

**Sierra Nevada Conservancy-Progress Report**

**Sierra Nevada Conservancy Grant Program  
Safe Drinking Water, Water Quality and Supply, Flood Control  
River and Coastal Protection Act of 2008 (Proposition 84)**

**Grantee Name:** Sequoia Natural History Association

**Project title:** Crystal Cave Solar Power

**SNC Reference Number:** SNC 70233      **Submittal Date:** 11/1/2011

**Report Preparer:** Mark Tilchen      **Phone #:** 559-565-3759

**Check one:**

**6-Month Progress Report**  
 **Final Report**

<p>6-Month Progress Reports should reflect the previous six months. Final Reports should reflect the entire grant period.</p>
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- A. Progress Report Summary:** (Please provide a general description of work completed during this reporting period.)  
**Completed installation of new light fixtures and bulbs. Installed new electrical wiring and related work. Purchased maintenance accessories and storage bins for parts. Produced project DVD. Purchased back-up generator for cave booth.**
- B. Deliverables or Outcomes completed during this Reporting Period or Milestones Achieved:** (Include specific information, such as public meetings held, agency participation, partnerships developed, or acres mapped, treated or restored.)  
**The project, including installation of solar array, new LED and low power lighting, battery and electronics building, and back-up generator is now deemed complete.**
- C. Challenges or Opportunities Encountered:** (Please describe what has worked and what hasn't; include any solutions you initiated to resolve problems. If your project is not on schedule, please explain why here.)  
**The freezing of state funds caused us to seek alternate funding. We received that funding from the federal government stimulus. By combining these funds with the SNC money, we were able to install a much more efficient system as well as purchase additional peripherals to enhance the overall system.**
- D. Unanticipated Successes Achieved:** (Please describe any additional successes beyond completing scheduled tasks or meeting scheduled milestones.)

**Our goal was to create a system that would operate 80% on solar and 20% on propane generator. Using the extra funds, we created a more efficient system with the best possible battery storage capacity. As a result, the system is now 100% efficient, providing all of the needed power all of the time. The backup propane generator is usually only run on occasion to oil its parts. Prior to system installation, the cave required up to 3000 gallons of propane each summer. No propane has been ordered since 2009.**

**E. Compare Actual Costs to Budgeted Costs:** (Please refer to your grant agreement to list your deliverables/budget categories and budgeted costs compared to actual costs incurred during this reporting period in the table below.)

<b>PROJECT BUDGET CATEGORIES</b>	<b>Budgeted SNC Dollars</b>	<b>Actual Dollars</b>
Solar Power	139,330	<b>119,057.45</b>
<b>LED Lights</b>	28,170	<b>27,461.01</b>
<b>Lighting System</b>	9,800	<b>95,48.81</b>
<b>Back-up generator</b>	19,200	<b>4,885.09</b>
<b>GRAND TOTAL</b>	<b>211,500</b>	<b>175,842.29</b>

**Explanation:** (if needed)

**F. Do you have information to report on the project-specific Performance Measures for your project?** (If so, please list the Performance Measures below and describe your progress.)

- 1. Reduce air pollution: Non-measurable. Pollutants from old generator reduced by 99%**
- 2. Reduce algae growth in cave: Measured by observation, the Park Service reports significant decline.**
- 3. Previous to installation, the cave operation required burning about 3000 gallons in propane annually to run the electrical systems. In 2010 and 2011, we purchased 0 gallons and except the same in 2012.**
- 4. Previous to the project, the generator created significant noise pollution. This no longer exists.**

**G. Were there any other relevant materials produced under the terms of this Agreement that are not a part of the budgeted deliverables? If so, please attach copies.** (Include digital photos, maps, media coverage of project, or other work products.)

**We previously provided digital photos.**

**H. Next Steps:** (Work anticipated in the next 6 months, including location and timing of any scheduled events related to the project.)

