

## **Proposals to Support the Environmental Education Priorities of the Blue Ribbon Committee**

UC Davis Team:  
Center for Regional Change, Tahoe Environmental Research Center  
and the Center for Community and Citizen Science  
September 2021

The Blue Ribbon Committee for the Rehabilitation of Clear Lake has identified environmental education as one of its top priorities in the area of socio-economics. The UC Davis team has been working with the BRC and its Socio-Economic Sub-Committee to develop a series of projects that will support these priority areas. This has included active engagement with the BRC since 2018 and three focus groups with key stakeholders (tribes, educators, environmental organizations, civic leaders) during the winter and spring of 2021 and that culminated in an issue brief that was presented to the BRC at their June 17<sup>th</sup>, 2021, meeting. The proposals in the attached project templates are based on the following criteria: they address the high priorities of the BRC and area stakeholders; they are selected to have the greatest short-term benefits and set up longer-term impacts they support and do not duplicate existing efforts; and they are feasible within the existing timeframe and resource parameters.

The UC Davis approach is based on a 5-year strategy as described below. The attached scopes of work address the first two-year phase of this strategy with the understanding that these activities will set up the future phases of the work that supports the identified BRC priorities.

### **Vision:**

Youth and other residents of the Clear Lake region have the knowledge, skills, and values needed to become effective stewards of the Clear Lake environments and succeed in related education and career pathways. Clear Lake region organizations, school systems, and governments (including Tribal governments) are collaborating to provide comprehensive environmental education programs that leverage their unique strengths and assets.

### **Goals:**

1. Develop environmental education programs that build a stewardship ethic in the Clear Lake region for residents, including youth.
2. Ensure that Clear Lake environmental educators (K-14 as well as extended/ non-formal education) have the curriculum and training needed to be effective in their teaching.
3. Offer environmental education programs that actively engage learners in hands-on scientific discovery and that provide pathways to academic and professional achievement.
4. Actively engage area Tribal governments and residents in the development and implementation of environmental education programs in ways that draw on traditional ecological knowledge and current culturally-relevant approaches to resource stewardship.
5. Orient all activities around building local capacity for long-term sustainability.

Initial 2-year activities:

1. Scan the environmental education centers, programs, curriculum and other assets in the Clear Lake region to curate and adapt these resources for environmental education programming in the region.
2. Adaptation of a Community and Citizen Science web-based app to collect, compile and share an initial suite of ecological monitoring data with benefits to the community, scientists and natural resource managers.
3. Apply a program evaluation methodology to assess progress towards the BRC's goals and to guide ongoing efforts to improve and scale up activities.

We propose to coordinate UC Davis activities through an emerging and open-membership Clear Lake Environmental Education Roundtable (CLEER) led by all stakeholders (researchers, Tribes, educators, environmental organizations) involved in environmental education in the region. CLEER can help coordinate environmental education strategies across the region, support new fundraising, and ensure a participatory and inclusive context that is based on local leadership.

Longer-term (years 3-5) activities:

1. Develop place-based youth citizen science programs that engage young people in environmental monitoring centered on the Lake connected to larger scientific and natural resource management projects.
2. Develop a comprehensive environmental education teacher professional development program linking formal K-14 educators from across the Clear Lake region.
3. Develop new place-based environmental education curricula keyed to state science and other education frameworks for seamless integration into classroom settings.
4. Develop environmental education curricula to provide programming associated with existing and proposed water labs in the Clear Lake region.
5. Support a regional youth leadership strategy to engage young people in planning and evaluating environmental education programs.
6. Develop a sustainable funding strategy to support the expansion and enhancement of environmental education in the Clear Lake region.

Summary:

By the end of the 5 years, the Clear Lake Region will have an integrated set of comprehensive and sustainable environmental education programs serving all Clear Lake residents and visitors with educationally rigorous, scientifically robust, and culturally-relevant activities. This education program, which would have been adapted and refined by CLEER over the period, will be based on locally run organizations and institutions and serve as an integral part of the long-term strategies for the rehabilitation of Clear Lake.



