Research and Education Activities

Roadside Heritage® (RH) is designed to capture the interest of scenic byway travelers and rural communities by revealing the wealth of science, technology, engineering, and mathematics (STEM) content inherent in rural landscapes, interpreted through the project’s deliverables of audio stories, community festival kits of tabletop exhibits, youth enrichment classes, and an interactive website. While creating this unique opportunity for travelers, RH also extends its benefits to a rural population that is underserved by informal science education. In particular, youth and other residents from the byway communities contribute to the project as they play a central role in the interpretation of the region’s contributions to scientific achievement.

This report constitutes the final report (2007-2010) on the activities, findings, and achievements of the RH program and collaborators: the University of Nevada, Reno’s Academy for the Environment (UNAE) and Raggio Research Center for STEM Education (RRC), Eastern Sierra Institute for Collaborative Education (ESICE), and the Lawrence Hall of Science (LHS) at the University of California, Berkeley.

Third year RH objectives included the finalization of four audio episodes to complete the 13-episode audio program that explores the Eastern Sierra environment, showcasing its extreme characteristics and the adaptations these characteristics have fostered. Along with achieving the production of the multi-platform audio program and CD, youth enrichment classes were conducted in three communities, a STEM-rich interactive website—roadsideheritage.org--was completed and the portable hands on science festival kit underwent final testing and production.

Further RH objectives attained in year 3 encompassed the inclusion of Native American perspectives into the audio deliverables, the planning and dissemination of RH products in collaboration with tourism organizations, dissemination of the RH program model, and completion of the RH Best Practices Handbook, Business Plan, and summative evaluation.
In the third year, RH collaborators undertook the following activities to meet these objectives:

**Engagement of Community Advisory Committee**

As an essential stakeholder group, vital to the goal of engaging local rural communities, the RH Community Advisory Committee participated actively through all three years of the program. The purposes and duties of the Advisory Committee were to discuss and make recommendations to the RH collaborators regarding audio program scripts and the portrayal of local history.

The Advisory Committee was convened by telephone on an as-needed basis to review the development and scripts for the final four audio episodes. They continued to find new experts for interviews and served as liaisons to the community. Comments on the programs ranged from editorial corrections and questions about the accuracy of information mentioned in the scripts, to feedback about new scriptwriting approaches.

Committee members participated in the Roadside Heritage open house held in April 2010 to celebrate the completion of *Roadside Heritage: Exploring Extreme Environments* and were informally debriefed about their experience as advisors.

**Audio Theme and Subject Selection**

In the third year of the program, the theme of exploring extreme environments was well established and episode subject areas had been selected. Subject refinement and decisions regarding audio story approaches constituted the major activities. The Design Team, which consisted of program implementation staff from LHS, RRC, and ESICE, determined the order of programs. Further details on these activities are described in the Audio Development section of this report.

**Youth Enrichment Program**

The Youth Enrichment Coordinator was responsible for the complete development of this program, and her duties included STEM content subject research,
recruiting docents, students and experts, scheduling interviews, locating and adding pertinent information to the youth workbook and curriculum materials, arranging fieldtrips, managing equipment and recordings, working with youth to create podcasts using Photo Story 3, a free software program designed for podcast and slideshow creation, and preparing questionnaires for youths to complete as pre- and post-class evaluations. Many of these activities intersect with audio program development, necessitating close coordination between these two project elements.

As in year two, the Youth Enrichment Coordinator met with local school site officials and 4H program representatives to: 1) recruit class participants and docent teaching assistants; 2) research potential venues for Year 3 enrichments classes; and 3) establish preliminary class schedules.

Research and refinement activities for curriculum materials continued into the third year. The youth workbook and teacher notebook were expanded with the addition of podcasting templates. Detailed instructions for using Photo Story 3 were also added. A section with new pages for journaling about interviews and field trips were inserted. These changes, along with the streamlining of a few of the older pages, finalized the student workbook and teacher notebook. Both were used successfully in the remaining classes for the project.

Three classes were held in Year 3 of the Program:

1. March 2009: A one-month class, in which youth met two days a week for four weeks, was held in Lone Pine, population of 1,606, with 10 middle school youths recruited from a school with an enrollment of 227. Participants studied desert flora, interviewed five subject experts, and participated in two field trips. The scientists interviewed were a retired university botany professor who specializes in desert plants, a U.S. Forest Service (USFS) botanist, a U.S. Bureau of Land Management (BLM) botanist, a ranger interpreter with desert botany expertise and a local teacher who is a member of the Big Pine Paiute-Shoshone Tribe knowledgeable about ethnobotany. On field trips, the class visited the local native plant botanical garden, Death Valley National Park, and the lower Owens River, a rare desert riparian habitat
and the site of the largest river restoration of its kind undertaken in the United States. Youth created RH podcasts, short multimedia slide show productions using Photo Story 3, to highlight topics of personal interest.

2. May 2009: A two-week class, in which youth met daily and attended 2 weekend field trips, was held in Independence, population of 557, with 10 middle school and high school youths recruited from a school with an enrollment of 40. Participants studied desert fauna, interviewed 6 subject experts and participated in two, weekend field trips. The youths interviewed a wildlife biologist specializing in bat research, a US Geological Survey wildlife biologist, a wildlife rescue veterinarian, a university professor who is a raptor specialist, a U.S. Bureau of Land Management (BLM) wildlife biologist and a California Department of Fish and Game aquatic biologist. Additionally, three Native Americans, representing Eastern Sierra tribal communities, were interviewed to gain their perspective on desert animals and adaptations. On field trips, the class visited a local wildlife rescue program, and a sanctuary for the pupfish, a rare desert endemic desert fish. Youths created podcasts reflecting what they had learned using Photo Story 3.

3. June 2009: A two-week class was also held in Big Pine, population of 1,310, with 6 middle school youths recruited from a school with an enrollment of 100. Participants studied glaciers and archaeology, interviewed seven subject experts and participated in three field trips. The scientists interviewed were a USFS geologist, a graduate student researching glaciers, an earth studies scientist, three BLM archaeologists, and a National Park Service ranger interpreter. On field trips, youth visited a glaciated canyon, a local archaeological site featuring rich heritage through multiple occupations, and Manzanar National Historic Site, one of ten World War II internment centers where people of Japanese ancestry were relocated and site of multiple occupancies by indigenous people and Euro-American settlers. Youth’s Photo Story 3 podcasts were created and uploaded to the RH website.
Over the course of the three-year project, 13 RH Youth Enrichment after-school classes were conducted testing four different class format models. A total of 72 youth and 16 docent/teachers participated, 22 field trips were taken, and 86 people were interviewed, with 51 representing scientists or science subject experts. Thirty-nine student podcasts were created and uploaded to the RH website. STEM subjects covered by the classes and programs included geochemistry, ethnobotany, wildlife biology, population ecology, ichthyology, limnology, avian ecology, and entomology; highway engineering; meteorology; and archeology.

Audio Program Development

Over the past five years, the phased implementation of RH resulted in the production of more than 3.5 hours of audio programs describing the cultural, natural, and scientific history of the Eastern Sierra. Under NSF Award 0638917, approximately 1 hour and 50 minutes of STEM-rich content has been researched, developed and produced.

By the third year, the theme and subject matter for the entire program and the final episodes had been largely defined. The project team focused on narrowing the subjects for the final four episodes, creating an engaging approach, writing and reviewing scripts, and audio production.

The episodes were developed in concert with the organization and implementation of the youth enrichment classes. STEM content research was conducted for each of the subjects, which in the third year spanned glaciology, archeology, botany, and wildlife biology. Project staff determined which of the scientific discoveries and contemporary research taking place in the Eastern Sierra could best be translated into engaging content for the audio episodes. The project team conducted a wide search for Eastern Sierra-related STEM experts involving significant outreach to the community, conferring with local scientists, university field station managers, tribal representatives, and community members with relevant STEM knowledge.
In year three, 21 individual interviews were recorded for four new episodes. Five of these interviews were conducted outside of the after-school classes, in order to include commentary from experts who were unavailable for participation in the youth program due to time and travel constraints.

After these interviews were transcribed and pertinent research was reviewed, the Design Team developed each script through several iterations. Script development was driven by the content of the interviews, so that the most interesting and current information on each topic could be included.

The Design Team, composed of representatives from ESICE, LHS, UNR and Audio Landscapes, was responsible for reviewing story scripts for content, literacy, interest and scientific accuracy. This team determined primary content objectives for each episode, edited scripts, conducted research, and identified experts from the scientific community. In several cases, multiple approaches to episode development were considered and tested by the team.

Use of both male and female narrators, including voice actors to read quotes from people such as Mark Twain, and other aesthetic choices were driven by discussions at Design Team meetings. This input shaped the concept of audio programs as a traveling companion (see findings for further discussion), using cultural contexts as one method to pique and sustain the interest of the general public. Many of the stories use an accessible character (e.g. Mark Twain, John Muir) to increase engagement and provide a bridge to the STEM content.

The scripts were reviewed by the Advisory Committee Members, and the Design Team incorporated those comments. In addition to the Design Team, the scripts were reviewed for scientific accuracy by each of the scientists whose research was incorporated in the episode. After this review process, the scripts were submitted to the audio production company for finalizing, audio mixing and recording of the episodes.
Incorporation of Native American Perspectives

In year three, 18 people from the local indigenous communities were consulted, and four were interviewed. Songs, music, and interview material, featuring local Paiute tribal members, were collected for the audio episodes.

There were limited opportunities to integrate diverse perspectives on nature and science in the audio episodes. However, the project created additional venues to include diverse voices and stories that were recorded. Interviews with Paiute community members on their heritage and observations of the natural world, that had been granted over the life of the project, were used to create audio clips that were embedded in the interactive maps on the RH website under the heading “Native Voices and Extras.” These web-extras are found in the episodes for Obsidian, Alpine Flora, Weather and Climate, Mountain Building, Mineralogy, Alpine Fauna, and Desert Terminal Lakes. A representative link features Gerald Howard, a local (Paiute) resident discussing his heritage in the Eastern Sierra. These elements demonstrate ways in which different cultures observe and perceive the environment, natural processes, and STEM content. The interview segments include information about native plants used for basketry and food stuffs, observation of native animal behavior for hunting purposes, and native irrigation practices used in the Owens Valley.

Through an existing program in neighboring Yosemite National Park, the RH Youth Enrichment Coordinator arranged to accompany Native students from a tribal education program in Bishop to Yosemite Valley, where they enjoyed a rare visit with Native American elder and Yosemite cultural center icon, Julia Parker. Segments of the recording made of Ms. Parker as she spoke to the youth are featured in the Native Voices portion of the RH website: http://roadsideheritage.org/maps/alpineflora.html

As a result of the development of the glaciology program and class, the RH Youth Enrichment Coordinator met two members of the Native American community interested and active in STEM education for Native youth leading to possibilities of future program development with tribal communities.
Docent Program

In the three sets of classes held during the third year, four docents actively participated as teaching assistants in the Youth Enrichment activities. As in Year 2, docents were trained using hands-on STEM activities and assisted the youth in conducting their interviews of scientists and STEM experts. Activities included the use of recording technology, exposure to the STEM content through relevant activities, and supporting class participants in their creation of Student Casts.

Docents were recruited for these enrichment classes through extensive email and phone communication with school site officials, as well as through attendance at school staff meetings to explain the program and invite teachers to participate.

Community Festival Kit

One major project goal and key deliverable was the completion of 11 science festival activity stations that highlight the major STEM features of the Eastern Sierra landscape in an engaging fashion to the general public living in and/or visiting the area. The science festival was created through a rigorous and systematic development process of formative evaluation and prototyping. At the beginning of year one, brainstorming sessions were conducted with over 40 people who had backgrounds in science research, managers of public agencies in the Eastern Sierra, educators, naturalists and community leaders. The notes from these meetings were distilled into a survey that allowed the project team and its Community Advisory Committee to rank proposed educational themes for the festival stations. The results of these surveys were used by the project team as the framework to create a detailed outline for 15 possible activity stations. Extra station ideas were proposed with the realization that some ideas might not be transformed into an effective activity.

The development process was iterative, and initial prototype activities were developed by the team and tested with educator colleagues until a working prototype emerged. The prototypes were then tested with visitors to the LHS science museum,
while evaluators made observations and conducted interviews. This process was repeated several times with modifications of the activities until a reliable activity was created.

Incorporating audience and evaluator feedback, the festival activities were presented at different public venues in the Eastern Sierra in years two and three. Evaluators gathered feedback for each activity to inform the modifications necessary to improve the design and implementation of each activity station. After each prototype had successful trial tests and positive evaluations, the LHS team fabricated the final festival materials.

The development of table-top signage for each station followed the same sequence of prototyping, trial testing and formative evaluations. Graphic artists created a layout rich in graphics, including project branding/logo.

The final version of each activity was packaged in a sturdy and portable crate with packing and set-up instructions created by the project team with input from ESICE docents. Project staff also created instruction manuals that gave information on how to prepare, set up and lead each activity, along with resource information on the science concepts and educational goals for each learning station. Practical information on packaging and restocking were other components of the manual.

The traveling science festival kits were piloted in two additional venues, Inyo Elementary School in Lone Pine and Mammoth Elementary School in Mammoth Lakes. The final pilot test took place at Pine Street School in Bishop, after which the festival kit was delivered to ESICE for future deployment. Docents for these festivals included parents, teachers, retired persons, and high school students. Festival docents were recruited from the existing pool of docents from ESICE and from local schools. Over the three years of the project, approximately 60 docents received training and participated in classes and festivals.
Major Findings

At its inception, RH was conceived as “Roadside Science,” a new venue for engaging travelers in informal science education along scenic highways. As the program developed, a broader vision emerged, in large part due to the collaborative nature of the project. Organizations integral to the establishment of the regional Eastern Sierra Scenic Byway, including heritage tourism and transportation organizations and government agencies, were called upon to be active partners in the project. As this process unfolded, separate sources of funding developed and Roadside Science became a part of Roadside Heritage®, a series of programs exploring the unique natural, cultural and scientific heritage of the Eastern Sierra that has been established as a trademark registered with the U.S. Patent and Trademark Office.

Over a span of more than five years—beginning with the 2005 National Science Foundation (NSF) Planning Grant Award 0520219 Roadside Science: Informal Science Education for the Eastern Sierra Nevada Byways, through the 2010 completion of Roadside Heritage: Informal Science Education in the Eastern Sierra Scenic Byways, Award 0638917—Roadside Heritage has produced these results:

1. Three audio CDs representing 3.5 hours of audio programs (including the award-winning programs, Paiutes, Prospectors and Pioneers) have been produced along with a portable hands-on science exhibit and an interactive STEM-rich website and concomitant deliverables.

2. The dynamic relationship between regional and local partners, along with the integration of tourism sector objectives, has enabled the development of the program in stages. The first two Roadside Heritage audio programs were released in succession, in 2007 and 2008, building brand recognition and momentum for the 2010 release of Roadside Heritage: Exploring Extreme Environments.

3. The technological approach has shifted from brick and mortar, capital intensive approaches (e.g. low-power highway information
radio) to rapidly evolving portable electronic devices, resulting in more cost-effective deployment.

RH activities included an experimental approach to the development of 13 audio episodes, each of which focused on a particular aspect of the STEM content intrinsic to the region. By varying the approaches, the project gained important information about the most effective ways to engage children and families. In addition to increasing the science literacy of the traveling public and rural byway communities, the project aspired to affect increased awareness and valuing of the science legacy of the region by these same audiences.

**Partnerships and the Advisory Committee**

In order to genuinely engage rural communities in the discovery and interpretation of the Eastern Sierra’s natural, cultural, and scientific history, the project team cultivated a broad range of community partnerships. The project created opportunities for members of the community with diverse interests, skills and availability. In particular, the project was committed to developing stories imbued with depth, authenticity, and a sense of local ownership, created with the expertise of local, knowledgeable citizens and cultural heritage assets.

The project team has learned that, in addition to its academic partners, a community-based group is essential to a program such as RH, which has a primary aim of engaging local communities extensively in the discovery and interpretation of the region’s cultural and natural history, and its scientific legacy. Informal associations characterized many of the partnerships that formed around RH. A small sample of the types of roles partners have fulfilled include facilitation of after school youth groups, integration of RH products with tourism initiatives, promotion of RH to local media, establishment of relationships with tribal communities, connection with knowledgeable local citizens for interviews, and identification of scientists conducting research in the region. Without a community-based group such as ESICE, few of these partnerships
could have been established. The strong partnership structure grew from ESICE’s establishment of the Community Advisory Committee (CAC), first established in 2005.

The CAC was formed in response to members of the rural communities. Community members expressed uneasiness with the local scenic byway and the interpretation of local history being put into the hands of organizations perceived as powerful outsiders, disinterested and potentially dismissive of the concerns of rural communities.

