information and genetic material within animal populations [51].

Despite our general finding of individual consistency in network position, betweenness was consistent between contexts in the summer with typical rainfall (2017), but not in the summer during a drought year (2016). Several other mammalian species [54,99,100] vary the strength of their direct associations in response to rainfall. Future studies spanning additional years should, therefore, conclusively elucidate whether ecological perturbations associated with drought disrupted otherwise consistent network positions in the California ground squirrel.

(d) Implications for understanding flow across dynamic networks

Our finding that individuals tend to occupy consistent network positions from one ecological context to another has important implications for understanding transmission networks. Within the context of disease, heterogeneity in contact rates may determine whether a disease dies out or becomes epidemic [36,101,102]. Parasites may be directly transmitted from one individual to the next (e.g. via direct social interactions) or transferred indirectly when potential hosts visit locations used earlier by infected hosts (e.g. via...
space-use overlap [103]). This may produce time-lagged interactions [104]. Modelling pathways for parasite (disease) transmission in the ground squirrel system should prove particularly useful; these hosts may carry fleas and ticks that transmit zoonotic diseases (e.g. plague, Lyme disease, tularaemia and relapsing fever [50,105]). Flea density varies among burrows [58] and flea abundance on hosts varies with microhabitat use by hosts [106]. Study of individual differences in social personalities should thus offer additional insights into parasite transmission.

Applications of automated technologies are also revealing how social information spreads across animal groups [107]. For example, these technologies offer a rare glimpse into how social innovations spread across foragers [108]. Network structure also has implications for prey species, fostering the detection of and cooperative protection against predators [109]. Because California ground squirrels rely upon multiple modes of communication to locate food and cope with intense predation via the production of alarm calls [50], studies of communication networks may similarly explain the extent to which acoustic and/or olfactory information about food sources and predation risk flows across the social networks of ground squirrels.

(e) Conceptual framework for uncovering animal social networks

Our research establishes a novel approach for future studies aiming to understand how interactions in constrained spaces (that may or may not involve direct contact) and those occurring in relatively unconstrained spaces (e.g. aboveground, in the air, or in open aquatic environments) contribute to social structure. First, we offer a dependable, inexpensive alternative to heavier and more expensive proximity collars [47,110,111] and extend previous network studies that capture activity in other closed spaces, such as at nests and roosts [85,108,112], by capturing belowground activity. Second, we establish a conceptual framework for combining the use of two straightforward methods—direct social observations and passive data logging—to study networks in multiple contexts and across time. Automated measures should, therefore, complement insights gained from direct observations. Going forward, integration of both approaches should offer new insights into social structures for animals that socialize in easily observable, open spaces but that also visit relatively hidden architectural structures at fixed spatial locations for which direct observation is prohibitive, such as occurs in fishes [113], birds [108,114], bats [85,95] and other semi-fossorial mammals [63,110]. Comparing networks should prove particularly useful for understanding how heterogeneities in node connectivity may affect disease [36,37,115] and information [116,117] transmission (flow) dynamics across contexts. Further investigations into the processes producing social structures and the role of key individuals across multiple habitats or major situations should, therefore, elucidate the ecological rules that generate and maintain social structures across animal societies more broadly.

Ethics. All field methods were approved by the Mills College Animal Care and Use Committee and were consistent with the guidelines of the American Society of Mammalogists for the use of wild mammals in research [118]. Research permits were obtained from the California Department of Fish and Wildlife and the East Bay Regional Park District.

Data accessibility. Data have been deposited in the Dryad repository [119].

Acknowledgements. We are extremely grateful to C. Pasqualetta, M. Silk, L. Hobson, N. Pinter-Wollman and an anonymous reviewer for their help with the statistical analysis, suggestions for improving an early version of this manuscript, or both.

References


Agenda Item 6


Earth Team Sustainable Youth Interns at Antioch High School lead a strong year of programming at the Upper Sand Creek Basin between November 2017 and June 2018. A team of 14 interns began the year training in invasive species identification and removal and habitat restoration techniques as well as water testing protocols using GLOBE hydrosphere approved equipment and processes. Weekly after school meetings allowed interns to develop strong hands on STEM skills that they used to implement their watershed restoration project at the Upper Sand Creek Basin.

A meeting with the Contra Costa Flood Control District, the agency responsible for overseeing the basin along with access to and work within it, made clear that certain restoration efforts at the basin were of higher priority than others, which allowed the team to shift focus to ensure the most effective use of resources. Based on this meeting, it was determined that focus for the year should lie on water quality testing, oak mapping, litter removal, invasive species removal, native planting, and primarily education of community members.

In the months of November and December, interns collected water quality data on several occasions at 3 sites in the basin in order to compare affects of riparian vegetation on the following parameters: water temperature, turbidity, pH, and dissolved oxygen. They collected data at these sites on several occasions, but during one particular extended field visit they were able to conduct trials at all three sites in order to perform the most accurate analysis.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Urban Drool Inflow</th>
<th>Sand Creek Inflow</th>
<th>Mid-Basin Parking Lot</th>
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<tr>
<td>Water Temp.</td>
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<td>pH</td>
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<td>Dissolved Oxygen</td>
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</table>

The results of their tests indicated that water quality improved as it moved through the basin, passing though a creek channel lined by willows and other native riparian plants. Water quality at the inflow of the urban drool was the worst, suggesting that the
pollutants and other contaminants found in runoff water from South Antioch was being purified as it filtered through the basin and creekside riparian vegetation.

In order to share the findings of their study with the community as well as to invite community members to assist in restoration at the private site, interns worked with project partners to host a community event at the basin for Earth Day on Saturday, April 21. At this event, interns lead teams of volunteers to remove over 1,500 pieces of litter, install 20 native riparian species, plant 75 acorns collected from within the watershed, remove invasive species, and mulch around existing plant specimens. Over 85 community members attended the event, including Supervisor Diane Burgis of the Contra Costa Board of Supervisors and Carl Roner, Chief Engineer responsible for designing the basin. The purchase of plants was contemplated in the original budget, but the Flood District provided them for the event and we have not received the invoice yet.

Interns completed their year of service by presenting their water quality research from the basin at NASA AMES Research Center in Mountain View California as participants in GLOBE’s Pacific Student Research Symposium. Their accomplishments were also shared with participants at the Contra Costa Watershed Forum in Brentwood, California hosted and attended by county agencies such as the Resource Conservation District, Flood Control District, East Bay Regional Parks District, and local elected officials.

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>OUTCOME</th>
<th>PROGRESS NOTES</th>
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</thead>
<tbody>
<tr>
<td>Water Testing</td>
<td>3 days of water testing and benthic macroinvertebrate monitoring along Upper Sand Creek</td>
<td>Interns performed 30 water quality tests on 3 different days focusing on 3 distinct locations in an effort to quantify improved water quality due to water filtration from riparian plants. The team focused on parameters such as dissolved oxygen, pH, temperature, alkalinity, nitrates, and transparency. Unfortunately, the team was unable to test for benthic macroinvertebrate presence and numbers because the permit restricted access to the creek channel due to endangered red legged frogs presence which initiates further permitting, as well</td>
</tr>
<tr>
<td>(altered due to permit restrictions and unsafe conditions)</td>
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<tr>
<td>Agenda Item 7</td>
<td>as because of deep water underlain by unstable soil, which fostered unsafe conditions.</td>
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<td>-------------</td>
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<tr>
<td><strong>Invasive Species Removal</strong> (altered after meeting with FCD)</td>
<td>Interns removed invasive species around established oaks and other native plants, then mulched in these areas. Invasive removal of open space at the basin was determined not to be a priority so the team did not focus on removing the full 25,000 square feet of invasive but instead focused more specific areas and target species i.e. thistles.</td>
<td></td>
</tr>
<tr>
<td><strong>Native Plant Installation</strong> (altered after meeting with FCD)</td>
<td>After a past community planting event, the entirety of the creek channel was adjacently planted with willow stakes. As a result, it was determined that minimal plant installation was necessary along the channel. Instead, based on oak mapping results and meetings with ecologists and biologists, interns decided to install over 95 native plants including blue oaks, inland live oaks, silver bush lupine, Fremont cottonwood, blue elderberry, and California sagebrush throughout the basin.</td>
<td></td>
</tr>
<tr>
<td><strong>Oak Mapping</strong> (added at meeting with FCD)</td>
<td>This was an additional need communicated by the FCD to map and monitor established oaks from prior planting. Interns mapped and assessed health of oaks throughout the basin based on an existing map of previous planting sites. This data informed decisions about further native installation and ideal areas for particular species to thrive.</td>
<td></td>
</tr>
<tr>
<td>Community</td>
<td>The team developed educational</td>
<td></td>
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<tr>
<td>Education</td>
<td>educational flyers developed and distributed</td>
<td>flyers, native plant guides, native animal guides, an educational poster about restoration efforts in the basin, and an adapted academic poster focusing on data collection and analysis that was presented at GLOBE SRS at NASA Ames Research Center. Because the basin is not open to the public, it was determined that installation of permanent signs would not be effective; instead, portable signs to be used at multiple school and outreach sites about the basin were created.</td>
</tr>
<tr>
<td>Community Restoration Event</td>
<td>Community participation in restoration efforts at the basin</td>
<td>The team of interns planned and hosted an Earth Day event on 4/21/18 in partnership with Contra Costa Flood Control District, Contra Costa Resource Conservation District, Friends of Marsh Creek Watershed, and Supervisor Diane Burgis. Over 80 community members attended and participated in litter clean-up, invasive removal and mulching, and native plantings. Educational materials were provided at the event including the educational sign, informational flyers, native plant and animal guides, and tick safety information.</td>
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<tr>
<td>City Council Presentation</td>
<td>Presentation to Antioch City Council</td>
<td>The presentation to City Council was replaced as interns decided instead to take advantage of time sensitive opportunities. For example, they presented at Friends of Marsh Creek Watershed community meeting ahead of the Earth Day event, shared their work with Contra Costa Watershed Forum, and participated in GLOBE’s Student Research Symposium at</td>
</tr>
</tbody>
</table>
NASA Ames Research Center in Mountain View where they shared the data collection and restoration work completed at the Upper Sand Creek Basin.

Interns attended 25 in-class meetings, 7 field events, and 4 community presentations. Several of the in-class meetings were attended by guest presenters including employees from FCD, RCD, and other professionals.

Budget vs. Actual Narrative

Due to some changes in the new priorities set by the FCD for the Upper Sand Basin site, some of the estimated expenses changed, in particular line item 12 “native plants for restoration”. Some of the plants used in restoration events were purchased by the FCD, and we have not received an invoice yet.

LABOR COSTS
- All labor costs were covered by Earth Team in the amount of $7,845

PROJECT SUPPLIES
- Research supplies and equipment was purchased for the project: $1,972.99
- Plants for restoration events were provided by the FCD. We are asking the FWC to reassign $770 of this amount to the excess in per diem expenses. The research interns completed their year of service by presenting their water quality research from the basin at NASA AMES Research Center in Mountain View California as participants in GLOBE’s Pacific Student Research Symposium. We had extra expenses based on travel and per diem for this 2 day conference, including an overnight stay. Total charged is $1,120
- Signage includes expected expenses in paper, ink and printing costs $434.95
- PI mileage expenses amounted to $402.

A table with detail of actual reimbursable expenses totaling $3,929.94 is included below:
# Project Expenses

## LABOR COSTS

<table>
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<tr>
<th>Line Item</th>
<th>Item</th>
<th>Rate</th>
<th>Hrs./Units</th>
<th>FWC</th>
<th>Actual FWC</th>
<th>Actual Match</th>
<th>Total</th>
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<tr>
<td>Task 1 – Planning, Research Training</td>
<td>Earth Team PI (Program Associate)</td>
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<td>10</td>
<td>$0</td>
<td>$400</td>
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<td>$30</td>
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## DIRECT COSTS

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<td>Research supplies, turbidity meters, probes, other.</td>
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## Contractors & Subcontractors

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## TOTAL PROJECT COST

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## Signage, flyers (line 13)

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<td>Research supplies, turbidity meters, probes, other.</td>
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**Receipts Breakdown**

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<td>Research Equip. Globe Hydro</td>
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**Educational / Signage, flyers (line 13)**

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### Mileage Earth Team Staff to Marsh Creek

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<th>Year</th>
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<tbody>
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<td>Joelle Alley, Program Manager</td>
<td>$792.56</td>
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INTRODUCTION

We experienced employee turnover during the grant period of two experienced full-time employees, and that change started in early spring 2017, culminating during early summer of that year when both moved to better paying jobs in the Bay Area. We had expected these two individuals to move to other positions, and at the same time we had to compensate by picking up projects they were responsible for. This meant making adjustments to continue with most of the planned work. We also focused on one bee taxonomist, Jaime Pawelek, during this period, which proved to be a productive decision. The other two taxonomists, who had worked earlier with us, faded as Jaime assumed this principal position.

Described below are the major products that have emerged during the project period.

BEE IDENTIFICATIONS

With the hiring of Jaime Pawelek, who was trained by Dr. Robbin Thorp at UC Davis, we were able to make significant progress on bee identifications to the species level in the Brentwood Farms. Most bees surveyed at each farm have been identified through 2017; there are still a few collections that await identifications. The total list of identified bees stands at 144 species. Because this list has been increasing each year, we now feel confident that the total number will eventually rise to at least 175 species.

This survey also indicated there were 23 native bee species that were also visiting crop flowers such as cherries, apples, and berries. Some of these species were common on the crop flowers, and most were considered pollinators of crop flowers.

We also suggested in a recent report (see attached) that there may be a relationship between agricultural Brentwood bees and Urban Brentwood bees. That is, bees may be moving between the 2 major environments. We have started to sample bees in urban Brentwood, and already we have identified ~ about 60 species in common (this work started in 2016 and continues to date). If these numbers increase, as we expect, this means that urban Brentwood could be a refuge for native bee species, and this has much to do with the wide variety of ornamental and weed bee plants that exist in the urban area, and the fact that bees are common on some plants at times of the year beyond spring time. A count of known bee plants in urban Brentwood revealed more than 100 species. Increasing urbanization will eventually produce more bee plants as more diverse people move into the area. The new BART extension to Antioch will help that process.

One important outcome of the Ag Brentwood native bee survey is that we have good host records of the plants that these native bees like. Whenever possible, we planted more of the host plants of native bees known to visit crop flowers. We also used this model for our avocado native bee pollination work in the Ventura area, and this has proved to be very successful in terms of increasing the native bee populations.

A survey of the native bees in Ag and Urban Brentwood is attached.
TRAP NESTING STUDY

Beginning in February of 2017, we began studying the impacts of artificial nesting systems on the 8 farms in Brentwood. Since 2012 we have been working with native bees on these Brentwood farms to provide additional habitat. We installed native bee habitat gardens in order to track native bee populations and see whether they could supplement honeybee populations for crop pollination. The establishment of these gardens was a major success (see paper Farming with Native Bees), as we managed to collect and identify a total of 144 species across all farms. With this success came even more questions regarding native bee habitat requirements.

Roughly 70 percent of native bees are ground nesters and the other 30 percent are cavity nesters. These cavity nesting bees require habitat to nest in (i.e. piths of flower stems, dead wood). In order to maintain these cavity nesters on farms long term, sufficient habitat for nesting needs to be provided. Agricultural areas lack resources such as dead wood. As a result, we wanted to explore how we could artificially provide cavity nesters with nesting resources. We have been using these artificial nesting systems (trap nests) in other projects across California and in our research in Costa Rica. This project was designed to specifically answer three large questions:

1. Nesting habits and requirements of wild bee species commonly found on Brentwood farms;
2. Potential risks and benefits of using trap nests in agricultural areas;
3. Whether these trap nests could be tailored to fit the nesting habitats of specific native bee species.

In February, we located 2-4 sites at each of the Brentwood farms (depending on the overall acreage of the farm). We then established 6 trap nest blocks at each site. These blocks were composed of 12, 5” redwood blocks with 1 length-wise 4” hole. Three different sized holes were used in order to attract all sizes of native cavity nesting bees and understand their nesting habits and requirements. Filled trap nest blocks were collected every 3 weeks from February through August of 2017 and replaced with new sticks. Once collected, these blocks were capped off with a glass vial in order to trap the emerging native bee, wasp, or other insect, which was then collected for identification.

There were 221 total blocks collected from each of the farms. Of this number, roughly a third have emerged. Native cavity nesting bees take roughly a year to emerge from their nests. This time can be lengthened by instances of severe drought and other unusual climatic conditions. As a result, this work is still ongoing and we continue to collect data from emerged trap nest blocks weekly. Preliminary data from the already emerged native bees and wasps can be used to answer parts of the three questions listed above.

1. Nesting habits and requirements of wild bee species commonly found on Brentwood farms

Although we do not have enough emergences to completely answer this question, there are some trends from the data that are beginning to appear. Brookside and Wolfe farms were the only two
farms to have a significant number of mud fills. Both wasps and native bees use mud in order to enclose their nests. Both Brookside and Wolfe are the closest farms to a water source (Marsh Creek), where there would be an available mud source. This early trend points to the significance of surrounding land and wild areas in order to support native bee populations. In correlation with this trend, sites within the same farm, closer to additional floral resources where native bees can gather resources such as pollen and nectar, had more filled blocks compared to other sites. We are still waiting to see what specifically emerges from these blocks.

In addition to this finding, we project that we will need roughly twice the amount of trap nests for future studies. This conclusion was based on the overall rate that sticks were being filled and the total number of fills at the end.

2. Potential risks and benefits of using trap nests in agricultural areas

Until we gather all of emergence data, it’s impossible to analyze the specific benefits and risks. It’s clear that native bees are using these artificial nesting systems, but it’s unclear yet how these additional habitats are affecting their populations. Since we have completed similar projects in the past in Costa Rica and California, we realized the associated risk of using artificial nesting systems and potentially attracting parasitoids and other predators. We will have to wait to see the number of parasitoids that emerge. In order to prevent predators from attacking the nesting bees, we continually checked the trap nest blocks and cleaned them of unwanted arthropods (i.e. spiders and Dermaptera).

3. Whether these trap nests could be tailored to fit the nesting habitats of specific native bee species

As more native bees and wasps emerge, we expect to answer this question.

HABITAT IMPROVEMENTS:

As indicated above we continued to make improvements in the bee habitat gardens that we established in the treatment farms. One of the improvements was to continually evaluate the performance of the plants that we selected for use in the treatment bee gardens. For example, plants that could tolerate dry conditions were used in most gardens to deal with the ongoing drought that has impacted CA for the past several years. Plants such as Lavandula spp., Salvia spp., Grindelia spp., Ceanothus spp., and Calandrina grandiflora topped our lists of the most desired plants. In addition, we used bee plants that attracted bee species that also were attracted to crop flowers. The lessons learned in Brentwood were also taken to Ventura for the avocado pollination project there.

MONDULAR PROJECT:

We had intended to integrate the findings and visual aids from the modular project into our presentations, but this goal fell short of being realized when the main person in charge of the modules left the project in 2017. Despite this loss, we developed a wide range of standard visual aids (e.g., posters of bee species in action on flowers, graphs of bee monitoring data through
time, and demos with bee condos) that we used at the numerous presentations that we
made. Please see the attached list of presentations.

CONCLUSIONS:

1. We continue to identify native bees to the species level that visit the most attractive
flowers. This information in turn is used to improve and enhance bee gardens for bee species
that we expect are the best candidates for native bee pollinators of crop flowers along with honey
bees.

2. Building on Point 1., we continue to improve the bee habitats that we have established by
making selections of plant species that are best suited for drought tolerance and in some cases
soil type. We also take into account plants that the growers may like for a variety of their own
reasons. In the case of the organic farms, we also encourage leaving some species of weeds that
all species of bees forage on.

3. We have demonstrated how to use the trap nest to monitor bee species that are cavity nesters
in wood. This information is useful for filling in an important gap in our knowledge of native
bee nesting.

4. Results of our Brentwood work have been and are still being used to construct bee habitat
gardens in avocado orchards in SoCal. We use this information to better fine tune the gardens
with desired from the start. Growers there have commented on the usefulness of our work. They
have also offered to help us in the expansion of all the bee gardens with the goal of attracting
more bees and establishing larger bee populations of desired species.

5. We made a total of 30 presentations of our work to a wide variety of audiences.
Invoice To:
Contra Costa County
Maureen Parkes, Maureen.Parkes@dcd.cccounty.us
30 Muir Road
Martinez CA 94553
United States

Date: 7/6/2018
INVOICE NO: GM00140165
UCB Ref: 042692

Contract/Grant/Agreement/Purchase Order Number: 042692
Project Title: Farming for Native Bees
Pl/Director: Gordon Frankie

| Period Billed | 03/01/2017 - 05/02/2018 |

Payment Due 07/11/2018 Per Contract $4,791.13

Amount Now Due $4,791.13

Refer to invoice # GM00140165
and make check payable to:
THE REGENTS OF THE UNIVERSITY OF CALIFORNIA - BERKELEY
Contracts and Grants Accounting
2195 Hearst Ave RM 130 MC 1103
Berkeley CA 94720-1103, United States
TIN # 94-6002123

It is hereby certified that all expenditures reported (or payment requested) are for appropriate purposes and in accordance with the agreements set forth in the application and award documents.

Larkin, Phillip, Award Analyst
Phone: 510/642-1587  FAX:
Email: phillipglarkin@berkeley.edu

Questions regarding this invoice should be sent to:

Agenda Item 8
UNIVERSITY OF CALIFORNIA
Contracts and Grants Accounting Office
2195 Hearst Ave, Rm. 130 #1103
Berkeley, CA 94720-1103

Contra Costa County
Maureen Parkes, Maureen.Parkes@dcd.cccounty.us
30 Muir Road
Martinez, CA 94553

CUMULATIVE FINANCIAL REPORT

UCB Fund No. 85294-042692
Report Type Final

Award No. 042692
Period: From- To- 3/1/2017 5/2/2018

RECEIPTS:
UNEXPENDED BALANCE at
Cash received during the period
Total Cash Available

$0.00

EXPENDITURES:
Salaries/Wages
Employee Benefits
Supplies & Expenses
Equipment
Travel Domestic
Travel Foreign
Other:
1) Tuition & Fees
2)
3)

Total Direct Costs
Indirect Costs at 6.00%

Total Expenditures

Unexpended Balance at 5/2/2018

Prepared by: Phillip Larkin
510-642-1587; Fax 510-643-8997
e-mail: philliplarkin@berkeley.edu

Award Analyst
6/21/2018
Date

Approved by: Esther Chang
510-643-6724; Fax 510-643-8997
e-mail: estherc@berkeley.edu

Accounting Supervisor
Date

Principal Investigator: Gordon Frankie
Title: Farming for Native Bees
Dear Maureen,

I would like to comment on a few financial matters regarding our grant with Contra Costa Co. that you have raised recently.

Regarding the amount of $171.76, this was a trip I took to Arcata. My long-time statistical colleague, Dr. Mark Rizzardi, lives in Arcata and teaches at Humboldt State University. I consult with him regularly about analyses that can be used for our bee work in both urban and agricultural Brentwood. On this occasion of my trip, Mark was without a vehicle and we had exhausted our email communication on data analysis for the Brentwood bee paper (you have a copy), and decided that an in-person meeting was necessary. So, I felt it necessary to travel to his office in Arcata for the meeting, which was very productive in deciding how to handle the problem of dealing with all the variations that appeared in our long-term data set from each of the 8 Brentwood farms. This meeting was necessary in imperative in order to analyze the data and begin to look at the connections between urban and agricultural Brentwood.

Regarding the salary issue for our bee taxonomist, Jaime Pawelek, her work on identifying the native bees goes on non-stop. In addition, she is also asked to compile the bee data in various ways for the purpose of viewing the best presentation of the data into graphs and tables. So, this means that I continually call on her to work with the bee ID data. This also means that I need to pay her for this work. While I thought that $1,500 was sufficient in order to cover her salary, it took slightly longer to identify the urban Brentwood bees and compile the data. This should have been corrected earlier, but the full $2,000 was used to pay Jaime for work specifically on this project.

I hope these explanations help to understand how I use grant funds that CCCo. has made available for my research. We could not do this work without your help as this is the only source at my disposal for the research.

Respectfully,

Gordon W. Frankie
Dear Maureen,

We are in the process of finishing our current research grant from the CCC Fish and Wildlife Committee on urban native bees in Brentwood, and we still have more work to do that will extend beyond the grant end date of February 28, 2019.