## Clear Lake Blue Ribbon Committee

September 9, 2021

### **Project Title: Environmental Education Resources and Program Support for Citizen and Community Science at Clear Lake**

**BRC Priority:** Develop citizen science mobile applications

**BRC Priority:** Educational materials, signage, and physical outreach around the lake

#### **Project Description:**

Participatory approaches that involve diverse publics in research and monitoring -- also known as community and citizen science (CCS) -- have demonstrated evidence for advancing environmental education goals such as environmental literacy and stewardship behaviors and benefits to the community, while also generating valuable data for researchers and local community decision-makers.

The UC Davis Center for Community and Citizen Science (CCCS), Center for Regional Change, and Tahoe Environmental Research Center (collectively referred to here as the UCD Team), will work with the emerging Clear Lake Environmental Education Roundtable (CLEER), the Clear Lake Environmental Research Center (CLERC), are Tribal governments and organizations, educators, and other community partners to identify, develop and pilot a CCS monitoring project that can support ongoing lake monitoring and be conducted by community partners as well as youth from Clear Lake communities.

The UCD Team will support the development of Clear Lake focused environmental education (EE) through the development and piloting of resources framed around and engaging with the citizen science project developed as of the associated "Citizen and Community Science App" project. This EE project would curate and adapt existing EE resources from both the Clear Lake region and beyond (such as Lake Tahoe) to be able to leverage work already being done in and around the lake. Those resources would then be synthesized for non-formal educational settings to support piloting youth engagement with the citizen science monitoring program and qualitative data collection focused on environmental stewardship.

This complements the citizen science project development effort by drawing on existing sources of knowledge and approaches through capacity building, collaborative assessment and ongoing feedback with community stakeholders.

Based on feedback from the initial pilot of these resources in Years 1 and 2, the intention of this iterative process would be to support prospective work in years 3-5 which could include the refinement and modification of environmental literacy resources and training (teacher professional development, collaboration with state standard alignment, etc.) for wider application in the non formal education setting and expansion into the formal K-12 education setting around Clear Lake. The long term goal of this project is to establish a sustainable citizen science monitoring model tailored to the needs of Clear Lake communities that: 1) enhances youth leadership and engagement; 2) supports culturally-sustaining youth stewardship of the lake through deepened content knowledge, connection, and understanding of lake science; and 3) provides content and support for the environmental education center(s), formal and informal educational materials, and lake signage.

#### **Potential Project Timeline:**

##### Year One-

- Inventory existing resources from local environmental literacy efforts and environmental education community partners.
- Gather insights from similar efforts in other locations, including the Citizen Science Tahoe initiative.
- Synthesize and modify existing environmental education resources to customize material for a Clear Lake Community and Citizen Science project pilot.
- Plan pilot activities for Year 2 with community partners.

##### Year Two-

- Collaborate with community partners on development of a youth environmental monitoring program.
- Develop and facilitate a training series to pilot the youth CCS monitoring program with nonformal environmental education partners.
- Collaborate with local partners to implement, guide and assess pilot activities.
- Pilot lessons with non-formal educators who are engaging with facility/ location based projects (field trips, outreach, etc.).

- Hold workshops with pilot participants to reflect on pilot activities and scope the development activities needed for sustainable implementation.
- Curate community-based environmental literacy resources to facilitate lake-wide collaboration and access.

**Projected Budget:**

| <b>Task Description (brief- 1 sentence)</b>   | <b>Suggested Responsible Party</b> | <b>Amount</b> |
|---|------------------------------------|---------------|
| Outreach to local nonformal environmental literacy educators, including tribal communities, to evaluate and curate/cross reference existing initiatives, outreach and curricula | UCD Team                           | \$30,000      |
| Development of Clear Lake citizen science focused environmental literacy resources based on existing projects and connected to the Citizen and Community Science App            | UCD Team                           | \$60,000      |
| Collaboration with Blue Ribbon Committee members focused on environmental education as well as non formal educators to develop training and feedback opportunities              | UCD Team                           | \$30,000      |
| Development and delivery of training for non formal educators engaging with pilots (inc. stipends)  | UCD Team                           | \$50,000      |
| Facilitate piloting of Clear Lake CCS-focused resources through ongoing monitoring and coaching   | UCD Team                           | \$50,000      |
| Hold workshops with community partners to evaluate and reflect on pilot resources   | UCD Team                           | \$30,000      |

|  |  |           |
|--|--|-----------|
| Compile models of environmental education communication and interpretation exhibits.         | UC Team  | \$20,000  |
| Support CLEER to play a coordinating role on the curriculum and project resources activities | CLEER  | \$15,000  |
|  | <b>Subtotal:</b>                                 |           |
|  | <b>Expected Overhead or Administrative Fees:</b> | 0         |
|  | <b>Projected Total:</b>                          | \$280,000 |