Relying on the ESICE reputation and community trust, RH was able to gather the appropriate community stakeholders, which included the founders of the Eastern Sierra Scenic Byway, the Coalition for Unified Recreation in the Eastern Sierra (CURES); Inyo County Local Transportation Commission, Mono County Economic Development Department, Inyo County Coalition of Chambers of Commerce, K-12 Service Learning Educators, the California Department of Transportation, U.S. Bureau of Land Management; Los Angeles Department of Water and Power, Mono Lake Committee, Sierra Club, Eastern California Museum, Inyo County Local Transportation Commission, Inyo and Mono counties University of California Cooperative Extension; and the U.S. Forest Service. Further, ESICE and RH project partners worked collaboratively with this wide range of agencies and institutions to establish programmatic guidelines, learning objectives, and decision making processes that satisfied the concerns of the local community.

The CAC served the entire RH program as a bellwether for alerting the team to subject areas that the local community considered inappropriate. Early on, the RH team stressed that the program’s focus would be on “what is right about our community,” an approach developed by RH National Advisory Panel member Dr. William Kelley, also an advisor to the National Scenic Byway program. This “what’s right” approach satisfied a key member of the transportation commission and led him to seek a role on the advisory committee.

Establishing this approach proved extremely helpful when one of the RH partners was interviewed on a National Public Radio program in Reno. The NPR
interviewer wanted to know if the program would revisit the region’s centuries old dispute over water export to the City of Los Angeles. Stating that the focus would remain on “what is right” about the Eastern Sierra communities kept the interview on track and allowed RH to keep its promise to the rural constituency.

Participation in the CAC was enthusiastic in the beginning, even as some doubts and misgivings about outside interests lingered. CAC members met several times with representatives of the universities and steadily developed confidence in the program.

In the first year the CAC was highly active, and logistical considerations needed to be addressed for the committee to function smoothly. Members were dispersed over distances of more than 100 miles, many living at a distance from larger byway communities and without broadband Internet access. Communications were cumbersome at best.

In order to facilitate the CAC script review, a primary function of the group, a system for posting programs to a password protected area on the RH website was established. Technology support was provided, e.g. video and telephone conferencing. To address the cost of travel for members, the project recorded and posted audio files of CAC meetings so that those unable to attend had the ability to hear the discussion.

Some committee members reliably and productively participated in script reviews as they were posted, while others contributed comments on scripts that were important to them in some way. For example, one committee member became much more actively involved as the script for Desert Fauna was reviewed, most likely because she was invited to be interviewed by the youth enrichment class for this episode. The CAC also provided feedback for different approaches to audio program episodes, from the use of male and female narrators and character voices to an experiment in a documentary style episode.

By the end of the second year it was apparent that bi-monthly meetings had become excessive. The CAC maintained its vital role in identifying interviewees, reviewing scripts and keeping RH partners aware of community activities throughout
the project. As the RH planning entered its last year, CAC meetings proceeded on an as needed basis.

CAC members were important to the project as ambassadors of RH, keeping other community members aware of and interested in the program. These stakeholders not only expanded the breadth of local community involvement in the program, they also opened doors to undiscovered resources—often in the form of introductions to local experts, all of which added authenticity to the program.

Whether their interests reflected business and tourism promotion, equitable representation of local culture, preservation of fragile environments, or fell under the mission of the governmental agency they served, RH Community Advisory Committee members were valuable contributors to the RH program.

**Audio Program Theme and Subject Selection**

One of CAC’s valuable contributions was participating in the initial selection of potential themes and subjects for inclusion in the STEM audio programs. In addition to the CAC, a diverse set of community members and organizations participated in this well-attended brainstorming session. Representatives from the RH university partners also attended the session, and were welcomed by the local citizens.

A subcommittee of the project team was charged with sifting through the suggestions to select a coherent overarching theme and 13 subjects for the audio episodes and out of school classes. Because audio stories were key deliverables, the theme and subjects needed to relate to and make the most of the visual travel experience and the essential quality of the region. The team devised the idea of a “traveling companion” approach to informing the motorists, as if a botanist, a geologist, and other specialists were riding along with the family, pointing out interesting facts about the landscape.

The subjects suggested causal mechanisms as a main theme, i.e., the extremely steep topography of the region, something strikingly visible and identifiable from any point along the 220-mile byway. The theme could then be expanded into subject areas
addressing how this topography came to be and how life adapted to these extreme environments. The project debated whether the subject should be related to something that could be seen from the highway or correlated to particular points of interest (POI) along the byway. The audio production company provided guidance in the matter, stating that POIs were spaced too far apart to work well with the conventional waypoint audio tour format. The project team adjusted to this format by choosing topics that related broadly to the landscape. One example is the tree line, above which trees will not grow, which can be seen along the byway. By discussing alpine flora and presenting facts about the response of vegetation to harsh conditions above tree line, the listener can be informed without stopping or taking a side trip, or be inspired to return and spend more time learning about the theme, *Exploring Extreme Environments*.

The project team learned that for most people the term “audio tour” evokes the concept of a waypoint tour. Therefore, the project CDs explicitly state that this tour does not direct motorists to stop at a given point but rather it serves as a traveling companion, enriching the experience of the visitor to the region as s/he drives through.

The selected subjects (alpine and desert flora and fauna, geology, volcanology, climatology, glaciology, archeology, mineralogy, and limnology) allowed flexibility in searching for experts to interview, but were so broad that they created difficulties in focusing content. Upon advice of the audio production company, a useful overarching decision was made: The episodes would not attempt to give extensive general information about the subject, but rather the intent was to give a broad brush overview of the topic and then select a few narrowly defined details to intrigue the listener, inspiring them to seek more information on the website and at the visitor locations.

**Audio Production**

There were diverse partners in the audio production, which presented coordination challenges. Roadside Heritage carried out a strategic experiment that engaged rural youth, community docents, and program partners in the interpretation and communication of the region’s scientific heritage in audio stories. The project
learned that this approach is not the most economical or sophisticated method for creating audio programs. It likely would have been easier for a small project team to independently make decisions, interview experts, write scripts and produce a professional audio program and website without engaging the multiple community partners.

However, community participation and partnership in the project were guiding principles for RH, and that approach opened doors and enriched the final products. Whether it was a researcher who took time out of a busy day or a member of the Native American community who had children or grandchildren participating in the program, the results of this project’s welcoming and diverse community participation were positive. In general, when project staff mentioned youth involvement and support from the National Science Foundation, the science community responded with access, cooperation, and fruitful interactions.

The RH program design commingled the audio production elements with the Youth Enrichment program for the duration of the project, requiring a high degree of coordination between these two project elements. Logistical considerations drove decisions. For example, the project planned and implemented interviews with local experts and scientists to ensure intimate familiarity with the region while minimizing time and travel demands for those scientists who would be interviewed by youth at the after-school program site.

The ESICE project staff led both Youth and Audio production program elements, coordinating and integrating these activities.

*Episode Primary Source Material and Research*

While the project team began by researching episode content on the Internet, the team recognized that all web sources and references must be vetted. Rigorous review and fact checking through many sources – journals, books, and researchers -- ensured accuracy of information.
**Interviews**

A goal of the project was to be inclusive in the selection of scientists, researchers, and other experts. Authenticity of the audio programs was considered key to achieving our desired outcomes. While expert in their scientific discipline and field of study, researchers may not necessarily be comfortable being interviewed and recorded nor able to speak to a public audience, while the groundskeeper at the local museum, who has pored over its history, can be a lively and compelling speaker. Generally, persons actively involved in educating others about the region— from national park interpreters to lecturers to mountain guides—can often convey natural history information to both youth and to the general public in a way that is easily understood and captures their imagination.

Supplemental interviews outside the after-school classes continued to be necessary to enrich the content, script development and program production. These local interviews were conducted at locations separate from the classes. The audio production company conducted a few interviews with researchers in Oregon. LHS staff was able to conduct interviews with scientists in the San Francisco Bay Area and at the UC Berkeley campus. Similarly, the UNR project team members were able to conduct interviews on the UNR campus. On occasion, the project contracted with a professional recording studio to interview experts at a distance, obtaining a high quality audio recording.

The project team also briefly considered recording interviews over the telephone, a common practice in radio. However, the team determined that the poor sound quality would detract from the final product.

**Scriptwriting**

The RH Youth Enrichment Coordinator was one of the most effective script writers. In preparing for youth enrichment classes, the Coordinator conducted extensive research, contacted science and community experts and was present at nearly all of the interviews. Through this process, she reviewed all the material available and drafted a cohesive outline and script for each episode.
The project’s Design Team was an effective forum for discussing key decisions, meeting challenges with solutions, and proactively developing new resources. The team was scheduled to meet each week and was an ongoing and essential mechanism for decision making and tracking progress.

**Script Development**
Distilling the program theme and episode topics into a set of seven- or eight-minute audio programs presented a formidable challenge for script writing. For example, in formulating a script for Alpine Flora, the generalities of the subject, such as defining “alpine”, must be covered before specifics could be introduced. The script must introduce the subject and draw the listener in, talk about the subject, introduce the sound bites, and present a satisfying conclusion – all in fewer than 1500 words.

The breadth and depth of the project’s interviews provided a rich pool to draw from as script writing proceeded. Program content was influenced greatly by the individuals willing and available to be interviewed. Consequently, the script was driven by interview content. Teaching and employing effective interview skills were critical. Interviewers had to be prepared in advance, with background on the scientist’s expertise and the subject of the interview. Effective questioning strategies elicited engaging and useful information and sound bites for the script.

**Approach**
The audio tour production consultant suggested that each episode be approximately seven minutes in length. This was based on their research and experience with listeners’ attention span. However, the first RH program was over 12 minutes long. Although the project’s evaluation team played the episode for visitors and concluded that the length was not a problem, informal comments from listeners persisted that the program was too long and extremely dense. Therefore, subsequent programs were shorter. Negotiating these time constraints while including necessary basic background information on chosen subjects was difficult, and much of the compelling information collected could not be included. The design team continued to struggle with time constraints and subject coverage in a way that would satisfy the need to introduce the
public to the basics of the topic, yet expose them to the cutting edge research and intrinsic scientific value. A solution for including more of the compelling interviews was to post this information on the website, a process which will continue beyond the conclusion of the NSF project.

As the RH programs are based more on an audio book model, listeners need to be reminded that programs were intended to be experienced as a “traveling companion," e.g. on the CD cover. Efforts to include more interview segments and to guide story development through cultural and historical characters were well received.

**Script Review**

Initially, the project team planned to provide the research and interviews to the audio production company so they could generate the script. It soon became apparent that their lack of familiarity with the region and the science content resulted in scripts that lacked authenticity, intimate knowledge of the region and rigorous scientific accuracy. The team determined that local residents (e.g. the Youth Enrichment Coordinator) were more effective in drafting scripts, and subsequently inviting review. The scripts were polished and finalized by Audio Landscapes, the audio engineering and audio tour producers that collaborated on the program.

Each person on the Design Team brought diverse and critical contributions to the program. While the audio tour production consultant did not have science expertise, she brought knowledge and skills in presenting information in entertaining ways. Her “everyman” perspective and skill in writing to the public audience were essential to RH. Collaborators from LHS and UNR contributed to the scientific accuracy and ESICE collaborators provided the necessary local character.

**Youth Enrichment Program**

**Establishing Classes**

Although RH is an informal science education program, linkage with formal education is advantageous and essential for the project’s reach in smaller rural towns. Local school site officials and 4H program representatives were critical for recruiting
class participants and docent teaching assistants, identifying venues for enrichments classes, and establishing class schedules at optimal times. Regular communication with schools and teacher/docents enabled classes to proceed efficiently.

**Recruitment**
As RH became more widely recognized, the program increased in popularity, resulting in stronger student recruitment. Several youths joined classes through word of mouth recommendation.

**Class Design**
The project compiled and refined curriculum and materials through the life of the project, building on the experiences of the previous classes. The youth enrichment program served as a youth-developed oral history project, and the participants viewed similar projects on oral history websites, such as Vermont Folk Life and the Oral History Association. Youth Radio websites and links were also useful resources.

Altogether the youth enrichment program contributed to the development of the audio stories through 13 classes, of 8 sessions each. Seventy-two youth of ages 10 to 14, and from towns as small as 400 in population, were engaged in the enrichment activities. These youth gained expertise/experience in interview techniques, multimedia skills—including videotaping, audio recording, and editing.

The enrichment program included many successful and content-rich field trips with frequent hands-on real world experiences. Some of the most successful trips were visits with park rangers in the field, as ranger interpreters are more comfortable talking to large groups and school age youth. On one memorable field trip to an archeological site, students tried grinding seeds on a mortar or “metate” rocks. As one young participant toiled, she chose to reveal her Native American heritage and culture to the class. Although allowing adequate time for formal review and reflection was difficult to fit into the time allotted for class, the class participants often reflected informally about what they were learning and what they wanted to learn.

The location of the various enrichment programs often determined the structure of the out-of-school program that worked best. Constraints on participants’ schedules
also affected program timetables. The project found that a daily, two-week class seems to work best for youth, as class activities and their projects are fresh in their minds. A month-long, twice a week class schedule also works well. Scheduling summer classes for the first couple of weeks after the regular school session ends appeared to provide the best attendance. The two classes held as weekend workshop-style classes were successful in attendance and participation. However, they proceeded at an accelerated pace and allowed insufficient time for quality reflection and media production.

Student Cast Production
The project team learned that Student Cast production was a highlight of the class curriculum, giving the youth participants a sense of accomplishment and genuine involvement.

To help youth participants to conceptualize what their Student Casts might be, the team shared examples of other youths’ work. The youth explored the project’s chosen template for producing podcasts, Microsoft’s Photo Story 3 program on the first day of classes to pique interest and contributed to ease of program use as the class progressed.

Student Casts were also a mechanism for ESICE staff to evaluate the youth participant experience. Choosing digital photos and interview segments to construct their Photo Story Student Casts gave participants a chance to reflect on and to review what they had learned and experienced during the enrichment program.

Computer access and software issues varied from site to site. Often there were unique circumstances that required different approaches.

Value of Youth Enrichment Program
RH assumed the challenge of involving youth to create a STEM-rich audio program, website, and festival. As indicated by the high level of engagement by class participants, both in their use of equipment, interaction with scientists and final Student Cast projects, the project team concludes that their involvement significantly enriched these young peoples’ lives while also enriching the experience of travelers.
The inclusion of youth made the program much more attractive to such diverse groups as potential funders, government agencies, and Paiute elders. For local people who wished to pass on a sense of the place they live, the involvement of youth had great appeal. This appeal also spoke to scientists interested in inspiring youth to consider careers in STEM fields.

Youths participating in the program continued to enjoy and gain proficiency in all aspects of audio and video recording; many found their voice and gained poise as interviewers and in producing their Student Casts.

Instructions and suggestions for conducting a Youth Enrichment Program have been documented in the *RH Handbook of Best Practices*.

**Native American Perspectives**

RH project members learned that relationships are key to achieving the project’s goals and objectives in representing diverse perspectives.

Prior to RH implementation, at the very early stages of program design, ESICE had learned it was important to invite multiple Native American project partners to take an active role. Projects seeking to engage Native American communities, must deal with issues of intellectual property rights, in particular addressing ownership of deliverables that might be construed as belonging exclusively to an award recipient. Whereas RH developed talent releases for all youth and persons interviewed, releases for Native American interviews needed careful and collaborative construction. The Oral History Association has examples on its website of several appropriate releases that address intellectual property issues. One of the key considerations is whether the release stipulates in what context the interviews can be used. Another issue is whether the deliverables will be available for sale. For this project, ESICE staff worked with Native American partners to develop an agreement stipulating that any funds generated from the sale of CDs would be re-invested in the RH program, thereby enhancing sustainability of the program.

The project also learned that in some cases, hiring (or otherwise paying) a Native American person to work on a program was understood as paying the individual for
her/his time and should not be construed as paying for rights to the information. In seeking advice from Dr. Darla Garey-Sage, Professor of Anthropology, Truckee Meadows Community College, to resolve the intellectual property rights dispute, it was recommended by Dr. Garey-Sage that interview material be confined to information that has already been widely published and shared with the general public.

ESICE staff found that personal acquaintance with individuals from Native American community or individuals working for tribal communities were the most promising places to begin constructing relationships.