I would like to request a no-cost extension for 3 more months in order to complete the ongoing work. More specifically, we have approximately $1,761.00 left for travel and I would like to request to use this money to pay Jaime Pawelek, our taxonomist, so she can finish up the bee identifications for this project. As you know, we rely on Jaime's expertise to identify bees down to the species levels. This information is crucial to our overall research findings and to the final report that we will submit. Bee identification is incredibly time-consuming. While we hoped we could finish the IDs within the allotted timeframe of the grant, bee identification work is unpredictable as some specimens take more time than expected. Jaime Pawelek is one of the few individuals within the western U.S. that has the skillset to identify these native bees, and she has many years of experience working with our research lab and others.

Please let me know if the no-cost extension can be arranged. Your committee's generous support has allowed us to learn a lot about the native bees of urban and agricultural Brentwood, and we could really benefit from this time extension. Thank you for your consideration in this request.

I look forward to hearing from you. Happy New Year.

Respectfully,

Gordon Frankie
Advisory Body Name: Contra Costa County Fish and Wildlife Committee

Advisory Body Meeting Time/Location: 3rd Wednesday of the month, 6 meetings per year, 3 – 5 pm
2475 Waterbird Way County Public Works Department Road Maintenance Division lunch room

Chair: Daniel Pellegrini
Staff: Maureen Parkes and Abigail Fateman

Reporting Period: January 2018 – December 2018

1. Activities and Accomplishments: The Fish and Wildlife Committee (FWC) implemented a pilot program reducing the number of FWC meetings from 12 to 6 annually. They met five times to discuss matters related to fish and wildlife issues in Contra Costa County (CCC). The Committee is responsible for running a grant program that expends the Fish and Wildlife Propagation Funds (funds that are collected by the CA Department of Fish and Wildlife for code violations). The Committee also hosts an annual Fall Forum to raise awareness among people working in law enforcement, environmental restoration, education and outreach about fish and wildlife issues.

Grant Program: The Committee received 10 proposals requesting Fish and Wildlife Propagation Fund grant funds during the regular grant cycle and one out-of-cycle grant request. The Committee reviewed the proposals, interviewed applicants and selected all eleven proposals for full or partial funding totaling $109,167 to recommend to the Board of Supervisors. Grant awards ranged from $1,030 to $23,135.00 each. The Committee reviewed progress and final reports from previous grant cycles and extended invitations to grantees to give presentations.

Outreach: 1) The Committee hosted the annual Fall Forum on September 13th, which is open to the public and encourages people involved in fish and wildlife law enforcement issues in CCC to attend. Invited attendees included representatives of the California Department of Fish and Wildlife, Sheriff’s Department, District Attorney’s Office, Superior Court, Public Defender’s Office, the East Bay Regional Park District Police, the Board of Supervisors and members of the public. Participants have indicated that the Fall Forums have been helpful in raising awareness and fostering cooperation on fish and wildlife issues and law enforcement. Approximately 100 people attended the event. 2) Distributed Wildlife in Your Backyard brochure. 3) Updated website.

Volunteer Activities: Several members volunteer in the community with other organizations that are interested in fish and wildlife issues. Rhonda Gehlke – California Water Environment Association - San Francisco Bay Section Communications Committee, Aquarium in the Classroom Program and Director of the Delta Science Center; Susan Heckly - Lindsay Wildlife Experience, CCC Master Gardener, International Wildlife Rehabilitation Council and the FWC representative on the CCC Integrated Pest Management Advisory Committee; Kathleen Jennings - Co-chair of the Peyton Slough Wetlands Advisory Committee; Danny Pellegrini - Contra Costa Mosquito and Vector Control District Board of Trustees, Sheriff’s Posse of CCC (Barbeque Captain) and the Martinez Sportsmen’s Club; Heather Rosmarin – Friends of Pleasant Hill Creeks.

Committee members were regularly updated on activities related to fish and wildlife in CCC which included four presentations and updates by guest speakers and grant recipients. The presentations and updates are listed below:

- Update on the California Waterfix project. (Ryan Hernandez, CCC Department of Conservation and Development)
- Update on the activities of the Contra Costa County Integrated Pest Management Advisory Committee. (Tanya Drlik, CCC Health Services Department)
- Presentation on the Point Isabel/Hoffman Marsh Restoration project. (Jane and Tom Kelly, Greens at Work)
- Presentation on the impacts of introducing high quality native bee habitat in Brentwood farms. (Professor Gordon Frankie, University of California, Berkeley)

2. Attendance/Representation: The FWC is composed of ten members. Each Supervisor appoints a member and the Internal Operations Committee appoints four At-large members and one At-large Alternate. As of the writing of this annual report, the FWC met five times at which a quorum was always present. The members were: Judy Bendix (D-1), Susan Heckly (D-II), Clark Dawson (D-III), Brett Morris (D-IV), Daniel Pellegrini (D-V), Rhonda Gehlke (At-large), Kathleen Jennings (At-large), Jeff Skinner (At-large), Heather Rosmarin (At-large), and Dawn Manley (At-large Alternate). Dawn Manley resigned in July 2018 and Nicole Kozicki was appointed to the At-large Alternate seat on October 16, 2018.

3. Training/Certification: Committee members were regularly updated on activities related to fish and wildlife in CCC which included four presentations/updates from guest speakers and grant applicants (see Activities/ Accomplishments). All members have viewed the required videos: “The Brown Act and Better Government Ordinance – What You Need to Know as a Commission, Board or Committee Member” and “Ethics Orientation for County Officials.” Certifications are on file for all of the members.
4. Proposed Work Plan/Objectives for Next Year

(1) FWC Operations:
- Develop and refine Work Plan (working document).
- Maintain FWC membership by advertising vacancies and forwarding applications to the Internal Operations Committee.
- Seek to coordinate with other Fish and Wildlife Committees on regional matters.
- Coordinate with the Contra Costa Watershed Forum.

(2) Make recommendations to the Board of Supervisors via the Internal Operations Committee for the appropriation of funds from the Fish and Wildlife Propagation Fund to support fish and wildlife projects in the community:
- Conduct grant program to solicit proposals, evaluate their relative merits, and recommend funding for projects which will contribute most to the fish and wildlife resources of the County.
- Develop and advertise FWC grant program by: 1) Reviewing past Request for Proposals (RFP), funding applications; and 2) Developing new RFP, funding application deadline, and funding priorities; and 3) posting to the County website, distributing these materials to the media, the FWC mailing list and RFP mailing list, and to anyone who requests them.
- Work with agencies, organizations, and individuals to help them plan and develop projects suitable for support from the Fish and Wildlife Propagation Fund.
- Monitor the efficiency and effectiveness of the grant disbursement process.
- Review funding applications received. Make recommendations to the Board of Supervisors via the Internal Operations Committee for the awarding of grants.
- Follow-up on projects that receive funding to assure that projects proceed as proposed. One way the FWC will do this is to extend invitations to prior Fish and Wildlife Propagation Fund Grant recipients to future meetings to give status reports, outcomes and presentations regarding their projects.
- Send out a letter to grant recipients requesting project status reports.

(3) FWC priorities for 2018/2019:
- Make recommendations to the Board to approve Fish and Wildlife Propagation Fund grant applications for projects that increase collaboration with law enforcement agencies, the court, and community cultural organizations on enforcement issues and increase education focusing on communities that may be unaware of local fish and game laws.
- Provide public forum opportunities for open discussion on wildlife issues that affect CCC residents and impact natural resources in our County, increase outreach efforts and provide advisory updates to Board of Supervisors as needed.
- Disseminate “Wildlife in Your Backyard” booklet and develop other projects for involvement of the FWC and the community in CCC.
- Update website with information on invasive species and a list of awarded Fish and Wildlife Propagation Fund grants.
- Implement pilot program reducing the number of FWC meetings from 12 to 6 annually.

(4) FWC projects (develop and prioritize a list of projects for potential FWC involvement; select projects for FWC involvement and provide appropriate support, including: initiation, planning, consultation, and/or funding):
- Make recommendations to the Board on awarding Certificates of Appreciation for significant contributions to the fish and wildlife resources of the County.
- Consider hosting a forum about wildlife.

(5) Improve enforcement of fish and game laws and regulations; increase flow of money into the Fish and Wildlife Propagation Fund:
- Review status reports on Fish and Game Code enforcement in the County. Consider advising the Board on trends.
- Help assure that, when appropriate, a portion of fines from violations of laws designed to protect fish and wildlife resources is deposited in the Fish and Wildlife Propagation Fund. Promote awareness of the harm caused by violation of fish and wildlife regulations and the value of enforcement.
- Host a Fall Forum with law enforcement officials (CA Dept. of Fish and Wildlife, Sheriff’s Dept., District Attorney’s Office, Superior Court, Public Defender’s Office, the East Bay Regional Park District Police) to discuss fish and wildlife issues and enforcement.

(6) Monitor and advise the Board on projects that may affect fish and wildlife resources in the County:
- Attend field trips to see major restoration projects and prior Fish and Wildlife Propagation Fund Grant recipients’ projects in the County.
- Consider tours of East CCC Habitat Conservancy properties, Marsh Creek Fish Ladder, Walnut Creek Drop Structure, Dow Wetlands and Chelsea Wetlands at Pinole.

(7) Develop policy recommendations (“white papers”) on fish and wildlife issues:
- Discuss impacts of invasive species.
- Discuss wildlife and human interaction / interface.
- Discuss public education on reducing the impact of free-roaming cats on wildlife.
- Discuss the California WaterFix and proposal for water conveyance tunnels.
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<th>Type of Project</th>
<th>Location of Project</th>
<th>Requested Funding Amount</th>
<th>Recommended Funding Amount</th>
<th>Staff Summary of Request</th>
<th>FWC Rationale for Recommendation</th>
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<td>The Regents of the University of California</td>
<td>non-profit</td>
<td>Native Bees in Urban Brentwood and Agricultural Brentwood</td>
<td>(a) public education (i) scientific research</td>
<td>East County</td>
<td>$8,572.00</td>
<td>This is a request for funding the sampling of native bees and their flower hosts in urban Brentwood during the main flowering season of 2018 (complete) and 2019 (proposed for 2019) (March-Sept.) and compare this inventory with sampled collections from adjacent Ag Brentwood farms. This is a continuation of Professor Frankie’s research on California’s native bees and their relationships with flowering plants, and their pollination role in agricultural, ornamental, and natural landscapes. They will also will be sharing their findings with several audiences. Funds would be used for travel, materials and supplies and a bee taxonomist hired on a contract basis to identify bees.</td>
<td><em>CDFW has confirmed this project is eligible to receive funds under FGC Section 13103 (i)</em></td>
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<td><strong>B</strong></td>
<td>Contra Costa Resource Conservation District</td>
<td>government</td>
<td>Sacramento perch: from watersheds to classrooms, and back!</td>
<td>(a) public education (d) by breeding, raising and releasing Sacramento perch</td>
<td>Countywide</td>
<td>$2,895.00</td>
<td>This is a request for funding a Sacramento perch restoration project combined with watershed education for students. Funds would be used for supplies for aquariums, and supplies for spawning and food acclimation.</td>
<td><em>CDFW has confirmed this project is eligible to receive funds under FGC Section 13103 (d)</em></td>
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<td>Organization</td>
<td>Type of Org</td>
<td>Project Title</td>
<td>Type of Project</td>
<td>Location of Project</td>
<td>Requested Funding Amount</td>
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<td>Staff Summary of Request</td>
<td>FWC Rationale for Recommendation</td>
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<tr>
<td>C</td>
<td>non-profit</td>
<td>Resolving Negative Human-Wildlife Interactions (AKA Urban Wildlife Conflicts)</td>
<td>(b) Temporary emergency treatment and care of injured or orphaned wildlife. (c) Temporary treatment and care of wildlife confiscated by the department as evidence.</td>
<td>Countywide</td>
<td>$12,500.00</td>
<td>$12,500.00</td>
<td>This is a request for funding to offset nutrition, medicine, and veterinary medical supply costs for birds admitted from Contra Costa County to the San Francisco Bay-Delta Wildlife Center located in Cordelia, California between April 1 and December 31, 2019.</td>
<td></td>
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<tr>
<td>D</td>
<td>non-profit</td>
<td>Treasure Hunt for the ‘Lost Key to the Waters’</td>
<td>(a) public education</td>
<td>Central County</td>
<td>$1,025.00</td>
<td>$1,025.00</td>
<td>This is a request for funds to support a learning activity at the 12th annual Beaver Festival in Martinez. Children and parents will learn the essential benefits of a beaver pond with a ‘treasure hunt’ theme. Funds are requested for various supplies, directional sign flags, exhibit location map, bronze keys, chalk and soft pastels.</td>
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<td>Organization</td>
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<td>Project Title</td>
<td>Type of Project</td>
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<tr>
<td>E Kids for the Bay non-profit</td>
<td>watershed action program</td>
<td>Watershed Action Program</td>
<td>(a) public education (e) habitat improvement</td>
<td>West County 50% Central County 25% East County 25%</td>
<td>$6,000.00</td>
<td></td>
<td>This is a request for funds to deliver the Watershed Action Program and to fund eight (8) local bay and delta field trips (school bus transportation) for students and teachers from low-income Contra Costa County schools, which will teach students about the scientific principles of fish and wildlife conservation, as well as help to improve the health of fish and wildlife habitats in Contra Costa County through Environmental Action Projects and trash clean-ups.</td>
<td></td>
</tr>
<tr>
<td>F City of Lafayette, Creeks Committee government, voluntary advisory committee</td>
<td>Lafayette - Creek Interpretation and Education Signage</td>
<td>Lafayette - Creek Interpretation and Education Signage</td>
<td>(a) public education</td>
<td>Central County</td>
<td>$4,200.00</td>
<td></td>
<td>This is a request for funds to design, fabricate and install two interpretive wayside panels in Lafayette community parks near downtown Lafayette. The signage will increase awareness of the creeks and their natural values in the downtown area of Lafayette in a way that will inform and promote projects identified in the Lafayette Downtown Creeks Preservation, Restoration and Development Plan (DCP).</td>
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<tr>
<td>Organization</td>
<td>Type of Org</td>
<td>Project Title</td>
<td>Type of Project</td>
<td>Location of Project</td>
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<tr>
<td>Greens-at-Work/Berkeley Partners for Parks</td>
<td>non-profit</td>
<td>City of Richmond Adopt-a-Spot Rehabilitation Project (Richmond/CA)</td>
<td>(e) habitat improvement</td>
<td>West County</td>
<td>$2,022.30</td>
<td></td>
<td>This is a request for funds for habitat restoration on City of Richmond property next to the Hoffman Marsh. This site is the gateway to the Greens-at-Work Point Isabel/Hoffman Marsh restoration project previously funded by CCC Fish and Wildlife Propagation Fund. Work will include fencing part of the site to deter trash from blowing into Hoffman Marsh, filling in and maintaining native plant vegetation, and conducting public outreach. Funds will be used for bamboo fence panels, steel stakes/rebar, tools + tie wire, native plants, soil and gloves.</td>
<td></td>
</tr>
<tr>
<td>Marine Science Institute</td>
<td>non-profit</td>
<td>2019 Delta Education Equipment</td>
<td>(a) public education</td>
<td>Central County 51% East County 49%</td>
<td>$7,733.55</td>
<td></td>
<td>This is a request for funds to replace their Samson ropes for mooring their 90 foot research vessel at the Antioch Marina, which is used to deliver STEM and environmental education to CCC 5th grade students with hands-on science curriculum that is aligned with Next Generation Science Standards (NGSS).</td>
<td></td>
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<tr>
<td>Organization</td>
<td>Type of Org</td>
<td>Project Title</td>
<td>Type of Project</td>
<td>Location of Project</td>
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<tr>
<td>I Regional Parks Foundation</td>
<td>non-profit</td>
<td>Kids Healthy Outdoors Challenge (KHOC)</td>
<td>(a) public education</td>
<td>West County</td>
<td>35%</td>
<td>$10,000.00</td>
<td>This is a request for funds for their Kids Healthy Outdoors Challenge Program. This program promotes outdoor education and play while also supporting the delivery of third-grade curriculum. Funds would be used for bus transportation, teacher's guide, student booklets and teacher orientation (supplies and lunches).</td>
<td></td>
</tr>
<tr>
<td>J The Watershed Project</td>
<td>non-profit</td>
<td>Water Quality Monitoring in Contra Costa County</td>
<td>(a) public education (e) habitat improvement</td>
<td>Countywide</td>
<td></td>
<td>$21,580.00</td>
<td>This is a request for funds to go toward TWP’s third year of their county-wide creek monitoring program. They will continue all aspects of the monitoring program while expanding their network, making their data available through California Environmental Data Exchange Network (CEDEN), and deploying monitoring loggers at certain sites. Funds would be used for monthly monitoring equipment, Water Reporter app to publish data, test kits, testing samples at Enthalpy Analytical, ID bug samples and a Water Quality Monitoring Design Course.</td>
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<tr>
<td>Organization</td>
<td>Type of Org</td>
<td>Project Title</td>
<td>Type of Project</td>
<td>Location of Project</td>
<td>Requested Funding Amount</td>
<td>Recommended Funding Amount</td>
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<tr>
<td>K Mt. View Sanitary District</td>
<td>government</td>
<td>MVSD Pollinator Garden</td>
<td>(a) public education</td>
<td>Central County</td>
<td>$17,180.00</td>
<td></td>
<td>This is a request for funds to reduce ground squirrel population by removing turf/bare ground, replacing it with native and Mediterranean plants, and installing a pollinator garden, which will have four interpretative panels and a garden brochure to educate visitors and school students on the importance of pollinators and pollinator habitat conservation. Funds would be used for plants, interpretive panel fabrication and base, and UC Berkeley Bee Lab follow-up study.</td>
<td></td>
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<tr>
<td>L California Native Grasslands Association (CNGA)</td>
<td>non-profit</td>
<td>Grassland Monitoring Workshop: Methods and Techniques for Vegetation and Wildlife Monitoring</td>
<td>(a) public education</td>
<td>Countywide</td>
<td>$3,014.00</td>
<td></td>
<td>This is a request for funds to put on a two-day workshop in Contra Costa County. This workshop will provide 30 attendees with a framework to effectively design a monitoring plan for vegetation and/or wildlife, understand current protocols and field methods, get an introduction to several methods of data analysis, and provide guidelines for how to use the results to inform future management decisions. Funds would be used for instructors, food, handouts and field work materials.</td>
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<tr>
<td>M</td>
<td>Organization</td>
<td>Type of Org</td>
<td>Project Title</td>
<td>Type of Project</td>
<td>Location of Project</td>
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<td></td>
<td>City of El Cerrito, Operations + Environmental Services Division</td>
<td>government</td>
<td>El Cerrito Recycling + Environmental Resource Center - Hillside Habitat Restoration Project</td>
<td>(e) habitat improvement</td>
<td>West County</td>
<td>$2,867.66</td>
<td></td>
<td>This is a request for funds to support El Cerrito's volunteer efforts to improve wildlife habitat on the portion of the hillside nearest to the El Cerrito Recycling + Environmental Resource Center. They will remove invasive and fire-prone plants and add new native plants to improve pollinator and other wildlife habitat, prevent erosion, decrease fire risk, and increase the overall aesthetics of the site. Interpretive signage will be used to encourage people to recognize both invasive and native plants and understand their role in the greater ecosystem of the hillside. Funds would be used for landscape staples, weed barrier landscape fabric, plants, compost, seeds, refreshments for volunteers and interpretive signage.</td>
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<td>Total Available Funds as of January 10, 2019</td>
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<td>Remainder</td>
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Agenda Item 12
<table>
<thead>
<tr>
<th>Subtotals By Region</th>
<th>Requested Funding Amount</th>
<th>Percentage of Total Amount Requested</th>
<th>Recommended Funding Amount</th>
<th>Percentage of Total Amount Recommended for Approval</th>
</tr>
</thead>
<tbody>
<tr>
<td>East</td>
<td>$18,261.44</td>
<td>18.34%</td>
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<tr>
<td>West</td>
<td>$11,389.96</td>
<td>11.44%</td>
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<tr>
<td>Central</td>
<td>$29,949.11</td>
<td>30.07%</td>
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<tr>
<td>Countywide</td>
<td>$39,989.00</td>
<td>40.15%</td>
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<td>TOTAL</td>
<td>$99,589.51</td>
<td>100.00%</td>
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<td>Organization</td>
<td>Type of Org</td>
<td>Project Title</td>
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<td>Location of Project</td>
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<tr>
<td>A Regional Parks Foundation (RPF)</td>
<td>non-profit</td>
<td>East Bay Regional Mountain Lion Project (EBMLP)</td>
<td>(i) scientific research (m) other expenditures</td>
<td>East County</td>
</tr>
<tr>
<td>Organization</td>
<td>Type of Org</td>
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<tr>
<td><strong>B</strong> Regional Parks Foundation (RPF)</td>
<td>non-profit</td>
<td>Kids Healthy Outdoors Challenge (KHOC)</td>
<td>(a) public education</td>
<td>West County 60% East County 23% Central County 17% (data from school year 16-17)</td>
</tr>
<tr>
<td><strong>C</strong> The Regents of the University of California</td>
<td>non-profit</td>
<td>Native Bees in Urban Brentwood and Agricultural Brentwood</td>
<td>(i) scientific research (m) other expenditures</td>
<td>East County</td>
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<tr>
<td>Organization</td>
<td>Type of Org</td>
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<tr>
<td>D</td>
<td>Worth a Dam</td>
<td>non-profit Build-A-Beaver Pond</td>
<td>(a) public education</td>
<td>Central County</td>
</tr>
<tr>
<td>E</td>
<td>Marine Science Institute</td>
<td>non-profit 2018 Delta Education Supplies</td>
<td>(a) public education</td>
<td>Central County 58% East County 42%</td>
</tr>
</tbody>
</table>

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Agenda Item 12

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!!!For Reference Only!!! 2018 Grant Recommendations !!! For Reference Only!!!
<table>
<thead>
<tr>
<th>Organization</th>
<th>Type of Org</th>
<th>Project Title</th>
<th>Type of Project</th>
<th>Location of Project</th>
<th>Requested Funding Amount</th>
<th>Recommended Funding Amount</th>
<th>Staff Summary of Request</th>
<th>FWC Rationale for Recommendation</th>
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</thead>
<tbody>
<tr>
<td>California Department of Fish and Wildlife</td>
<td>government</td>
<td>Decoys</td>
<td>(g) purchase and maintain materials, supplies, or equipment for either the department's ownership and use or the department's use</td>
<td>Countywide</td>
<td>$3,496.70</td>
<td>$3,496.70</td>
<td>A request by the CA Department of Fish and Wildlife for propagation funds to be used to purchase a deer and turkey decoy and then be gifted to CDFW. CDFW's Enforcement Division will use the decoys throughout CCC to target poachers. The primary goals for the use of the decoys are to deter violations, reduce illegal hunting and related violations, reduce the unlawful harvest of deer and turkey and reduce the threat of injury to both the public and property.</td>
<td>This project meets the requirements of Section 13103 (g) by purchasing equipment for the CDFW's ownership and use. The decoys will be placed in areas that have reported problems of deer or turkey poaching or are suspected to have a poaching problem.</td>
</tr>
<tr>
<td>Contra Costa Resource Conservation District</td>
<td>government</td>
<td>Morgan Territory Pond 7 Project Phase 2</td>
<td>(e) habitat improvement</td>
<td>East County</td>
<td>$5,100.00</td>
<td>$2,300.00</td>
<td>This is a request for funds to construct and install a temporary livestock exclusion fence around a swale and purchase native plant seeding to promote vegetation establishment to maintain cover and reduce soil erosion from entering a seasonal pond known to provide breeding habitat for California red-legged frog.</td>
<td>This project meets the requirements of Section 13103 (e) habitat improvement. Partial funding is recommended and may only be used for fencing materials and seed. The project will improve special status species habitat by ensuring soil erosion and sedimentation loads are reduced from entering into an existing livestock pond improving water quality, and the breeding and dispersing habitat of the California red-legged frog and California tiger salamander.</td>
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<tr>
<td>Organization</td>
<td>Type of Org</td>
<td>Project Title</td>
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<td>Location of Project</td>
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<tr>
<td>H The Watershed Project</td>
<td>non-profit</td>
<td>Monitoring Water Quality in Contra Costa County Watersheds</td>
<td>(a) public ed.</td>
<td>Countywide</td>
<td>$23,135.00</td>
<td>$23,135.00</td>
<td>A request for funds to expand their countywide water quality monitoring program in six Contra Costa County watersheds, which includes stipends for interns, monitoring equipment and supplies, costs for testing of samples and identification of bug samples sent to scientific labs. The goal of their creek monitoring program is to train and engage citizen scientists on improving water quality in CCC in order to provide suitable habitat for fish populations.</td>
<td>This project meets the requirements of Section 13103 (e) habitat improvement. The Watershed Project is adding three new partnering groups, eight new sites, one new watershed, and will begin sampling for benthic macroinvertebrates living in the creek which will provide a longer perspective on water quality. The project will address local water quality concerns and result in more highly-trained citizen scientists living in these communities who can work toward improved water quality and habitat for native fish in the years to come.</td>
</tr>
<tr>
<td>I Mt. View Sanitary District</td>
<td>government</td>
<td>The Moorhen Marsh, McNabney Marsh, and Wildlife Garden Interpretive Panels Project</td>
<td>(a) public ed.</td>
<td>Central County</td>
<td>$5,634.00</td>
<td>$5,634.00</td>
<td>A request for grant funds to design, fabricate, and install 14 interpretive panels and purchase four metal bases for three MVSD sites. The goal of this project is to provide an effective educational tool to reach County residents about wetland and garden habitats and the wildlife dependent on them.</td>
<td>This project meets the requirements of Section 13103 (a) public education. The project will help increase public awareness on variety of subjects such as: special status wetland species, the Endangered Species Act, the Migratory Bird Treaty Act, the dangers of pesticides to wildlife, wetland management challenges, and the value of clean water to fish and wildlife.</td>
</tr>
</tbody>
</table>
### Organization: Mt. View Sanitary District