## Clear Lake Blue Ribbon Committee

September 9, 2021

**Project Title: Promoting Citizen and Community Science through the development and piloting of a participatory environmental monitoring app**

**SES/ BRC Priority:** “Develop citizen science mobile application for community participation in research and monitoring”

### **Project Description:**

Participatory approaches that involve diverse publics in research and monitoring -- also known as community and citizen science (CCS) -- have demonstrated evidence for advancing environmental education goals such as environmental literacy and stewardship behaviors and benefits to the community, while also generating valuable data for researchers and local community decision-makers.

The UC Davis Center for Community and Citizen Science (CCCS), in collaboration with the Tahoe Environmental Research Center (TERC) and other community partners, will identify and develop a CCS monitoring project(s) that can support ongoing lake monitoring and be conducted by educators, Tribes, non-profits and other community partners as well as K-14 students from a variety of locations around the lake. A key component of this project will be a freely available mobile application, based on the Citizen Science Tahoe program (<https://citizensciencetahoe.org/home>) currently supported by TERC. Partners will use that platform as a starting point to develop a project specific to the local context of Clear Lake. This initial development will provide a tangible beta-version product early in the process that can be used to evaluate and refine user needs, and at the same time provide usable data that align with some known Stakeholder priority areas.

The development process will take into account data needs of scientists and managers as well as community interest and priorities. The project will also be in dialog with education resources development activities. CCCS, with expertise in facilitating and training for projects like these, will liaise with researchers and community partners, and draw on examples and experiences from other locations to target the best community and citizen science opportunities for Clear Lake. They will identify

priorities for data collection through a collaborative process, and recommendations for driving and sustaining long-term participation in the activity. TERC will lead development of the app.

The process for project development will include facilitating stakeholder meetings to determine the potential audiences, refinement and expansion (as necessary) of the collected data, and methods to link the data to scientific research, natural resource management and restoration activities. It will also involve researching relevant models to inform a local approach.<sup>1</sup>

The Clear Lake Community and Citizen Science App, once fully developed at the end of this two-year project period, will be able to be used as an important element and data repository of future citizen science activities by all Stakeholders (customizable as necessary); be a part of future curricula and formal science learning activities; and be a vehicle for building science literacy in the community.

Key outputs include:

- Clear Lake Community and Citizen Science app (Beta version)
- Clear Lake Community and Citizen Science app - Ver. 2 based on Stakeholder review and assessment
- Guidance documentation identifying ways that local partners can foster and sustain participation in the citizen science project.
- Scope description of other options identified by stakeholders for citizen science projects engaging youth in the next phase.

### **Potential Project Timeline:**

Year One - Identify topics, methods, and project structure

- Gather insights from similar efforts in other locations, including the Citizen Science Tahoe initiative.
- Iterative meetings with community groups and scientists to identify the best options for ongoing citizen science project development, including but not limited to a Community and Citizen Science Clear Lake app.
- Establish citizen science project team of local environmental organizations, Tribes, scientists, and educators to determine immediate topics
- Code and release Community and Citizen Science Clear Lake - Beta Version

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<sup>1</sup> See “Citizen Science Tahoe” mobile phone app (<https://citizensciencetahoe.org/home>) as an example of a tool that could be used for collecting data and promoting learning around these issue areas. See example programs here: <https://www.keeptahoeblue.org/our-work/volunteer>. A resource for developing CCS projects based on community interest is available at [https://education.ucdavis.edu/sites/main/files/ccc\\_manual\\_dam\\_removal\\_and\\_watershed\\_restoration\\_final\\_online.pdf](https://education.ucdavis.edu/sites/main/files/ccc_manual_dam_removal_and_watershed_restoration_final_online.pdf)



- Plan development, pilot activities and marketing/outreach for Year 2, with input from key local partners

Year Two-

- Collaboration with local partners to implement pilot activities.
- Trial and evaluate Community and Citizen Science Clear Lake - Beta
- Workshop to reflect on pilot activities and scope the development activities needed for sustainable implementation.
- Generate recommendations for improvements to the app, and for ways that local partners can build capacity to both increase and sustain participation in the citizen science activity.
- Modify and Release Citizen Science Clear Lake - Ver. 2