The RH project team learned that numerous other principal investigators and cross cultural program staff had similar goals, objectives and difficulties. Project team members met with like-minded project directors at the NSF ISE Summit in 2008 and the Cosmic Serpent conference (NSF Grant DRL-0714631 & DRL 714629). The project team also learned that developing sensitivity for other cultural constructs can help ISE teams anticipate issues and avoid unintentionally antagonizing cross cultural partners. The corollary to this finding is that members of the dominant culture must accept that they will need to take risks and potentially make cultural blunders if they are to make meaningful progress in this realm. The RH project learned the following as a result of its work with the Native American community: 1) Avoid the mindset that Native Americans are human artifacts, with only historical relevance. Relegating Native American culture to the past denies that the cultures have adapted. They not only persist but also are viable and relevant in the 21st Century, and 2) do not assume there is a “Native American community.” These are multiple, complex communities. If at all possible, it would be advantageous for implementation team partners to sit in on training for teachers designed to improve their skills in communicating and working effectively with culturally diverse students and their families that is required schools receiving federal Title I LEA Grants.

RH learned that the cultural constructs of the dominant culture paradigms cannot be superimposed on non-dominant groups without becoming problematic. As an example, RH partners built a program design that imposed dominant cultural timelines
and deliverables. Team members learned that attempting to have a Native American elder speak about a certain subject using these timelines and expectations was generally unsuccessful. It was not that information was withheld; it was that the information provided was on a different topic or shared when the individual felt it was right and did not necessarily conform to a project timeline. In an effort to adapt to this situation, we included Native American perspectives in the audio program content as the opportunity presented itself. Other Native American audio content was developed into “Native Voices” on the RH website.

Working within the context of Tribal Education Centers was a positive step toward building relationships. In this setting, individuals or programs from the non-dominant culture with similar educational aims can begin to work with projects like RH to understand their objectives.

Finally, the project learned that inclusive program evaluation takes into consideration the perspectives of non-dominant communities regarding the success measures of program outcomes.

*Docent Program*

Volunteer docents served the project in two significant and valuable ways: as teaching assistants for the Youth Enrichment Classes and as facilitators for the Science Festival. Adult docents represented local community members who both contributed to and benefited from the activities of this program. It is interesting to note that there were not any docents that “crossed over” and helped out with both classes and festivals. This reflects a trend in volunteerism for individuals to prefer volunteering for one discrete event rather than for an ongoing program.

It was crucial to have a teacher/docent that was presently working at the school site where the youth enrichment class was held. This facilitated student recruitment, classroom and computer use, and communication with school, students, and parents. Recruiting for docents was best accomplished through school visits, attending staff meetings, offering a stipend, and word of mouth recommendation. Advance planning and organization was crucial. The teachers who became docents were language arts and
self-contained classroom teachers. No science teachers were successfully recruited as classroom docents.

For the Science Festivals, ESICE staff members were able to recruit from their cadre of docents already in place for an existing science education program. These energetic men and women provided an enthusiastic interface with the public as they assisted in the hands-on activities of the festival. Their previous experience with informal science education helped to improve on festival exhibits and make the festival experiences successful. Docents were offered a stipend for program time.

*Investigation of Emerging Dissemination Technologies*

Rural undeveloped and underdeveloped landscapes with rugged terrain provide challenging environments for the deployment of many forms of information and communication technologies (ICT). The most basic of 21st Century communications, cellular telephone connectivity, does not function reliably, if at all, along most of the Highway 395 corridor through the Eastern Sierra. Considering the wide recognition that education, knowledge, information and communication are fundamental to human progress and well-being, the situation speaks to a technology equity issue. While progress is being made, people living in outlying areas of the Eastern Sierra still rely on systems as “primitive” as dial-up Internet connectivity. For these reasons, we believe it is accurate to say that rural communities are underserved not only in access to technology (that urban communities take for granted), but also in access to informal science education. With the rapid advance of ICT as a tool for informal education, the relationship between technology and ISE equity issues is worth examining.

It is with the caveat that technology is not universally deployable that ESICE has committed to pursuing opportunities to build larger regional and national audience awareness of our products and new approaches to distributing the RH programs. While providing on-demand information to the traveler while they are en route is hindered by topography, urban vacationers have the opportunity to pre-load information prior to travel. “Point of interest” style of tours activated by reaching designated GPS
coordinates are promising for RH and will be pursued due to the opportunity and are described in the RH Business Plan.

The development of download stations has been postponed due to the existence of multiple types of mobile devices with proprietary software for downloads and concerns about the possibility of inadvertently erasing audio files on the mobile device.

Next steps include directly approaching US-based ICT companies with strategic partnership opportunities to both utilize the existing Roadside Heritage Program products and to underwrite the creation of new products. Subsequent steps will include an approach letter and submittal of product samples, followed-up by phone calls to decision makers within the company.

Other forms of technology that have been in existence for some time have been upgraded and offer new opportunities. Digital photo frames now commonly come with wireless Internet connectivity and will play audio and video files in addition to still photography slide shows. ESICE is working with its tourism sector partners to test disseminating audio programming via digital photo frames in places such as Bed and Breakfast accommodations. In addition, tourism and public sector partners have encouraged ESICE to develop DVDs that could be played on tour buses similar to the current use of RH audio programs by shuttle service operators in the Mammoth Lakes area.

*Adult Education Seminars*

We have found that the economic climate has generated a good deal of uncertainty about the viability of adult education programs. As described in the docent program findings, hands on learning for adult RH participants has proven to be a more authentic and relevant way for adults to get involved with the program. This approach reduces the extent of the time commitment the adult participants must make and is a less labor intensive and a more cost-effective way of training the docents. We found that the adult participants at recording sessions readily engage scientists with questions of their own and enjoy having an opportunity to join in the interview process. Providing
these authentic experiences for both adults and youth sustained their interest and enthusiasm.

**Training and Development**

K-12 teachers, working as docents, and county office of education personnel, have had the opportunity to develop digital audio and video recording skills and acquire experience with Photo Story 3. In addition, K-12 teachers have used RH programs to demonstrate original research with their students in formal education settings.

The youth enrichment classes have also created the opportunity for technology specialists with the county offices of education to develop additional skills in audio and video recording and, in particular, editing.

The particular emphasis on high quality audio has created the opportunity to introduce software that provides high quality audio production. In addition to local K-12 teachers, the Riverside, Inyo, Mono, San Bernardino region (RIMS) California Technology Assistance Project Coordinator is working with ESICE and LHS web developers to provide access to the RH website as a resource for California public school students.

**Handbook**

Documenting RH best practices has offered another way of capturing and sharing very specific and detailed information about the implementing the program. Producing the guide has served as an opportunity to reflect on RH challenges and accomplishments. RH believes that the guide will be useful as a springboard for new programs. However, each group developing a program will have to adapt the lessons learned to fit its unique situation. Distribution of the guide offers another opportunity to reach out to new professional audiences or reconnect with individuals we interacted with over the last five years.

RH finds that there is a wide range of applications—from intergenerational oral history projects in indigenous communities to heritage tourism groups to school-based activities. The Handbook is presented with the hope that it will be a tool for on-going
dialogue with others who find new and innovative ways of adapting the RH approach to Informal Science Education (ISE).

**Traveling Festival Kits**

The creation of a hands-on science festival centered around and reinforcing the themes addressed in the audio programs allowed the RH project to further expand its impact due to the wide diversity of the audience at the festival’s projected venues. Meant to provide a stimulating experience for the whole family, some festival stations draw a crowd, and some are very quiet. The festival needs to be well publicized prior to the event to insure good attendance. The connection between the festival and the audio programs was not always emphasized.

The project determined the following elements of effective festival activities:

- **Reading level**: Each activity was developed at a 6th grade reading level to accommodate a wide range of audience engagement. As most visitors to the festival were in family or school groups (as opposed to individuals), there was a reader in nearly all visiting groups.

- **Volunteer facilitation**: Using a docent or volunteer was valuable in engaging the audience. When a volunteer was present at each activity station, her/his participation led to the following successful outcomes:
  - Visitors were more attracted to the activity.
  - Visitors were more engaged, especially the younger ages.
  - Stations were easier to manage, since volunteers reset and restocked materials between visitors.

- **Local information, regional relevance**: The themes of the activities were drawn from local science phenomena, which were highly valued by the audience. This content integrated with that of the other deliverables of the project (audio stories, website, youth classes) in meeting the needs of the regional audience. While the content of each activity station is related to the content of all the other activity stations, each station
functions effectively as a standalone experience. Such modularity facilitates using the stations’ flexibility in rural community venues where physical space and the number of available volunteers may be limited.

Activity portability: Each activity station was designed to fit inside one or two standard sized storage containers. This allowed for easy transport and storage by one or two facilitators.

Station signage: Clearly written, attractive signage is important to better visitor understanding, and durability and ease of use are critical to tabletop sign design.” The festival team experimented with different tabletop signage materials and sizes. A flexible acrylic sleeve was chosen because of its durability and ease of packing.

Sign Graphics: The team selected a standard size of 17 inches wide by 11 inches tall, enabling a more readable larger type size and space for graphics that facilitated audience engagement. Minimizing the amount of text was key—a sign with more than three sentences was less likely to be read by a visitor, based on observations by formative evaluators.

Activity length: Following formative evaluation feedback, most activities were designed to be completed in 5 minutes to facilitate active flow with a larger number of visitors and to keep engagement levels high.

Engagement: Each activity was designed for active participation through the use of hand held materials and artifacts. An engaging question or challenge was the first instruction on each sign.

Large audience accommodation and dwell time: With adequate volunteer or docent staffing levels, up to 90 participants were accommodated simultaneously and kept fully engaged.

Sustainability: Docents and rural project partners were surveyed for ways to make this festival sustainable. Key feedback included keeping consumables to a minimum and using low cost and readily obtainable materials.

The festival provides an effective supplement and reinforcement to the content in the audio programs produced by RH. The festival can now be included as a part of
the variety of public events that draws tourists to the Eastern Sierra, and introduces non-traditional participants to ISE activities.

Organizing the manpower to put on the festival is also labor and cost intensive. As a result of this project, ESICE now has a pool of trained docents, ensuring a high quality experience for the public. At some events, particularly at local public schools, a mix of docents and volunteer teacher or parents works well. As described in the Business Plan, another way to sustain the festival may be to seek corporate or private sponsorship to cover costs associated with event fees, transportation, docents and consumables.

Although an adult education seminar was originally planned as part of RH, the local county-supported adult program closed as the project began. As a result, docent training for both the Youth Enrichment Program and the Science Festivals took place on site for both festivals and youth classes. The youth enrichment docent/teachers successfully learned technology and content alongside the youth participants. Festival docents were briefed on the same day as the festival was to be held.

Docents gave positive feedback to formative evaluators, remarking on their personal learning as well as that of the participating youth.

One of the primary reasons the project included a docent program was to engage community members in the program and provide informal science opportunities for them. Judging by the familiar refrain, “I’ve lived here 25 years and I didn’t know this stuff,” the project learned RH has increased awareness of STEM content in the Eastern Sierra environment. Future learning opportunities for ESICE docents may include a field trip that enriches and deepens their knowledge of topics in the festivals.
WestEd Evaluation of the Traveling Festival Kits

RH sponsored a Science Festival at Pine Street School in Bishop the evening of March 10, 2010 from 5:30 p.m. to 7:30 p.m. Children from grades kindergarten through grade 5 attend the school, which has a total enrollment of about 800 students. The Festival was held the same evening the school held an event for families in the school’s bilingual education program allowing families the opportunity to participate in both events. The Festival was held in the school’s large multi-purpose gymnasium/cafeteria. Ten tables were set up in a circle around the sides of one-half of the room. The eleventh station was placed inside the circle, about one-third of the way toward the center because it did not fit in the circle perimeter with the other stations. The Festival was designed with the intent that visitors would stop at each station.

Attendance and Engagement

The strategy of holding both events the same evening was a plus for the Festival and resulted in a good turnout with people coming and going throughout the two-hour event. We tallied the number of people at each station every 15 minutes beginning at 5:40 p.m., noting their level of engagement as well as their emotion. Two WestEd evaluators conducted the observations with one person observing stations one through six during the first hour while the second person covered stations seven through 11. After the first hour, the evaluators switched which stations they were observing. This way, our observations were not biased because the same person made every observation at each station. At the busiest point of the Festival, 6:10 p.m., 82 people were distributed among the 11 stations. Otherwise, we counted between 43 and 67 people at the stations when we made our observations except at 7:25 p.m., just before the end of the Festival, when 28 people were working with activities.

We tallied the total number of people at a station across our eight observation periods and computed the mean level of engagement that we observed. The totals
presented in Exhibit 1 represent counts of what was occurring at eight very short points in time during a two-hour period. The reader should not infer the counts represent the total number of people who visited a station. The counts are just the sum of eight brief snapshots of what was occurring during the Science Festival.

The results in Exhibit 4 show that Desert Leaves and Mountain Driving were the two most well-attended stations at our observation points, with about a total of 60 people observed at each station. We counted a total of between 40 and 50 people at the stations for Archeology, Mountain Building, What Lives in a Stream, and Mono Lake. The remaining stations tallied between 20 and 30 total observed visitors during the observation period. We totaled the fewest people at the station on Sage Brush. This low tally was likely because there was only room for 10 stations in the main circle of stations. Sagebrush was located inside the circle. Its low tally suggests that many people did not realize the station was there.

**Exhibit 4: Number of Observed Visitors and Level of Engagement**

<table>
<thead>
<tr>
<th>Station</th>
<th>Total Number of Visitors Observed</th>
<th>Mean Level of Engagement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mountain Driving</td>
<td>59</td>
<td>3.9</td>
</tr>
<tr>
<td>Desert Leaves</td>
<td>62</td>
<td>3.8</td>
</tr>
<tr>
<td>Archeology</td>
<td>47</td>
<td>3.8</td>
</tr>
<tr>
<td>Rock &amp; Minerals</td>
<td>24</td>
<td>3.6</td>
</tr>
<tr>
<td>Mountain Building</td>
<td>42</td>
<td>3.5</td>
</tr>
<tr>
<td>Mono Lake</td>
<td>40</td>
<td>3.5</td>
</tr>
<tr>
<td>Animal Adaptations</td>
<td>28</td>
<td>3.5</td>
</tr>
<tr>
<td>Sage Brush</td>
<td>20</td>
<td>3.4</td>
</tr>
<tr>
<td>Mountain Climate</td>
<td>25</td>
<td>3.4</td>
</tr>
<tr>
<td>What Lives in a Stream?</td>
<td>47</td>
<td>3.4</td>
</tr>
<tr>
<td>Tree Rings</td>
<td>25</td>
<td>3.3</td>
</tr>
</tbody>
</table>
We rated how engaged people were when we observed them at each station. We assigned one rating to each station during each observation period using the following four-point scale with one equal to low engagement:

- **Low.** Visitor makes cursory stop with minimal engagement with activities (e.g. sitting down, talking with facilitator &/or quickly touch manipulatives).

- **Moderate, low.** Visitor engages with facilitator or focuses on activities, but with low interest (e.g. tries the activity, but may not complete).

- **Moderate, high.** Visitor engages with facilitator or activity, but with medium interest (e.g. "goes through the motion" to do activity, but does not take further).

- **High.** Visitor fully engaged with facilitator &/or activities (e.g. demonstrates prolonged engagement with the activity, appearance of directed focus or discussion related to activity, actively completes the activity, repeats, repeats it multiple times or does related activity).

Overall, the festival kits were moderately high to highly engaging. We calculated the mean level of observed engagement at each of the 11 stations, summing the level of engagement we saw at each observation point during the Science Festival. Exhibit 1 shows these means ranged from a high of 3.9 for Mountain Driving to a low of 3.3 for Tree Rings. Mountain Driving seemed particularly popular because one of the activities at that station was designed to show how going too quickly around a curve on an icy road could cause a car to slide off the road, thanks to centrifugal force and the slippery road. The station included a manually operated turntable (road) that little toy cars could travel. As the turntable increased speed and centrifugal force increased, cars were thrown off the “road.” Children were particularly attracted to this station with many boys having great fun with the cars as they spun the turntable. An older group of students might have found the activity less engaging, but it seemed well-suited to elementary students.
As we rated how engaged people were when visiting the science stations, we also observed the types of emotion participants showed at each station. We watched for seven different states: pleasure, displeasure, frustration, neutral, surprise, interest/intrigue, and pleasure and recorded which types of affect we saw when making each observation. Exhibit 5 shows the number of times we observed each of four types of affect at each station. We excluded displeasure, frustration, and surprise from the table because we did not observe any instances of these during the Science Festival.