**Type of Org:** Government  
**Project Title:** MVSD Floating Treatment Wetlands Project - Pilot Study  
**Type of Project:** (e) habitat improvement  
**Location of Project:** Central County  

<table>
<thead>
<tr>
<th>Requested Funding Amount</th>
<th>Recommended Funding Amount</th>
<th>Staff Summary of Request</th>
<th>FWC Rationale for Recommendation</th>
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</thead>
<tbody>
<tr>
<td>$9,120.00</td>
<td>$9,120.00</td>
<td>A request for grant funds for materials and supplies to fabricate 15, 4' x 10' floating treatment wetlands (FTW) in Moorhen Marsh to improve water quality and provide refuge and nesting habitat.</td>
<td>This project meets the requirements of Section 13103 (e) habitat improvement. Floating Treatment Wetlands (FTW) are a useful tool to improve water quality for fish and wildlife. FTWs target excess nutrients which are a primary contributor to algae and weed growth in aquatic systems. In addition to improving water quality, FTWs also provide refuge habitat for birds, macroinvertebrates, and fish, as well as potential nesting habitat for waterfowl and songbirds.</td>
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### Subtotals By Region

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<tr>
<th>Subtotals By Region</th>
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</thead>
<tbody>
<tr>
<td>East</td>
<td>$41,850.64</td>
<td>40.18%</td>
<td>$39,050.64</td>
<td>38.53%</td>
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<tr>
<td>West</td>
<td>$12,000.00</td>
<td>11.52%</td>
<td>$12,000.00</td>
<td>11.84%</td>
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<tr>
<td>Central</td>
<td>$23,672.99</td>
<td>22.73%</td>
<td>$23,672.99</td>
<td>23.36%</td>
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<tr>
<td>Countywide</td>
<td>$26,631.70</td>
<td>25.57%</td>
<td>$26,631.70</td>
<td>26.28%</td>
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<tr>
<td>TOTAL</td>
<td>$104,155.33</td>
<td>100.00%</td>
<td>$101,355.33</td>
<td>100.00%</td>
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Total Available Funds as of January 12, 2018: $227,856.21

Remainder: $126,500.88
<table>
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<tr>
<th>Organization</th>
<th>Type of Org</th>
<th>Project Title</th>
<th>Type of Project</th>
<th>Location of the Project</th>
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</thead>
<tbody>
<tr>
<td>A Friends of Alhambra Creek</td>
<td>non-profit</td>
<td>Alhambra Native Plant Trail</td>
<td>(e) habitat improvement</td>
<td>Central County</td>
<td>$980.00</td>
<td>$980.00</td>
<td>A request for funding to add additional native plants and garden enhancements for their existing gardens and future new gardens and the printing cost of their Alhambra Native Plant Trail brochure.</td>
<td>The project meets the requirements of Section 13103 (d) by providing forage, cover, and nesting areas for insects, local birds, and small mammals. It also creates an opportunity to teach student volunteers and visitors about the importance of native plants and wildlife.</td>
</tr>
<tr>
<td>B California Department of Fish and Wildlife</td>
<td>government</td>
<td>Spotting Scopes</td>
<td>(g) purchase and maintain materials, supplies, or equipment for either the department's ownership and use or the department's use</td>
<td>Countywide</td>
<td>$21,019.33</td>
<td>$21,019.33</td>
<td>A request for seven Swarovski spotting scopes to be gifted to CDFW. The spotting scopes will be used by the Department's enforcement branch throughout CCC to aid in the surveillance of violators, locating evidence, and observing behaviors and actions that may result in violations.</td>
<td>The project meets the requirements of Section 13103 (g). The spotting scopes will be used by the CDFW's enforcement branch throughout CCC to aid in the surveillance of violators, locating evidence, and observing behaviors and actions that may result in violations.</td>
</tr>
<tr>
<td>C Worth a Dam</td>
<td>non-profit</td>
<td>Working for the Bay</td>
<td>(a) public education</td>
<td>Central County</td>
<td>$1,000.00</td>
<td>$1,000.00</td>
<td>A request to fund a wildlife educational activity at the 10th Annual Beaver Festival in Martinez. Children will earn badges while learning the importance of beavers' role in the ecosystem, highlighting the direct impact beavers have on other wildlife.</td>
<td>The project meets the requirements of Section 13103 (a) public education and Festival in Martinez. Children will earn badges while learning the importance of beavers’ role in the ecosystem, highlighting the direct impact beavers have on other wildlife.</td>
</tr>
<tr>
<td>D Greenbelt WorkBankerF Panthers for Parks (BPFP)</td>
<td>non-profit</td>
<td>Point Isabel/Hoffman Marsh Restoration Project (Richmond)</td>
<td>(e) habitat improvement</td>
<td>West County</td>
<td>$1,320.00</td>
<td>$1,320.00</td>
<td>A request for funding to expand, fill in, and maintain an existing habitat restoration project (including wetland removal, native plant re-vegetation, public outreach, and trash pickup) along 2,000 feet of the Bay Trail at Point Isabel and marsh from just above the Hoffman Channel to the southern end of Hoffman Marsh (at the intersection of Central Avenue and Rydin Road).</td>
<td>The project meets the requirements of Section 13103 (e) habitat improvement. This is an important area for restoration and helps to achieve a healthier environment for the multitude of shorebirds that use the marsh.</td>
</tr>
<tr>
<td>E KIDS for the BAY</td>
<td>non-profit</td>
<td>Watershed Action Program</td>
<td>(a) public education</td>
<td>West County</td>
<td>$5,079.00</td>
<td>$5,079.00</td>
<td>A request for funding to deliver the Watershed Action Project to five classes in low-income Richmond elementary schools. The Program will teach students about the scientific principles of fish and wildlife conservation, as well as help to improve the health of the fish and wildlife habitats in CCC through Environmental Action Projects.</td>
<td>The project meets the requirements of Section 13103 (a) public education and (e) habitat improvement. The project provides hands-on science classroom lessons and a field trip where the students will use water quality testing equipment to assess watershed health and learn scientific skills. Through trash clean-ups, habitat restoration and water quality testing, students will improve the quality of life for fish and wildlife in CCC.</td>
</tr>
<tr>
<td>F Golden Gate Audubon Society</td>
<td>non-profit</td>
<td>Eco-Richmond/Bird-Friendly Schools Program</td>
<td>(a) public education</td>
<td>West County</td>
<td>$3,983.50</td>
<td>$3,983.50</td>
<td>A request for partial funding to support the materials associated with their Eco-Richmond/Bird Friendly Schools Program, a year-long program that serves 3rd-5th grade children and their families in four Title I (federally-assisted) schools within the communities adjacent to the North Richmond Shoreline. Each class will receive a progression of at least three in-class/schoolyard lessons and field trips to North Richmond Shoreline and Wildcat Creek Canyon related to ecology and stewardship while improving the habitat.</td>
<td>The project meets the requirements of Section 13103 (a) public education and (g). The project fulfills the goals of the Committee by providing hands-on lessons of at least three in-class/schoolyard lessons and field trips to North Richmond Shoreline and Wildcat Creek Canyon related to ecology and stewardship while improving the habitat.</td>
</tr>
<tr>
<td>G The Watershed Project &amp; SPAWNERS</td>
<td>non-profit</td>
<td>Monitoring Water Quality in Contra Costa County Watersheds</td>
<td>(a) public education</td>
<td>Countywide</td>
<td>$20,478.00</td>
<td>$20,478.00</td>
<td>A request to fund an expansion of their water quality monitoring program in four additional CCC watersheds: Wildcat Creek, Walnut Creek, Grayson Creek and Marsh Creek Watersheds. The funds will go toward annual stipends for trained monitoring interns as well as purchasing monitoring equipment and supplies. Results will be shared with the community through outreach events, newsletters, and websites, including behavioral changes people can make to improve the creeks’ water quality.</td>
<td>The project meets the requirements of Section 13103 (a) public education and (e). The monitoring project will provide hands-on lessons of at least three in-class/schoolyard lessons and field trips to North Richmond Shoreline and Wildcat Creek Canyon related to ecology and stewardship while improving the habitat.</td>
</tr>
<tr>
<td>Organization</td>
<td>Type of Org</td>
<td>Project Title</td>
<td>Type of Project</td>
<td>Location of the Project</td>
<td>Requested Funding Amount</td>
<td>Recommended Funding Amount</td>
<td>Staff Summary of the Request</td>
<td>FWC Rationale for Recommendation</td>
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<tr>
<td>H Lindsay Wildlife Experience</td>
<td>non-profit</td>
<td>Habitats disease control in a wildlife hospital through commercial-grade laundry equipment</td>
<td>(a) temporary emergency treatment and care of infected and orphaned wildlife</td>
<td>Countywide</td>
<td>$6,884.50</td>
<td>$6,884.50</td>
<td>A request to fund the purchase and installation of two-commercial grade stack dryer unit.</td>
<td>The project meets the requirements of Section 13103 (a) temporary emergency treatment and care of infected or orphaned wildlife. These commercial grade Speed Queen stack tumble dryers are the same make/model as as they have had since 2003 and have found them to be energy efficient and reliable.</td>
</tr>
<tr>
<td>I Marine Science Institute</td>
<td>non-profit</td>
<td>Delta Discovery Voyage</td>
<td>(a) public education</td>
<td>Central/ East County</td>
<td>$4,888.00</td>
<td>$0.00</td>
<td>A request for partial funding for marine science education for 5th grade students at Horizons Independent High School and home schooled students with their families in accordance with Watershed Forum guidelines and protocols.</td>
<td>Funding is not recommended. Payroll, benefits and overhead costs were a substantial amount of their funding request.</td>
</tr>
<tr>
<td>J Regional Parks Foundation</td>
<td>non-profit</td>
<td>East Bay Regional Park District - Education, Outreach, and Resource Protection using Horse Mounted Patrol Officers</td>
<td>(a) public education</td>
<td>Countywide</td>
<td>$10,000.00</td>
<td>$10,000.00</td>
<td>A request for funding to expand the EBRPD’s Horse Mounted Patrol unit from a 2-person to a 3-person team. The funds would be used to purchase a horse. The focus of outreach, education and resource protection is to prevent the spread of disease potentially carried by domestic dogs which could be spread to San Joaquin kit fox. They will patrol Round Valley Regional Preserve approximately 5 - 6 times a month. Other park trails they visit are Ironhorse Trail, Marsh Creek Trail, Big Break, Contra Loma and Delta Drain.</td>
<td>The project meets the requirements of Section 13103 (m) other expenditures. Funding the purchase of the horse will help to expand EBRPD’s horse mounted patrol which will focus on outreach, education and resource protection.</td>
</tr>
<tr>
<td>K Pleasant Hill Instructional Garden</td>
<td>non-profit</td>
<td>Grizzly Creek Watershed Initial Assessment at Pleasant Hill Education Center</td>
<td>(a) public education</td>
<td>Central County</td>
<td>$953.64</td>
<td>$953.64</td>
<td>A request for funding to provide water quality monitoring, sampling and observation for initial assessment of Grayson Creek, involving MDUSD Horizons Independent High School students and home schooled students with their families in accordance with Watershed Forum guidelines and protocols.</td>
<td>The project meets the requirements of Section 13103 (d) public education. The project provides for public education with a base line site assessment including water quality data for Grayson Creek near and behind Mt. Diablo Unified School District’s Pleasant Hill Education Center. The project will practice curriculum and standard water sampling protocols used by other volunteer creek restoration organizations as part of the County Watershed Forum.</td>
</tr>
<tr>
<td>L Save Mount Diablo</td>
<td>non-profit</td>
<td>Curry Creek Habitat Restoration</td>
<td>(a) habitat improvement</td>
<td>Central County</td>
<td>$10,000.00</td>
<td>$10,000.00</td>
<td>A request for funding to improve habitat for wildlife, including threatened species, along a sensitive riparian corridor of Curry Creek by removing debris and re-establishing native plantings.</td>
<td>The project meets the requirements of Section 13103 (g) habitat improvement for improving water quality and allowing natural cover (native plant species) to re-establish along Curry Creek, which will provide food and shelter for both migrating and resident populations.</td>
</tr>
<tr>
<td>M California Waterfowl Association</td>
<td>non-profit</td>
<td>Quimby Island Marijuana Trespass Grow Site Clean Up and Reclamation</td>
<td>(a) habitat improvement</td>
<td>East County</td>
<td>$4,760.00</td>
<td>$0.00</td>
<td>A request for funding to facilitate clean up and reclamation of a marijuana trespass grow on Quimby Island in the Sacramento - San Joaquin Delta.</td>
<td>Funding is not recommended. The Committee determined this was not a good use of public funds. The island is privately owned and generally, there is no open public access to it.</td>
</tr>
<tr>
<td>N Nomad Ecology</td>
<td>non-profit</td>
<td>Study to Identify Important Characteristics of California Red-Legged Frog Breeding Sites on John Muir Land Trust and Save Mount Diablo Lands</td>
<td>(i) scientific research</td>
<td>Countywide</td>
<td>$11,880.00</td>
<td>$0.00</td>
<td>A request to fund a study to collect aquatic feature characteristics and conduct focused surveys for the purpose of understanding habitat features important for California red-legged frog breeding populations within John Muir Land Trust and Save Mount Diablo properties.</td>
<td>Funding is not recommended. Staff salaries were a substantial amount of their funding request.</td>
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<tr>
<td>Organization</td>
<td>Type of Org</td>
<td>Project Title</td>
<td>Type of Project</td>
<td>Location of the Project</td>
<td>Requested Funding Amount</td>
<td>Recommended Funding Amount</td>
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<tr>
<td>Mt. View Sanitary District &amp; The River Otter Ecology Project</td>
<td>non-profit</td>
<td>ROEP - non-profit</td>
<td>scientific research</td>
<td>Central County</td>
<td>$8,940.00</td>
<td>$800.00</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>non-profit</td>
<td>The Ruth Bancroft Garden</td>
<td>public education</td>
<td>Central County</td>
<td>$7,100.00</td>
<td>$7,100.00</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>non-profit</td>
<td>Earth Team</td>
<td>public education</td>
<td>East County</td>
<td>$10,761.00</td>
<td>$9,396.00</td>
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<tr>
<td></td>
<td>non-profit</td>
<td>Mills College</td>
<td>public education</td>
<td>Countywide</td>
<td>$9,430.75</td>
<td>$9,430.75</td>
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<tr>
<td></td>
<td>non-profit</td>
<td>The Regents of the University of California</td>
<td>public education</td>
<td>East County</td>
<td>$15,080.00</td>
<td>$4,800.00</td>
<td></td>
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</tr>
</tbody>
</table>

**Agenda Item 12**

**Type of Org**
- Mt. View Sanitary District & The River Otter Ecology Project: ROEP - non-profit
- The Ruth Bancroft Garden: non-profit
- Earth Team: non-profit
- Mills College: non-profit
- The Regents of the University of California: Public University

**Requested Funding Amount**
- $8,940.00
- $7,100.00
- $10,761.00
- $9,430.75
- $15,080.00

**Recommended Funding Amount**
- $800.00
- $7,100.00
- $9,396.00
- $9,430.75
- $4,800.00

**Staff Summary of the Request**
- A request for partial funding to study the ecological niche of river otters in MVISD's wetlands throughout Moorhen Marsh, McNabney Marsh, and Peyton Slough. ROEP, as part of its "Hands-On High School" environmental education project, will partner with Marin Academy in San Rafael to undertake scat analysis for this project, providing a unique environmental education experience for participating students. If successful, ROEP and MVISD will explore expanding the environmental education experience to Contra Costa County High schools.

**Subtotals by Region**

<table>
<thead>
<tr>
<th>Region</th>
<th>Requested Funding Amount</th>
<th>Percentage of Total Amount Requested</th>
<th>Recommended Funding Amount</th>
<th>Percentage of Total Amount Recommended for Approval</th>
</tr>
</thead>
<tbody>
<tr>
<td>East</td>
<td>$27,945.00</td>
<td>19.20%</td>
<td>$8,736.00</td>
<td>8.65%</td>
</tr>
<tr>
<td>West</td>
<td>$10,202.50</td>
<td>7.01%</td>
<td>$10,202.50</td>
<td>9.98%</td>
</tr>
<tr>
<td>Central</td>
<td>$15,917.64</td>
<td>10.94%</td>
<td>$5,433.64</td>
<td>5.32%</td>
</tr>
<tr>
<td>Countywide</td>
<td>$91,492.78</td>
<td>62.86%</td>
<td>$47,127.88</td>
<td>77.75%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$145,557.92</td>
<td>100.00%</td>
<td>$102,184.92</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

**Total Available Funds (as of January 13, 2017)**
- $272,962.20

**Remainder**
- $170,777.28

**FWC Rationale for Recommendation**
- The project meets the requirements of Section 13103 (a) scientific research. Partial funding is recommended and may only be used for the purchase of the sampling equipment. Staff costs and not benefiting Contra Cost County students were the factors for not recommending the funding of the remainder of the grant request. Since The River Otter Ecology Project involves multiple counties, the FWC recommends a condition that requires that the equipment only be used and stored in Contra Costa County.

- The project meets the requirements of Section 13103 (a) public education and (e) habitat improvement. The project fulfills the goals of the Committee by providing funds for public education and has important long-term ecological restoration objectives that include the viability of the fish passage in the lower Marsh Creek. Partial funding is recommended to fund the direct costs for project supplies, materials and services, and travel as outlined in Earth Team's grant request application.

- The project meets the requirements of Section 13103 (a) public education. The Ruth Bancroft Garden will partner with other environmental and conservation groups to educate the community about specific, actionable and practical ways community members can reduce water consumption, create beautiful areas of wildlife habitat and forage in home gardens, and reduce the use of pesticides and herbicides.

- The project meets the requirements of Section 13103 (a) public education. The project fulfills the goals of the Committee by providing funds for public education and has important long-term ecological restoration objectives that include the viability of the fish passage in the lower Marsh Creek. Partial funding is recommended to fund the direct costs for project supplies, materials and services, and travel as outlined in Earth Team's grant request application.

- The project meets the requirements of Section 13103 (a) scientific research and (m) other expenditures for travel expenses for research trips to Brentwood and educational materials only.
Contra Costa County
2019 Fish and Wildlife Propagation Fund
Application Cover Page

Project title: Native Bees in Urban Brentwood and Agricultural Brentwood

Organization/Individual applying: The Regents of the University of California

Address: Sponsored Projects Office, University of California, 2150 Shattuck Ave., Ste 313
Berkeley, CA 94704-5940
Telephone: (510) 664-9014
Fax: (510) 642-8236

E-mail: jwbrown@berkeley.edu

Name and title of contact person: Jessie Brown, Contract and Grant Officer

One sentence summary of proposal: Conduct inventory of native bees of urban & Ag Brentwood

Requested grant: $8,572.00

Proposal prepared by (name & title): Dr. Gordon Frankie, Faculty, University of California, Berkeley

Signature (Typing your name does not count as a signature. If this section is empty, your proposal will not be considered):

Signed on October 29, 2018
Native Bees in Urban Brentwood and Agricultural Brentwood

Description of the project for which funding is requested

Honey bees (*Apis mellifera*) have been in decline since 2006 when the term “Colony Collapse Disorder” (CCD) was coined to describe greatly declining populations of bees in North America, Europe, India, and Brazil (NRC 2007). No single causal factor was identified, but several factors were suspected of contributing to CCD including neonicotinoid pesticide poisoning, poor honey bee nutrition, increases in natural enemies (mites, bacteria, viruses), poor handling and transporting of hives, and destruction of floral habitat around agricultural areas. The White House and EPA in 2015 announced significant warnings of decline in honey bees and urged that steps be taken to address decline and look for alternatives to honey bees.

These events have led to interest in *native bees* and their possible role in providing pollination services to supplement honey bees. This is not a new suggestion as native bees such as alkali bees (*Nomia melanderi*), blue orchard bees (*Osmia lignaria*) have been used to provide crop pollination services. Chaplin-Kramer et al. (2011) estimated that up to 39% of the pollination services required by California crops are provided by native bees at an economic value of $0.9-2.4 billion annually.

In 2009, USDA-NRCS approached the Urban Bee Lab at the University of California, Berkeley about bringing urban bee-flower knowledge to agricultural fields in Brentwood, Contra Costa County with the goal of attracting native bees to supplement honey bees in crop pollination. This started a dialogue with 8 Brentwood farms to evaluate native bees as possible pollinators of crop flowers. The project was initiated in 2010. Report on this study from 2010-2017 available upon request.

The overarching goal of this project, which started in 2018, is to systemically sample native bees and their flower hosts in urban Brentwood during the main flowering season of 2018 (complete) and 2019 (proposed for 2019) (March-Sept.) and compare this inventory with sampled collections from adjacent Ag Brentwood farms. We also will be sharing our findings with several audiences. The project corresponds with the following requirements of Section 13103:

a. Public education relating to scientific principles by providing farmers, elementary schools and residents with hands-on workshops and presentations, and printed and online education materials

i. Scientific fish and wildlife research conducted by institutions of higher learning, qualified researchers, or governmental agencies, if approved by department

Progress in 2018 from last year’s grant

We sampled bees numerous times in a variety of urban garden environments during 2018 throughout urban Brentwood. The city continues to develop with new housing projects in a patch work of sites where there used to be large vacant lots. We noted that bee flowers are found widely scattered in gardens within urban Brentwood. This mosaic of bee plants necessitated spending considerable time traveling around the urban area locating gardens and public garden corridors. It clear that we have just scratched the surface of the native bee story of urban Brentwood. In 2017 we collected 38 bee species and associated host flower records. In 2018 we
added 24 more species for a cumulative 2-yr total of 62 species. Also of great interest was the fact that 10 of 62 have only been collected in urban Brentwood compared to the bee species list from Ag Brentwood (where we have collected 144 bee species over a 7-yr period (2010-2016).

We have also been sampling native bee species from nearby Mt. Diablo and vicinity from a small grant from "Save Mt. Diablo". We expect that next year we will have enough data for a comparative table of Ag and urban Brentwood and Mt. Diablo to evaluate the similarities and contrasts in native bee species among the 3 sites, which will give a regional picture of the natives.

**Project schedule**

**Mar.-Sept. 2019:** Monitor bees in **urban Brentwood** to develop a relatively complete inventory of bees from this environment.

**Oct.-Nov. 2019:** Bee species identification; compare bee inventories for similar and dissimilar bee spp. between urban and Ag Brentwood

**Oct.-Feb. 2020:** Present findings to urban and farming communities on website, e-newsletter, and other social media. Develop posters for everyday growers and urban residents. Produce bee image posters to distribute to program participants, especially through invited Master Gardener programs.