**Projected Budget:**

| <b>Task Description (brief- 1 sentence)</b>  | <b>Suggested Responsible Party</b>               | <b>Amount</b> |
|--|--|---------------|
| 1. Scoping priorities for citizen science app (includes iterative meetings with community groups, scientists, and managers, and background research on other contexts) | UCD Center for Community and Citizen Science     | \$70,000      |
| 2. Development of beta-version of mobile app   | UCD Tahoe Environmental Research Center (TERC)   | \$40,000      |
| 3. Development of Ver. 2 mobile App based on stakeholder interactions  | TERC   | \$35,000      |
| 4. Pilot activities, meetings and recommendations and reflections document   | UCD Center for Community and Citizen Science     | \$70,000      |
| 5. Support CLEER to play a coordinating role on the community and citizen science app  | CLEER  | \$15,000      |
|  | <b>Subtotal:</b>                                 |               |
|  | <b>Expected Overhead or Administrative Fees:</b> | 0             |
|  | <b>Projected Total:</b>                          | \$230,000     |



## **Clear Lake Blue Ribbon Committee**

### **Near-Term Project Abstract:**

September 9, 2021

#### **Project Title:**

Program evaluation to enhance environmental educational programs for Clear Lake

#### **Project Description:**

A mixed methods evaluation using developmental, participatory and culturally responsive evaluation frameworks will be conducted with all the relevant stakeholders like Clear Lake residents, Tribes, funders, policy makers, program staff and others identified by the team. The goal of this evaluation will be to identify the social, economical, and cultural factors needed for successful implementation of environmental education programs in the Clear Lake region.

Evaluation methods include observation, interviews (individual and focus groups), surveys, and any other methods that might emerge as the project unfolds with the participation from all relevant stakeholders. The evaluation results are expected to help with educational, community and economic development policy making in the Clear Lake region.

#### **Project Timeline:**

Year 1:

- Develop evaluation methodology
- Collect baseline data
- Develop year 1 report

Year 2:

- Conduct in-depth evaluation research on near-term program impacts
- Develop recommendations on how to scale the programs up in years 3-5.

**Projected Budget:**

| <b>Task Description (brief- 1 sentence)</b>   | <b>Suggested Responsible Party</b>               | <b>Amount</b> |
|---|--|---------------|
| 1. Interviews with UC Davis team, BRC members and environmental education stakeholders to understand how their experience of working in the Clear Lake region over the last two years | Vikram Koundinya, UC Davis CRC                   |               |
| 2. Analyzing the above collected interview data and extracting themes   | Vikram Koundinya, UC Davis CRC                   |               |
| 3. Attending all relevant team meetings over the next two years   | Vikram Koundinya, UC Davis CRC                   |               |
| 4. Developing data collection instruments to collect data from each of the sub components   | Vikram Koundinya, UC Davis CRC                   |               |
| 5. Analyzing data and developing the evaluation reports for local use   | Vikram Koundinya, UC Davis CRC                   |               |
| 6. Developing conference abstracts and a journal manuscript   | Vikram Koundinya, UC Davis CRC                   |               |
|   | <b>Subtotal:</b>                                 |               |
|   | <b>Expected Overhead or Administrative Fees:</b> | 0             |
|   | <b>Projected Total:</b>                          | \$50,000      |



## **Clear Lake Blue Ribbon Committee**

**Near-Term Project Abstract:** *Scientific Research and Environmental Education Capacity Building in Lake County*

*September 5, 2021*

**Project Title:** *Scientific Research and Environmental Education Capacity Building in Lake County*

### **Project Description:**

The goal of this capacity building proposal is to build the local human resources and organizational capabilities needed for Lake County to fully realize the benefits of the investments made by the State of California as a result of the recommendations from the Blue Ribbon Committee. Having a Lake County-based organization and staff dedicated to ongoing implementation is critical to ensuring the long term success of any environmental education or scientific research program. This proposal will fund new local professionals to work in conjunction with the Blue Ribbon Committee member agencies to advance the recommendations of the committee. This proposal relies heavily on the continued involvement of the UC Davis Center for Regional Change (CRC) and UC Davis Tahoe Environmental Research Center (TERC) through separate contracts to help guide the development of these new and expanded capacities in Lake County.