Exhibit 5: Observed States of Emotion

<table>
<thead>
<tr>
<th>Station</th>
<th>Neutral</th>
<th>Pleasure</th>
<th>Interest/Intrigue</th>
<th>Excitement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mountain Driving</td>
<td>0</td>
<td>8</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Desert Leaves</td>
<td>0</td>
<td>5</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Archeology</td>
<td>0</td>
<td>2</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>Rock &amp; Minerals</td>
<td>1</td>
<td>1</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Mountain Building</td>
<td>1</td>
<td>2</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>Mono Lake</td>
<td>2</td>
<td>3</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Animal Adaptations</td>
<td>0</td>
<td>1</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Sage Brush</td>
<td>2</td>
<td>2</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>Mountain Climate</td>
<td>0</td>
<td>4</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>What Lives in a Stream?</td>
<td>2</td>
<td>3</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>Tree Rings</td>
<td>1</td>
<td>0</td>
<td>4</td>
<td>0</td>
</tr>
</tbody>
</table>

Overall, the science stations generated a combination of pleasure, interest, intrigue, and excitement among the children and adults who attended the Science Festival. This positive combination suggests the festival kits successfully attracted visitors’ attention and then delivered their science content in a way that frequently took that interest into excitement or pleasure as people interacted with the kits’ science content. Sometimes, visitors appeared neutral at some of the stations, but we observed
neutral no more than one or two times at a station. We did not see any instances where people appeared to experience displeasure, frustration, or surprise during the evening.

Interest and intrigue were the most common affect participants at the Science Festival displayed. We observed interest and intrigue more than we saw any other affect except at the station for Mountain Driving. At that station, we saw more instances of pleasure reflected in people’s faces and an equal number of instances of both interest/intrigue and excitement. The high number of times we saw both pleasure and excitement at this station is likely a function of the station’s appeal to children, as we noted earlier. We observed experiences of pleasure at all but one of the stations and excitement at six stations. These findings suggest that each station offered valuable experiences that visitors found engaging.

Enjoyment and Learning

During the science festival, WestEd evaluators interviewed visitors about their reactions to the science kits. Interviews were very short and included only a few questions to gauge whether visitors enjoyed the science stations and learned science content from them. Interviews began with two general questions about the festival kits:

- How would you rate the science stations overall on a scale of 1 to 5 where 1 is “I didn’t enjoy them at all” and 5 is “I enjoyed them a lot?”
- Please rate how much you learned from the stations overall on a scale of 1 to 5 where 1 is “I didn’t learn anything” and 5 is “I learned a lot?”

WestEd evaluators then asked which station the visitor enjoyed the most and how the visitor would rate that station in terms of enjoyment and learning using the two scales above. Lastly, evaluators asked the visitor to tell us something he or she learned from the activity at the station.

Evaluators targeted fourth and fifth grade children for interviews during the Science Festival because this was the grade level that was the school’s focus for the evening. We randomly selected children to interview after they had visited each of the science stations and asked if we could ask them a few brief questions, including their
age. In all, we completed 16 interviews during the evening, ten with boys and six with girls. Exhibit 6 shows the children’s mean responses to the questions about enjoying and learning from the festival kits.

The children responded very positively to the festival kits. Mean ratings of how much they enjoyed the science stations and how much they learned were very high for both the stations overall and for the activities children enjoyed the most. All but three of the children rated their overall enjoyment of the stations at 5, enjoying them “a lot” while the other three children rated the stations at 4, yielding a mean rating of 4.8. Children’s rated level of learning was not quite as high. Fourteen children rated their level of learning at four or five, and two children rated it as 3 (Mean = 4.4).

Exhibit 6: Children’s Mean Ratings of Science Activities (N=16)

<table>
<thead>
<tr>
<th>Question</th>
<th>Mean Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>How would you rate the science stations overall?</td>
<td>4.8</td>
</tr>
<tr>
<td>Please rate how much you learned from the stations overall.</td>
<td>4.4</td>
</tr>
<tr>
<td>Please rate the activity you enjoyed the most.</td>
<td>4.6</td>
</tr>
<tr>
<td>Please rate how much you learned from the activity you enjoyed the most.</td>
<td>4.6</td>
</tr>
</tbody>
</table>

The mean of children’s ratings of the activity they enjoyed the most, 4.6, was slightly lower than their rating of the science stations overall. Additionally, they mentioned many different activities as the activity they most enjoyed. The activities and stations they mentioned were:

- Mountain Clouds
- Rocks
- Arrowheads
• Mountain driving
• Bristlecone pines
• Fish
• Insects
• Mono Lake
• Leaves
• Archeology

These responses show that there was diversity in what most appealed to children. Children also learned many different facts as they visited the science stations. Among the things they cited about what they learned were the following:

• Rock density;
• Telling the age of stone from the stone’s hydration;
• Where fish like to hide;
• Some insects put sand in their bodies in order to sink in water;
• The amount of salt in water affects the buoyancy of objects in the water;
• Clouds dissipate as they go over mountains;
• Rocks wear down over time;
• Mountains may be wet on one side by dry on the other; and
• One has to drive more slowly on wet, icy pavement than on dry pavement.

Overall, these findings show that the festival kits are interesting to children in the 8 to 12 year age range. This seems very positive, especially since the writing on the displays was oriented to the reading level of middle school children, but the children we spoke with grasped some complex concepts from visiting the science stations.

The Roadside Heritage Science Festival was a well-attended success. The people appeared very engaged as they visited the science stations and were interested/intrigued by them, and often experienced pleasure and excitement at the stations. We targeted children in the upper elementary grades to interview about how much they enjoyed the stations and what they learned. Overall, they rated their enjoyment and level of learning as high, with mean ratings between 4.4 and 4.8 on a
five-point scale where 5.0 was the most positive possible rating. Questions about what children liked and what they learned showed that even at ages 8 to 12, children learned some complex scientific concepts from interacting with the activities at the science stations. Our findings suggest that the festival kits will be valuable science education tools with a wide age-range of children and adults.

WestEd Evaluation of Audio Stories

WestEd evaluators conducted an online survey of people who received the *Exploring Extreme Environments* CD. RH collected the names and email addresses of 508 people who received CDs. Exhibit 1 presents information about the survey’s response rate. Sixty people were removed from the evaluation because they provided invalid email addresses, were out of town, or were unable or unwilling to complete the survey. Of the remaining 448 people, 157 responded to the survey for a response rate of 35.0 percent.

Of the 157 people who responded to the survey, eight (5.1%) did not remember receiving a copy of the CDs. Of the remaining 149 who remembered getting the CDs, 24 (16.1%) had not listened to the CDs at the time they were asked to complete the survey. Reasons for not listening to the CD included not having time (37.5%), having misplaced the CDs (20.8%), the CDs would not play (8.3%), they were too long (8.3%), and individual reasons such as lack of a CD player, loaning the CDs to others, or waiting to listen to the CDs until the drive of an upcoming trip.
Exhibit: Survey Response Rates

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name and Email Received</td>
<td>508</td>
<td>100.0</td>
</tr>
<tr>
<td>Invalid Emails/Unable to Complete the Survey</td>
<td>60</td>
<td>11.8</td>
</tr>
<tr>
<td>Responded to the Survey</td>
<td>157</td>
<td>35.0</td>
</tr>
<tr>
<td>Did not Remember Getting the CD</td>
<td>8</td>
<td>5.1</td>
</tr>
<tr>
<td>Did not Listen to the CD Yet</td>
<td>24</td>
<td>16.1</td>
</tr>
<tr>
<td>Completed the Survey</td>
<td>125</td>
<td>79.6(^1)</td>
</tr>
</tbody>
</table>

Often, people responding to the survey indicated others also listened to the audio stories with them. In all, the 125 people who completed a survey indicated an additional 155 adults and 35 children listened to the CDs with them. This finding implies that the reach of the project may expand well beyond just those individuals who obtain a copy of the audio stories. Additionally, nine people, in written comments, specifically mentioned loaning the CDs to other friends or family members planning to visit the Eastern Sierra, or because the CDs would interest them into going to the area.

The survey asked respondents to indicate their level of agreement with several statements about the CDs. Ratings were made on a five-point scale where 1 = “Strongly Disagree” and 5 = “Strongly Agree.” Two questions were directly related to the science information provided on the CDs. We asked about whether the listener learned interesting science concepts from the CDs and whether the science content was intriguing. Exhibit 2 presents the mean responses to these questions. The mean for the question about learning interesting science concepts was 4.5 while the mean related to intriguing science content 4.4. Both of these means are quite high and indicate the RHP

\(^1\) Percentage calculated based on number of people who responded to the survey.
audio stories were very successful in helping listeners learn interesting science concepts that listeners found intriguing.

Exhibit 2: Mean Ratings for Science-Related Survey Questions (n=125)

<table>
<thead>
<tr>
<th>Survey Item</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>I learned interesting science concepts listening to the CD.</td>
<td>4.5</td>
</tr>
<tr>
<td>The science content of the CD was very intriguing.</td>
<td>4.4</td>
</tr>
</tbody>
</table>

The survey about the Exploring Extreme Environment CDs included items about topics such as CD quality, ease of understanding, enjoyment from listening, and their contents’ suitability for children. Exhibit 3 presents the mean ratings of survey items relating to these areas. Overall, the highest rating was for the quality of the CDs themselves (mean = 4.7), followed by ease of understanding the information presented (mean = 4.6), enjoyment of the local anecdotes (mean = 4.6), and respondents’ overall enjoyment of listening to the CDs (mean = 4.6). Like listeners’ ratings about the scientific content of the CDs, these ratings are very positive. The only item whose mean rating was less than 4.0 was whether children would enjoy the CDs (mean = 3.8).

Exhibit 3: Mean Ratings for Survey Questions (n=125)

<table>
<thead>
<tr>
<th>Survey Item</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>The quality of the CD was very good.</td>
<td>4.7</td>
</tr>
<tr>
<td>The information on the CD was easy to understand.</td>
<td>4.6</td>
</tr>
<tr>
<td>The local anecdotes included on the CD made the stories more engaging.</td>
<td>4.6</td>
</tr>
<tr>
<td>I enjoyed listening to the CD.</td>
<td>4.6</td>
</tr>
<tr>
<td>I would encourage my friends to pick up a copy of the CD on their trip.</td>
<td>4.5</td>
</tr>
<tr>
<td>The information presented on the CD was useful.</td>
<td>4.5</td>
</tr>
</tbody>
</table>
Listening to the CD made my trip in the Eastern Sierra more enjoyable. 4.5

Other people who have heard the CD enjoyed it. 4.1

I stopped at one of the locations suggested on the CD. 4.0

Children will enjoy listening to the CD. 3.8

Participants were asked to comment about what they thought was the most interesting thing they learned from listening to the CD. Twenty-nine people indicated they were intrigued by the geology and volcanology of the region, and another 17 enjoyed learning about the history of the region. Other aspects of the CD people reported learning about included the process of forming mountains and the Owens Valley (n = 12), native animals (n = 11), the weather (n = 9), flora/fauna (n = 8), local areas described (n = 7), and Mono Lake (n = 7). Some specific comments included:

- The formation of the mountains & plate movement section was great.
- I think I enjoyed the historical geology the most, perhaps because it was what I knew the least about.
- The facts about the creatures that are able to survive in these harsh climates were interesting. Also the amount of information that was provided about each subject was clear and was easy to follow.
- I really enjoyed learning about the volcano and how it came to be. The imagery used on the CD made it seem like I was there watching the plates move and create the volcano.
- I appreciated listening to the overview of the regional geology, and the life history strategies employed by various plants and animals.

The survey also provided an opportunity to provide additional comments. Of the 68 people who provided comments, 44 (64.7%) were compliments describing the high quality of the CDs, their usefulness, and their enjoyment listening to the CDs. Sixteen
people also mentioned that listening to the CDs improved their travels along Highway 395. Eight people hoped additional CDs would be produced and six people indicated the CDs identified places they would like to visit. Along with the compliments, there were a small number of complaints such as poor or mispronunciations by speakers, the audio stories went too slowly or did not provide enough information, the content was not presented in a cohesive order, or the CDs would not play. Some people also mentioned topics they would like to learn more about, such as the mining towns and local history.

Although many people believed the CD was not intended for children, some parents commented how much their children enjoyed the CD. One parent indicated they could not listen to the second CD because their daughter wanted to listen to the first one again, and one parent stated:

- I wish the funders of this project could see the notebook that my five year old daughter filled on the way home from our Owens Valley trip with drawings of obsidian rocks, granite mountains with fault lines underneath pushing them up, volcanoes (internal and external views, with magna and lava carefully detailed - plus a magic magma-surfing submarine for her and her class to ride in, complete with special cold suits of course!), desert habitats, etc, all inspired by what she saw on the trip and heard on the CD on the way home. Thank you for this wonderful experience.

WestEd’s Evaluation of the Website

WestEd conducted interviews to gather perceptions and impressions of the RH website. The online survey about the Extreme Environments CDs included an item that asked respondents if they had visited the RH website. Twenty-three people who received the CDs indicated they had also visited the RHP website. WestEd evaluators
contacted these 23 people and invited them to participate in a telephone interview about the RH website. Eight agreed to be interviewed. WestEd conducted these interviews over a two-week period with interviews lasting between 20 to 30 minutes.

**Impressions**

First impressions of the website were mostly positive. Interviewees often stated that the site looked professional and beautiful, was well organized, and informative. They also had many of the same impressions of the overall quality of the website. Additionally, several interviewees felt the website was of high quality because of its unique features, like the ability to customize CDs and its graphics.

The largest elements of the homepage stood out most for the users. The picture of the mountains, the Highway 395 road sign, and the YouTube video in the center of the screen made the boldest impression on the interviewees. While many interviewees did engage with the material located on the tabs at the bottom of the homepage, these elements did not stand out to them. Several interviewees stated they had to scroll down to see what was on the tabs. This is likely why the “Scenic Science”, “Mono County”, “Inyo County”, and “Customize Tour” portions of the homepage were not as readily described when interviewees spoke about the homepage.

**Interactions**

There appeared to be three approaches users employed when they visited the RH website. Three users “experimented” on the website, selecting different elements in an unordered manner. The other two approaches were more structured. A third of the interviewees accessed the website having listened to the RH audio CD. They were interested in accessing additional audio stories and learning more about the information presented on the CD. The last third of interviewees interacted with the website based on elements of the homepage. The top navigation bar guided several users’ explorations of the site as they reported going through the “About” and “Stories” sections listed in the bar. Only the respondent with a child explored the “Kids Corner” section. She reported that her eight-year-old daughter spent time in this section and played a couple
of games there. A few interviewees also reported playing the YouTube video that was so prominently displayed on the homepage.

Once they accessed the website, interviewees engaged with nearly every aspect of it. They listened to audio stories and a few even made custom CDs. The users interviewed also looked at the pictures, video, and maps. A feature that none of the interviewees fully utilized was the set of maps with accompanying audio stories found on the bottom tabs of the homepage. Interviewees usually clicked on the “Download Audio Story” instead of the map. Those who did click on the map did not realize that an audio story could accompany it and that different pictures on the map would automatically pop up as the audio progressed. It was only after we directed interviewees on how to use this feature for the purposes of the interview that they fully realized how to access it.

The users interviewed reported wanting to explore a variety of activities and topics further after visiting the website. Several wanted to explore specific points of interest in the Eastern Sierra around Highway 395, like Devils Post Pile, that they learned of from the RH website. One interviewee specifically stated he wanted to see what was off the beaten track of Highway 395. Others were interested in activities that they could do in the region, such as hiking, camping, and visiting museums. The website inspired less active exploration for one user as she wanted to listen to all of the audio CDs.

Expectations

Users held certain expectations about what the website was about, what they could do on it, and who was the website’s best audience. There were two main expectations of what the website was about. One expectation was that the website was created as a supplement to the audio CD and that it contained more information about items on the CD. The majority of users thought the site was about the Eastern Sierra and the region around Highway 395.

Expectations about what activities in which one could engage were largely informed by prior use of the audio CD. Interviewees expected to download audio and
view pictures that accompanied the stories from the CD. Also, there was the expectation that there would be even more information on the topics discussed on the audio CD. One user thought the Roadside Heritage website would provide interactive video and maps that allow virtual tours of the region so that one could see the area without actually needing to visit.

When it came to identifying the best audience for the website, interviewees overwhelmingly identified travelers to the area. This audience group was subcategorized into campers and families planning vacations. A third of the users interviewed had a more educational perspective as they stated kids and teachers or educators would be good audiences. A couple of interviewees selected residents of the area as they felt the website could give background history and more in-depth information about the whole area. As well, audio book listeners were seen as a good audience since they could download the audio stories.

Map and Audio Story

Once users understood the full relationship between the map feature of the website and audio stories, they all really enjoyed the map. Most found this feature to be very helpful. It helped people orient themselves to where things are in the area based on the object’s positioning on the map. Interview participants said it also helped with visualization when preparing for a trip. Many also felt that the map and audio story suggested new places they would like to visit. They saw places they did not know about and this piqued their interest in visiting those areas. A couple of website users commented that it was not useful for when you are actually driving on Highway 395. They thought that perhaps audio or a DVD for those who have a DVD player in the car could better share the information to travelers who were en route exploring Highway 395.