**Methods**

Bee monitoring will be conducted using a standard procedure to assess diversity and abundance of bee species at each farm. Aerial collecting will be used. In addition to this, fifteen 6 oz. plastic pans, alternating between an equal number of fluorescent blue, fluorescent yellow, and plain white will be spread out on the ground ~24 feet apart in sunny locations along a mostly linear transect for 4-hour periods. Each pan will be filled with a dilute solution of soapy water (Blue Dawn in 1 gallon of water), which kills bees upon contact. Aerial netting will be used to collect bee species off known bee flowers and weedy flowering plants during the 4-hour period. We will also be adding bee plants to some urban gardens to increase attraction of bees.

**Project Budget**

<table>
<thead>
<tr>
<th>Expenses</th>
<th>Amount in $</th>
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<tbody>
<tr>
<td><strong>Travel</strong></td>
<td></td>
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<tr>
<td>RT from Berkeley to Brentwood; 24 trips @ $53.00. Per trip ($0.545/mile)</td>
<td>$1,272.00</td>
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<tr>
<td><strong>Materials &amp; Supplies</strong></td>
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<tr>
<td>Purchase of bee plants</td>
<td>$1,500</td>
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<tr>
<td>Poster supplies</td>
<td>$500</td>
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<tr>
<td>Insect collection boxes; 6 @ $50.00 each</td>
<td>$300</td>
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<tr>
<td><strong>Total Travel &amp; Supplies</strong></td>
<td>$3,572.00</td>
</tr>
<tr>
<td><strong>Personnel</strong></td>
<td></td>
</tr>
<tr>
<td>Bee taxonomist Jaime Pawelek* will be hired on a contract basis to ID bees; $50.00 per hour for 80 hrs</td>
<td>$5,000.00</td>
</tr>
<tr>
<td><strong>Total direct costs</strong></td>
<td>$8,572.00</td>
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</tbody>
</table>
Bee identifications are a critical expense owing to the difficulty and time-consuming work to ID bees to species. Jaime Pawelek is a skilled and highly competent taxonomist who has worked in past years in the UC Berkeley Bee Lab. We are expecting to collect more bees in 2019 compared to 2018. This is because we have located several more sites for future collections, and because we were not able to start collecting bees until May during the 2018 monitoring season. This upcoming year in 2019, we plan to start collections the first week of March.

**Statement describing the applying organization**

The University’s mission is to serve society as a center of higher learning, providing long-term societal benefits through transmitting advanced knowledge, discovering new knowledge, and functioning as an active working repository of organized knowledge. That obligation includes undergraduate education, graduate and professional education, research, and other kinds of public service, which are shaped and bounded by the central pervasive mission of discovering and advancing knowledge. UC governance consists of three bodies: the President (Mark Yudof), the 26-member Board of Regents, and the Academic Senate (for more information, see: www.universityofcalifornia.edu/aboutuc/governance.html). Affiliated organizations include the National Science Federation, National Institute of Health, Environmental Protection agency, and various state agencies.

Should this proposal be selected for funding, the University requests terms and conditions which are suitable to a non-profit, educational institution. Such terms musts abide by our Policy Guidelines Governing Openness and Freedom to Publish (more info here: http://www.spo.berkeley.edu/calmessages/publish.html).

**Statement describing qualifications of sponsoring organization and participating individuals**

For over 16 years, the Urban Bee Lab has conducted groundbreaking research on California’s native bees, their relationships with flowering plants, and their pollination role in agricultural, ornamental, and natural landscapes. Our work is providing encouraging evidence that high quality habitats can increase native bee populations, providing important pollination services, and serving as a buffer against native bee declines. Partnering with local gardeners, botanical and community gardens, schools, farmers and scientists, the Urban Bee Lab puts these groundbreaking findings to use through hands-on outreach programs that create new habitat for native bees.

Dr. Gordon Frankie has been a faculty member of the ESPM Department in the College of Natural Resources (CNR) at UC Berkeley since 1976. CNR addresses biological, social, and economic challenges associated with protecting natural resources and environment. CNR (http://cnr.berkeley.edu) and the Extramural Funds Accounting (http://controller.berkeley.edu/efa) manage funding and accountability for all funded projects.

- **Project Supervision:** Dr. Gordon Frankie, Principal Investigator
- **Project Team:** Lab assistant, Marissa Chase; Bee taxonomist: Jaime Pawelek

**Statement describing the status of permit approvals necessary to perform project:** N/A

**Total Grant Request** $8,572.00
Contra Costa County
2019 Fish and Wildlife Propagation Fund
Application Cover Page

Project title: Sacramento perch: from watersheds to classrooms, and back!

Organization/Individual applying: Contra Costa Resource Conservation District

(Organization type: please check one – government, non-profit, for-profit, other (explain))

Address: 5552 Clayton Rd
Concord, CA 94521
Telephone: (925) 672-4577
Fax: (844) 206-6977

E-mail: clim@ccrcd.org

Name and title of contact person: Chris Lim, Executive Director

One sentence summary of proposal: Restoring Sacramento perch in Contra Costa County ponds with classroom stewardship.

Requested grant: $2,895.00

Proposal prepared by (name & title): Chris Lim, Executive Director

Signature (Typing your name does not count as a signature. If this section is empty, your proposal will not be considered):

Signed on 11/1/18
Sacramento perch (*Archoplites interruptus*) is a fish that was endangered before the Endangered Species Act was enacted. It has been extirpated from its native habitats in California and is found currently only in small pockets across California. Yet, a group of Bay Area fish experts are teaming up to bring back populations of Sacramento perch to Contra Costa County.

Sacramento perch are the only native sunfish west of the Rockies that historically thrived in our Bay Delta system, but have now been outcompeted by other invasive fish. Otherwise, they are extremely hardy fish, able to survive in water with wide range of temperature, salinity, turbidity, and dissolved oxygen. Beyond increasing their numbers, restoring these fish can be beneficial in several ways:

1. They can be used to control mosquito populations (by eating larval mosquitoes)
2. They are prized sportfish
3. They are being eyed as a hardy candidate for aquaponics systems

The Contra Costa Resource Conservation District (CCRCD) understands the need to create programs with multiple benefits for both the health of the watershed and for people, current generations and beyond. With that goal in mind, our program combines Sacramento perch restoration with watershed education for students. This funding would support both the restoration and educational component of the program, *Sacramento perch: from watersheds to classrooms, and back!* (SPWCB)

Our program begins in the back rooms of the Contra Costa Mosquito and Vector Control District. Here, Biologist Chris Miller, breeds and spawns mating pairs of Sacramento perch, originally obtained from Jewel Lake, a place to have a relatively unique strain of genetic diversity for Sacramento perch. To enhance genetic diversity, Chris plans to also incorporate other individuals from locations in our Bay Area watersheds.

These resulting larval fish will then be placed in local ponds to grow out. Our first option has already been scoped out, agreed upon by the landowner, and is being pushed forward by the partners at the newly constructed Western Pond Turtle habitat ponds at Mountain View Sanitary District in Martinez, CA. The District uses these ponds to release their effluent which eventually travels out into the Carquinez Strait. The construction timeline calls for the new ponds to be filled with water this winter. We needed to find ponds without other sunfish as Sacramento perch are outcompeted by other sunfish. Another major obstacle was finding ponds without Red-legged frogs that could eat the perch. We also are working with East Bay Regional Parks District for a potential second pond located at Point Pinole Regional Park and continually searching for other ponds that meet criteria.

Once thousands of larval fish are planted into the initial ponds at Mountain View Sanitary District, they will be allowed to grow for a few months until they reach about fingerling size. Some fish will then be captured using traps and brought back to Contra Costa Mosquito and Vector Control District, where Chris M. will acclimate the fish to eating commercial feed. Once that is completed over a few months, the fish will be placed in aquariums in partner classrooms to provide students an environmental stewardship experience through the lens of Sacramento perch. The highlight of the educational program is the release field trip where students release their fish back into local ponds.

CCRCD will develop and deliver Sacramento perch curricula to four local elementary schools throughout Contra Costa County, including one in West County, one in Central County, and two in East County. Our program targets two classrooms per school for a total of eight classrooms. We will deliver four sessions, including three in-class sessions and one field trip to each classroom. We anticipate the classrooms to average 28 students for a total of 224 students served with 8.5 program hours and 1904 contact hours. Together our targeted schools have a free and reduced lunch percentage of 82.
The curricula of SPWCB focuses on the past, present, and future of Sacramento perch and how each student makes everyday choices that either positively or negatively affect our watersheds and thus Sacramento perch. The curricula use Sacramento perch as the lens to further discuss students’ connection to their natural world, and allows us to discuss broader topics such as their interconnectedness with watersheds, water, and invasive species. This program is special in its direct public health benefits. It is clear for students that with our additional knowledge about Sacramento perch, its proclivity for eating mosquito larvae, that restoring this species has full circle health benefits for the watershed and people.

To engage students, we use inquiry-based learning, as well as hands-on, experiential learning to promote students onto a pathway of sustainable living. The developed curricula will align with the Next Generation Science Standards and Common Core. We will also develop and administer pre- and post- surveys for the students to evaluate the program. Our programmatic team meets with teachers prior to the start of the program to discuss how best to complement each teacher’s classroom curricula.

The schedule of the environmental educational sessions are as follows: two in-class, then the release field trip, and a final in-class wrap up to debrief the field trip and conclude the program.

HOW THIS PROJECT MEETS THE REQUIREMENTS OF SECTION 13103

This project meets Section 13103 letters (a) and (d).

It satisfies letter (a) with the environmental education component with partner classrooms. Our project also satisfies letter (d) by breeding, raising, and releasing Sacramento perch.

<table>
<thead>
<tr>
<th>PROJECT SCHEDULE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Spawn fish</td>
</tr>
<tr>
<td>Release fish into ponds</td>
</tr>
<tr>
<td>Fish grow out in ponds</td>
</tr>
<tr>
<td>Trap fish</td>
</tr>
<tr>
<td>Acclimate fish to commercial feed</td>
</tr>
<tr>
<td>Place fish in partner aquariums</td>
</tr>
<tr>
<td>Deliver educational program</td>
</tr>
<tr>
<td>Students release fish back into ponds</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PROJECT BUDGET (ITEMIZED)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supplies for aquariums</td>
</tr>
<tr>
<td>20 gallon Aquarium kit</td>
</tr>
<tr>
<td>Aquarium stand</td>
</tr>
<tr>
<td>Gravel</td>
</tr>
<tr>
<td>Siphon</td>
</tr>
<tr>
<td>Extra carbon + bags</td>
</tr>
<tr>
<td>Bubbler</td>
</tr>
<tr>
<td>Batteries for bubblers</td>
</tr>
<tr>
<td>Plastic tubing for bubbler</td>
</tr>
<tr>
<td>5 gallon bucket w/ lid</td>
</tr>
<tr>
<td>TOTAL</td>
</tr>
<tr>
<td>Supplies for spawning, food acclimation</td>
</tr>
<tr>
<td>Bag of fish food</td>
</tr>
<tr>
<td>Fish bags for transport (case)</td>
</tr>
<tr>
<td>Artemia Cysts</td>
</tr>
<tr>
<td>Frozen Artemia</td>
</tr>
<tr>
<td>Frozen shrimp</td>
</tr>
<tr>
<td>TOTAL</td>
</tr>
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TOTAL ASK FROM CONTRA COSTA COUNTY FISH AND WILDLIFE COMMITTEE $2,895
ANNUAL BUDGET

<table>
<thead>
<tr>
<th>Income</th>
<th>Total REVENUE</th>
<th>646,399.68</th>
<th>43,080.00</th>
<th>265,000.00</th>
<th>772,479.68</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expense</td>
<td>Total EXPENDITURES</td>
<td>472,125.51</td>
<td>94,407.21</td>
<td>284,462.56</td>
<td>850,995.28</td>
</tr>
<tr>
<td>Net Income</td>
<td>(7,725.83)</td>
<td>(51,327.21)</td>
<td>(19,462.56)</td>
<td>(78,515.60)</td>
<td></td>
</tr>
</tbody>
</table>

STATEMENT DESCRIBING THE CCRCD, BOARD OF DIRECTORS

The Contra Costa Resource Conservation District is a non-regulatory, special district of the state of California. The mission of CCRCD is to facilitate the conservation of natural resources in Contra Costa County. We accomplish our mission by partnering with farmers, ranchers, nonprofits, private business, and local, state, and federal agencies. We work throughout Contra Costa County watersheds, including projects such as livestock pond restoration, developing carbon farming plans, coordinating county collaborations such as the Contra Costa Watershed Forum, and supporting small grassroots “friends of” Creeks/Watershed groups.

CCRCD Board of Directors

Igor Skaredoff – Board President, Retired Chevron chemist, LAFCO commissioner
Walter Pease – Board Treasurer, Retired City of Pittsburg Public Works
Bethallyn Black – Horticulture professor at DVC
Tom Brumieve – Rancher on Mt. Diablo

Bob Case – Retired Department of Agriculture
CCRCD Associate Directors

Bob Simmons – Retired, Chair of Walnut Creek Watershed Council, Former Mayor of Walnut Creek
Lorena Castillo – Internship and Outreach Coordinator, New Leaf Collaborative

STATEMENT DESCRIBING THE CCRCD QUALIFICATIONS

The CCRCD is well suited to oversee this program. The organization has existed for over 75 years in bringing together like-minded partners to help fulfill our mission. Our strength lays in consistently pushing projects forward while keeping partners engaged and being non-regulatory, which allows us to be seen as a “friendly face” of government. We have worked with a multitude of partners, including funders, over the organization’s history to make programs come to fruition. Our current funding structure, including receiving a part of the County parcel tax, allows us to leverage those funds to fundraise the remainder of our budget.

INDIVIDUALS RESPONSIBLE FOR PERFORMING PROJECT AND OVERSEEING PROJECT

Chris Lim – CCRCD’s Executive Director will act as program manager for Sacramento perch: from watersheds to classrooms, and back! This program is very similar to Trout in the Classroom, another program overseen by Chris with his previous organization at Central Coast Salmon Enhancement. This educational offering would be the first of its kind in California. Chris also developed and delivered the Bay Area’s first joint restoration and education program for native Olympia oysters, which also consisted of in-class sessions and field trips. Chris has over 15 years of experience in the environmental field and has worked in all three sectors, nonprofits, private, and government. He has extensive experience with curriculum development and working with underserved youth. He also manages programs with special insight due to his Masters of Nonprofit Administration and undergraduate degree in Integrative Biology with an emphasis in Marine Biology and Oceanography from UC Berkeley.

Chris Miller – Biologist for the Contra Costa Mosquito & Vector Control District will obtain permits, spawn fish, conduct field work, acclimate fish to commercial feed and assist with data analysis and report writing. Mr. Miller has over 25 years of experience culturing mosquitofish, surveying fish populations and report writing. He has been working with Sacramento perch for over 15 years.

STATEMENT DESCRIBING STATUS OF PERMIT APPROVALS NECESSARY TO PERFORM PROJECT

- Contra Costa Mosquito & Vector Control District biologist has the necessary permit in hand: California Department of Fish & Game Aquaculture Registration #0866 (exp. 12/31/19).
- CDFW Private Stocking Permit, DFW 749 – need to apply
Project title: Resolving Negative Human-Wildlife Interactions (AKA Urban Wildlife Conflicts)

Organization/Individual applying: International Bird Rescue

Address: 4369 Cordelia Road, Fairfield, CA 94534

Telephone: 707-207-0380

E-mail: grants@bird-rescue.org

Name and title of contact person: Phil Kohlmetz, Grants Coordinator

One sentence summary of proposal: Offsetting nutrition, medicine, and veterinary medical supply costs for birds admitted from Contra Costa County to our San Francisco Bay-Delta Wildlife Center between April 1 and December 31, 2019.

Requested grant: $12,500

Proposal prepared by (name & title): Phil Kohlmetz, Grants Coordinator

Signature (Typing your name does not count as a signature. If this section is empty, your proposal will not be considered):

Signed on 10/9/18
Grant Proposal to the Contra Costa County Fish and Wildlife Committee

Resolving Negative Human-Wildlife Interactions (AKA Urban Wildlife Conflicts) in Contra Costa County - 2019

Funding Request and Project Description
International Bird Rescue respectfully requests a $12,500 grant from the Contra Costa County Fish and Wildlife Commission. The goal of this project is to address known, ongoing Urban Wildlife Conflicts (negative human-wildlife interactions) in Contra Costa County in 2019. It will benefit Contra Costa wildlife by giving aquatic birds that have been harmed by human impact a second chance at a normal life. The grant’s purpose is to offset nutrition, medicine, and veterinary medical supply costs for birds admitted from Contra Costa County to our San Francisco Bay-Delta Wildlife Center between April 1 and December 31, 2019.

Our San Francisco Bay-Delta Wildlife Center in Cordelia, CA admits more than 2,000 local aquatic birds annually, and releases them back into the wild once they are successfully rehabilitated. We receive an average of 175 birds annually from Contra Costa County. As a "referral hospital," we often treat the most challenging cases that are beyond the capacity or skills of other regional wildlife centers and clinics.

Unlike traditional veterinary clinics, our patients come to us with no funding, no insurance, and no one responsible for paying the bill. Birds injured by human impact (as the majority of our cases are) require round-the-clock care, capable hands, and large volumes of food and vitamins in order to be rehabilitated successfully and returned to the environment. Only with philanthropic support from concerned citizens, foundations, corporations, and municipal agencies are we able to meet the demand for our services.

Organizational Overview – Qualifications, Partners, Permits, and Personnel
International Bird Rescue was founded in 1971 in response to a massive oil spill that covered 50 miles of coastline on all sides of the Golden Gate Bridge, effecting between 7,000 and 15,000 birds. Since then, we have become a global leader in addressing man-made disasters affecting marine wildlife, such as oil spills and debris, and have pioneered life-saving techniques to address ongoing human impacts on aquatic birds. Our mission is to inspire stewardship of our global waters by rescuing and protecting aquatic birds. We pursue our mission through four core programs:

- **Wildlife Rehabilitation**: Not counting oil spills, millions of birds die every year due to injury from fishing (hooks, nets, and lines), human cruelty (illegal shootings), habitat disruption, starvation, pollution, and climate change-induced hazards including algae blooms and domoic acid toxicity. Our two specialty hospitals in LA and near San Francisco treat 4,000+ native aquatic birds annually and release them back into the wild. This ongoing work maintains our staff and volunteers’ skills and facilities to respond rapidly to crisis events when they occur. Each case we treat is a step towards restoring balance to our global ecosystem.

- **Oil Spill Preparedness and Emergency Response**: We provide wildlife capture, rehabilitation, and documentation for oil spills and other marine emergencies. Since 1971, we have led wildlife rescue efforts in over 225 incidents on six of the seven continents, and have treated over 100,000 wild lives.

- **Research and Innovation**: We continually evaluate techniques and protocols to improve animal care and professional emergency response, conduct clinical trials, and publish post-release studies.

- **Education and Training**: Education of the public, of energy industry workers, and of wildlife first responders is an essential component of our work to protect and restore wildlife populations.

[www.Bird-Rescue.org](http://www.Bird-Rescue.org) · San Francisco Bay · Los Angeles · Anchorage · grants@bird-rescue.org
Throughout a bird's time with us, from their initial triage assessment to their release, we record data and track their progress using RaptorMed software. In addition, treated birds are banded so that other scientists, volunteers, and enthusiasts can track them in the wild, and in case a treated bird returns to us for further care. We are one of the few organizations that possess the federal permit to band birds.

The data generated by the banding effort, as well as our internal data, is analyzed by our veterinary care team as part of ongoing research, and the results shared at professional conferences and with our partners in the Global Oiled Wildlife Response System, a consortium of leading experts solving the challenges of oiled wildlife globally.

International Bird Rescue is a founding partner in the State of California's Oiled Wildlife Care Network (OWCN), as well as a member of the Global Oiled Wildlife Response System (GOWRS), a consortium of leading experts trying to solve the challenges of oiled wildlife. Other partners include local, state and federal Fish and Wildlife departments, multiple Audubon Society chapters, and local Animal Control agencies.

Executive Director JD Bergeron manages a professional staff of 27. Our staff have literally "written the book" on wild animal care, contributing to "Merck Veterinary Manual" and “Medical Management of Wildlife Species: A Guide for Practitioners,” among many others. Senior personnel responsible for the San Francisco Bay-Delta Wildlife Center include:
- Clinical Veterinarian and Research Director Dr. Rebecca Duerr
- Program Operations Manager Julie Skoglund
- Wildlife Center Manager Isabel Luevano

Our eight-member Board of Directors includes:
- Ron Morris, Chair; Captain, U.S. Coast Guard (retired)
- Susan Kaveggia, Vice Chair; Wildlife Response Team
- Beth Slatkin, Secretary; Director of Marketing and Outreach, Bay Nature Institute
- John Sifling, Treasurer; Principal, Broad Reach Maritime
- Will Gala; Fellow, Chevron Energy Technology Company
- Ian Liston; Attorney, Wilson Sonsini Goodrich & Rosati
- Toni Arkoosh Pinsky; Community Leader
- Jodi Benassi; Associate, McDermott Will & Emery LLP

**Meeting the Requirements of Section 13103 of the Fish & Game Code**
The work of International Bird Rescue addresses multiple elements of the California Fish and Wildlife Code, especially in Section 13103.

The proposed project is a direct expression of 13103(b): “Temporary emergency treatment and care of injured or orphaned wildlife." The individual animals we return to the wild are then able to propagate future generations. When we work with Animal Control Officers and Game Wardens, we also address element 13103(c): “Temporary treatment and care of wildlife confiscated by the department as evidence.”

Additionally, through our Wildlife Rehabilitation work and our Oil Spill Preparedness and Emergency Response work, we protect and restore local wildlife populations, especially when human impact has negatively affected those populations and individual animals. Our ongoing Research leads to innovations and new standards in wild animal care (13103(i)). Our public education and outreach efforts reach over 100,000 people annually through numerous social media channels and real-time events (13103(a)).
**Project Schedule and Budget**

Over our long history serving northern California (and emergencies and incidents notwithstanding), there are two "peak seasons" for our San Francisco Bay-Delta Wildlife Center: "Baby Bird Season" from April to August, and "Migratory Bird Season" from October to February. During both of these events, concerned Contra Costa County residents and local Animal Control officers bring us wild, injured birds collected from dense urban areas throughout Contra Costa County, and from the local shores and waterways of San Pablo Bay, Alhambra Creek, and others.

A $12,500 grant from the Contra Costa County Fish and Wildlife Commission will enable us to treat and rehabilitate approximately 85 wild avian Contra Costa patients admitted after April 1, 2019. Commission funds would be used to pay for costs of animal nutrition, medicine, and medical supplies:

- $10: average cost per bird for a day's worth of animal nutrition, medicine, vitamins, dietary supplements and veterinary supplies (such as vet wrap, sutures, surgical supplies, etc.)
- 15: average length of days of stay for a bird in care
- 85: # of birds supported by a 2019 Contra Costa County Fish and Wildlife Committee $12,500 grant in 2019

Our plan to meet the demand for our services during these peak times involves having sufficient staff, volunteers, supplies, and financial resources on hand. With over 45 years of experience treating sick and injured wild aquatic birds, we are well-suited to address these ongoing Urban Wildlife Conflicts.

However, International Bird Rescue must secure philanthropic support from the residents and municipalities where these birds are found and released in order to keep our operations sustainable. In the past, when philanthropic support did not match the scope of work presented to us, organizational reserves have been used to support the San Francisco Bay-Delta Wildlife Center. This is, understandably, not a sustainable solution. The plan to address this financial imbalance includes an organizational investment in greater fundraising resources, increased outreach to local communities and citizens, and additional requests made to granting organizations like the Contra Costa County Fish and Wildlife Commission.

A $12,500 grant from the Contra Costa County Fish and Wildlife Commission will ensure our ability to provide appropriate nutrition and medicine to meet the demand for services in 2019, and help propagate future generations of local wildlife.

**Annual Organizational Budget**

International Bird Rescue operates two specialty wildlife hospitals in California and an emergency response center in Alaska on a balanced $2.37M annual cash budget.

Total annual operating expenses for the San Francisco Bay-Delta Wildlife Center are approximately $400,000. Major expenses of this Center include $225,000 for personnel (birds don’t heal or treat themselves) and approximately $50,000 for utilities to provide clean and stable wildlife rehabilitation enclosures (as opposed to utilities for office uses), including tens of thousands of gallons of clean and temperature-controlled water.