The organization proposed to lead this project is the Clear Lake Environmental Research Center (CLERC), a Lake County-based 501c3 nonprofit organization. Founded in 2014, CLERC exists to: bring science, education, government, tribal and business groups together to resolve issues involving Clear Lake; study the unique properties of Clear Lake and the surrounding area; and coordinate programs and projects that focus on solutions to environmental and economic problems locally and worldwide.

CLERC operates the only accredited water analysis lab in Lake County. CLERC also collaborates with partners across all sectors on landscape-scale forest health and wildfire resilience projects. CLERC is in discussions with the City of Lakeport to lease the Carnegie Library for use as an office, lab, and publicly accessible environmental education space. This proposal leverages CLERC's current capacities, previous accomplishments, and unique position to implement the recommendations from the Blue Ribbon Committee.

Total Proposed Costs: 2-year project: \$599,500

3-year project: \$880,000

**Project Timeline:**

This project is intended to be implemented over a 2-3-year period to allow adequate time for recruitment, strategic planning, partner collaboration, and evaluation. For planning and discussion purposes, 3<sup>rd</sup> year costs are included in the attached budget

|   |   |
|---|---|
| Year 1  | Years 2 and 3   |
| <ul style="list-style-type: none"> <li>• Contracting and Partner Agreements</li> <li>• Recruitments and Hiring</li> <li>• Planning and Program Development</li> </ul> | <ul style="list-style-type: none"> <li>• Program Implementation and Evaluation</li> </ul> |

**Projected Budget:**

| Task Description (brief- 1 sentence)   | Responsible Party | Amount  |
|--|-------------------|---|
| <p><b>1. Clear Lake Research and Data Library</b></p> <ul style="list-style-type: none"> <li>• Create and hire Clear Lake Data Manager/Librarian position</li> <li>• Catalog and digitize Clear Lake research materials on an ongoing basis</li> <li>• Establish and maintain “open” database for Clear Lake environmental data (CLERC Lab, UC Davis, water agencies, CEQA reviews, etc.)</li> <li>• Work with TERC and other partners to develop and expand the use of mobile applications for citizen data collection.</li> </ul>                | CLERC             | <p><b>\$100,000</b></p> <ul style="list-style-type: none"> <li>• Computer, cloud data storage, scanner = \$20k</li> <li>• Data Manager/Librarian; \$40k/year x2 years</li> </ul> <p><i>3<sup>rd</sup> year = +\$45,000</i></p>  |
| <p><b>2. Environmental Education Pilot Project</b></p> <ul style="list-style-type: none"> <li>• Hire Education Program Manager</li> <li>• Work with CRC and <i>CLEER</i> to establish specifics of programming and curriculum</li> <li>• Hire additional program support staff if needed (Education Field Technician)</li> <li>• Implement K-12 program with LCOE and other partners for 1-2 years</li> <li>• Evaluate and revise programming and curriculum for future years</li> <li>• Host monthly speaker series open to the public</li> </ul> | CLERC             | <p><b>\$205,000</b></p> <ul style="list-style-type: none"> <li>• Education Manager; \$60k/year x2 years</li> <li>• Education Field Tech; \$30k/year x 2 years</li> <li>• Education program supplies = \$5k</li> <li>• Guest speaker fees and travel = \$20k</li> </ul> <p><i>3<sup>rd</sup> year = +\$100,000</i></p> |