The map helped the interviewees explore the audio story in several ways. It provided a framework of where something was that was being discussed during the audio. Also, several website users liked that the map could show the magnitude of items, such as the spread of ash from a volcanic eruption or the size of a large natural
structure. Interview participants appreciated the pictures that popped up on the map as they added more visuals of what was being discussed. Overall, everyone liked the accompaniment of the visuals to the audio.

**Science Content**

There were mixed results from interviewees about the science content on the website. Some said they learned a few new interesting things, such as volcanology and alpine flora and fauna. But several said that they did not learn anything new as they were familiar with the topics presented due to their science backgrounds.

These mixed results were evident when website users were asked how intriguing they found the science content of the website. Several found it intriguing because of the presentation of the science content. They said it was presented in a way that one would not get bored with it. A few likened it to talking to the experts or listening to a good radio show. The website’s science content was better than a textbook because of the video and audio. Additionally, the material presented was not too challenging and thus felt to be user friendly. It seems there is a tension between difficulty of the science concepts and their user friendliness. Less challenging material is easier for the lay user to digest and appreciate, but it does not hold the interest of those who are more knowledgeable about science beyond an elementary level.

**Improvements**

While the interviewees were primarily quite satisfied with the website, they did describe multiple ways the RH website could be improved to further heighten future users’ experiences. There were a variety of technical aspects of the site that the users felt did not work properly. A few interviewees had problems with videos on the site. One user said that because of her wireless connection in the campground site where she lived, data take a long time to download. While on sites like YouTube, one has the option to pause the video and let it fully download before it plays, there is not the same option for video on the RH website. This resulted in what users described as choppy video that starts and stops as it downloads in segments. This particular interviewee
would like to see a feature similar to YouTube where video can be paused so that it can
download fully. Another user noted some features did not seem to work properly
despite having the most current version of Internet Explorer. This user also felt text
contrast in some places, like the thin black lettering over the mountains on the
homepage, made it a little difficult to read the content.

Several points of feedback were offered around content. Users wanted to see
more photos and more video of the area. One user wanted to see more content that
referenced modern and historical topics relevant to the Eastern Sierra. A couple of
interviewees wanted to see more resources on the website. They discussed resources
like books and articles about the area and links to other relevant websites. One person
felt the children’s content could be more engaging. This individual also felt the map
design could be more engaging as he thought it looked too much like a plain Google
map. Two interviewees wanted more connection between the CD and the website. One
felt that all information discussed on the CD should be available on the website. Also,
more in-depth detail about topics on the CD should be available on the website, too.

Some users had ideas for unique additions to the website. One felt that video of
locals talking about the area would be engaging. Another discussed an improvement to
the Custom Tour section. Currently, one sees a screen with cogs turning that reads
“Please wait while we burn your CD” when a custom CD is being created. This user felt a
more engaging addition would be a map highlighting the areas selected for the custom
CD. Such a graphic would be more visually appealing and it would provide an added
bonus of helping the user visualize the location of the places he or she chose to create a
CD about in relation to one another. Featuring places that were off the beaten track of
Highway 395 was another content suggestion an interviewee made. Adding a calendar
of events in the area was another comment.

Lastly, there were a few comments made about the design of the page. While
most interview participants felt the website was well organized and easy to navigate,
one wanted a list of videos so that they could be more easily accessed. A couple of users
felt there was some redundancy on the site as the same content could be reached in
multiple ways. Because everyone did not understand how the map and audio story worked, several interviewees asked for clearer instructions about this content so it would not be missed. A final design comment was ensuring all material was kept current and up-to-date.

*Website Traffic*

WestEd obtained statistics produced by Google Analytics about the level of traffic on the RH website over a four-month period, March through June, 2010. This period coincides with the time that the *Extreme Environments* CDs were being distributed to travelers along Highway 395. Exhibit 7 presents several statistics about use of the website including the number of times the site was accessed, the average length of time visitors remained on the site, and the average number of page views. The exhibit indicates that between about 400 and 750 people visited the website between about 550 and 1,000 times each month. Visitors remained on the site for an average of two to three minutes and viewed two to three pages of content.

**Exhibit 7: RH Website Statistics, March-June, 2010**

<table>
<thead>
<tr>
<th>Month</th>
<th>Number of Visits</th>
<th>Number of Unique Visitors</th>
<th>Average Time on Site (in Minutes)</th>
<th>Average Number of Pages Viewed</th>
</tr>
</thead>
<tbody>
<tr>
<td>March, 2010</td>
<td>983</td>
<td>756</td>
<td>2:29</td>
<td>2.0</td>
</tr>
<tr>
<td>April, 2010</td>
<td>557</td>
<td>392</td>
<td>2:44</td>
<td>2.4</td>
</tr>
<tr>
<td>May, 2010</td>
<td>597</td>
<td>425</td>
<td>2:04</td>
<td>2.0</td>
</tr>
<tr>
<td>June, 2010</td>
<td>788</td>
<td>598</td>
<td>3:02</td>
<td>2.7</td>
</tr>
</tbody>
</table>

Reports from Google Analytics provided information about the top sources of the traffic to the RH website. We compiled this information for March through June
2010 and display it in Exhibit 8. The information helps understand how many visitors are coming directly to the site because they are aware of it possibly because of RH brochures or a reference on a CD of audio stories (direct access) or are coming to the site through a link on another website. We see from Exhibit 8 that about 30 percent of visitors to the RH site are coming directly to it through [www.roadsideheritage.org](http://www.roadsideheritage.org). The other sources of traffic vary by month. In March, about as many visitors came to the site through the *Los Angeles Times* website as accessed the site directly. But the *Los Angeles Times*’ site ceased to be a source of visitors after March. Cmsmania.com and Google were sources of traffic to the website each of the four months. CSSMania is a website that displays other sites. LHS staff posted the RH website to CSSMania in early January 2010. Two sites that complement CSSMania, creattica.com and SquareBoxStudio.com, developer of the RH site, also were sources of referrals to it.

As spring progressed, traffic to the RH site came from three more local sites: the Lone Pine Chamber of Commerce, the California Department of Transportation (dot.ca.gov), and Scenic395.com. These traffic patterns with different, more local sites referring traffic to the RH side in different months show the value of projects like RH forming relationships with multiple organizations that are able to refer web traffic to you.

**Exhibit 8: Sources of Referrals to RH Website, March-June, 2010**

<table>
<thead>
<tr>
<th>Top Traffic Sources</th>
<th>March</th>
<th>April</th>
<th>May</th>
<th>June</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Access of RH Website</td>
<td>292 (30%)</td>
<td>167 (30%)</td>
<td>132 (22%)</td>
<td>254 (32%)</td>
</tr>
<tr>
<td>Travel.latimes.com</td>
<td>265 (27%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>cssmania.com</td>
<td>138 (14%)</td>
<td>66 (12%)</td>
<td>70 (12%)</td>
<td>51 (6%)</td>
</tr>
<tr>
<td>google</td>
<td>67 (7%)</td>
<td>51 (7%)</td>
<td>61 (10%)</td>
<td>94 (12%)</td>
</tr>
<tr>
<td>creattica.com</td>
<td>27 (3%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lonepinechamber.org</td>
<td>40 (7%)</td>
<td>91 (15%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aol</td>
<td>39 (7%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Domain</td>
<td>Count</td>
<td>Percentage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------</td>
<td>-------</td>
<td>------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>squareboxstudio.com</td>
<td>80</td>
<td>13%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>dot.ca.gov</td>
<td>159</td>
<td>20%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scenic395.com</td>
<td>37</td>
<td>5%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Outreach and Dissemination Activities

Dissemination activities to popularize RH products were designed to reach the broadest range of traveling individuals and families on vacation. With non-NSF funds, ESICE developed two heritage audio programs on CD with a historical and cultural focus: *Paiutes, Prospectors and Pioneers* and *Traditions, Travel and Tales of Mono County*. The content for these two CD’s often intersected and reinforced the educational outreach activities funded under Award 0638917. In Year 3, 5,900 copies of *Traditions, Travel, and Tales of Mono* were distributed in July 2009 to the public at 21 museums, chambers of commerce, and visitor centers in Inyo and Mono Counties.

Building on the distribution and reception of two previous CDs, the project built anticipation for the Spring 2010 release of 46,800 copies of the NSF-sponsored *Exploring Extreme Environments*, distributed through the established outlets. An additional 200 CD copies of *Exploring Extreme Environments* were distributed to southern California residents visiting the Eastern Sierra during the summative evaluation. 10,000 additional copies of *Exploring Extreme Environments* will be distributed at the end of July to keep the programs in circulation for the next year.

Continued distribution of the RH brochure in racks located in local businesses, restaurants, galleries, and other public places throughout Inyo and Mono Counties directed consumers to locations where the audio CDs are available and to the RH website.

Press releases were sent out to California and Nevada media following the release of each audio CD program, resulting in press and radio coverage in the local and regional media. ESICE staff worked with the local press to generate coverage that showcased the RH CDs and the website and the Science Festivals held in various schools. The project team also succeeded in strategically developing public awareness through the *Los Angeles Times* travel blog, reaching a large number of potential visitors from the Los Angeles Basin. ESICE staff also participated in interviews and other outreach efforts that generated public awareness of RH through radio programs, which played excerpts.
from *Exploring Extreme Environments* on the air. These outreach activities included collaboration with media resulting in a five-minute interview with director of ESICE in March 2010. UNR project staff, scientists and outreach specialists also collaborated with KOLO TV News in Reno, Nevada, the ABC affiliate, resulting in the broadcast of a five-part RH series that aired on the evening news during sweeps weeks in May 2009, reaching much of rural northern Nevada as well as the Carson City/Reno metropolitan area. The first two segments can be viewed at [http://www.youtube.com/watch?v=mcRiLbUm23Q](http://www.youtube.com/watch?v=mcRiLbUm23Q) and the remaining three segments at [http://www.youtube.com/watch?v=in6Mf4eY1E0](http://www.youtube.com/watch?v=in6Mf4eY1E0).

An article submitted to the California Travel and Tourism Commission has been accepted for publication in California Travel and Tourism Commission's *What’s New in California* fall 2010 edition, a guide highlighting unique travel experiences distributed free to about 3,500 media outlets, tourism and travel industry representatives, and consumers by the agency, which is a public/private partnership promoting California tourism.

The project also conducted a targeted campaign to establish web links to the RH website on sites where the traveling public customarily looks for information on the Eastern Sierra, including Caltrans District 9, the National Geographic Sierra Nevada Geotourism site, White Mountain Research Station, the Trip Advisor, Lonely Planet, Eastern Sierra Regional Airport, a local realtor site, Laws Railroad Museum, and [www.easternsierra.us](http://www.easternsierra.us). Currently there are links to roadsideheritage.org from 35 other websites.

Bi-annual e-newsletters about the latest audio CDs, science festivals, and updated RH website were distributed to program supporters and visitor contacts. To boost the online presence for travelers, RH staff placed an article about the program on the Wikipedia site.

The project team has developed strong partnerships with local tourism outlets, and promotion and outreach activities included participation in Eastern Sierra community events to establish RH program and brand recognition. These events
included: Banff Film Festival, Community Connections (Bishop City Park), Eastern Sierra Land Trust Wildlife Festival, the Rainbow Days Festival, and local chamber of commerce events.

ESICE hosted Open Houses in June 2009 and March 2010 to bring together all of the regional partners who participated in the Roadside Heritage Program including youth from the after-school classes, teacher/docents, members of the Community Advisory Committee, staff from local distribution sites (museums, chambers of commerce, visitors centers), local media and elected officials, and speakers who were interviewed for the audio stories. The events showcased various features of the programs with slideshows, the prototype kiosk (described below), CD displays and Science Festival kit displays. ESICE also consulted with various local business owners and the executive director of the Eastern Sierra Interpretive Association about the feasibility of selling the RH audio programs on CD at visitor centers bookstores and local businesses.

ESICE established an agreement with a distributor to trial test selling the first CDs as one of multiple activities to sustain the program and products in order to build for the future.

ESICE also participated in a Public Lands Partnership workshop sponsored by the local cooperating agency, the Eastern Sierra Interpretive Association. New contacts were made with members of the tribal communities, environmental advocacy organizations and local businesses, including the operator of a shuttle service, currently using RH CDs to entertain and inform shuttle passengers en route to local resort destinations.

Collaboration with the local community includes on-going discussion about incorporation of RH into the five-year interpretive plan with the staff of the nearby Devils Postpile National Monument.

Local program outreach extended beyond the immediate Eastern Sierra Nevada region, with an ESICE advisory panel member making community contacts on the western side of the Sierra Nevada and at the statewide California Roundtable on
Recreation, Parks and Tourism, founded in 1998 to encourage cooperation between public and private entities involved and interested in outdoor recreation, public lands, and tourism in California.

The Roundtable's membership includes recreation, parks, and tourism leaders from local, state and federal governmental organizations, private enterprises, user groups, environmental groups, educational institutions, and the public.

ESICE also gave several presentations and updates on RH to the Yosemite Gateway Partners group, an organization of government, business, and nonprofit stakeholders with more than 90 members, established in 2006 to help the public access, enjoy, and appreciate the natural, cultural, historic, and recreational resources and engage in stewardship of the region encompassing Yosemite National Park and surrounding areas. In partnership with University of California Cooperative Extension (UCCE), an article was written for publication in a UCCE publication. Efforts are currently underway to develop a greater awareness of RH in Death Valley National Park and surrounding communities. ESICE staff is also supporting Mono County in pursuing National Scenic Byway recognition of Highway 395. In addition, ESICE is collaborating with the Yosemite Chamber of Commerce in the extension of National Scenic Byway designation along Highway 120.

**Investigation of Emerging Dissemination Technologies**

The ESICE Information Technology consultant explored the development of a kiosk where travelers could download Roadside Heritage audio files. ESICE staff also conducted a proof of concept exercise creating a global positioning system (GPS) auto navigation tour.

Efforts are ongoing to present the RH program model to GPS navigation and communications companies such as Garmin Ltd., a company that develops consumer technologies for GPS devices. Sponsorship and other forms of endorsement will be sought beyond the end of the NSF Award 0638917. A total of 56 GPS companies were thoroughly researched and 26 qualified prospects are identified in the RH Business Plan.
RH collaborators investigated the possibility of developing an RH iPhone application. ESICE continues to monitor the development of Intelligent Transportation System (ITS) and Advanced Traveler Information Systems (ATIS) in cooperation with the California Department of Transportation regional planners.

**Visitor Center Kiosk**

The project team developed and tested a RH kiosk and listening station. The prototype was installed at the large official California Welcome Center office in Mammoth Lakes. Activities include locating photographs for the “flyover” tours and audio scripts. The kiosk programs are also available on You Tube.

**Handbook of Best Practices Deployment and Documentation**

ESICE staff has documented lessons learned in all phases of the deployment of RH, from organizing the community advisory committee to evaluating the program’s success. This documentation has formed the basis of a manual of Best Practices that details strategies for replicating the program in other communities. The handbook is arranged to present goals, challenges, and lessons learned along with a comprehensive teachers’ guide that includes sections on class planning, reference materials, and recruitment tools. In addition, the youth notebook includes “how to” resources for equipment, each job, pages for journaling, and Student Cast resources. The handbook dissemination takes advantage of a national network established over the course of the deployment of RH. Approximately 50 organizations will receive announcements of the availability of the Handbook.

**Website**

The ESICE staff conducted many more interviews than were able to be included in the audio programs. A selection of these interviews that include a variety of experts and community resources are available on the RH website. Through the Youth Enrichment Program, ESICE contributed 39 youth-produced Student Casts to the
website. ESICE staff also worked with Eastern Sierra organizations to locate and secure permission to use collections of locally-held photographs. The ESICE technology consultant worked with LHS staff to transfer administration of the RH website post-NSF funding. LHS, ESICE, and UNAE have also developed and signed an agreement for use of the website in sponsorship campaigns to enable sustainability of RH. ESICE staff collaborated with LHS to create an introductory video for www.roadsideheritage.org.

Although most RH web visits are from California, Google analytics show that the website reaches a national audience interested in the Eastern Sierra and the Owens Valley. The RH site also announces Science Festivals on the Kids Corner page, and by highlighting photo stories produced by local youth, leverages peer learning and influence to spark interest in RH youth programs.

Potential Dissemination of RH Model

Project staff has actively promoted the RH model, and collected interest in dissemination from other agencies. Over the past three years, RH project team members have presented at national conferences, including the 2008 Informal Science Education Summit, the 2009 Oral History Association Conference, and the 2009 National Association for Interpretation Conference. RH was also an exhibitor at the 2009 National Scenic Byway Conference. Regional presentations were made to groups including the California Roundtable on Recreation, Parks, and Tourism and the National Geographic Geo-tourism workshops. In 2010, ESICE gave a presentation on RH to the multi-state Southwest Oral History Conference. RH was the subject of the keynote speech at the May 2010 California Preservation Foundation Conference entitled The Sierra Nevada: Preserving a Sense of Place.