However, as much as personnel and energy are critical to our work, this grant request focuses on medicine, surgical and rehabilitation supplies, and nutrition (food and vitamins) for the wild patients in our care.
Project title: **Worth A Dam**

Organization/Individual applying: **Heidi Perryman**

(Organization type: please check one - government, non-profit, for-profit, other (explain))

Address: **101 Brookwood Ave. Ste. 204 Santa Rosa, CA 95404**

Telephone: *(707) 477-6317*  
Fax: *

E-mail: **mtzbeavers@gmail.com**

Name and title of contact person: **Heidi Perryman, president**

One sentence summary of proposal: **Eco-Treasure Hunt activity at Beaver Festival 12**

Requested grant: **$1,025.00**

Proposal prepared by (name & title): **Heidi Perryman, president**

Signature (Typing your name does not count as a signature. If this section is empty, your proposal will not be considered):

*Signature*

Signed on **1/20/2019**
Treasure Hunt for the ‘Lost Key to the Waters’

Beaver habitat has been extensively studied in terms of salmon population, water storage and biodiversity, but more recently looked at as a crucial tool for surviving climate change. Beaver dams act as speed bumps to slow flooding in weather extremes, and have been shown to help compensate for a shrinking snowpack. As temperatures heat and landscapes dry, California has already seen the most destructive fire in our states’ history. Experts argue more beaver-created wetlands would provide a moist buffer for our too flammable lands, while beaver forage would help remove downed fuel. The beaver was even discussed as a tool for helping threatened forests in the 2018 climate report. It’s hard to think of a more important time to better understand this animal.

To say California has a love-hate relationship with beavers may be to paint too rosy a picture. The golden state that desperately needs water still traps these water-savers from Siskiyou to San Bernadino and most places in between. This year, with the publication of “Eager” the beaver is enjoying somewhat of a heyday - with praise everywhere from the Washington Post to National Geographic - but California beavers (Chapter 6 in Ben Goldfarb’s book) are still woefully under-appreciated.

This project was designed to help change that.

The Treasure Hunt for the ‘Lost Key to the Waters’ will provide a fun way for parents and children to learn about the essential benefits of a beaver pond using a playful ‘treasure hunt’ theme. Participants will be the first 100 children attending the 12th annual Beaver Festival in Martinez, CA on June 29th, 2019. Last year this event had an attendance of 1000, with over 50 participating environmental groups. Children will begin the activity by receiving instructions to search out the “pieces of the treasure map” which will show them how to find the ‘lost key to the waters’. While they hunt, a healthy life-sized pond will be drawn that day by the chalk artist, Amy G. Hall who will be donating her time again this year. As children cross the park looking for clues, they will see her vivid work unfolding and be allowed to contribute their own creations.

The eight map fragments will be obtained at participating booths along with a mini ‘clue card’ explaining how ‘the lost key’ helps that particular species. (For example, the otter card and map piece can be found at the otter booth). The cards can be collected on a key chain and saved. When all eight portions of the map are gathered, children can go to a “mapmaker station” to join them together so that they can read the message hidden on the back. This will direct them to the final booth where they will be asked for their best guess about what might be the “Key to the waters” considering everything they have learned on their journey so far. Guided help will be provided to make the riddle clear and the child will then be presented with a ‘jeweled’ key, bearing an image of the beaver, which they can add to the key chain and take with them.

Exhibitors will be selected for their knowledge of the topic and willingness to participate. They will be considered ‘sponsors’ of the activity and be approached ahead of time regarding the information
distributed. Sponsor stations will be designated with directional signs, treasure map flags and listed on the event brochure. The treasure map itself will be designed by our artist to reflect each species in question. ‘Clue cards’ will contain simple language and illustrations as well to show how these species are helped by beavers. The pieces will be distributed to sponsors on the morning of the festival by the California Core Watershed Steward Interns, Jackie VanDerHout and Emma Goodwin, who will also review the activity with exhibitors.

Amy G. Hall will be dynamically illustrating the 10 foot square in the plaza the day before and day of the festival - focusing on the beaver pond and the difference it makes to the surrounding ecosystem. Amy is an award-winning street and graphic artist from Napa with a special interest in beavers. Even though she typically receives $1000 a day for similar commissions, she enjoyed her participation so much last year that she has agreed to do this two-day piece without fee provided Worth A Dam pays for needed materials. Last year we learned that Susana Park was an ideal venue for this event, and provided an excellent way for exhibitors to spread comfortably around the focal point of Amy’s artwork. Children will be encouraged to draw their own illustrations in the plaza margins when they finish the activity, so that by the end of the event attendees will be surrounded by the benefits of beaver ponds at every level.

Upon completing the activity, participants will be invited to complete a short survey on what they learned in order to gauge effectiveness. We have found that parents enjoy seeing what their children remember of what they learned, and it’s not uncommon for kids to correct their parents loudly in this process. Completed surveys will be raffled for prizes awarded after the festival to encourage maximum participation. (We have learned that a ‘beaver kit puppet’ makes a great motivator in getting kids eager to complete after-quiz!) Results will be analyzed along with sponsor and parent feedback to fine-tune next year’s activity.

**Responsible parties:**
Project oversight: Heidi Perryman
Event brochure distribution: Cheryl Reynolds
Beaver pond art: Amy G Hall
Treasure Map design: Amelia Hunter
Map fragment Distribution: California Core Watershed Steward Interns
Post-test administration: Jon Ridler

**Project Budget (itemized):**
The following Expense List outlines costs for the activity. Note that in-kind donated services include: sponsor consultation and participation, Amy G. Hall two-day artwork and Worth A Dam volunteer labor, preparation and printing of survey, as well as painting signs and making keys.

- 250 double-sided printed cards for map pieces $150.00
- 800 clue cards explaining species helped by “Lost key” $103.00
Various supplies (Ink, paper, paint & tape for map station) 125.00
Directional sign flags for sponsor stations 70.00
Exhibit location map festival brochure x 500 350.00
150 Bronze Keys 120.00
5 artist quality 48 Koss soft chalk pastels @ 16.00 ea 82.00
3 pk's of children’s 12 soft pastels @ 8.00 ea 25.00

Total cost for project: 1025.00

Eligibility for Grant Requirements:
The *Lost Key to the Waters* project meets requirements for 13103(a) by providing a specific curriculum of supervised learning in a unique community setting where children can learn alongside parents and siblings. By solving the riddle of the ‘treasure map’ children will be guided to think about the role beavers play for multiple species and see their critical value. While solving this puzzle, Amy’s artwork unfolding ‘under their feet’, will help them become connected personally to the story of the watershed and what shapes it. Even the adults in attendance will be invited (maybe for the first time) to think of beavers as a ‘treasure’.

“The Lost Key to the Waters” uses a playful framework to cheerfully and starkly illustrate that beavers matter, and what they do is valuable. Participating exhibits will likely be the following:

<table>
<thead>
<tr>
<th>Participating Exhibits</th>
</tr>
</thead>
<tbody>
<tr>
<td>US Forest Service</td>
</tr>
<tr>
<td>Marine Mammal Rescue</td>
</tr>
<tr>
<td>NOAA Fisheries</td>
</tr>
<tr>
<td>Mt Diablo Audubon</td>
</tr>
<tr>
<td>National Wildlife Federation</td>
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<tr>
<td>River Otter Ecology Project</td>
</tr>
<tr>
<td>NPS John Muir Site</td>
</tr>
<tr>
<td>East Bay Regional Parks</td>
</tr>
</tbody>
</table>

Requesting Organization:
Worth A Dam is an unincorporated association formed in 2008 to maintain the Martinez beavers in Alhambra Creek. In January 2014, it became a fiscally sponsored project of Inquiring Systems Inc.(ISI), a tax-exempt 501 (c) (3) nonprofit corporation with EIN: 94-2524840. Worth A Dam’s education and outreach has been instrumental in teaching other cities how and why to live with beavers. It and the festival were prominently featured in Ben Goldfarb’s book and subsequently discussed in many national articles. The beaver festival has an annual budget of $5000.00. In addition to holding the yearly festival and providing presentations and training on beavers throughout the year, Worth A Dam maintains an internationally visited website, with daily updates on beaver news and research from around the world. Our members are:

<table>
<thead>
<tr>
<th>Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heidi Perryman - President</td>
</tr>
<tr>
<td>Cheryl Reynolds - Vice President</td>
</tr>
<tr>
<td>Jon Ridler - Treasurer</td>
</tr>
<tr>
<td>Frogard Butler – Art</td>
</tr>
<tr>
<td>Lory Bruno - Donations</td>
</tr>
<tr>
<td>Igor Skaredoff - Watershed</td>
</tr>
<tr>
<td>Kimberly Robertson - Wildlife</td>
</tr>
<tr>
<td>Leslie Mills – children’s activity</td>
</tr>
</tbody>
</table>

2 NCAS-4 (2018) Fourth National Climate Assessment - Chapter 6
Project title: Watershed Action Program

Organization/Individual applying: KIDS for the BAY
(Organization type: non-profit)

Address: 1771 Alcatraz Avenue, Berkeley, CA 94703

Telephone: 510-985-1602    Fax: 510-547-4259

E-mail: gabriela@kidsforthebay.org

Name and title of contact person: Gaby Antonova, Development Manager

One sentence summary of proposal:
KIDS for the BAY is seeking $6,000 to deliver the Watershed Action Program and to fund eight (8) local bay and delta Field Trips for students and teachers from low-income Contra Costa County schools, which will teach students about the scientific principles of fish and wildlife conservation, as well as help to improve the health of fish and wildlife habitats in Contra Costa County through Environmental Action Projects.

Requested grant: $6,000

Proposal prepared by (name & title): Gaby Antonova, Development Manager

Signature: [Signature]

Date: 12/18/18
KIDS for the BAY
Funding Request to the Contra Costa County Fish and Wildlife Propagation Fund

KIDS for the BAY (KftB) is requesting a $6,000 grant from the Contra Costa County Fish and Wildlife Propagation Fund to support our Watershed Action Program (WAP) and to fund eight local bay and delta Field Trips for the following teachers’ low-income fourth and fifth grade classes: Ms. Phippard and Ms. Milani at Madera Elementary School in El Cerrito, Mr. Albright and Ms. Thompson at Fair Oaks Elementary School in Pleasant Hill, Ms. Yee and Ms. VanWinkle at Ohlone Elementary School in Hercules and Mr. Roehl and Mr. Garro in Los Medanos Elementary School in Pittsburg. The Watershed Action Program will teach students about the scientific principles of fish and wildlife conservation, as well as help to improve the health of fish and wildlife habitats in Contra Costa County through Environmental Action Projects and trash clean-ups.

Project Description
In the WAP, elementary school classes adopt their local watershed and use it as a stimulating educational resource through Classroom Lessons and Field Trips to local bay and delta habitats. The local watershed is also a focus for environmental action, including litter reduction, water quality testing, and habitat restoration Environmental Action Projects.

The WAP includes:
- Four two-hour environmental science Classroom Lessons at the school site with preparation and follow-up activities for the teacher to complete with his/her students
- A school neighborhood trash clean-up project
- A Field Trip to a local bay or delta habitat
- A service-learning Environmental Action Project
- Professional development and professional-level academic credit units for teachers, who learn to teach the WAP alongside their students and continue to teach it themselves to new classes of students using the training, curriculum guide, and equipment kit provided by KftB.

In hands-on science Classroom Lessons, students and their teachers will learn about the ecology of their local watershed. They will learn how their neighborhoods are connected to their watershed through the storm drain system, which drains to local creeks and the San Francisco Bay estuary. Students will learn about the important organisms that make up the watershed food web, the effects of storm drain pollution on wildlife, and how to take action to protect local wildlife. Students will complete neighborhood surveys to identify examples of storm drain pollution and organize a neighborhood clean-up project.

In the 2018-19 school year, each class will go on a Field Trip to the Martinez Marina or Keller Beach in Contra Costa County. Field Trips help students connect what they learn in the classroom to the environment and watershed around them. On Field Trips to bay, delta, and ocean habitats students will learn about the diversity of aquatic life in close-up encounters with nature. They will take action to adopt, clean up, and restore these habitats by removing trash. Students will use microscopes to investigate plankton and other organisms found in the watershed, observe and identify local bird species, investigate wildlife on the rocky shoreline, and participate in trash clean-ups to protect the wildlife that they learn about during their Classroom Lessons and Field Trip.
Each class will also develop their leadership skills by completing an Environmental Action Project in their local watershed environment. The Action Projects are crucial because by planning and implementing their own project, students are empowered to become environmentalists. Environmental Action Projects allow students to make a positive impact on their local watershed environment and community. In Action Projects students:

- Adopt, clean up, and restore local urban watershed habitats by removing trash and planting native plants
- Participate in a water conservation project to learn about and alleviate the effects of the drought in California
- Plan and implement a waste reduction project and monitoring plan for their classes and their school communities.

WAP goals for the 2018 – 2019 school year for our partner schools:

- **200 students** will increase their knowledge of watershed science in the classroom and in the field and became stewards of their local watershed through habitat restoration activities.
- **200 family members** will increase their understanding of their watershed environment and learn how to reduce storm drain pollution to the watershed.
- **Eight teachers** will increase their confidence in using the local watershed as an educational resource and in empowering students to become environmental stewards.
- The WAP will be integrated into the curricula and culture of partner schools and engage the school principals, teachers, students, and their families in environmental science education and stewardship.

The WAP meets two requirements of California Fish and Game Code Section 13103:

- **Section 13103a.** The WAP planned curriculum will provide 200 students with an opportunity to learn about the scientific principles of fish and wildlife conservation.
- **Section 13103e.** Through trash clean-ups on Field Trips and waste reduction Environmental Action Projects, the eight classes will improve the quality of life for fish and wildlife in Contra Costa County.

**Project Budget**

The current annual organizational budget for KIDS for the BAY is $481,700. The project budget for the eight WAP classes is $82,427. The $6,000 grant from Contra Costa County Fish and Wildlife Propagation Fund will be an important part of that budget, and the funds will be spent on providing transportation to outdoor Field Trips in Contra Costa County for WAP students and teachers:

<table>
<thead>
<tr>
<th>2018 – 2019 Expenses</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field Trip Transportation Costs for Students</td>
<td>~$750/bus</td>
</tr>
<tr>
<td>Eight school buses</td>
<td></td>
</tr>
<tr>
<td><strong>Total Project Budget</strong></td>
<td>$6,000</td>
</tr>
</tbody>
</table>

Matching funding is committed from the San Francisco Foundation and California Coastal Conservancy.
**Project Schedule**

<table>
<thead>
<tr>
<th>Month</th>
<th>Tasks</th>
</tr>
</thead>
<tbody>
<tr>
<td>February 2019</td>
<td>• Purchase educational materials and plan Environmental Action Projects</td>
</tr>
<tr>
<td>March – June 2019</td>
<td>• Teach Classroom Lessons</td>
</tr>
<tr>
<td></td>
<td>• Conduct Environmental Action Projects</td>
</tr>
<tr>
<td></td>
<td>• Lead Field Trips to the Martinez Marina and Keller Beach</td>
</tr>
</tbody>
</table>

**Organizational Overview**

**Background:**

Since 1992, KftB has provided environmental education programs to **86,541 students and 3,533 teachers** in Alameda and Contra Costa counties. KftB programs provide professional development for teachers and academic enrichment for students using the local environment as a living laboratory for learning and for environmental action. At least 65% of our students are low-income, students of color in urban schools. KftB is a project of Earth Island Institute, our fiscal sponsor.

KftB has received local and national recognition, including Parents Press BEST of the Bay Awards in 2016 and 2018, the John Muir Association’s Environmental Education Award in 2011, the California Governor’s Environmental and Economic Leadership Award in 2009 and the Contra Costa County Watershed Forum’s Watershed Education Project of the Year Award in 2007.

**KftB Advisory Board Members:**

- **Leilani Alo**, Advisory Board President – Senior Philanthropic Advisor, Marin Community Foundation
- **Elaine Miyamori** – Human Resources Consultant, AAA Northern California
- **Kimberly Aguilar** – Second Grade Teacher, Oakland Unified School District
- **Shefali Shah** – Consultant in Environmental Education and Environmental Justice
- **Sheela Shankar** – Development Director, The Rose Foundation for Communities and the Environment
- **Jonathan Sorof** – Senior Vice President, Global Blood Therapeutics

**KftB Staff Overseeing Project:**

Mandi Billinge, Executive Director/Founder of KftB – Mandi has directed program development and organization expansion for the past 26 years. Mandi has a B.S. Honors Degree in Biology from Hull University in England, a Teaching Credential from Leeds University in England, and a Development Director’s Certificate from the University of San Francisco.

Marianne Keith, Watershed Action Program Manager – Marianne manages the WAP, collaborates with the Program Staff team, teaches student participants and trains partner teachers. Marianne has a B.S. Degree in Environmental Anthropology from Keene State College. Before her work with KIDS for the BAY, Marianne worked for “e” inc., an environmental education center in Boston and as a Camp Educator for the Arboretum of Flagstaff.

**KftB Staff Involved in Project:**

- Mandi Billinge, Executive Director/Founder
- Gabriela Antonova, Development Manager
- Marianne Keith, Program Manager
  - Valerie Lowe, Program Manager
  - Cynthia DeLeon, Program Manager
Project title: Lafayette - Creek Interpretation and Education Signage

Organization/Individual applying: City of Lafayette, Creeks Committee

(Organization type: please check one – government, non-profit, for-profit, other (explain) Gov. voluntary advisory committee

Address: Lafayette City Offices, 3675 Mt. Diablo Boulevard, Lafayette, CA 94549

Telephone: (925) 586-1121

E-mail: welder96@comcast.net

Name and title of contact person: Will Elder, Chair, Lafayette Creeks Committee

One sentence summary of proposal: Create and install two wayside signs for Lafayette City parks.

Requested grant: $4,200.00

Proposal prepared by (name & title): William Elder, Chair, Lafayette Creeks Committee

Signature (Typing your name does not count as a signature. If this section is empty, your proposal will not be considered):

Signed on 1-2-19
Lafayette Creek Educational/Interpretive Panels

1) Project Narrative

This is a proposal to design, fabricate and install two interpretive wayside panels in Lafayette community parks near downtown Lafayette. The popularity of these parks adjacent to Lafayette and Las Trampas creeks provides opportunities for public education about creeks, their riparian corridors, and stewardship of the watershed to enhance fish and wildlife values. This proposal to the CCC Fish and Wildlife Committee requests $4,200 to create and place these interpretive wayside panels at Brook Street and Leigh Creekside parks near the downtown area of Lafayette.

Proposed signage created by this grant will increase awareness of the creeks and their natural values in the downtown area of Lafayette in a way that will inform and promote projects identified in the Lafayette Downtown Creeks Preservation, Restoration and Development Plan (DCP). The DCP was approved and adopted by the City on October 23, 2017. The Lafayette Creeks Committee, a City-appointed advisory committee, worked with the City’s Public Works staff and community members to create the DCP. The Creeks Committee has successfully obtained East Bay Regional Park District Measure WW funding for a small project identified in the DCP and is seeking further funding to implement other projects identified in that plan. In addition to educating and encouraging citizens to take steps at home to lower their impact on the watershed and to improve fish and wildlife habitat along the creeks, these signs would further raise awareness of City projects that are planned to improve the creek habitats and their public enjoyment in the downtown area.

In 2012, the Lafayette Creeks Committee obtained funding from the Contra Costa County Fish and Wildlife Propagation Fund to install two interpretive panels on the pervious path along Lafayette Creek connecting downtown Lafayette to the Lafayette Reservoir. These panels, whose design matches EBMUD panels around Lafayette Reservoir, were successfully installed using those funds. The new proposed panels will be designed to have a consistent look and messaging as the existing signs. Signage will be printed on a high pressure laminate surface that is durable and designed to withstand weather and vandalism. The signs will match standards of other local agencies. The signs will be designed with input from the Lafayette Creeks Committee, City Parks, Trails & Recreation Commission, City staff, and other local stakeholders.

How it meets the requirements of Section 13103

Section 13103 (a): The proposed interpretative signage will be adjacent to Lafayette Creek at Brook Street Park and by Las Trampas Creek at Leigh Creekside Park. The panels will highlight ways to improve the quality of storm water runoff and the value of riparian corridors for wildlife migration and aquatic habitat. They will also point out everyone’s role in helping to protect watersheds and wildlife. When people better understand how creeks and watersheds function, they can better protect our natural resources and the fish and wildlife that use them.

2) Project schedule

   Summer 2019: Design interpretive panels
   Fall 2019: Fabricate and install interpretive panels; project completion
3) Project budget

<table>
<thead>
<tr>
<th>TASKS</th>
<th>FUNDING SOURCES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FWC Prop Fund¹</td>
</tr>
<tr>
<td>Design</td>
<td>$2,000</td>
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<tr>
<td>Production</td>
<td>$2,000</td>
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<tr>
<td>Installation</td>
<td>$200</td>
</tr>
<tr>
<td>Project Total</td>
<td>$4,200</td>
</tr>
</tbody>
</table>

Footnotes

¹ These estimates are based on an estimate from an exhibit fabricator and previous experience working with designers.

² The value of donated volunteer labor is calculated at CA minimum wage in 2019, $12.00/hour.

The Creeks Committee will work with local Boy Scout troops to solicit an Eagle Scout project to make site improvements and install the panels. Although we expect the Scouts to be able to provide the labor for the installation, the proposed budget does cover some minor expenses related to equipment and supplies needed to install the panels. The Lafayette Creeks Committee can provide additional funding from its annual budget for professional installation if an Eagle Scout project cannot be organized to meet our project timing.

4) Annual budget of the organization

The Lafayette Creeks Committee’s annual budget in the 2018-19 fiscal year is $2,500. The budget is determined and allocated annually by the City Council. The Creeks Committee is willing to commit up to $1,000 to augment design fees for this project as a match for the grant. In previous years the Creeks Committee’s budget has been used to assist with a variety of creek-related activities, including funding an annual Creek Day event in Lafayette, room rental for a Contra Costa Watershed Forum meeting, ongoing creek maintenance projects, sponsorship of the Quadrennial Creeks and Watershed Symposium, and development and publication of educational pamphlets, including local watershed maps.

5) Statement describing the applying organization

The City of Lafayette is in the Walnut Creek Watershed. The City has an elected City Council and a small staff, and depends on a variety of volunteer committees to advise it on issues. The Lafayette Creeks Committee advises the Council and City staff on creek-, water quality- and flood control-related issues. This committee currently has six members with a range of experience related to creeks, hydrology, applicable regulation, local government, and riparian resource management. The Creeks Committee has worked with the City’s Public Works Department to develop this proposal. Members of the Lafayette Creeks Committee are: Will Elder (chair), Jeff Gilman (vice-chair), Austin Payne, Philip Bradley, David Clark and Ron Huffit.

6) Statement describing the qualifications of the sponsoring organization and participating individuals

Will Elder - Will has been a volunteer member of the Lafayette Creeks committee for 19 years. As long-time chair of the Committee, he has helped spearhead the DCP, obtain grant funding for creekside restoration projects, and conducted community surveys and City-wide creek awareness campaigns utilizing outreach materials developed by the committee. Professionally, Will is a visual media specialist with the Golden Gate National Recreation Area and has over 20 years of experience developing interpretive signage for the National Park Service.
7) List of individuals responsible for performing the project and individuals responsible for overseeing the project:
Will Elder, Chair, Lafayette Creeks Committee, will perform the project.
Mike Moran, City of Lafayette Director of Engineering and Public Works, will oversee the project.