|  |  |  |
|--|--|--|
| <p><b>3. Lab and Research Workforce Development</b></p> <ul style="list-style-type: none"> <li>• Develop 2<sup>nd</sup> Certified Lab Analyst (to work in CLERC's lab)</li> <li>• Conduct lab demonstrations and provide "hands-on" opportunities to the public</li> <li>• Develop research and data analysis projects that can be conducted from Lake County</li> <li>• Train CLERC staff to provide field services for TERC and other research institutions</li> </ul> | CLERC  | <p><b>\$120,000</b></p> <ul style="list-style-type: none"> <li>• Lab Analyst; \$30k/year x2 years</li> <li>• Field Technician; \$25k/year x 2 years</li> <li>• Supplies for lab demonstrations = \$10,000</li> </ul> <p><i>3<sup>rd</sup> year = +\$60,000</i></p> |
| <p><b>4. Facility Enhancement</b></p> <ul style="list-style-type: none"> <li>• Improve the public access experience at the Carnegie Library</li> <li>• Work with TERC and other partners on Science Education Hub Feasibility Study</li> </ul>   | CLERC  | <p><b>\$60,000</b></p> <ul style="list-style-type: none"> <li>• Carnegie Library exhibits</li> <li>• Outreach Coordinator; \$20k/year x2 years</li> </ul> <p><i>3<sup>rd</sup> year = +\$20,000</i></p>  |
| <p><b>5. Administration and Project Communications</b></p> <ul style="list-style-type: none"> <li>• Coordination and collaboration with partners</li> <li>• Participation in local community meetings to discuss projects</li> <li>• Grant reporting</li> </ul>  | CLERC  | <p><b>\$60,000</b></p> <ul style="list-style-type: none"> <li>• Partner stipends = \$20k/year x2 years</li> <li>• CLERC Management Staff; \$10k/year x2 years</li> </ul> <p><i>3<sup>rd</sup> year = +\$30,000</i></p>   |
|  | <b>Subtotal:</b>                                 | <b>\$545,000</b> (with 3 <sup>rd</sup> year \$800,000)   |
|  | <b>Expected Overhead or Administrative Fees:</b> | <b>\$54,500</b> (with 3 <sup>rd</sup> year \$80,000)   |
|  | <b>Projected Total:</b>                          | <b>\$599,500</b> (with 3 <sup>rd</sup> year \$880,000)   |



**Clear Lake Blue Ribbon Committee**

**Near-Term Project Abstract: Cobb Mountain/ Clear Lake Watershed Education and Stewardship Program (WEP) for community leaders/volunteers**

*September 13, 2021*

**Project Title:**

Cobb Mountain/ Clear Lake WEP

**Project Description:**

Recognizing that the health of Clear Lake is inextricably tied to the overall health of the Clear Lake Watershed and the responsible stewardship practices engaged in by residents in the entire basin, the proposed WEP targets the Cobb Mountain community, which include the Kelsey Creek, Adobe Creek and Cole Creek watersheds and proposes a five session program of education and field trips, concluding with an exercise to make specific recommendations, including Best Practices, to the Cobb Area Council, and its “Forest Stewardship Working Group” (in formation)

Participation in the program will be offered to local residents who have significant influence on local stewardship practices including:

- Local schoolteachers (Cobb Mt Elementary)
- Local high school students
- Members of the Cobb Area Council (CAC) and committee chairs
- Significant landowners in the watershed
- Forest management practitioners
- Staff at the Boggs Mountain State Demonstration Forest
- Members of the CAC Forest Stewardship Working Group

**Project Timeline:**

The schedule below can be executed upon allocation of funding with the following assumptions: two months of startup for administration and curriculum development; one month for recruitment of students; one class per month.

- Session 1: Overview of the Clear Lake Basin watershed and the role that upland areas play in the overall environmental health of the Lake.
- Session 2: Understanding local watersheds; Kelsey Creek Adobe Creek Cole Creek. and their influence on Clear Lake (field trip)

- Session 3: Understanding Hydrology of the local water basins and their effect on Clear Lake, including effect of groundwater withdrawals, septic systems and drought conditions (field trip)
- Session 4: Review of the regulatory regime that currently applies to local watershed management
- Session 5: Workshop drafting of local best practices, potential local agreements

**Projected Budget:**

| <b>Task Description (brief- 1 sentence)</b>    | <b>Suggested Responsible Party<br/>(suggested organization or agency- will require Committee and Agency approval)</b> | <b>Amount</b> |
|--|---|---------------|
| 1. Curriculum Development                      | Cobb Area Council   | \$10,000      |
| 2. Instructor Support per diem @ \$750/day     | Cobb Area Council   | \$7,500       |
| 3. Materials (printing, references, workbooks) | Cobb Area Council   | \$2,000       |
| 4. Student field trips                         | Cobb Area Council   | \$3,200       |
|  | <b>Subtotal:</b>  | \$22,700      |
|  | <b>Expected Overhead or Administrative Fees:</b>  | \$3,400       |
|  | <b>Projected Total:</b>   | \$26,100      |