## **Please Complete this Section for FINAL Report ONLY**

### **Capacity-Building Results and Collaboration and Cooperation with Stakeholders:**

(What partnerships did you initiate or strengthen as a result of this project? How did they affect the project outcome? If applicable, how did this grant increase your organization's capacity? What is your plan to sustain this increase?)

**This project required that we work very closely with the National Park Service's maintenance and planning team. This strengthened our partnership with a division of the park service with whom we often have a direct working relationship. We contracted with a local electrician to learn the solar array and battery system and he will be our normal contractor for future work required to maintain the system.**

### **Description of Project Accomplishments:**

#### **1. Most Significant Accomplishment**

Describe in one concise, well-written paragraph, the most significant accomplishment that resulted from this grant.

**We have significantly reduce various pollutants that pertain to water quality, air quality, and noise while demonstrating to the public just what is possible with alternative sources of energy. The LED lighting has eliminated in some areas of the cave and significantly reduced in others, the growth of small grasses and mosses on cave walls and formations that normally would not exist in a complete darkness environment.**

#### **2. WOW Factor**

If applicable, please describe anything that happened as a result of the project or during the project that is particularly impressive.

**As explained earlier, the system has far exceeded our expectations. Designed to only provide 80% of daily power needs, the array provides 100% of our needs and the batteries, based on testing, can store enough electricity to operate without any sunshine for at least a week.**

#### **3. Design and Implementation**

When considering the design and implementation of this project, what lessons did you learn that might help other grantees implement similar work?

**Look around at existing materials that might make your project greener. One of the factors that made the solar array more expensive is that it must withstand**

**200 MPH winds because the parking area in front of the array is an emergency helicopter landing zone. Instead of extensive digging and use of steel and concrete to secure the system, the array was built on a huge metal “basket” that sits atop the asphalt. The basket, which holds down the system, was filled with several tons of old concrete that were removed from the cave as part of a restoration project. The concrete was saved from ending up in a landfill.**

**It is very important to overestimate construction. Design, equipment and supply costs. Don’t forget to include administrative costs in managing the project and the grant itself.**

#### **4. Indirect Impact**

Please describe any indirect benefits of the project such as information that has been developed as a result of the project is being used by several other organizations to improve decision-making, or a conservation easement funded by this grant that encouraged other landowners in the area to have conservation easements on their property.

**When the solar array first came online in 2010 we held a special private event for the news media and local business people. A manager from the Rawhide baseball stadium in Visalia attended this event with plans to utilize our experiences in using solar at the cave to investigate solar power for the baseball stadium.**

**The park visitors expressed overwhelming support for the project and our desire to be as green as feasible in a national park.**

#### **5. Collaboration and Conflict Resolution**

If you worked in collaboration or cooperation with other organizations or institutions, describe those arrangements and their importance to the project. Also, describe if you encountered conflict in the project and how you dealt with it, or if there was conflict avoided as a result of the project.

**The project required a close relationship with the National Park Service and various contractors. This went very smoothly.**

#### **6. Capacity-Building**

SNC is interested in both the capacity of your organization, as well as local and regional capacity. Please describe the overall health of your organization including areas in need of assistance. SNC is interested in the strength and involvement of your board, significant changes to your staff, size and involvement of membership. In addition, describe how your project improved capabilities of partners, or the larger community.

**Our association is currently experiencing lean financial times. The economy (visitor spending) and the heavy snowfall last winter has made our cash position tighter than we would like. We are currently developing new revenue sources for the future, but in the interim, support for our own programs and park service natural resource protection projects will be less than in the recent past. The availability of small grants from SNC (under \$10,000) for natural resource and education programs would be a huge help. Also, please keep sending us your list of other grant funding. We have not found any that were a match for our needs, but with an increased need for outside help, we are hopeful this will be of benefit to us.**

**7. Challenges**

Did the project face internal or external challenges? How were they addressed? Describe each challenge and any actions that you took to address it. Was there something that SNC did or could have done to assist you? Did you have to change any of your key objectives in response to conditions “on the ground”?