Statement of permits needed: No permits are needed for this project other than notifying USA North 811 before digging for panel installation.
Contra Costa County
2019 Fish and Wildlife Propagation Fund
Application Cover Page

Project title: City of Richmond Adopt-a-Spot Rehabilitation Project (Richmond/CA)

Organization/Individual applying: Greens at Work / Berkeley Partners for Parks

(Organization type: please check one – government, non-profit, for-profit, other (explain))

Address: P.O Box 12521
Berkeley, CA 94712
Telephone: (510) 849-1968
Fax: (510) 849-1968

E-mail: books@bpfp.org

Name and title of contact person: Ms. Charlie Bowen, BPFP Board of Directors

One sentence summary of proposal: Habitat restoration on City of Richmond property next to the Hoffman Marsh

Requested grant: $2,022.30

Proposal prepared by (name & title): Jane and Tom Kelly, Project Co-Directors

Signature (Typing your name does not count as a signature. If this section is empty, your proposal will not be considered):

[Signature]

Signed on 4 Jan 2019
Contra Costa County
2019 Fish and Wildlife Propagation Fund
PROJECT PROPOSAL

Project Title: City of Richmond Adopt-a-Spot Rehabilitation Project (Richmond/CA)
Co-Directors: Thomas and Jane Kelly
Project Group: Greens-at-Work/Berkeley Partners for Parks
Address: c/o Tom Kelly, 1809 San Ramon Avenue, Berkeley, CA 94707
Phone: (510) 528-3949 (h); (510) 684-6484 (cell)
e-mail: tkelly@kyotousa.org

1. Project Description:
A grant from the CCC Fish and Wildlife Propagation Fund will enable us to revegetate and to protect a City of Richmond lot at the intersection of Central Ave. and Rydin Road. Greens-at-Work is responsible for this site under the City’s Adopt-a-Spot program. Work will include fencing part of the site to deter trash from blowing into Hoffman Marsh, filling in and maintaining native plant vegetation, and conducting public outreach.

This site is the gateway to the Greens-at-Work Point Isabel/Hoffman Marsh restoration project previously funded by CCC Fish and Wildlife Propagation Fund. In 2014, we began clearing this piece of City of Richmond property by removing invasive weeds and clearing it of trash that blows onto it from the surrounding roads and freeway. The site is next to the Hoffman Marsh and a small channel on the site carries runoff from Central Ave. into the Marsh. By protecting the site with a low bamboo fence, we will reduce the trash that blows in while still allowing pedestrians and car passengers who pass by to view the California native plants on the site.

Since starting work on this highly visible site, volunteers from our group “Greens-at-Work” have connected with a significant number of people who stop to admire and question us about the work. We recruited one of our current Stewards, Nancy Leibowitz, at this site when she saw us weeding and stopped to inquire about our work. We will continue our outreach activities at this site with the objective of informing people about the habitat value of Hoffman Marsh, the beauty of California native plants and their importance to the creatures with whom we share this planet, and recruiting more volunteers.

Our volunteer group “Greens-at-Work” has been restoring and improving a stretch of the Bay Trail at Point Isabel/Hoffman Marsh in Richmond (Contra Costa Co.) since 2007. To date, we have restored approximately 1/3 of a mile (1,760 ft.) of trail (both upslope and marsh edge from 140 feet north of the Hoffman Channel south towards Central Avenue). We have detected an increase in the number of birds, native bees, snakes, gophers, butterflies and insects over the duration of the project and attribute it to the expansion of the plantings we have completed that provide shelter, berries, seeds, nectar, and healthy habitat. We believe that our consistent efforts at keeping the Hoffman Marsh clean of trash and invasive plants have helped achieve a healthier environment for the multitude of shore birds that use the marsh.

The East Bay Regional Park District (EBRPD), East Bay Chapter of the California Native Plant Society (CNPS), and the City of Richmond support the Adopt-a-Spot project as well as the Point Isabel/Hoffman Marsh project – see the monthly archived articles about these projects in the East Bay CNPS Newsletter “The Bay Leaf” at http://ebcnps.org/publications/archive-of-the-bay-leaf/

We hold official work parties on the 1st and on the 3rd Saturdays of every month and conduct approximately 10 additional ad hoc workdays throughout a calendar year with the project organizers and core team members as well as with other volunteers (e.g. church groups, students, schools, and community service participants).
The project qualifies under section 13103(e) (improvement of fish and wildlife habitat) of the California Fish and Game Code as it is intended to enhance, improve, and extend the quality of the habitat on which the plants, animals, birds, and insects of Hoffman Marsh rely.

2. **Project Schedule:**
We will complete invasive plant removal, install 2 ft. high bamboo fencing around part of the site to protect trash from blowing into the site and ending up in Hoffman marsh, and we will complete the revegetation with CA native plants providing food for birds, butterflies + other insects, and showcasing for passersby the beauty of our native flora. The fencing will be installed first and revegetation will be on going. The project will be complete by the end of March 2020.

3. **Project Budget:**

<table>
<thead>
<tr>
<th>Item</th>
<th>Grant</th>
<th>Donated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bamboo Fence Panels (25)</td>
<td>$1,250</td>
<td></td>
</tr>
<tr>
<td>Steel Stakes/Rebar</td>
<td>$90</td>
<td></td>
</tr>
<tr>
<td>Tools + Tie Wire</td>
<td>$150</td>
<td></td>
</tr>
<tr>
<td>Native Plants</td>
<td>$300</td>
<td></td>
</tr>
<tr>
<td>Soil</td>
<td>$50</td>
<td></td>
</tr>
<tr>
<td>Gloves</td>
<td>$50</td>
<td></td>
</tr>
<tr>
<td>Refreshments</td>
<td></td>
<td>$200</td>
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<tr>
<td><strong>Sub-Total</strong></td>
<td><strong>$1,890.00</strong></td>
<td><strong>$200</strong></td>
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<tr>
<td>BPFP Fee of 7%</td>
<td>$132.30</td>
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</tr>
<tr>
<td><strong>GRAND TOTAL</strong></td>
<td><strong>$2,022.30</strong></td>
<td></td>
</tr>
</tbody>
</table>

4. **Annual Budget (not itemized) for the Applying Organization Berkeley Partners for Parks (BPFP):**
$88,000.

5. **Description of the Applying Organization (Berkeley Partners for Parks), listing Board of Directors, Officers, and all Affiliated Organizations:**
Berkeley Partners for Parks (BPFP) - [http://www.bpfp.org/](http://www.bpfp.org/) - is a citywide nonprofit organization that encourages volunteerism and community development for parks, community gardens, natural habitat, and open space, and recreation in their area. They help citizens form new groups, help those groups find needed financial and volunteer resources, provide voices of experience and help with publicity, and serve as a 501(c)(3) nonprofit fiscal sponsor. For sponsored projects the services provided include bookkeeping, banking, tax filing, insurance, and the ability to receive tax-free donations and grants.

**Board Members:** John Steere, President; Charlie Bowen, Treasurer; Brad Stewart, Secretary; Susan Schwartz; Jack Appleyard; Jeni Webber; Charlie Altekruse; Miranda Ewell.

**Affiliated Organizations (Active):** Berkeley Path Wanderers, Greens-at-Work, Friends of Five Creeks, Schoolhouse Creek Common, Friends of the Berkeley Rose Garden, Take to the Hills, Friends of Halcyon Commons, Citizens for Cesar Chavez Off Leash Area, Aquatic Park EGRET, Friends of Ohlone Park.

6. **Qualifications of the Sponsoring Organization (Greens-at-Work) and Participating Individuals for Completing the Project:**
Greens-at-Work has been working on East Bay restoration projects since 1995 and conducting its own restoration/revegetation projects in the East Bay since the year 2000. Co-Directors Jane and Tom Kelly are responsible for completing work on the Richmond Adopt-a-Spot site leading to the Point Isabel/Hoffman Marsh Habitat Restoration project also under their direction. Jane was trained by the National Wildlife Federation in habitat restoration and is a docent at the EBRPD Botanic Garden in Tilden. Tom co-led a multi-year habitat
restoration project at Strawberry Creek Lodge on Strawberry Creek in Berkeley that was supported by small grants from the Alameda Countywide Clean Water Program. In 2014 and in 2017, we received grants from the Contra Costa County Fish and Wildlife Propagation Fund for the Point Isabel project.

7. **Individuals responsible for performing and overseeing project:**
   - Six (6) core team volunteers including native plant experts and birders
   - Five (5) dedicated project stewards
   - An average of 10 additional volunteers per work party
   - Jane Kelly (Project Co-Director)
   - Tom Kelly (Project Co-Director)

8. **Permits Required:**
None.

Site and Map with outline of proposed site

![Site and Map with outline of proposed site](image-url)
Contra Costa County
2019 Fish and Wildlife Propagation Fund
Application Cover Page

Project title: 2019 Delta Education Equipment

Organization/Individual applying: Marine Science Institute

(Organization type: please check one – government, non-profit, for-profit, other (explain)

Address: 500 Discovery Parkway
Redwood City, CA 94063
Telephone: (650) 364-2760
Fax: (650) 364-0416

E-mail: marilou@sfbaymsi.org

Name and title of contact person: Marilou Seiff, Executive Director

One sentence summary of proposal: Funding for equipment specific to Delta Discovery Voyages for Contra Costa Cosy 6th grade science education.

Requested grant: $7,733.55

Proposal prepared by (name & title): Melanie Kimbel, Advancement Director

Signature (Typing your name does not count as a signature. If this section is empty, your proposal will not be considered):

Signed on 1/3/2019
Marine Science Institute Proposal for Funding
Contra Costa County Fish and Wildlife Propagation Fund Grant

Date: January 4, 2019
To: Maureen Parkes; Contra Costa County Fish and Wildlife Committee (FWC)
From Primary Contact: Marilou Seiff, Executive Director, marilou@sfbaymsi.org, 650-364-2760
MSI Annual Budget: $2,009,000
Title of Program: 2019 Delta Education Equipment

Project Description:
Marine Science Institute (MSI) has provided Delta Discovery Voyages (DDV) for Contra Costa County schools every winter since 2003. The DDV program delivers STEM and environmental education to Contra Costa County 5th grade students with hands-on science curriculum that is aligned with Next Generation Science Standards (NGSS), aboard our 90-foot research vessel, the Robert G. Brownlee, on the Sacramento-San Joaquin River Delta.

We are asking the Contra Costa County FWC to fund the replacement of our Samson Ropes with a grant of $7,733.55 so the DDV program will carry on safely and without interruption.

The ropes we use for mooring at the Antioch Marina are a different from those we use to moor at our home dock in Redwood City. The rope is attached in a different configuration than at our home dock, and needs to be of different lengths to accommodate the floating dock of Antioch versus the fixed dock that we have in Redwood City. New ropes will help ensure the safety of the ship and passengers during docking and undocking. The lines we currently use for mooring at the Antioch Marina are wearing out after the strain of many years. We need replacement lines to secure the boat to the Antioch dock that can withstand the strong winds and currents of the Delta in the winter. Our 2019 DDV season goes from January 7 through February 27. We believe that the ropes we currently have will last through the next few months, but they will definitely require replacement by the end of February.

DDV Program Description:
MSI's Delta Discovery Voyage Program addresses both education and environmental needs of Contra Costa County (CCC). The scheduling of schools for the 2019 DDV program is done, and ship manifests have been received. We expect to educate 3,894 CCC 5th graders this year. Among the students we will educate this year, 1,985 (51%) will come from schools in Central CCC, and 1,909 (49%) will come from schools in East CCC. (While the DDV program does not serve schools in West CCC, our San Francisco Bay Discovery Voyage education program is available to them when our ship comes to the Richmond Marina for 3 weeks in October and November each year.) The breakdown of specific schools that will be served this year is available upon request.

An average of 46% of 5th grade students from the Contra Costa County schools served by the DDV program have historically scored below-proficient in science. Their teachers have reported that they are under-supported in acquiring the resources to provide the high-quality science education these students need. MSI fills this need. Delta Discovery Voyages teach science to Contra Costa County students that is SUPER exciting, unique and relevant to the special region in which they live. DDV's support Contra Costa County teachers by providing curriculum and activities that help them meet the new NGSS that began full implementation in the Fall of 2018 in California.

The students this program serves, along with their families, get their water from the Delta, yet they know so little about their direct effect on the Delta ecosystem. Most do not know what a watershed is and why it is important to protect it. By educating students at this impressionable age on these issues and what they can do, water quality and supply will improve.
Anticipated outcomes of this program include:
The goal for the 2019 Delta Education Equipment project is to replace the Samson Ropes that are essential to the safe implementation of the Delta Discovery Voyage Program during the months of January and February each year.

The 2019 Delta Education Equipment Project satisfies the eligibility requirements of Section 13103 (a) of the Fish & Game Code for requesting funding from the Fish and Wildlife Propagation Fund. It provides equipment for public education that is aligned with CA Common Core and NGSS for public schools, and to the scientific principles of fish and wildlife conservation by using supervised formal instruction carried out with a planned curriculum and aids to education.

MSI agrees to obtain advance written approval from the FWC of any communication/written material that may reasonably be understood to represent the views of the FWC and to provide the FWC with reasonable opportunity to review, comment and approve the communication/written material in advance. MSI also agrees to use the following statement, if funding is granted: “Delta Discovery Voyage equipment is funded in part by the Contra Costa County Fish and Wildlife Committee.”

Project Schedule:

<table>
<thead>
<tr>
<th>Completion Date</th>
<th>Task Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/8 through 2/27/2019</td>
<td>Show Delta Discovery Voyage to CCCFWC</td>
<td>Identify opportunities to discuss the Delta Discovery Voyage program with CCCFWC. Opportunities include MSI attending CCCFWC meetings and CCCFWC representatives attending Delta Discovery Voyage programs.</td>
</tr>
<tr>
<td>1/8 through 2/27/2019</td>
<td>(Teach programs)</td>
<td>(Students participate in Delta Discovery Voyages. Program Delivery costs are not included in this proposal. This is stated so CCCFWC sees MSI’s sequence of events.)</td>
</tr>
<tr>
<td>12/31/2019</td>
<td>Report on results</td>
<td>Evaluate the outcomes. Create and submit report for CCCFWC.</td>
</tr>
</tbody>
</table>

Project Budget:

**Delta Discovery Voyage**

<table>
<thead>
<tr>
<th>EQUIPMENT TO BE REPLACED</th>
<th>Quantity</th>
<th>Unit Cost</th>
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</thead>
<tbody>
<tr>
<td>Samson Rope</td>
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<td>$46.87/ft</td>
<td>$7,030.50</td>
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<tr>
<td>Commercial Amsteel Blue, 12 strand, 1-1/2 in diameter</td>
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<tr>
<td><strong>Subtotal</strong></td>
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<td><strong>$7,030.50</strong></td>
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<tr>
<td>Estimated Sales Tax and Shipping</td>
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<tr>
<td><strong>TOTAL EXPENDITURE</strong></td>
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<td><strong>$7,733.55</strong></td>
</tr>
</tbody>
</table>

Organization Description:
The Marine Science Institute (MSI) is a 501c3 organization founded in 1970. Our mission is to cultivate a responsibility for the natural environment and our human communities through interdisciplinary science education. We provide NGSS-aligned science curriculum and field trips for schools on the San Francisco Bay and CA Delta aboard our 90’ research vessel, the Robert G. Brownlee; at our Discovery Aquarium and shoreline in Redwood City; at locations on the Pacific coast; and within school classrooms using our Mobile Aquarium. All MSI school programs provide students with the opportunity to observe, touch, and discuss live marine animals from the SF Bay, Delta and/or coastal ecosystems while building fundamental knowledge in several scientific disciplines including biology, physics, microbiology, and chemistry.
MSI Board of Directors and Officers:
Andrea Aust, Board Chair; Senior Manager, Science Education, KQED
Victoria Whitehill, Board Vice Chair; Project Manager, Genentech
Julian Osinski, Board Secretary; Principal, Opticalogic Advisors
James Roberts, Board Treasurer; Financial Consultant, Perceptive Insights
Lisa Becker, Member at Large; Animal Care Manager, National Marine Life Center
Norman Chen, Member at Large; Co-Founder/Director DeltaHealth China, Ltd.
Clark Morey, Member at Large; Application Sales, Oracle
Randy Reyes, Member at Large; Clinical Contracts, Gilead Sciences
Reema Shah, Member at Large; Financial Professional

Other Funders:
Funders who provide funding for the Delta Discovery Voyage program include Contra Costa Water District, Delta Diablo, Central Contra Costa Sanitary District, Mt. View Sanitary District, Golden State Water Co, Dean and Margaret Lesher Foundation, Dow Corp and Andeavor Foundation.

Qualifications of Marine Science Institute:
Since 1970, MSI has reached over 1.3 million students through programs that build science knowledge, spark curiosity, and inspire stewardship for the local environment. The Delta Discovery Voyage program began in 2003. MSI completed the upgrade of our school curricula to achieve alignment and implementation with NGSS in 2015, three years before the State of CA is requiring full deployment in the 2018-19 school year. In addition, we have held workshops to support training for teachers in their transition to NGSS. All curriculum is presented with strong conservation messages and new habits students can apply to their everyday lives to encourage their personal environmental stewardship behaviors.

Key personnel responsible for the Delta Discovery Voyage program and qualifications:
Marilou Seiff, Executive Director: Marilou has been with the Marine Science Institute since November 1996, and became Executive Director in 2003. Before MSI, Marilou worked as an Aquatic Biologist at the Pacific Environmental Laboratory, a diver at the Marineland of the Pacific, and a biologist at the California Department of Fish & Game. Marilou holds a B.S. in Biology from Stanford University, and a M.S. in Biology from the University of the Pacific.

Karen Peluso-Galaviz, Ship Program Manager: Karen directs all aspects of the ship- and canoe-based programs including hiring, training and scheduling of all Science Instructors and Marine Educators. She started at MSI as Instructor with the Delta Discovery Voyage program in 2003 and became MSI Ship Program Manager in 2006. Prior to MSI, Karen held educator roles with Save the Bay, Don Edwards SF Bay NWR, and the Common Murre Restoration Project. Karen has a B.S. in Biology from Murray State University in KY.

Jackson Gentry, Senior Captain: Jackson captains the Robert G. Brownlee, performs vessel maintenance, trains and oversees the crew on program procedures and safety protocols. Jackson has obtained and maintains licenses or permits in US Coast Guard (USCG) Masters 100GT NC, CA Dept of Fish and Game (DFG) Scientific Collection, CA DFG Commercial Fishing, CA DFG Commercial Fishing Vessel Operator, USCG Marine Safety and Survival Drill Instructor, NorEastern Trawl Advanced Deck and Equipment Skills, and Southern CA Merchant Marine Training Master and Towing Instruction.
Project title: Kids Healthy Outdoors Challenge (KHOC)

Organization/Individual applying: Regional Parks Foundation

(Organization type: please check one – Non-Profit)

Address: 2950 Peralta Oaks Court
          Oakland, CA 94605
Telephone: (510) 544-2202

E-mail: JSchirmer@ebparks.org

Name and title of contact person: Juliana Schirmer, Development Dir or Tina Paez Grant Writer

One sentence summary of proposal: KHOC promotes outdoor education & play while also supporting the delivery of third-grade curriculum content in Alameda and Contra Costa County elementary schools.

Requested grant: $10,000.00

Proposal prepared by (name & title): Christina Paez, Consulting Grant Writer

Signature (Typing your name does not count as a signature. If this section is empty, your proposal will not be considered):

__________________________

Signed on 1/7/2019
1. **Project Description**

The 2013 East Bay Regional Park District (EBRPD) Master Plan highlights the importance of connecting youth to nature and building future environmental stewards. Unfortunately, over the past several decades, being outside has become secondary to television, video/computer games, and obligations such as demanding school work and extra-curricular activities. In addition, many low-income and minority children are often more cut-off from nature because of their built environment – the housing conditions, a high-volume of traffic, and/or lack of parks and green space all make it much harder for these young people to play outside (National Environmental Education Foundation, 2015).

At the same time the mounting evidence shows that when youth lose contact with the natural environment they are missing key opportunities for physical activity, stress reduction, attention restoration, and healthy development (Committee on Environmental Health, 2009). And as equally as important, this “Nature Deficit” also weakens ecological literacy and stewardship of the natural world (Louv, 2006). By not going outside to play in the natural world kids miss out on these great health improvement opportunities and can grow up without an understanding of basic ecological principles and what they can do to be good stewards of our environment.

To offset these trends, The Master Plan priorities include expanding efforts to attract young people to parks, and the Kids Health Outdoors Challenge (KHOC) directly supports this plan. The program started as a pilot project in 2012 to promote outdoor education and play while also supporting the delivery of third-grade curriculum content in Alameda and Contra Costa County elementary schools. The program is meant to be a tool to help teach required curriculum content standards (now including common core) for third graders outside in nature, while also helping teachers become more confident delivering lessons outdoors. Not only does the program ensure that future generations of kids have access to the outdoors for play, but nature is the ultimate hands-on learning environment, and through KHOC, teachers have the chance to help bridge the science achievement gaps that persist in underserved communities.

KHOC closely aligns with the California Children’s Outdoor Bill of Rights, which states that every child in California by the completion of their 14th year, should have the opportunity to experience a number of common outdoors activities such as discovering California’s past and heritage, exploring nature, and learning to follow a trail. These themes are the basis for KHOC which includes 10 lessons that are a combination of classroom and field work, as well as activities for the kids to complete outside of formal instruction with their families. The activities are designed to be fun and easy to complete. Once the classroom is done, teachers can take their students to a Regional Park where they use the park as an outdoor learning environment. The cost of bus transportation for the field trip, which is KHOC’s single largest expense, is underwritten by the generous support of organizations such as the Contra Costa County Fish and Wildlife Commission.

Program goals include:

**For Students**
- Promote health, well-being, & life-long parks use
- Introduce students to the EBRPD Parks
- Increase students' interest in nature
- Create lifelong environmental stew

**For Teachers**
- Increase comfort and skills teaching outdoors
- Help teachers deliver 3rd grade science content
- Use EBRPD resources to support learning
- Promote health, well-being, & life-long parks use

One of the goals of KHOC is to introduce kids to the East Bay Regional Park District parks that are right in their backyard. For many kids, they have never visited these local parks nor do their families know about the Park system.
The field trip, which is typically done in the spring, is very popular with teachers and kids alike. Teacher evaluations reveal that kids love the parks so much that they often return to the parks with their families over the weekend.

Some parks are closer and more accessible than others, and the most popular are typically the parks where a naturalist guide is available to help with the field trip. In the 2017-18 school year these parks were visited: Coyote Hills (16), Tilden Nature Area (11), Crab Cove (9), Black Diamond Mines (8), Big Break (6), Redwood (6), Shadow Cliffs (4), Del Valle (3), Martinez Shoreline (3), Ardenwood (2), Temescal (2), Garin (1).

In the 2017-2018 school year, the cost of providing transportation remained very low at approximately $12.00 per bus passenger and on average the buses carried 60 people. This year we are requesting $10,000 to help cover the cost of transportation, as well as a small amount to help pay for the cost of printing the teacher and student booklets and part of the teacher trainings.

These funds will only be used for the schools in Contra Costa County. Based on the numbers listed above, an award of $10,000 will cover 750 kids in Contra Costa County.

KHOC aligns with “a” under the requirements of Section 13103 of the Fish & Game Code – Public education relating to the scientific principles of fish and wildlife conservation, consisting of supervised formal instruction carried out pursuant to a planned curriculum and aids to education such as literature, audio and video recordings, training models, and nature study facilities.

2. Annual Budget for the apply organization (not itemized) - $3,320,480
3. Statement Describing the applying organization, listing the BOD and officers of the organization and listing of affiliated organizations

The purpose of the Regional Parks Foundation (RPF) is to provide broader public access to the East Bay Regional Park District's 73 Regional Parks, 1,250 miles of trails, and 40 miles of shoreline that make up the 121,030 acres throughout Alameda and Contra Costa Counties. The Foundation's goal is to ensure that all East Bay residents have equal opportunity to enjoy the treasured parklands, because connections with nature are essential for overall well-being.