ESICE developed an extensive list of national affiliations including the National Trust for Historic Preservation, the National Association for Interpretation, the Association of Children’s Museums, the Federal Highway Administration’s National Rural Intelligent Transportation System, the Association for the Advancement of Science, and the Association for Environmental and Outdoor Education. Many of the outreach
activities conducted by the ESICE dissemination staff served the dual purpose of publicizing and promoting the RH model. Notably, RH presentations and updates were given to the Yosemite Gateway Partners including the Yosemite National Park National Park Service Superintendent, division directors, and members of three tribal communities whose ancestral lands are within the Park’s boundaries. ESICE staff brought the RH model to two National Science Foundation funded project workshops. In 2008, ESICE participated in EarthScope, an earth science program to explore the structure and evolution of the North American continent and understand processes controlling earthquakes and volcanoes. In 2010, ESICE participated in Cosmic Serpent, a program exploring commonalities between western and native science. Other RH model dissemination discussions include the director of the Generation X Public Radio Exchange and the California Department of Transportation state scenic byway coordinator. ESICE continues to discuss RH in relation to the California Travel and Tourism Commission’s (CTTC) rural heritage tourism program. CTTC’s manager expressed interest in promoting RH through the Commission’s publications and at the annual statewide three-day Cultural and Heritage Tourism Symposium. ESICE staff also established a Roadside Heritage article on the web-based free encyclopedia, Wikipedia.

**Dissemination of RH Program Model**

Engaging professionals in a variety of fields has taken place on multiple fronts. Early in the development of program design, RH anticipated collaboration with the National Scenic Byway program of the Federal Highway Administration. RH soon learned that federal byway program support was restricted to byway groups that have attained or are in the process of attaining national recognition. Because two nearby National Scenic Byways exist in Death Valley and Yosemite national parks, we approached National Park Service personnel at both locations.

Yosemite staff offered support in the form of making ranger interpreters available for classes and introduced RH to the Yosemite Gateway Partner Group, discussed previously. Since that time RH has provided support to the Yosemite Chamber
of Commerce as they seek the extension of the National Byway designation on Highway 120, a route through Yosemite National Park, which intersects with Highway 395 and would be a logical extension of RH programs. In conversations with the Pacific West Partnership Program Coordinator for the National Park Service officer, it was suggested that desert parks, with great expanses of terrain virtually devoid of interpretation would be well suited for the RH approach to interpretive travel. Better known and more accessible parks, such as Yosemite National Park, on the other hand, offer high visibility in addition to partners with interpretive programming excellence.

RH has found that the scenic byway program still offers possibilities for dissemination of RH. ESICE participated as an exhibitor at the National Scenic Byway conference in 2009. Staff members were able to discuss RH with numerous groups involved in the National Scenic Byway program. Three aspects of RH were of interest to the conventioneers:

1. The inclusion of scientific discovery and research as cultural tourism assets,
2. involving youth in the creation of the program, and
3. using the audio tour format to provide a traveling companion experience rather than the customary waypoint or POI tour.

ESICE, LHS, and Audio Landscapes gave a presentation on RH as a new approach to interpreting science at the National Association for Interpretation National Workshop in 2008. At the workshop RH had the opportunity to talk about the program with Dr. Teresa Coble, Associate Professor of Forest Recreation at Stephen F. Austin State University in Texas, which offers a Master of Science degree in Resource Interpretation cosponsored by the National Park Service. RH discussed a mutual interest in program evaluation experiments conducted by graduate school students. Given that Highway 395 and the Eastern Sierra Scenic Byway represent a solitary route through a vast landscape, RH offers an exceptional opportunity in the Eastern Sierra to conduct research in interpretive program evaluation.
RH also found that the presentation on RH at the national conference of the Oral History Association was of great interest to the group. The conference organizers were extremely helpful in the development of a panel discussion on innovative applications of oral history in audio tour programs. RH found an audience of oral history professionals that saw possibilities for replication in other communities. This was followed up by a well-received presentation at the Southwest Oral History Association conference in Boulder City, Nevada. It can be concluded that the RH approach to presenting STEM content is of interest to a range of individuals involved in this grass-roots approach to history that rural residents favor.

Through all of these partnership activities, ESICE staff finds the RH approach very well received. The involvement of youth, in particular, generates enthusiasm. Many people involved in historic preservation, including Native American partners, are searching for ways to interest youth in this important activity for identity development. The attraction of learning digital recording skills has been successfully parlayed into a strategy for interesting youth in heritage topics. This finding should be of significant interest to heritage preservation groups for some time to come.

**Outreach and Dissemination of RH Products and Model**

In order to reach the primary audience most effectively, RH needed to be visible when vacations are planned, when consumers are on vacation and for follow-up after vacations end. Over the duration of the program, RH used a wide variety of media to reach its target audience and promote awareness. The initial outreach was through local tourism publications commonly called “vacation planners,” which are distributed by Chambers of Commerce and Visitor Bureaus (CVB) during the vacation planning stages. Articles appeared on a range of topics covered by RH, along with stories about the creators of the product and the classroom students who both recorded interviews and shot video on site. These stories were coupled with traditional activities promoting the locations where audio CDs could be acquired. The Roadside Heritage website ([www.roadsideheritage.org](http://www.roadsideheritage.org)) was developed into comprehensive site hosting all audio
stories from the three CDs, allowing the public to download audio stories prior to travel or en route for free, as well as a means to inform the public about the area in detail with interactive, content-rich maps, photos, travel route planners, video, kids’ activities, Student Casts by youth who participated in the after school classes, and press information, all using the most contemporary web tools. The website also serves as a follow-up tool after a vacation, for individuals seeking additional information on subjects they became aware of through RH.

For vacationers in transit, the most effective means of reaching the widest audience was a billboard at the entrance to the scenic 395 corridor. The billboard directs the public to CVB partners and the 16 original distribution points. RH provided local visitor center staff at each location with custom-fabricated point-of-sale (POS) displays holding RH materials. In addition RH supplied the visitors’ center staff with fact sheets containing specific information to manage customer questions about the project. Informational brochures were placed strategically in other roadside stops, such as gas stations and mini-marts along the corridor, to raise awareness in the traveling public and to put something in their hands to carry with them. The brochure contained distribution points for the CD and the RH web address to find additional information or use our web-based CD maker to create customized CDs of audio stories.

To create other means of acquiring the audio stories besides the more common MP3 download via a website, while also utilizing the latest technologies, RH constructed a prototype audio listening center with video kiosk, discussed further in the website section of this report.
None to report.

The program fulfills its mission of providing access to the lessons learned during the planning and implementation of RH through the web publishing of the Handbook of Best Practices featuring the goals, challenges, and lessons learned, as well as the Student Notebook and Teacher’s Guide. The guide and audio files will be downloadable from the RH and ESICE websites. Through its many partnerships with tourism, recreation, heritage preservation, history, and STEM education organizations, RH believes the handbook will help to further disseminate information that will benefit non-traditional ISE providers.

The project has a publically accessible website that will be maintained and expanded by ESICE: [http://www.roadsideheritage.org](http://www.roadsideheritage.org)

**Audio Stories**

During year three of this project, five new audio programs or episodes, and 15 new student programs Student Casts, were posted on the website completing the 13 episodes on the *Extreme Environments* CD and 39 Student Casts.

Roadside Heritage Episode 1: Mountain Building in the Eastern Sierra. This audio program describes the forces that caused the creation of the Sierra Nevada. The program discusses plate tectonics, faulting, and uplift, concluding with a description of the ongoing controversy in the scientific community as to when and why the Sierra
Nevada became a high mountain range. Segments of interviews with three experts in the field of geology are included along with local indigenous perspectives.

Roadside Heritage 2: Volcanic Features of the Eastern Sierra. This audio program describes the various forces that created the many volcanic features of the Eastern Sierra. Features covered include lava fields, cinder cones, rhyolitic tuff, volcanoes, craters, geothermal sites, and calderas. The Long Valley Caldera super-volcano is featured. Experts in the field of geology are interviewed. Local indigenous perspectives as well as pioneers’ use of the hot springs are included.

Roadside Heritage Episode 3: The Fingerprints of Obsidian. The exploitation of obsidian mineral resources is discussed in this seven-minute story in the context of the travel and trade of obsidian of the indigenous people. Native American elders tell of their ancestors’ lifeways. A geochemist describes how indigenous peoples’ travels can be verified by geochemical fingerprinting of obsidian chips and artifacts.

Roadside Heritage Episode 4: Mineralogy of the Eastern Sierra. This seven-minute audio segment introduces the traveler to the rich mining history of the Eastern Sierra, then explores the region’s exceptional mineral wealth. The segment links the region’s geothermal and hydrothermal characteristics with mineral deposits and explores how veins of gold and quartz and compounds such as tungsten form underground. The segment ends with a look at technological advances and remote sensing technology. Mining’s problematic environmental legacy is juxtaposed with the role and importance of mining engineering to make certain the mistakes of the past are not repeated. Professors of mining engineering and economic geology provide expert commentary.

Roadside Heritage Episode 5: Alpine Flora and the Bristlecone Pine. The traveler’s attention is drawn to the highest mountains, where life must adapt to climatic extremes. The segment explores the adaptations of the Bristlecone pine, which lives to ages approaching 4,000 years. Interviews with two ranger naturalists, a botanist specializing in alpine plants, and a researcher in the field of dendrochronology are included.
Roadside Heritage Episode 6: Alpine Fauna Bighorn Sheep. Two distinct species of Bighorn sheep are found in the region and live in climatic extremes. In the Sierra Nevada, the bighorn are adapted to live at elevations above 14,000 feet. However, in the desert region to the east, the sheep are adapted to dry environments. Two wildlife biologists discuss the natural history of the bighorn sheep and a Native Paiute elder talks of the indigenous people hunting the elusive bighorn.

Roadside Heritage Episode 7: Desert Terminal Lakes. Mark Twain called Mono Lake the Dead Sea of the West, but he was dead wrong. This land-locked lake provides an exceptional habitat for birds, brine shrimp and the brine flies that were a staple for the Native Americans who called the basin home. This audio segment draws on interviews with two naturalist rangers, a limnologist, and a researcher whose study of extremeophiles gives us insights as to what life might look like on distant planets.

Roadside Heritage Episode 8: Weather. The program introduces listeners to two meteorologists, and a research climatologist who describe the ways the extreme topography of the Eastern Sierra create such phenomenon as orographic lift, lenticular clouds and the rain shadow effect. Information includes a mention of T-REX, or Terrain Induced Rotor Experiment atmospheric research supported by the National Science Foundation. A Paiute woman describes the indigenous belief in wind spirits and a champion hang glider pilot describes the so called “big air” and glider plane records set in the Eastern Sierra.

Roadside Heritage Episode 9: Archaeology. This audio segment introduces the traveler to the rich cultural heritage of the Eastern Sierra. The segment explores the scientific pursuits of archaeology in this region, including some of the important projectile points found here. Also discussed is the importance of tribal monitors and their relationship to the work of archaeologists. Several archaeologists provide expert commentary including a University of California professor.

Roadside Heritage Episode 10: Mountain Travel. The travelers’ attention is drawn to the difficulties of building and maintaining roads in this region, as well as the hazards that weather and animals present to traveling along Highway 395. Interviews
with a local hydrologist specializing in avalanches, Caltrans highway engineers, and wildlife biologists provide details about the latest technology and research devoted to keeping Highway 395 safe.

Roadside Heritage Episode 11: Glaciers. Most travelers along the Eastern Sierra corridor are not aware that glaciers still adorn the region’s high peaks. The audio program outlines the history of geologic research in this area, including the work of John Muir. Glacial features are described and interviews with two glacier researchers highlight the significance of more recent research.

Roadside Heritage Episode 12: Desert Flora. The Owens Valley is situated at the confluence of three very different North American deserts. This makes it a unique place to learn about the amazing plants that grow here, in spite of extremely harsh conditions. Interview segments feature two local botanists who explain desert plant adaptations, a Paiute tribal member who tells about traditional uses of these plants, and a University of California professor who studies plant communication, most notably in sagebrush.

Roadside Heritage Episode 13: Desert Fauna. While desert plants can readily be seen by motorists on Highway 395, desert animals, though abundant in the Owens Valley, are rarely seen. This episode showcases a few of the most common desert animals and explains the adaptations that allow these animals to survive in the desert environment. Featured are interviews with a local wildlife biologist, two desert fish specialists, and a Paiute tribal member.

The Student Casts feature the work of participants in the RH Youth Enrichment Program. Primarily middle school students, they visited field sites and conducted and edited interviews with local scientists and experts. Created and narrated by the students themselves, the content of these Student Casts parallels, but does not duplicate, the audio episodes. Rather the Student Casts reflect interviews and field trips that were particularly compelling to each individual student. Topics include red tail hawks, desert flowers, indigenous use of desert plants, and the atlatl. A total of 39 Student Casts were produced.
Web Extras: Native Voices

The RH website features 13 “Web Extras” that include longer interview segments with local Paiute-Shoshone tribal members. These segments represent an effort to include traditional ecological knowledge of indigenous people as an integral part of informal science learning and a gateway to STEM learning.

The interview segments include commentary on traditional basketry (mathematical patterns, ethnobotany), tribal monitors (archaeology), trade items and obsidian (mineralogy), irrigation and semi-agricultural practices (engineering, ethnobotany), uses of desert plants and pine nut gathering (ethnobotany), Mono Lake weather (climatology), and hunting big horn sheep (wildlife biology).

Festival Kits

The RH project objective was to create 11 festival stations that highlighted the unique STEM components of the Eastern Sierra and that would engage a diverse audience of locals as well as the traveling public. To achieve this goal, a team of educators, scientists, fabricators, artists, and evaluators were assembled. Prototypes for each activity were tested on colleagues, visitors to the Lawrence Hall of Science Idea Lab, and at the following Eastern Sierra venues:

- Mammoth Lakes shopping mall;
- Bishop County Fairs and Mule Day festivals; and
- After-school venues located in the towns of Mammoth Lakes, Bishop, and Lone Pine.

Business Plan

The RH Business plan outlines a sustainability model for RH. The plan includes collaborative strategies and ongoing outreach. The plan also outlines a sponsorship campaign model in support of these current and future deliverables.

Handbook of Best Practices

The Handbook of Best Practices represents a thoughtful aggregation of practical considerations and wisdom gained over the life of the project. The Handbook addresses
the goals, challenges and lessons learned in each of the important elements of the project. The intention of this Handbook is to provide a springboard and a touchstone for successfully launching similar projects. Included in the Handbook are sample materials and forms, curriculum design and lesson plans for the Youth Enrichment Program, as well as a listing of helpful resources.

Sharing Information

The completion of all 13 RH episodes means that approximately 105 minutes of science-themed audio stories are now available on the RH website. RH supported the production of 17,000 STEM-themed CDs with these 13 programs. These CDs have been made available to the public at selected venues in the Eastern Sierra, including local and regional museums, businesses, chambers of commerce and visitor bureaus. Several hundred of these CDs were distributed to visiting motorists for the completion of the summative evaluation included in this document. These CDs represent the third in a series of RH CDs. Approximately 15,000 natural and cultural history CDs were produced prior to the release of the STEM CD.

Five hands-on science festivals were conducted in Eastern Sierra communities and ESICE has developed support to presenting 3 additional Family Science Festivals in 2010-11, including the first presentation in Death Valley.

The RH program was presented at two workshops for NSF-funded projects: the Indigenous Education Institute Cosmic Serpent workshop and EarthScope, and Earth Science program Exploring the Structure and Evolution of the North American Continent.

Co-PI Paula Brown-Williams and LHS educator Ted Robertson presented RH at the National Association for the Interpretation National Workshop, sharing the program’s unique approach to interpreting Eastern Sierra landscape through placed-based STEM education.

A series of presentations have been given in Yosemite National Park for the Yosemite Gateway Partners Group, which includes executives from the National Park
Service and concessionaire company Delaware North, and members of surrounding communities including byway locations and tribal communities.

The RH program model has also been presented at the California Travel and Heritage Tourism Conference, the California Roundtable for Recreation, Parks and Tourism quarterly meetings and for the California Preservation Foundation Conference in 2010.

Professional presentations of the festival development effort included the following:


Ms. Paula Brown-Williams, and Youth Program Coordinator, Jan Rhoades, presented RH at a session at the Annual Meeting of the Oral History Association, which seeks to bring together all persons interested in oral history as a way of collecting and interpreting human memories to foster knowledge and human dignity. Local historians, librarians and archivists, students, journalists, teachers, and academic scholars from many fields look to this association for professional guidance and a collegial environment for sharing research. The OHA encourages standards of excellence in the collection, preservation, dissemination and uses of oral testimony. To this end, the OHA has established a set of goals, guidelines, and evaluation standards for oral history interviews.