**Other than the temporary freeze on funding our biggest challenge was not incorporating administrative costs of managing the project and the grant into our costs.**

**8. Photographs**

Grantees are strongly encouraged to submit photos, slides or digital images whenever possible. These images will be used for SNC publications such as annual reports or on the website. Please make sure you clearly identify location, activity, and your project with each submitted image. Images will be credited to the submitting organization, unless specified otherwise.

**We have previously provided photos and a video. We can send more upon request.**

**9. Post Grant Plans**

What are the post-grant plans for the project if it does not conclude with the grant? Include a description of the following (if applicable): (1) Changes in operations or scope; (2) Replication or use of findings; (3) Names of other organizations you expect to involve; (4) Plans to support the project financially, and; (5) Communication plans?

**10. Post Grant Contact**

Who can be contacted a few years from now to follow up on the project? Please provide name and contact information.

**Mark Tilchen [mark\\_tilchen@sequoiahistory.org](mailto:mark_tilchen@sequoiahistory.org) 559-565-3759**

**SNC-approved Performance Measures:** (Please list each Performance Measure for your Project, as identified in your Grant Agreement, and the results/outcomes.)

1. Quality of educational program for park visitors: We have provided a reliable power source, eliminated all noise pollution from previous generator, and eliminated air pollution in the visitor parking area and on the trail previously present from the old generator. Signs and tour guides provide information on the project to further educate visitors on the project and its affect on watershed protection.
2. Protect cave species: We eliminated a significant source of air polluting in the watershed. Non-native plant growth inside the cave can be detrimental to delicate cave species. According to Joel Despain, National Park Service Cave specialist, Plant growth within the cave is way down. At a few sites (with soil) there are no plants at all now where a few years ago there dozens of small grasses and mosses. On the walls with algae, the plants are greatly reduced but still there remain a few small areas of green. But they are fewer and smaller by far.
3. Air quality: Before this project we burned an estimated 3000 gallons of propane each summer. In 2010, 2011, and anticipated in 2012, we burned almost no propane.
4. Other environmental aspects: over the last few years about 300 tons of old concrete were removed from the cave, a mistake made when the cave was first develop in the 1940's. This concrete was to be removed to a garbage dump in the Tulare County. About half of the rubble has been utilized as part of the solar array hold-down system. The remaining rubble is being held for potential other uses in the parks, such as road construction fill.
- 5.

## Sierra Nevada Conservancy Grant Program Project Reporting Guidelines

Progress Reports are required periodically throughout the term of the Grant Agreement (Refer to Exhibit B of the Grant Agreement). These reports will allow you and the Sierra Nevada Conservancy (SNC) to see the degree to which the project is on track and achieving your projected outcomes. Your Progress Reports will further provide the SNC with information that will help us to explain your work to the Board Members and various other audiences. Timing of Progress Reports is specified in the Project Schedule included in Exhibit A of the Grant Agreement, but generally every 6 months until completion of the project.

A Progress Reporting Form is provided to Grantees on the SNC Website. **Six-month Progress Reports** should reflect the previous 6-month period; **Final Reports** should address each question for the entire grant period – looking at the project as a whole.

The form specifies the items you will need to report on. For the Six-Month Interim Report these include, but are not limited to: *A Progress Report Summary of work completed, Deliverables or Outcomes Completed, Challenges or Opportunities Encountered, Unanticipated Successes Achieved, Actual Costs compared to Budgeted Costs, Any Additional Relevant Materials Produced, and Next Steps.*

The Final Report will include additional information, such as: *Resources Leveraged, Capacity-Building Results and Collaboration and Cooperation with Stakeholders, a Description of Project Accomplishments, and SNC Approved Performance Measures.*

Please make sure that you submit complete reports by the dates requested in your Grant Agreement.