Regional Parks Foundation – Board of Directors

<table>
<thead>
<tr>
<th>Executive Team</th>
<th>Members at Large</th>
</tr>
</thead>
<tbody>
<tr>
<td>President</td>
<td>Lisa Baldinger</td>
</tr>
<tr>
<td>Chip Conradi</td>
<td>East Bay Regional Park District</td>
</tr>
<tr>
<td>Retired, Clorox Company</td>
<td>Audree Jones-Taylor</td>
</tr>
<tr>
<td>Vice President</td>
<td>Jess Brown</td>
</tr>
<tr>
<td>John Dilsaver</td>
<td>Pacific Gas and Electric</td>
</tr>
<tr>
<td>Real Estate Broker</td>
<td>Jenny Mack</td>
</tr>
<tr>
<td>Patricia Deutsche</td>
<td>Marathon Petroleum Company</td>
</tr>
<tr>
<td>John Martin</td>
<td>John Martin</td>
</tr>
<tr>
<td>Drake's Brewing Company</td>
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<tr>
<td>Nathan Falk</td>
<td>Thomas Meier</td>
</tr>
<tr>
<td>Terasu, LLC</td>
<td>Kaiser Foundation Health Plan</td>
</tr>
<tr>
<td>Les Hausrath</td>
<td>Jack Uhalde</td>
</tr>
<tr>
<td>Wendel, Rosen, Black &amp; Dean, LLP</td>
<td>NBC Bay Area</td>
</tr>
<tr>
<td>Walt Gill</td>
<td>Keith White</td>
</tr>
<tr>
<td>Chevron</td>
<td>Gap, Inc</td>
</tr>
<tr>
<td>Robert Jacques</td>
<td>Geoffrey Zimmerman</td>
</tr>
<tr>
<td>Destination Wealth Management</td>
<td>Wealth Planner</td>
</tr>
</tbody>
</table>

4. Statement describing the qualifications of the sponsoring organization and participating individuals for completing the project

For 83 years the East Bay Regional Park District (EBRPD) has been connecting parks to people by preserving open space and cultural resources, and offering enjoyable and healthful recreational activities. The District encompasses 73 regional parks, 1,250 miles of trails, and 40 miles of shoreline that make up the 121,030 acres of parkland throughout Alameda
and Contra Costa Counties. It is the largest urban regional network of park lands in the entire nation, and annually receives approximately 25 million visits per year.

5. **List of individuals responsible for performing project & individuals responsible for overseeing project**
Ira Bletz is the EBRPD’s Regional Interpretive and Recreation Services Manager. Ira has worked at the Park District for over 30 years, including more than 25 years as the supervisor of Ardenwood Historic Farm in Fremont, and is currently in charge of overseeing the KHOC program. In addition, Ira works with a contracted program coordinator to coordinate KHOC activities and conduct the year-end evaluation.

6. **Statement describing the status of permit approvals necessary to perform project (if applicable)**
**Are permits necessary or needed?**
Not Applicable – No permits necessary

7. **Project Schedule**
KHOC follows the school calendar running from September to June each year. Important dates include:
- October 5 – Applications due to Park District (teachers must apply each year to be part of the program)
- October 18 – Selected classrooms announced
- October/November 2018 (4 dates) – Teacher orientation – All teachers attend the orientation even if they have participated in the past
- November 2018 - Official start date
- December 3 – Due date for naturalist guided field trip requests (optional)
- March 1, 2019 – Transportation request forms due – part of the program includes a field trip to one of the East Bay Regional Parks.
- May 10, 2019 – Last day to complete curriculum and field trips
- Late May 2019 – End of year teacher survey

8. **Project Budget**

<table>
<thead>
<tr>
<th>Kids Healthy Outdoors Challenge</th>
<th>Item &amp; Description</th>
<th>Cost</th>
<th>Propagation Fund Request</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bus Transportation</strong></td>
<td>Fieldtrips to Regional Parks for low-income schools (Average $12.00 per child)</td>
<td>$55,000</td>
<td>$9,000</td>
</tr>
<tr>
<td><strong>Personnel</strong></td>
<td></td>
<td>$16,000</td>
<td></td>
</tr>
<tr>
<td><strong>Contract</strong></td>
<td>Program Coordinator for teacher outreach, assessments, and evaluation</td>
<td>$10,500</td>
<td></td>
</tr>
<tr>
<td><strong>KHOC Teacher’s Guide</strong></td>
<td>Print</td>
<td>$1,600</td>
<td>$250</td>
</tr>
<tr>
<td><strong>KHOC Student Booklets</strong></td>
<td>Print</td>
<td>$5,000</td>
<td>$500</td>
</tr>
<tr>
<td><strong>Teacher Orientation</strong></td>
<td>Supplies &amp; Lunches</td>
<td>$1,600</td>
<td>$250</td>
</tr>
<tr>
<td><strong>Park Specific Activity Kits</strong></td>
<td>Redwood, Garin, Martinez Shoreline &amp; Shadow Cliffs</td>
<td>$400</td>
<td></td>
</tr>
<tr>
<td><strong>School Outreach</strong></td>
<td></td>
<td>$500</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>$90,600</td>
<td>$10,000</td>
</tr>
</tbody>
</table>

*If awarded a grant, funds will exclusively support schools located in Contra Costa County*
Project title: Water Quality Monitoring in Contra Costa County

Organization/Individual applying: The Watershed Project

(Organization type: please check one – government, non-profit, for-profit, other (explain))

Address: 1327 S. 46th St. Building 155, Richmond, CA 94704

Telephone: (510) 665-3538

E-mail: helen@thewatershedproject.org

Name and title of contact person: Helen Fitaniides, Program Manager

One sentence summary of proposal: Monitoring creek water quality in Contra Costa County

Requested grant: $21,580.00

Proposal prepared by (name & title): Helen Fitaniides, Project Manager

Signature (Typing your name does not count as a signature. If this section is empty, your proposal will not be considered):

______________________________  Signed on 1/7/19
Helen Fitaniides
1. Cover sheet

2. Description of the project for which funding is requested

In August 2017, with generous funding from the Contra Costa County Fish and Wildlife Committee, The Watershed Project began a county-wide creek monitoring program in partnership with 5 local watershed groups. By using protocols and quality assurance measures from the California Waterboards’ Surface Water Ambient Monitoring Program, we make sure our data will be useful to multiple agencies as well as the volunteer groups involved. In the second year of the program, we added first flush and BMI monitoring; we also published our data through Water Reporter, an online platform (https://api.waterreporter.org/v2/map/459de41c), as well as through our partner groups’ websites, newsletters, and outreach events, with the goal of educating the community about water quality issues and how we can work together to reduce them. In the third year of this program, we will continue all aspects of the monitoring program while expanding our network, making our data available through the California Environmental Data Exchange Network (CEDEN), and deploying monitoring loggers at certain sites. We are requesting $21,580 to support this water quality monitoring program for the 2019-2020 year.

Funds for our water quality monitoring program will go toward purchasing monitoring supplies, repairing and replacing parts for monitoring equipment, sending a subset of our samples to scientific labs for processing, sending one staff member to take a course on Water Quality Monitoring Design at UC Berkeley, and paying for our data to be published on the Water Reporter app. Monitoring will be conducted once per month at one or more locations per watershed, including the San Pablo Creek Watershed (behind the El Sobrante Library, El Sobrante; Hillside Dr. and Castro Ranch Rd., El Sobrante; behind De Anza High School, Richmond; behind the El Sobrante Boys and Girls Club, El Sobrante; Orchard Rd. and Glorietta Blvd., Orinda; Brookside Rd. and Moraga Rd., Orinda; Brookwood Rd. and Moraga Rd., Orinda; Lombardy Ln. and Sleepy Hollow Ln., Orinda; and Manzanita Rd. Bridge, Orinda), the Wildcat Creek Watershed (next to Verde Elementary, Richmond; in Davis Park, San Pablo; at Vale Road, San Pablo; and at Alvarado Regional Park, Richmond), the Rheem Creek Watershed (at Wanlass Park, San Pablo), the Walnut Creek Watershed (Civic Park, Walnut Creek; and below the 680/242 drop structure, Concord), the Grayson Creek Watershed (behind Pleasant Hill Middle School, Pleasant Hill; at Golf Course Dr., Pleasant Hill; and at Chilpancingo Pkwy., Pleasant Hill), the Alhambra Creek Watershed (at F St., Martinez) and the Marsh Creek Watershed (3240 Aspara Dr., Clayton; 2103 Marsh Creek Rd, Clayton; 14350 Marsh Creek Rd., Clayton; 16000 Marsh Creek Rd., Clayton). All sites have been selected by partnering nonprofit groups working in those watersheds to address local water quality concerns. Our program will result in more highly-trained citizen scientists living in these communities, who can continue to educate their neighbors and work towards improved water quality and habitat for native fish in the years to come.

We will measure at least four different parameters monthly to investigate the health of these creeks, including water temperature, conductivity, dissolved oxygen, and pH, with additional parameters such as nutrients or turbidity that come directly from watershed planning documents such as the San Pablo Creek Watershed Plan. Volunteers from watershed groups will also collect water samples during the first rain of the 2019-2020 water year (called the “first flush”) and we will test the samples for specific pollutants such as heavy metals and pesticides that tend to build up during the dry season. Some parameters such as copper will be tested in-house, while other parameters such as pesticides will be tested at a professional lab. In addition, we will continue surveys begun last spring for benthic macroinvertebrates, aquatic larvae and nymphs of insects and other invertebrates living in the creek that give a longer perspective on water quality. For example, finding a significant number of stonefly nymphs at a site will indicate that water quality must have been good for a prolonged period of time, as stoneflies have a very low tolerance to pollution.

Any interested community members will be invited to participate on all monitoring days and learn about water quality in watersheds. We will analyze and summarize the results and create a scorecard for each watershed. We will then share the information with the community through our website as well as outreach events and newsletters, including behavioral changes people can make to improve their creeks’ water quality. By using standardized methods, we can compare data across watersheds and learn important information about regional and local trends, with the goal of improving creek quality for native fish.

As we move forward with this program, we are continually looking for funding from other sources. This year, we were able to get a task order the through Contra Costa County Watershed Program to fund the intern positions, which were formerly paid for via stipend, thanks to the Committee. We also have funding through the California Environmental Protection Agency’s Environmental Justice Small Grants Program to build an interactive database to house our data for the long-term, as well as all other data collected in the region. We are so appreciative of the Committee’s foundational
support in getting our program off the ground, and hope for your continued support in funding some of our critical equipment and laboratory fees.

**Benefit to fish and wildlife of Contra Costa County**

The goal of our creek monitoring program is to train and engage citizen scientists on improving water quality in Contra Costa County in order to provide suitable habitat for fish populations. Citizen scientists will learn how to monitor the health of our creeks and play a role in educating other residents on how to ensure a healthier habitat for fish. By funding this program for an additional year, the Fish and Wildlife Committee can ensure we build on the data set and that fish and wildlife reap the benefits of a healthier habitat in years to come.

**Requirements of Fish and Game Code**

The project promotes public education relating to fish and wildlife conservation as indicated in Section 13103(a) of the Fish and Game Code, as well as and improves fish and wildlife habitat as indicated in Section 13103(e).

### 3. and 4. Project Schedule and Budget

#### Project Schedule

<table>
<thead>
<tr>
<th>Task</th>
<th>Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchase supplies listed below</td>
<td>as needed</td>
</tr>
<tr>
<td>Test water quality at creek sites</td>
<td>once a month</td>
</tr>
<tr>
<td>Enter monitoring data</td>
<td>once a month</td>
</tr>
<tr>
<td>Coordinate first flush monitoring</td>
<td>Fall 2019</td>
</tr>
<tr>
<td>Analyze and summarize data for watershed scorecards</td>
<td>by July 2020</td>
</tr>
<tr>
<td>Outreach to groups and community members regarding results</td>
<td>by July 2020</td>
</tr>
<tr>
<td>Enter data into CA Environmental Data Exchange Network</td>
<td>by July 2020</td>
</tr>
</tbody>
</table>

#### Project Budget

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monthly Monitoring (temperature, conductivity, oxygen, pH)</td>
<td></td>
</tr>
<tr>
<td>Standards and replacement parts for all meters in use</td>
<td>$6,000</td>
</tr>
<tr>
<td>Longer cables for meters to increase usability</td>
<td>$6,800</td>
</tr>
<tr>
<td>Water Reporter app to publish data</td>
<td>$480</td>
</tr>
<tr>
<td>First Flush Monitoring (heavy metals, nutrients, etc.)</td>
<td></td>
</tr>
<tr>
<td>Test kits</td>
<td>$200</td>
</tr>
<tr>
<td>Price of testing samples at Enthalpy Analytical</td>
<td>$5,000</td>
</tr>
<tr>
<td>Benthic MactoInvertebrates</td>
<td></td>
</tr>
<tr>
<td>Price to ID 5 bug samples at BioAssessment Services</td>
<td>$2,500</td>
</tr>
<tr>
<td>Water Quality Monitoring Design Course at UC Berkeley</td>
<td></td>
</tr>
<tr>
<td>Cost for 1 TWP staff to take course in Fall 2019</td>
<td>$600</td>
</tr>
<tr>
<td><strong>Total Cost</strong></td>
<td><strong>$21,580</strong></td>
</tr>
</tbody>
</table>

### 5. Annual budget for applying organization

The Watershed Project’s organizational budget for fiscal year 2017-2018 was $748,177. We anticipate a budget of $718,079 for fiscal year 2018-2019.

### 6. Statement describing organization, Board of Directors, and affiliated organizations

The Watershed Project began in 1987 as the education department of the San Francisco Estuary Institute, before becoming its own 501(c)(3) nonprofit in 1997. Based in Richmond, our mission is to inspire San Francisco Bay communities to understand, appreciate and protect our local watersheds. The Watershed Project’s goals include
increasing awareness and stewardship of natural resources, increasing capacity for grassroots groups, and building greater biodiversity and healthier habitats in the San Francisco Bay Area. We strive to inspire residents to get involved in ensuring cleaner water in the future, and to thereby improve water quality for fish and wildlife.

The Watershed Project’s Board of Directors includes Jane Gire, chair, an environmentalist with years of experience with grassroots outreach and fundraising; Eric Hyman, purchasing manager for Waterbar, a popular San Francisco seafood house with a meticulous commitment to sustainability; Annelise Moore, who has extensive logistical and fundraising experience and works with Nicholas Christ Construction, Inc., a green building company in Albany; Sigrid Mueller, an independent environmental education consultant; Patty Liao, Regional Operations Manager for Recurrent Energy; Nancy Hamill, Senior Counsel of the University of California Office of the President; and Dan Abbott, Central California Regional Manager at Reef Check and Richmond resident.

Our partners for this grant proposal include the Alhambra Watershed Council, Contra Costa Resource Conservation District, Friends of Orinda Creeks, Friends of Pleasant Hill Creeks, Friends of the Creeks, Pleasant Hill Instructional Garden, San Pablo Watershed Neighbors Education and Restoration Society, and Save Mount Diablo. We also actively participate in the Wildcat-San Pablo Watershed Council and the Contra Costa Watershed Forum.

7. Statement describing qualifications of sponsoring organization and participating individuals

The Watershed Project has won many awards for our work over the last 20 years, including the 2015 Contra Costa Watershed Forum Project of the Year for our Wildcat Daylighting Project, and the 2010 California State Parks Foundation’s State Parks Grassroots Champion Award. Since its inception, The Watershed Project has provided watershed education training for over 500 K-12 teachers (lessons that have reached over 100,000 students); engaged over 30,000 community members in creek and wetlands restoration efforts; and fostered the work of over 40 grassroots community creek groups, which have taken ownership of and responsibility for restoring local watersheds. Our actions have helped to educate thousands of community members about water quality issues and how to make critical behavior changes in order to create a healthier watershed, which will help improve water quality and enhance habitat for native fish and wildlife.

Helen Fitanides was hired to manage creek and oyster monitoring programs at The Watershed Project in 2015. Helen holds a B.S. in Biological Sciences from California Polytechnic State University, San Luis Obispo, and worked in scientific research before moving to the Bay Area in 2013. She is passionate about cultivating citizen scientists, and believes that it is the best way to make ecosystem monitoring and assessment more affordable, with the added benefit of educating communities about important watershed processes. Helen maintains relationships with 15 Bay Area groups and heads the Contra Costa Watershed Forum’s Creek Monitoring Subcommittee, where she facilitates the exchange of technical expertise and monitoring equipment and promotes data quality control measures. Helen has experience in grant administration, program development and evaluation, community outreach, environmental education, and volunteer coordination, in addition to aquatic biology.

8. Responsible individuals

Helen Fitanides will provide coordination and oversight of the entire project’s completion.

9. Permits

Helen Fitanides holds a Scientific Collection Permit (SC-13053) from California Department of Fish and Wildlife to conduct Benthic Macroinvertebrate monitoring.
Exception for Nonprofits That Can Demonstrate Financial Hardship

The Watershed Project is a relatively small organization, with only one staff member working on the monitoring programs, and a total staff of seven. We organize thousands of community volunteers every year, but do so on a shoestring, and must front the money for many of our larger Greening Urban Watersheds projects, which doesn’t leave much wiggle room for spending out of pocket and waiting up to a year for reimbursement. We are requesting that one half of the grant amount ($21,580/2=$10,790) be awarded up front if our grant proposal is accepted. We ask the Fish and Wildlife Committee to please consider our request, and thank you for your support of our programs.
Contra Costa County
2019 Fish and Wildlife Propagation Fund
Application Cover Page

Project title: MVSD Pollinator Garden

Organization/Individual applying: Mt. View Sanitary District

(Organization type: please check one – government, non-profit, for-profit, other (explain))

Address: PO Box 2757, 3800 Arthur Road
Martinez, CA 94553
Telephone: 925.228.5435 X19
Fax: 925.228.7585

E-mail: k davidson@mv sd.org

Name and title of contact person: Kelly Davidson

One sentence summary of proposal: Reduce ground squirrel population by removing turf/bare ground and installing pollinator garden.

Requested grant: $17,180.00

Proposal prepared by (name & title): Kelly Davidson - District Biologist

Signature (Typing your name does not count as a signature. If this section is empty, your proposal will not be considered):

Signed on 1/7/2019
“MVSD Pollinator Garden – Phase A”
Submitted by: Mt. View Sanitary District (MVSD) --- January 2019

1. Project Description

Problem No. 1: The summer of 2017 and 2018 saw a marked increase of the California ground squirrel (Otospermophilus beecheyi) population living near the Mt. View Sanitary District (MVSD) Administration Building. Although a formal survey has not taken place, staff estimates that the California ground squirrel (CAGS) numbers have doubled since summer 2016. This increase was likely due to the rains during winter 2016-2017, which created abundant local food resources, as well as the Moorhen Marsh Western Pond Turtle Habitat Enhancement Project, which broke ground May 2017 and pushed out an existing population of CAGS that may have taken up residence near the Administration Building. The increased number of squirrels has damaged the surrounding turf and irrigation system, and MVSD Management has determined that the population must be reduced.

Problem No. 2: Bees and other native pollinators are beset by many challenges, including: habitat loss, fragmentation and degradation; non-native species competition and disease introduction; pollution, especially pesticides; and climate change. The Xerces Society recently reported that the 2018 California overwintering population of monarch butterflies has been reduced to less than 0.5% of its historical size, and has declined by 86% compared to 2017 (https://xerces.org/2018/11/29/critically-low-monarch-population-in-california/). Much pollinator habitat has been lost to agriculture, resource extraction, and urban and suburban development. Although these land uses can provide floral resources and benefit some pollinators, many bees and butterflies are habitat-specific, and the loss of habitat that provides sites for overwintering, foraging for pollen and nectar, or nesting can be detrimental to these species (Tylianakis 2013, Gallai et al. 2009). Habitat degradation (decline in habitat quality) is also of concern. The loose, friable soil required by ground-nesting bees may be trampled by heavy foot traffic or the use of off-road vehicles. In cities, ground-nesting species may be particularly limited because of the large amount of landscape that has been covered with concrete or other impervious surface (Tylianakis 2013, Gallai et al. 2009).

Solution – The MVSD Pollinator Garden: By replacing the turf and un-landscaped areas around the Administration Building with native and Mediterranean plants, MVSD hopes to deter CAGS from the area via habitat modification, keep rodenticides out of the environment, provide quality habitat for native pollinators and honey bees, and create an educational experience for visitors. The MVSD Pollinator Garden will allow for the removal of existing turf, the conversion/replacement of a spray irrigation system to drip irrigation, and the design, construction, and installation, of a garden adjacent to MVSD’s Administration and Learning Center at 3800 Arthur Road, Martinez, CA. The proposed garden is approximately 4,000 square feet and will be installed in 2 Phases (A and B). MVSD is requesting $17,180 in funding for the needed plants, irrigation system, interpretive panels and bases, and follow up bee species ID by Dr. Gordon Frankie and Jaime Pawelek at UC Berkeley’s Bee Lab. The garden will incorporate the following design elements:

- Focus on CA Native Plants (approximately 85% natives and 15% Mediterranean non-natives)
- Provide year-round nectar and pollen sources
- Provide a water source and wind breaks
- Eliminate the use of pesticides
- Provide a walking path (using paving stones) to maintain nesting sites for ground-nesting native bees
- Provide 4 interpretive panels and a garden brochure to educate visitors and school students on the importance of pollinators and pollinator habitat conservation

Below is a list of organizations that have committed time and expertise to this project:

- MVSD – Project lead and organization, site preparation, irrigation installation, educational components
- UC Berkeley Bee Lab – Plant list, garden design, garden installation, follow up research and bee ID
- UC Davis Hummingbird Health and Conservation Program – Plant list and educational components
- The Wildlife Project – Conceptual garden design, CAGS expertise, garden installation
- Diablo Valley College (DVC) Landscape Design Program – Garden design lead
- Friends of Alhambra Creek – Garden installation and maintenance
Benefits to Fish and Wildlife
Although an unsuccessful attempt was made to use rodenticides to reduce the CAGS population in summer of 2018, MVSD is committed to keeping rodenticides out of the environment and seeks to find humane and environmental friendly methods for reducing the CAGS population near its facilities. According to the Lindsay Wildlife Experience Website: “California ground squirrels are a keystone species due to the fact that so many other species depend on ground squirrels. They are an important food source for golden eagles and hawks. Squirrel burrows also provide shelter for tiger salamanders, snakes, invertebrates, and burrowing owls.” Bees, butterflies, hummingbirds and other native pollinators play a pivotal role across many California’s ecosystems. Bees are among our most important pollinators, with bee populations providing pollination to nearly one-third of our food supply and allowing wild plants to produce the foods that form the base of the natural food web (Tylianakis 2013, Gallai et al. 2009). Yet, pollinators worldwide are in decline – with habitat loss, disease, and pesticides largely to blame (Tylianakis 2013, Gallai et al. 2009). The MVSD Pollinator Garden project can help address both of these issues by humanely dissuading ground squirrels from the site through habitat modification, keeping rodenticides and other pesticides out of the environment, and creating quality habitat for native pollinators and European honey bees.

Section 13703 Eligibility
This project is eligible for the Fish and Wildlife Propagation Fund under items 13103 (a) and (e).

2. Project Schedule
The following is the anticipated project schedule:

<table>
<thead>
<tr>
<th>Year</th>
<th>Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>January - May</td>
<td>DVC students finalize garden design</td>
</tr>
<tr>
<td>May - Sept 2019</td>
<td>Remove turf and install/convert irrigation</td>
</tr>
<tr>
<td>May - Sept 2019</td>
<td>Draft of garden brochure and interpretive panels completed</td>
</tr>
<tr>
<td>October – November 2019</td>
<td>Finalize brochure and interpretive panels artwork</td>
</tr>
<tr>
<td>----------------------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>December 2019</td>
<td>Artwork to Fossil Industries for fabrication of panels</td>
</tr>
<tr>
<td>December 2019 – February 2020</td>
<td>Plants and walkway installed</td>
</tr>
<tr>
<td>March – April 2020</td>
<td>Interpretive panels installed; garden brochure printed</td>
</tr>
<tr>
<td>May 2020</td>
<td>Garden opens for visitors</td>
</tr>
<tr>
<td>July – August 2020</td>
<td>Garden curriculum incorporated into Wetlands Field Trip Program</td>
</tr>
</tbody>
</table>

3. Project Budget

REQUESTED FUNDING: $17,180.00

| Match from MVSD for turf removal and irrigation system installation: | $11,900.00 |
| Match from MVSD for panel and brochure design and printing:         | $7,500.00  |
| Match from various organizations for garden installation            | $3,750.00  |
| Match from Diablo Valley College (DVC) Landscape Design Program    | unknown    |
| Match Total:                                                       | $23,150.00 plus DVC design |

Budget Detail - the following describes project components:

450, 1-gallon plants: $5,400.00

100, 5-gallon plants: $2,750.00

Irrigation system supplies: $950.00

Interpretive panel fabrication and base purchase and shipping: $3,280.00

UC Berkeley Bee Lab follow up study: $4,800.00

Total Materials and Supplies: $17,180.00

PROJECT TOTAL: $40,330.00 plus DVC design

4. Annual Budget for Applying Organization

MVSD’s operations and maintenance budget for FY 2018/2019 is: $5,690,550.00

5. Description of Applying Organization, Board of Directors, and Affiliate Organization

MVSD is a Special District that collects and treats an average of 1.3 million gallons of wastewater per day for about 18,000 residents and small businesses in Martinez and unincorporated Martinez. The Governing Board of Directors for MVSD is: Stanley Caldwell – President; Gregory Pyka – Vice President; David Maggi – Director; Brian Danley – Director; Elmer “Al” Schaal – Director.