An RH exhibit was presented at the National Scenic Byways Conference where more than 500 participants from the byway community gathered to learn about the latest innovations and develop networks with other scenic byway proponents.

Finally, an RH presentation was given at a session at the annual meeting of the Southwestern Oral History Association, a regional branch of the Oral History Association.

Several other conferences, such as the American Association for the Advancement of Science Annual Meeting, CAISE Informal Science Education Summit,
Astrobiology Science Conference and Association of Children’s Museums Annual Conference, constituted venues for sharing the RH program model. Participation in these important gatherings provided an opportunity to introduce the RH concept to other potential partners and audiences interested in replicating the project. For example, because of RH effort to introduce young people to oral history interview techniques, RH received an invitation and reviewed a manuscript written about similar projects.
Contributions Within Discipline

Within the ISE field, a new venue for engaging the average citizen in STEM content has been tested. The project team learned that there is interest and engagement by the primary audience—motorists traveling through rural settings.

The traveling public is already aware of the dramatic natural scenery, and has been engaged through RH deliverables with the STEM content just beyond their windshield. RH audio stories encourage travelers to learn about the natural history, geology, botany, etc. of the region, as a leisure time activity.

The project is developing methods to create audio content from local sources in the rural environment and engage scientists conducting research in the Eastern Sierra to work with project staff and youth in after-school courses, providing primary source material. This method is being evaluated, refined with each iteration, and documented for future dissemination to additional geographic sites and like-minded agencies and organizations. RH has a general ISE focus and tends not to focus on a specific scientific discipline, perhaps except for geology, which was well-represented in Year One RH programs. Even local residents who have had a role in developing geology audio programs said they saw the surrounding landscape in a new way because of their exposure through RH. Biological diversity will be a prime topic for future RH programs because this theme focuses on what is unique about the region.

Contributions to Other Disciplines

Most STEM disciplines are part of RH’s celebration of the contributions of rural landscapes and communities to the national body of scientific achievement and understanding. The methods and techniques being developed for enhancing informal science education can be transferred to and used by any discipline to better tell their
stories to less-traditional audiences and thus enhance interest in those disciplines.

**Contributions to Human Resource Development**

RH has brought together scientists who are working in the region and the local community members, through Advisory Committee meetings, docent training activities, audio story/festival/website development training, and after-school courses for youth. For the young students, RH has provided the opportunity to hear from researchers about careers that they may not have considered.

Local residents take pride in their region, related to a unique resource (resources such as geothermal energy or majestic biota). The RH project showed that the scientist and the community member can learn from each other, and expand each other's understanding. In the case of the rural citizens, opportunities to interact with scientists who come to study their environment are rather uncommon. RH provided an opportunity for that interaction to happen.

The website exposes STEM to a vast audience interested in travelling through the Eastern Sierra and the Owens Valley. By providing easy access to these materials, RH engaged a diverse audience that may not have a scientific background. Additionally, the Kids Corner encourages peer learning of STEM material from a diverse cross section of local youth. RH youth addressed topics such as native means of knowing, mining, railroads, and local flora and fauna.

With roadsideheritage.org, the technology team at LHS created a web destination where travelers and non-travelers can access STEM material in an accessible and memorable fashion from what was already an informative site. Starting with the home page, users find readily accessible content with visual milieu evocative of an Eastern Sierra roadside. Visitors watch an introductory video, and view Google Earth videos adapted from the science audio stories. Web visitors find RH audio STEM material immediately on the front page. The site features innovative use of cascading style sheets and JavaScript to enable visitors to navigate intuitively through audio
content, and visitors may download individual audio stories, an entire CD, or navigate to an interactive map.

The second major innovation for roadsideheritage.org was the use of Adobe Flash to handle online audio story listening. Since the audio stories’ strengths are the project’s prime deliverables, the web experience needed to provide complementary learning objects. Based on visitor feedback, the project team developed a visual element for the stories and connected STEM content to Eastern Sierra geography. The interactive map clearly displays relevant, complimentary content automatically. A visitor listening to an audio story about Mono Lake becomes familiar with the visual components of the story (e.g., what a brine shrimp looks like) as well as where in the lake certain phenomena occur. The website features photos of the people who contributed to the project—scientists and local residents—giving the science stories a personal touch. Visitors can also explore additional STEM content, indicated on the map where relevant. Roadside CD distribution centers are also mapped. In addition, content in the audio stories was greatly enhanced with interviews of local Native Americans called “Native Voices.” The Native Voices features respected community members talking about topics relevant to the science story from a native perspective.

Contributions to Resources for Research and Education

- Handbook of Best Practices
- Working with Indigenous People
- Business Plan
- Youth Enrichment Program Curriculum

Website for Children

All child-friendly content on the roadsideheritage.org site has been consolidated into The Kids Corner, a visually appealing place for kids to learn STEM materials in fun and compelling ways. The prominence of the children’s science Photo Stories reinforces peer-to-peer STEM learning while the Kids Activities are open-ended explorations in science centered on natural phenomena that shaped the Eastern Sierra’s natural
landscape. The Science Festivals aspect of the page informs kids about the next festival near them, and entices them with pictures of past festivals.

**Contributions Beyond Science and Engineering**

High-speed highways and homogeneous corridor environments separate travelers from the landscape. RH runs countercurrent by drawing travelers into the environment they are traveling through. As our resources grow scarcer and environmental change continues, RH represents an attempt to connect citizens with the countryside again and foster an atmosphere conducive to caring about the special places that surround us.

RH contributes to the science literacy of rural communities and the traveling public. RH also makes a contribution to the informal science education field in its use of engaging humanities techniques to explain STEM topics to the public.
An Introduction to Roadside Heritage®

Conjure up in your mind, if you will, the last road trip you took through an unfamiliar landscape. Stately Saguaro cactus—twice as tall as you had imagined—accompanied you mile after mile. Or, perhaps it was tiny buildings, scattered over the countryside, surely too small to live in, but housing what? Such trips are filled with imagery that evokes curiosity and present pathways to discovery.

Roadside Heritage® is designed to capture the interest of scenic byway travelers and rural communities by revealing the wealth of science, technology, engineering, and mathematics (STEM) content inherent in rural landscapes. While creating this unique opportunity for travelers, RH also extends its benefits to a rural population that is underserved by informal science education. In particular, residents and youth from the byway communities contribute to the project as they play a central role in the interpretation of the region’s contributions to scientific achievement. These interpretive programs guide the traveler beyond the scenery toward making deeper connections with the landscape.

Roadside Heritage multi-media productions include audio tour programming developed primarily through out-of-school youth enrichment classes and portable hands-on science festivals integrated with the audio tour lessons from the landscape. The festivals and the audio programs are accompanied by an interactive web site, which provides another access point to the program and takes the visitor ever deeper into compelling stories hidden in the scenery. The program’s educational components follow National Science Foundation guidelines for informal science education and draw on the expertise of collaborators and partners which include academic institutions, public science and K-12 education centers, tourism and hospitality industry organizations, transportation and public resource agencies, agricultural programs, recreation businesses, and historic preservation associations.

The origins of the program can be traced back to a relatively simple beginning. Roadside Heritage took root in the rural, isolated, and visually dramatic region known as the Eastern Sierra. The region lies to the east of California’s Sierra Nevada Mountains, an immense wall of granite, hundreds of miles long. The vast Mojave Desert skirts the Eastern Sierra to the southeast and, to the northeast, the high, cold Great Basin Desert stretches all the way to Utah. These impressive geographic barriers effectively separate the Eastern Sierra from the more populous regions of both Nevada and California. It was through the act of evaluating the region’s potential for a major informal science education initiative that Roadside Heritage came to life.

Assessment of the potential for an informal science project in the Eastern Sierra required identifying regional assets that might be leveraged, acknowledging the...
setting’s limitations, and responding with creative force. From assessment, imagination, and a deep connection to the countryside came a place-based program that strives to leverage these assets and turn constraints into strengths.

The local scenic byway offered a novel form of engagement. Well known for its beauty and recreational abundance, the Eastern Sierra has also been endowed with a colorful history inextricably linked to its natural features. The regional economy relies greatly upon the seasonal influx of visitors bent on leisure time pursuits. Roadside Heritage began with a hypothesis that held: When travelers are engaged in the multi-sensory travel experience, they will be receptive to novel forms of learning.

Research probing factors that influence self-directed learning suggest that both large-scale and small-scale environments affect the learner’s experience. The motorist’s learning experience, while traveling through a rural region, will be mediated by both the landscape and, more often than not, by the automobile.

In his book, Windshield Wilderness, author David Louter, a historian with the National Park Service, asserts,

“Early in the twentieth century, automobiles provided Americans with the authentic experience they desired from the natural world. Automobiles supplied not only the vehicle by which middle-class Americans got back to nature, but also the vehicle by which they knew nature itself.”

He goes on to explain,

“To many traveling Americans ...their expectations about and experiences with a wild landscape; “wilderness” ... is something they encounter while driving.”

A large regional project could not happen without a pool of contributors every bit as expansive, but every program depends on a core group of collaborators. The University of Nevada, Reno (UNR), Academy for the Environment (UNAE); UNR’s Raggio Research Center (RRC); the Lawrence Hall of Science (LHS) at the University of California, Berkeley; and the community based nonprofit Eastern Sierra Institute for Collaborative Education (ESICE) comprised the group that founded the program. The project planners reasoned that an integral part of exploring the natural and cultural history should include the region’s unique contributions to scientific discovery.

Institutions, communities, and individuals came together and supported a multifaceted program that provided unprecedented access to academic resources, celebrated—through informal science education-- the strength and values of local communities, and did so while entertaining and educating the traveling public about the region’s contributions to STEM discovery. Through Roadside Heritage visitors enjoy the
opportunities to share with locals an intimate sense of place and recognize the stewardship values that go along with this relationship.

After five years of phased program deployment, we now look back and ask ourselves “Were we successful meeting our goals? Were the local population, youth and adults alike, drawn into the program? Did Roadside Heritage provide motorists with memorable informal science learning experiences?” We do know from their comments that many participants came to see their surroundings in exciting new ways. Some began to view the scientific significance of the region as one of its assets. We also know that underserved rural youth became uniquely engaged in informal science education, as they played a central role in the discovery and interpretation of Eastern Sierra’s rich history.

If we are truly successful, other communities will be inspired to undertake similar projects. This handbook was created as a guide. In it will be found the goals, challenges and lessons learned as Roadside Heritage collaborators built the program. These pages should serve well as a springboard to any group with similar aspirations.

Building the Foundation

Roadside Heritage serves two audiences: the traveling public and the region’s rural communities. The support and contributions of a diverse array of individuals and organizations helped us to meet our dual objectives. At the center, however, was a core collaborative group, who brought together the resources necessary to support the development of high quality programs featuring scientifically sound information expressly about the region’s heritage. This collaboration produced an articulated program that delivered an Audio CD with 13 episodes, an 11-station portable hands-on science festival, and an interactive STEM-rich web site.

Establishing the core collaborative represented only half the partnership equation. In order for Roadside Heritage to serve the rural communities, a broad base of community alliances was needed to build a strong foundation. Some of the partnerships were entirely informal; some took place through the more structured advisory committee. All the grassroots supporters lent an irreplaceable local authenticity to the program.

Collaboration

Goals

The founders of Roadside Heritage envisioned establishing a team with the breadth of expertise needed to develop and implement a regional informal science education initiative that marshaled academic resources to support and empower rural
communities in the interpretation of their natural, cultural and scientific heritage. This We anticipated that the collaborators would forge links across regional boundaries with community-based groups to build capacity for Informal Science Education projects to continue in the region beyond the scope of the project.

**Challenges**

Building a robust collaboration spanning multiple areas of specialization was essential to the success of a multi-faceted program that encompassed all of the Roadside Heritage deliverables. The need for academic leadership and guardianship of the scientific integrity of the project was paramount. Yet specialists can be scarce in a rural area. Owing to the relative isolation of the Eastern Sierra, university-based collaborators would be located—at a minimum—200 miles away.

Experts who could provide skills and experience in informal education also had a pivotal role in guiding the project, but these collaborators would be based even farther away. The distances between collaborators and the rural communities became an issue because, with the exception of ESICE, none of the groups had experience working with each other. Developing a rapport between the regional collaborators and the rural community was essential. Bringing everyone together was an expensive but necessary step.

In addition, both of the university-based collaborators had to consider whether their institution should allocate resources to serve a community that was not part of their constituency. For UNAE the program crossed state lines, making the partnership even less straightforward.

**Lessons Learned**

Establishing core collaboration among regional and community-based organizations requires that each organization evaluate the benefits of entering in to a program that serves distant communities. However, it can be argued that the Roadside Heritage approach offered the collaborators a chance to experiment with new technology and build capacity for new informal science education.

Time must be set aside for developing trust and a working rapport among the collaborators and with the community. The University of Nevada, Reno’s Academy for the Environment (UNAE) took the lead in management and administration of Roadside Heritage. An initial face to face meeting of the collaborators brought them together as a team. With an interdisciplinary approach to developing, enhancing and coordinating “environmental teaching, research and service,” UNAE brought a wealth of experience including the administration of large and complex programs. Although hundreds of miles separated the Eastern Sierra from Reno, UNR was the closest university to the rural communities and many local youth attend college there. In addition, UNAE and RRC have a great deal of familiarity with similar rural constituencies in Nevada.
Enticing an organization such as a public science center renowned for K-12 education innovation not only elevated the expertise at hand, it also created good will and enthusiasm among rural K-12 educators. As a rationale for their participation in Roadside Heritage, the collaboration provided LHS with an opportunity to explore new technologies.

Securing the participation of RRC brought in a collaborator versed in the theory and practice of advancing STEM education for underrepresented groups, matching especially well with our planned Youth Enrichment Program.

ESICE, a community-based non-profit organization, brought its experience and extensive connections to the local communities to the collaboration. This included local Native American communities. ESICE had experience designing and implementing collaborative community science education programs with a proven track record at the local level. Familiarity with ESICE eased some of the apprehension rural citizens expressed.

**Partnerships**

**Goals**
In addition to the core collaborative group, wide-ranging partnerships were essential to the goal of genuinely engaging the local rural communities in the discovery and interpretation of their natural, cultural, and scientific history. By creating a wide variety of opportunities for numerous people with diverse interests, skills and availability to join the program, a bridge between rural residents and urban institutes of higher education would be built. In our proposal to the National Science Foundation, we planned to create several teams, including a STEM team, a technology team, and a marketing committee that would include local and regional affiliations. Our goal was to cultivate local ownership in the program by including as partners many local organizations with interests served by the program. The intention was to demonstrate how program objectives could support and add to the objectives of rural organizations and initiatives, ultimately strengthening the sustainability of all.

**Challenges**
The sheer number of partnerships that needed to be built or affirmed posed challenges. Partners were needed to facilitate after school youth groups, integrate Roadside Heritage products with tourism initiatives, reach the local media, act as liaisons to knowledgeable local experts that would agree to be interviewed, and identify scientists conducting research in the region. In short, the program was partnership intensive.

Recruiting members of teams and committees can be difficult in rural settings where a limited pool of potential candidates exist. Requiring people to commit to a long term, formalized partnership that entailed attending meetings was an impediment. Many
invitations to participate were declined because individuals felt they could not fit one more meeting into their schedule. The results suggest the original Roadside Heritage program design may have placed too great an emphasis on process. In contrast, it has been a good deal easier engage partners in the process of producing tangible products.

Some anticipated partnerships that never materialized forced modification to the Roadside Heritage design. The original design envisioned a program integrated with the regional scenic byway. Low power radio transmitters, located at byway pull outs, would transmit Roadside Heritage audio programs over a short distance. Entering into a partnership with the local byway’s founding organization was fundamental to the program design, as their goals and objectives aligned well with those of Roadside Heritage. But the organization was undergoing a change in leadership and direction. Despite persistent attempts to cultivate these partners, they were unable, as a group, to engage in the project.

Other partnerships, including the Roadside Heritage relationship with 4-H programs and Audio Landscapes will be discussed in the Youth Enrichment and Audio Production sections respectively.

**Lessons learned**
The need to formalize partnerships with other organizations was minimal. As mentioned, it was a good deal easier to generate enthusiasm about the deliverables instead of focusing on process-laden relationships. Informal associations characterized many of the partnerships that formed around Roadside Heritage.

If key partnerships do not materialize, as with the byway group, the program can be restructured and members of the group may be able to participate as individuals rather than as an organization. In the case of the scenic byway, Roadside Heritage was redesigned. Compounded by additional technology considerations, the Roadside Heritage was developed to align with the byway without extensive integration or a formal partnership agreement.

Instead of developing STEM teams and Technology teams, we were able to consult with the same individuals on an informal basis. The greatest degree of partnership structure was provided through the establishment of an advisory committee which is described in more detail in the next section.