6. Statement of Qualifications

MVSD has won a number of scientific research, habitat enhancement, and public environmental education grants from agencies such as the CA Department of Fish and Wildlife, CA Department of Fish and Wildlife – OSPR, the Contra Costa County Fish and Wildlife Committee, and the Community Watershed Stewardship Grant Program. MVSD staff is experienced in implementing these projects via effective leadership and cooperative partnerships.

7. Responsible Individuals

Kelly Davidson has been MVSD’s District Biologist since November 2010. She holds an MS in Education from Cal State East Bay and a Master of Natural Resources degree from Oregon State University.

8. Permits

No permits are required for this project.

Literature Cited


Contra Costa County
2019 Fish and Wildlife Propagation Fund
Application Cover Page

Project title: Grassland Monitoring Workshop: Methods and Techniques for Vegetation and Wildlife Monitoring

Organization/Individual applying: California Native Grasslands Association (CNGA)

(Organization type: please check one – government, non-profit, for-profit, other (explain)

Address: PO Box 72405 Davis, CA 95617

Telephone: (530) 902-6009

E-mail: admin@cnga.org

Name and title of contact person: Diana Jeffery, Administrative Director

One sentence summary of proposal: Request funding to assist with putting on a workshop on vegetation and wildlife monitoring grasslands.

Requested grant: $3,014.00

Proposal prepared by (name & title): Emily Allen, CNGA Workshop Committee Chair

Signature (Typing your name does not count as a signature. If this section is empty, your proposal will not be considered):

Signed on 01/07/2019
2. **Description of Project:**
   
a. **Overview of Workshop:**
   The California Native Grasslands Association (CNGA) is asking for funding assistance to put on a two-day workshop titled *Grassland Monitoring Workshop: Methods and Techniques for Vegetation and Wildlife Monitoring* in Contra Costa County. This workshop will provide the 30 attendees with a framework to effectively design a monitoring plan for vegetation and/or wildlife, understand current protocols and field methods, get an introduction to several methods of data analysis, and provide guidelines for how to use the results to inform future management decisions. One of the workshop days will be dedicated to vegetation monitoring and will cover seedbank sampling, repeat photography, point-intercept sampling, and quadrat sampling. The wildlife monitoring techniques will be presented for the following general taxonomic groups: birds, mammals, reptiles/amphibians, and invertebrates/pollinators. The morning of each day will include classroom presentations and the second half of each day the participants will apply their newly acquired skills and techniques in the field. We will be recruiting instructors for both days who have at least five years of experience with monitoring in grasslands and who are able to provide in-depth presentations on their topic. The Contra Costa Resource Conservation District and Contra Costa Farm bureaus have offered to co-sponsor this workshop by providing a venue at no cost and assisting with advertising.

   b. **How this project will benefit the fish and wildlife of Contra Costa County:**
   California grasslands are among the most endangered ecosystems in the United States. Grasslands in California support about forty percent of California’s total native plant species and around 90% of California’s rare and endangered plant species reside in grasslands. Many wildlife species including elk, deer, ground squirrels, mice, rabbits, rodents, wolves, bobcats, and many birds rely on grassland habitats as well. Many birds, reptiles, amphibians, and pollinators also live within California grasslands. Quality monitoring of the grasslands in California is critical to ensuring these systems continue to function and thrive. Proper monitoring of wildlife and vegetation can provide information about the current status of the grassland ecosystems, highlight changes in sites over time, provide information about the impact of current management having, and provide information to guide management planning for better long-term results. Designing an effective monitoring plan, implementing it, analyzing the data collected, and using those data during decision making processes are all necessary pieces of having a functioning monitoring program. Too often one of these pieces is missing, or done ineffectively, and that can have big impacts with how a project is managed moving forward. CNGA’s goal for this monitoring workshop is to provide the necessary information for participants to be able to have the framework to create, implement, analyze and use the information gathered for future managing of native grassland sites. Historically, two thirds of Alameda and Contra costa Counties were occupied by open grasslands and rolling oak savannas. Contra Costa County still has intact native grasslands including Point Molate, Point Pinole, Vasco Caves, and Tassajara Parks. By providing attendees the background and framework to properly monitor grasslands CNGA believes habitat that is vital to many wildlife species within Contra Costa County can be better monitored and managed over time.

   c. **How this project meets the requirements of Section 13103 of the Fish and Game Code:**
   Our proposed workshop meets requirement (a) of the California Fish and Game Code Section 13103. This workshop offers public education relating to the scientific principles of plant and wildlife monitoring and includes supervised formal instruction from qualified instructors using a planned curriculum. Each workshop participant will also receive a binder and flash drive containing additional educational aids consisting of current relevant monitoring guidelines, related and relevant literature, PowerPoint presentations given at workshop, examples of data collection forms, open-source data analysis templates, and an extensive list of pertinent resources.

   d. CNGA agrees to acknowledge the Fish and Wildlife Committee for financial support of the project using the provided standard language of “This workshop is funded in part by the Contra Costa County Fish and Wildlife Committee” on the advertising and handouts for this workshop if it is funded.

3. **Project Schedule:**
   This workshop will take place May 9-10, 2019, at the Farm Bureau Hall.
4. **Project Budget (itemized):**

<table>
<thead>
<tr>
<th>Item</th>
<th>Units</th>
<th>Item amount</th>
<th>Subtotal</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Instructors</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instructor honorarium</td>
<td>4</td>
<td>$150.00</td>
<td>$600.00</td>
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<tr>
<td><strong>Food</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continental breakfast</td>
<td>60</td>
<td>$7.00</td>
<td>$420.00</td>
<td>Two days of breakfasts</td>
</tr>
<tr>
<td>Catered lunch</td>
<td>60</td>
<td>$14.50</td>
<td>$870.00</td>
<td>Two days of lunches</td>
</tr>
<tr>
<td><strong>Handout Materials</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>flash drives</td>
<td>30</td>
<td>$7.50</td>
<td>$225.00</td>
<td></td>
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<tr>
<td>binders</td>
<td>30</td>
<td>$2.00</td>
<td>$60.00</td>
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</tr>
<tr>
<td>Printing of binder materials (125 pages)</td>
<td>30</td>
<td>$15.00</td>
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</tr>
<tr>
<td><strong>Field Work Materials</strong></td>
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<td></td>
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<tr>
<td>compasses</td>
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<td>$8.00</td>
<td>$40.00</td>
<td></td>
</tr>
<tr>
<td>biodegradable flagging</td>
<td>2</td>
<td>$12.00</td>
<td>$24.00</td>
<td></td>
</tr>
<tr>
<td>transect tapes 100'</td>
<td>5</td>
<td>$25.00</td>
<td>$125.00</td>
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<tr>
<td>meter sticks</td>
<td>20</td>
<td>$6.50</td>
<td>$130.00</td>
<td>used for 5 quadrat frames</td>
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<tr>
<td>PVC piping and glue</td>
<td>5</td>
<td>$14.00</td>
<td>$70.00</td>
<td>used for 5 quadrat frames</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td>$3,014.00</td>
<td></td>
</tr>
</tbody>
</table>

5. **Annual budget for CNGA:** Our budgeted 2018 income was $52,000 and our expenses were $52,000. As of 12/31/18 our bank account balance was at $46,152.

6. **Statement describing the applying organization**
   a. **Description of applying organization, CNGA:**
      CNGA’s mission is to promote, preserve, and restore the diversity of California's native grasses and grassland ecosystems through education, advocacy, research, and stewardship. We work towards increasing public understanding and appreciation of the value of native grassland ecosystems. CNGA was founded in 1991 and continues to develop comprehensive and innovative programs of education, training, and field experience for its members and the general public. Through our publications, workshops, field trips, and our annual field day at Hedgerow Farms, CNGA is the primary network among people with an interest in California’s native grasses and grasslands. We believe this peer-to-peer contact and technical transfer of information is the most effective way to develop and promote the “art” of native grass restoration and conservation. CNGA currently has 447 members.

   b. **Board of Directors and officers of applying organization, CNGA, with affiliations:**
      i. **Officers:**
         - **President:** Andrea Williams, Vegetation Ecologist for Marin Municipal Water District
         - **Vice President:** J.P. Marie, Manager of UC Davis Putah Creek Riparian Reserve
         - **Secretary:** Jodie Sheffield, Sod and Seed Specialist for Delta Bluegrass Company
         - **Treasurer:** Jennifer Buck-Diaz, Vegetation Ecologist for California Native Plant Society (CNPS)
      ii. **Board Members-at-Large:**
         - Emily Allen, independent Environmental Consultant
         - Christopher Gardner, Open Space Land Manager for the City of Davis
         - Michele Hammond, Botanist for East Bay Regional Park District
         - Jim Hanson, independent Landscape Architect for natural areas conservation, planning and management
         - Richard King, retired rangeland specialist for USDA/NRCS
         - Billy Krimmel, owner of Restoration Landscaping Company
         - Kendra Moseley, Regional Ecological Site Inventory Specialist for USDA/NRCS
         - Felix Ratcliff, rangeland ecologist and postdoctoral scholar at UC Berkeley
         - Patrick Reynolds, General Manager of Hedgerow Farms, Inc
         - Dina Robertson, Project Ecologist for AECOM
         - Jeff Wilcox, Managing Ecologist for Sonoma Mountain Ranch Preservation Foundation
7. **Statement describing qualifications:**
   a. Qualifications of CNGA:
      CNGA has been putting on high-quality workshops of this kind for over 25 years. One of our main goals is to train the public as well as grassland and rangeland managers on topics related to California grasslands. We generally offer 5-10 workshops each year throughout the state. These workshops cover a range of topics including grass identification, introduction to restoration technique and tools, landscaping with natives, sustainable grazing, and introduction to grasslands soils. CNGA’s last monitoring workshop was in 2014 and had 27 attendees, many who were from agencies and organizations that perform monitoring as a part of their role. CNGA was awarded a grant by the Department of Water Resources in 2015 to put on four workshops over 2015 and 2016 related to creating low-water landscapes using California native plants. These New Front Yard Workshops were very well received and we have continued to put on similar workshops even after the grant was completed.

   b. Qualifications of the participating individuals:
      - **Michele Hammond:** Michele will be one of the instructors for the workshop. She is the botanist for the East Bay Regional Park District and currently assesses rare plant communities and practices vegetation management for parkland in Alameda and Contra Costa Counties. She maps and manages rare plants including the introduced Santa Cruz tarplant (*Holocarpha macradenia*) in Wildcat Canyon Regional Park as well as newly acquired parkland within the East Contra Costa Habitat Conservation Plan. Michele earned her B.A. and M.S. in Environmental Science from UC Berkeley.
      - **Felix Ratcliff:** Felix will be one of the instructors for the workshop. He is a rangeland ecologist whose research focuses on riparian and grassland vegetation and wildlife dynamics and the effects of cattle grazing on these systems. He collaborates with land managers, public agencies, and park districts in California to produce data that is relevant to conservation and management. He completed his Ph.D. at UC Berkeley where he is continuing to investigate the impacts of rangeland management on vegetation and wildlife as a postdoctoral scholar. Before starting graduate school he worked five years at a biological consulting firm in the Bay Area.
      - **Emily Allen:** Emily is currently an independent consultant in Mendocino County. She previously worked as a sales manager for Hedgerow Farms, a native seed production farm in Yolo County, from 2009-2018. While there she provided customer assistance and expertise related to native grassland species and seed mixes. She has a B.S. in Biology with an emphasis in Restoration Ecology/Natural History from Westmont College in Santa Barbara. She has served on the CNGA board since 2014 and has assisted with organizing, presenting at, and supporting many CNGA workshops including the past 11 CNGA field days at Hedgerow Farms and four New Front Yard workshops in 2015 and 2016.
      - **Andrea Williams:** Andrea began her work in grasslands in college, with three seasons of monitoring and helping set up an experiment on Cascade Head in Oregon. She has spent portions of the past 20 years on coastal grassland study and restoration projects from Redwood National and State Parks to Point Reyes National Seashore and Golden Gate National Recreation Area to her current post at Mount Tamalpais with the Marin Municipal Water District. She is best known for her work with plant identification, invasive plants, mapping, and prioritization, and is the current President of CNGA.
      - **Diana Jeffery:** Diana has worked closely with USFW on reintroduction projects with the federally endangered grassland plant, showy Indian clover (*Trifolium amoenum*). She is co-author of the Sonoma Marin Coastal Grasslands Working Groups’ “California’s Coastal Prairies” website. She received a B.A. in Environmental Studies from Sonoma State and her Ph.D. in Ecology from UC Davis. She has been the administrative director for CNGA for two and a half years and has assisted and supported putting on over twenty workshops and conference sessions during that time.

8. **List of individuals:**
   a. Responsible for performing project:
      i. Emily Allen- workshop committee chair, monitoring workshop organizer
      ii. Michele Hammond- monitoring workshop committee member, workshop instructor
      iii. Felix Ratcliff- monitoring workshop committee member, workshop instructor

   b. Responsible for overseeing project:
      i. Andrea Williams- CNGA President
      ii. Diana Jeffery- CNGA Administrative Director
Project title: El Cerrito Recycling + Environmental Resource Center - Hillside Habitat Restoration Project

Organization/Individual applying: City of El Cerrito, Operations + Environmental Services Division

(Organization type: please check one – X government, non-profit, for-profit, other (explain))

Address: 7501 Schmidt Lane, El Cerrito, CA 94530

Telephone: (510) 215-4350

Fax:

E-mail: green@ci.el-cerrito.ca.us

Name and title of contact person: Maria Sanders, Division Manager, Operations + Environmental Services Division

One sentence summary of proposal: Invasive weed removal followed by planting of native habitat flora.

Requested grant: $2,867.66

Proposal prepared by (name & title): Carrie Bennett, Administrative Clerk

Signature (Typing your name does not count as a signature. If this section is empty, your proposal will not be considered):

Signed on 1/7/19
1) Signed Application Cover Page (see attached)

2) Description of the project for which funding is requested.
A grant from the Contra Costa County Fish and Wildlife Propagation Fund will support the City’s volunteer efforts to improve wildlife habitat on the portion of the hillside nearest to the El Cerrito Recycling + Environmental Resource Center. City staff will work alongside experienced volunteers to remove invasive and fire-prone plants such as French and Scotch Broom, Giant Reed, Pampasgrass, and invasive Thistle species. We will also add new native plants to improve pollinator and other wildlife habitat, prevent erosion, decrease fire risk, and increase the overall aesthetics of the site. The Native Here Nursery in Tilden Park has donated sixty native bunch grasses, as well as other plants. Additional seeds and plants will be purchased, including Yampah, California Poppies, California Buckeye, and Island Mallow. The City will improve soil by adding compost and mulch, thereby also increasing the carbon sequestration potential of the restoration areas. This project will improve the native plant habitat on the hillside, benefitting the Bay Area wildlife that depends on these species for food and shelter. Project may also lessen storm water runoff by storing rainwater in roots, stems, and leaves, and by helping hold the hillside soil in place. We also plan to add interpretive signage to encourage people to recognize both invasive and native plants and understand their role in the greater ecosystem of the hillside.

This project will meet the requirement of California Fish and Game Code Section 13103, (e) Improvement of fish and wildlife habitat, including, but not limited to, construction of fish screens, weirs, and ladders; drainage or other watershed improvements; gravel and rock removal or placement; construction of irrigation and water distribution systems; earthwork and grading; fencing; planting trees and other vegetation management; and removal of barriers to the migration of fish and wildlife.

The El Cerrito Recycling Center site is located within a former rock quarry. The disturbed soil on the hillside above has become overgrown with fast-growing invasive plants, especially Pampasgrass and Scotch and French Broom. Our project will focus on the relatively flat area (approximately 22,000 square feet) immediately to the north of the recycling operation. There already exist many native habitat plants, including Coyote Bush, California Poppies, Mugwort, and Bunch Grasses. We mean to encourage the native plants by reducing the competition from the invasive species, and planting additional natives. Animal wildlife, including deer, fox, red tail hawks, turkey vultures, scrub jays, towhees, western fence lizards, western garter snakes, and dragonflies, live in and around the quarry site and frequent the restoration area on a daily basis.

3) Project schedule - The project must be completed within a year from the date you receive notification of funding (by Spring/Summer 2020).
Project will be completed by March 31, 2020.

4) Project budget (itemized).

Requesting $2,867.66 – details below:

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<thead>
<tr>
<th>Item</th>
<th>Unit Price</th>
<th>Quantity</th>
<th>Cost</th>
<th>In-Kind Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Landscape Staples</td>
<td>$15.99/box of 100</td>
<td>2 boxes</td>
<td>$36.98</td>
<td></td>
</tr>
<tr>
<td>Weed Barrier Landscape Fabric</td>
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<tr>
<td>Purple Needlegrass (Stipa pulchra)</td>
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<tr>
<td>Small Flowered Needlegrass (Stipa lepida)</td>
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<td>20 plants</td>
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<tr>
<td>Blue Wildrye (Elymus glaucus)</td>
<td>$7/D-pot</td>
<td>20 plants</td>
<td>$140.00</td>
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</tr>
<tr>
<td>Blue Elderberry (Sambucus nigra, ssp caerulea)</td>
<td>$11.25/1-gal pot</td>
<td>5 1-gal plants</td>
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<tr>
<td>California Aster (Aster chilensis)</td>
<td>$11.25/1-gal pot</td>
<td>2 1-gal plants</td>
<td>$22.50</td>
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</tr>
</tbody>
</table>
Contra Costa County Fish and Wildlife Propagation Fund Grant Application 2019
El Cerrito Recycling + Environmental Resource Center - Hillside Habitat Restoration Project

<table>
<thead>
<tr>
<th>Plant Description</th>
<th>Price/Unit</th>
<th>Quantity</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hollyleaf Redberry (Rhamnus ilicifolia)</td>
<td>$29/plant</td>
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<td>$87.00</td>
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<tr>
<td>Narrow Leaf Milkweed (Asclepias fascicularis)</td>
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<td>10 plants</td>
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</tr>
<tr>
<td>Yampah (Perideridia kelloggii)</td>
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<tr>
<td>Island Mallow (Malva assurgentiflora)</td>
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<td>California Buckeye (Aesculus californica)</td>
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<td>1 plant</td>
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<td>Compost</td>
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<tr>
<td>Hills of California Wildflower Mix Seeds</td>
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</tr>
<tr>
<td>Refreshments for Volunteers</td>
<td></td>
<td></td>
<td>$200.00</td>
</tr>
<tr>
<td>Interpretive Signage for Restoration Site</td>
<td></td>
<td></td>
<td>$1,500.00</td>
</tr>
</tbody>
</table>

**Total Costs** | **$2,867.66** | **$642.50**

5) Annual budget for the applying organization (not itemized).

The City of El Cerrito Operations + Environmental Services Division consists of two operational units. The Maintenance Unit is responsible for maintaining the City’s facilities, roads and streetscapes, energy and water management, storm water system, parks, and urban forest and has an annual budget of $3.13 million. The Environmental Services Unit is responsible for integrated waste management and recycling services, the Clean Water Program, and implementation of environmental stewardship projects and policies and has an annual budget of $3 million.

6) Statement describing the applying organization, listing the Board of Directors and officers of the organization, and listing all affiliated organizations.

**City of El Cerrito Operations + Environmental Services Division:** The City of El Cerrito is a local government in Contra Costa County that serves, leads and supports its diverse and transit-rich community by providing exemplary and innovative services, public places and infrastructure, ensuring public safety, and creating an economically and environmentally sustainable future. Information regarding the City of El Cerrito’s City Council can be found at [http://www.el-cerrito.org/27/Your-Government](http://www.el-cerrito.org/27/Your-Government).

The El Cerrito Recycling + Environmental Resource Center is a program within the City’s Operations + Environmental Services Division (OESD), within the Department of Public Works. The OESD is the primary steward of the City’s valuable public infrastructure, including parks, natural areas, facilities, and recycling operations. Its responsibilities include developing and managing operations, programs and policies that maintain and improve environmental quality in the City. OESD operates the El Cerrito Recycling + Environmental Resource Center, which is the site of the proposed project.

The City of El Cerrito hosts various Green City Initiatives, including (among others) —

- Natural Systems: [https://www.el-cerrito.org/204/Natural-El-Cerrito](https://www.el-cerrito.org/204/Natural-El-Cerrito)
- Volunteer Opportunities: [https://www.el-cerrito.org/549/Get-involved](https://www.el-cerrito.org/549/Get-involved)

We also send out a monthly newsletter called Green Happenings, which is emailed to more than 1000 subscribers, and posted on the City’s website. Environmental events (including volunteer events and the free monthly tour of the Recycling + Environmental Resource Center) are posted to the City’s online Events Calendar. The City also maintains active Facebook, Nextdoor, and Twitter accounts to communicate events and other news to our residents and other subscribers.
Greens at Work: Greens at Work has been working on East Bay restoration projects since 1995 and conducting its own restoration/revegetation projects in the East Bay since the year 2000. Co-Directors Jane and Tom Kelly are responsible for completing work on the Richmond Adopt-a-Spot site leading to the Point Isabel/Hoffman Marsh Habitat Restoration project also under their direction.

7) Statement describing the qualifications of the sponsoring organization and participating individuals for completing the project.

The City of El Cerrito has a long history of environmental stewardship, going back at least five decades, and continues to devote significant attention and resources to building and maintaining and ecologically healthy city. The City’s Public Works Department has over the past 20 years proactively pursued and implemented various habitat restoration and green infrastructure projects, including the daylighting of various creek segments throughout the City, including the Poinsett Park and Gateway Park reaches of Baxter Creek and Cerrito Creek at the El Cerrito Plaza (http://www.el-cerrito.org/573/Baxter-and-Cerrito-Creeks).

The El Cerrito Recycling + Environmental Resource Center was rebuilt in 2012 to be a community focal point and the seat of the City’s environmental programs. The facility is U.S. Green Building Council LEED Platinum certified, featuring a zero-net energy building, solar electricity, recycled rainwater catchment, rain gardens, native plantings and reused building materials. The Center is a living model of sustainability. Please take a look at the video entitled “Where Recycling is a Pleasure” (https://www.youtube.com/watch?v=Nex-hUL-CSE) to learn more. The native habitat restoration of the area will augment the sustainability of the Center.

See below for more information regarding qualifications of project team.

8) List of individuals responsible for performing project and of individuals responsible for overseeing project.

- **Management Oversight:** Maria Sanders, Division Manager, Operations + Environmental Services Division (OESD), City of El Cerrito. In her role as OESD Manager, Ms. Sanders provides oversight for both the City’s Maintenance Unit and the City’s Environmental Services Unit. Ms. Sanders possesses Master Degrees in both Landscape Architecture and Urban and Regional Planning and has more than 20 years experience managing urban environmental programs and projects.

- **Landscape and Horticultural Expertise:** Stephen Prée, Environmental Programs Manager & City Arborist, OESD, City of El Cerrito. Mr. Prée manages the City’s creek maintenance programs, performing vegetation management and native plant restoration activities in accordance with the City’s CA Department of Fish and Wildlife SAA Permit guidelines. He also manages the sustainable landscapes program and the City tree program, and is a Certified Arborist (WE-8663A), and Licensed Pesticide Applicator (QAL 102510)

- **Project Coordinator:** Carrie Bennett, Administrative Clerk, OESD, City of El Cerrito. Ms. Bennett has co-organized several shoreline cleanup events in Berkeley, and participated in many native plant restoration activities in the East Bay. She is a Certified Master Composter and has been trained in Bay-Friendly Gardening methods.

- **Volunteer Coordinator:** Jane Kelly, Co-Director, Greens at Work, Berkeley. Ms. Kelly was trained by the National Wildlife Federation in habitat restoration and is a docent at the EBRPD Botanic Garden in Tilden.

- **Volunteer Coordinator:** Tom Kelly, Co-Director, Greens at Work. Mr. Kelly co-led a multi-year habitat restoration project at Strawberry Creek Lodge on Strawberry Creek in Berkeley that was supported by small grants from the Alameda Countywide Clean Water Program.

- **El Cerrito Green Team Volunteers & Greens at Work Volunteers**

9) Statement describing the status of permit approvals necessary to perform project (if applicable). N/A

10) Request for an exception to the grant funding cost reimbursement requirement due to financial hardship or an exception for a small project under $1,000. N/A