Providing potential partners with a written description of Roadside Heritage and detail about their role in the project helped them to understand the project’s overall goals and objectives, and the specifics of their involvement. The creation of a periodic newsletter kept informal partners aware of the program’s progress.
A community-based organization is best positioned to lead in establishing community relationships, but all collaborators need to allocate time and resources to building trust with community partners. Simple interactions go a long way toward establishing confidence that rural constituents’ interests will not be overlooked.

Exploring and engaging a wide variety of partnerships helps to realize the goal of empowering local communities in the interpretation of their regional science heritage. Every partnership formed and nurtured helps to realize the goal of empowering local communities in the interpretation of their region and its heritage.

**Advisory Committee**

**Goals**
Establishment of the Roadside Heritage Advisory Committee was undertaken to meet multiple goals. Foremost was the intent to develop a structure and process enabling the local citizens to retain substantial control over the development of Roadside Heritage. Our goal was to respond to members of the rural communities who expressed uneasiness with the interpretation of local history and development of the scenic byway being put into the hands of organizations perceived as powerful outsiders, disinterested in the concerns of rural communities. The advisory committee strategy called for simultaneously involving the local community in Roadside Heritage and providing them with the assurance that their knowledge and interests would be respected.

In terms of recruitment, the goal was to attract a cross section of the local population that would reflect multiple perspectives. A diverse and inclusive Advisory Committee would assist with making certain that diverse cultures and perspectives were included in the project.

Committee members could connect the program implementation team from ESICE, LHS, RRC and UNAE with members of the community and other local resources. Optimally, committee members would act as ambassadors, representing the project to other groups and organizations. The Committee would also help to develop the local ownership needed to sustain the program.

**Challenges**
Recruitment of diverse committee members is a goal likely to be achieved to varying degrees, but is also one that is never fully accomplished. Plans to recruit the committee members through the local scenic byway group were partially successful, as many of the group’s representatives independently joined the committee. But the group had no American Indian or Hispanic members. The reality of representing a diverse cross
section of community members on the Advisory Committee meant that recruitment was never truly over.

The challenges of diversity also extended to such seemingly innocuous activities as imposing timelines and deadlines on people. Cross cultural activities require meticulous attention to awareness of cultural constructs. All too often misunderstandings develop unless an adequate amount of effort is put into on-going relationship building and mutual understanding.

It was desirable for the local Committee members represent the far flung localities and towns within the region, which meant they hailed from locations as much as 200 miles apart. Meeting in person was not likely to be successful because of the travel distances, costs and varying schedules of a diverse group of collaborators.

The scope of the Committee’s responsibilities also posed challenges. In an effort to be inclusive, community involvement expanded. Once the program implementation began, it became apparent that convening the committee to oversee multiple tasks, such as graphic design decisions, created entirely too much activity for the project to proceed efficiently. When the committee’s role was scaled back, the inconsistency led to some confusion. Committee members were no longer clear about the extent of their involvement.

Other difficulties included sustaining Committee members’ interest in the program. In addition, adhering to timelines and meeting schedules was not always possible, in spite of agreed upon lists and agendas.

**Lessons Learned**

Recruitment is an ongoing task. We asked members to recommend other people that would be good to have as participants. At outreach presentations, we approached key individuals who showed enthusiasm for the program and invited them to consider joining the committee.

The Committee was vested with the authority to veto any unacceptable content in the scripts for the audio programs. This went a long way toward assuaging distrust and the underlying fear that powerful outside organizations would not respect the local community’s knowledge and interests.

The Advisory Committee brought together collaborators from regional universities and rural constituents. In this setting, the different advisors worked cooperatively taking on such activities as developing themes and subjects, providing input on the development of scripts, and discussing what experts might be called upon for interviews. It was a pleasure to watch the committee’s confidence in each other, and in the program, grow.
The use of web-based and telephone conferencing made it possible for the STEM-expert collaborators to participate in the Advisory Committee meetings and solved the challenge of holding committee meetings despite the distances between communities.

In addition to addressing travel concerns, the use of media based conferencing made it possible to record meetings. All members of the Committee, including those unable to participate in real time, received emails with a link to the web site where recordings could be accessed, complete with instructions to make it user friendly.

A job description for committee members was created, setting forth the advisors' roles and duties, and included a roster of committee members. The document also included the collaborators’ commitment that a clear explanation would be given to advisors as to why suggestions were or were not incorporated into the program. Input on such issues as graphic design was welcomed, but this level of involvement was no longer formally sought.

Meetings were initially held twice a week, but as time went on, it was obvious that the number of meetings became excessive. Monthly meetings continued as members wanted to stay informed about the program. Newsletters were another way of keeping members apprised of program developments and served to reinforce other forms of communication, such as meetings and meeting recordings.

Throughout the project, the advisory committee continued to convene on an as needed basis to review the development of scripts for the audio tour. They continued to find new experts for interviews and served as liaisons to the community. Their comments on the programs ranged from proofreading scripts and questioning the accuracy of information included in them, to feedback about new scriptwriting approaches.

**Choosing Theme and Subjects**

**Goals**
One of our most important goals was to define an overarching theme to guide the selection of cohesive individual subjects for our audio programs. The theme and subjects needed to readily draw travelers beyond the passive experience of driving through the region and taking in the scenery. The right theme supported by compelling subjects were viewed as essential tools for capturing the traveler’s attention and revealing to them interesting facts about the Eastern Sierra’s intertwined natural, cultural, and science heritage. We hoped to articulate, through the choice of theme, an essential quality of the landscape that gave rise to these unique attributes.
Through the selection of a theme and subjects revealing the region’s exceptionally rich heritage and that the traveling public would find intrinsically interesting, we could meet our goal of providing travelers a springboard for further inquiry and exploration.

We also hoped that the Roadside Heritage Programs would inspire a sense of stewardship for the landscape.

**Challenges**

Some of the challenges we encountered in this quest involved the process of selecting the theme and subjects. Part of the difficulty in this process stemmed from having to make selections that would be appropriate for the primary mediums, audio CD or MP3 player downloads, the expansive 220-mile setting, and the interests of traveling public audience.

With regard to process, one challenge arose because of how we went about generating themes and subjects. We chose to hold a group discussion with participants at all levels of involvement. The importance of being inclusive cannot be overstated, but it soon became clear that all of the suggestions could not be chosen. Group discussion, conducted as part of a “Breakfast and Brainstorming” kickoff event was effective for generating ideas, but a process to review the suggestions and make a final decision had not been decided until the group discussion was imminent. There was then a risk involved in choosing some of brainstormed ideas and not others. If certain ones were selected and others were not, there was a good chance that the person making the suggestions would feel ignored or left out.

With regard to sifting through the ideas to pick out the strongest, one challenge was to come up with a theme and subjects that would relate to the surrounding landscape at virtually any point along the highway. It was determined that the points of interest and key features were located too far apart to work as a waypoint tour. Should the subjects be features clearly seen from the highway? Was this too limiting, forcing us to leave out some of the most inherently interesting subjects? Should the theme and subjects be specific or more loosely defined, allowing the scriptwriter flexibility so that the best of the interview materials could be used? Could we find experts on the subject in short order?

The full extent of the consequences of our theme and subject choices became apparent as time went on. The broad theme and topics posed challenges for organizing the classes and creating scripts. Narrowing the subject of Alpine Flora, for example, to a seven or eight minute program is extremely challenging given the parameters of introducing the subject, defining the environment and incorporating interview material. This must then be put together in an engaging style in order to convey the information to travelers representing a wide variety of demographics.
A related challenge in handling time constraints was whether scripts should try to touch on the whole of a subject or hone in on an interesting aspect of the subject, anticipating that the listener would be interested in seeking out more information. This challenge is addressed further in the audio production section of the guide.

Presenting an already chosen topic to our classes for youth was another challenge. Students, in general, and middle school students, in particular, are more accustomed to choosing their areas of interest and activities. So, creating buy in to the subject area was not always easy – especially for subjects like alpine flora and desert flora.

**Lessons Learned**

The theme “Exploring Extreme Environments” easily encompassed the depth and breadth of natural and cultural history that is found in this region. It might have been helpful, however, to refine the theme to subjects with a sharper focus.

Conducting a survey prior to selecting the theme and supporting subjects was a tremendous asset. Geology, Vulcanology, Mineralogy, Botany, Wildlife Biology, Meteorology, and Archaeology, were subjects that rated highly on a traveler interest survey, conducted as part of a planning grant. The chosen subjects also fit well with the idea of how the region’s extreme topography was created and its influence on everything from climate to the physiology of animals.

One of the lessons learned was that by choosing a theme and individual episodes that related more broadly to the features of the surrounding landscape, the audio tour could produce an experience that felt as though a geologist, archeologist, botanist, and other experts accompanied travelers on their journey. Conversely, a related lesson learned was that when people hear the term audio tour, they expect point of interest styled tours. Explicitly stating that the tours are intended to be experienced as having a traveling companion can alleviate some of those expectations.

Inevitably, in spite of well chosen themes and subjects, unanticipated interview gems will present themselves and last minute cancellations will occur. Coping with the inevitable “detours” with a roadmap in hand makes the journey easier. And, a lesson learned, to this end, is that the value of detailed organization and careful front-end planning cannot be denied, especially given a project of this magnitude.
Youth Enrichment Program

Setting up Classes

Goals
The design of the program and its stated goal of empowering local communities to interpret their science heritage were largely met through the Youth Enrichment and community docent programs. This strategy allowed both youth and adults to play an active and vital role in producing the audio programs.

Our goal in setting up classes was to offer after school digital recording and production classes to middle school students in all the schools in Inyo and Mono Counties – as they represent the Eastern Sierra Region. Classes would be offered in each of the towns along the scenic byway. This opportunity would provide area youths with a chance to learn audio and video production skills, to meet scientists and talk with them about their work, and to experience their regional home in a new and exciting way.

Another goal was to provide rural youth with greater access to informal science education. In particular, Roadside Heritage was designed to provide information that included diverse perspectives, making the science more accessible for rural and Native American youth. Roadside Heritage sought to collaborate with the local 4-H program to develop and implement out of school classes in almost every byway community that had a 4-H program. The underlying intention was to integrate our activities with existing organizations, making it possible to share resources such as school site agreements and insurance coverage offered under the 4-H program.

Guiding the design of the Youth Enrichment classes was the desire to offer small youth groups a novel and meaningful experience. Class sessions would be adapted to each community’s particular needs. The Youth Enrichment Program aimed to offer an exciting experience, distinctly different from a classroom learning situation, in which youth participated in fieldtrips to experience “on location” reporting and enjoyed an opportunity to learn STEM content as a media reporter would. The intent was to have youth collect material to be used by a professional audio production company to create high quality, virtually professional audio programs.

Challenges
The program was launched in a rather hurried fashion, and the staff was challenged to research subjects, find appropriate scientists and local experts to be interviewed, schedule the interviews and write scripts while the youth enrichment and docent programs were implemented. This created a rather breathless pace.
Producing high quality audio recordings is challenging under the best circumstances. The expectation of obtaining professional quality recordings through a youth program was a source of anxiety that persisted throughout the program.

The classes and festivals were to be supported by docents who would be trained in STEM content, media technology, and classroom outreach methods through a local adult education program, however the adult education program closed as Roadside Heritage was being launched, necessitating a change in these plans.

Deciding on the format (hours and days) of the class presented a challenge, especially when the classes were offered in the more remote locations of our region. We made an effort to maintain a class structure of eight classes (1 and ½ hours in length), two field trips (6 hours in length) and at least 4 interviews. In some cases, we held class once or twice a week, with field trips on the weekend (Afterschool Program Style). In some cases, we held class daily, with field trips on Friday (Summer School Style). In some cases, we had class and field trips over a Friday night and all day Saturday. (Workshop Style).

Arranging for fieldtrips was another logistical challenge. Many phone calls and emails were made as we searched for an appropriate place to meet, as well as the right combination of times when an expert was available and when youth were able to travel. In relation to field trip planning, the challenge of transporting students to and from the desired location was another logistical consideration. Would we use private cars? Purchase a van?

Many of the interviews took place outdoors and these “on location” recordings presented many challenges. The equipment had to be durable. Background noise and wind were perpetual worries that could make the best interviews unusable. Of course, all of the youth participants wanted to operate the video camera, in spite of the foremost importance of the audio recordings.

**Lessons Learned**
The importance of including youth in the program cannot be overstated, in spite of the challenges it presented. Persons that might not have wanted to be interviewed, made time for us, local elected officials pitched in to help find additional funding, and any number of outreach groups that might not have been excited about the project initially, helped us to succeed because the program involved youth.

The hurried implementation of the Youth classes was not desirable. Staff worked heroic schedules to make it all happen. A Youth Program Coordinator was hired to address the concerns of the Youth Enrichment Program. However, this staff member inevitably took on other important pieces of the project, such as script research and writing. More meticulous planning would have saved time and effort, in the long run.
Setting up the youth program worked best when there was good communication with the schools and coordination with other activities such as testing and after school sports programs. These challenges could be met if an onsite teacher was willing to act as class docent as well as a liaison between the school and the program, the challenge became finding someone willing to take this on. This was important in order to accomplish such necessities as obtaining permission to use a room at the school, securing building use permits, and providing the youth with computers to create their own short multi-media compositions reflecting what they found of interest in the class, which came to be known as “student-casts.” This said, in a couple of instances, we found that, in spite of excellent communication and epic efforts to plan programs alongside school officials, our efforts were not reciprocated necessitating creative and hurried restructuring of our plans. It is well to remember that each small rural community has its unique character, and that these kinds of “glitches” should not be taken personally or as an affront to the project.

Having an enthusiastic, “on board” teacher-docent is essential to ensure that classes run well. It is well worth offering a stipend or honorarium to have an interested and capable teacher to help out with the program. A teacher-docent who knows the students and the school helps to make the program and curriculum proceed smoothly as they can anticipate problems that might arise, and can suggest local community resources. In general, the teacher-docent is an extremely valuable liaison and spokesperson for the program visavis the school and community.

A few “mover and shaker” parents can also help the program get off the ground. Inquiring at the school or in the community via clubs, organizations and special groups to find out who might help out in this way can contribute greatly the success of the program.

Letting the schools know well in advance that the program is coming and getting the principal or superintendent on board is very helpful. Asking to be scheduled at a teacher’s meeting to present the program and to invite teachers to participate as docents is well worth the time spent.

Summer school style classes (daily meetings) went very well, since the class was completed in two weeks, students attended regularly and enjoyed the quick “taste” of something new. The Workshop Style was effective in terms of setting up speakers and field trips. It was an exhausting pace, however, and we found that the students were quite fatigued at the end and creating their student-casts was a huge effort. The workshop format did not allow for any reflection (guided or individual) on information taken in. Some adjustment this style would be worth considering. After school style classes (two meetings a week for two months) worked well, although there was some student attrition over time due to the length of the class.
For transportation to and from field trips, we decided that renting a large capacity vehicle was the most cost effective solution to this need. And, while there is a nationally known company available in our area, we had better luck with a local automobile dealership that also provides this service. This decision alleviated insurance worries and negated wear and tear on personal vehicles.

**Student Recruitment**

**Goals**
Our sights were set on recruiting young persons from the community who would be open to learning about our chosen subjects, enjoy going on fieldtrips and meeting scientists. We hoped to recruit six to eight students for each class. The recruitment targeted middle school youth and 4-H members. We were determined to offer classes in every byway community.

**Challenges**
The local 4-H program was very receptive to our project and provided some help in publicizing classes. Ensuring that participants would have insurance coverage through their program necessitated completing lengthy paperwork and collecting a small membership fee. Often this led to the need for follow-up phone calls to parents.

Youth needed to be mature enough to take on a complex team project and yet still of an age where they are open to the experience. Classes were up to 120 miles away from the program base and travel costs had to be kept within reason. In most communities it was challenging to recruit students for classes. Especially in small, rural schools and during summer vacation, it was not always easy or apparent how to attract students to our program. Some locations in the region have populations as small as 400 and each community has its own special character.

Attracting six to eight students was, at times, too many to be reasonably expected given student population of the small rural schools we were targeting, but we also experienced having too many interested youth. In some towns, youth had after school jobs at their parents' business. Working around school holiday and testing schedules and sports programs was an ongoing challenge.

**Lessons Learned**
It seems that, for this project, middle school students are most attracted to and most able to enjoy this program. Class sign-ups were most successful as a personal invitation or if their friends were signing up. We also had good luck in recruiting students when we arranged to bring a DVD presentation into classrooms so potential students could get a feel for the program.
We did not find that being affiliated with 4-H enhanced our sign-ups, though it did provide some free advertising, in addition to insurance coverage.

Posters and fliers did not provide much impetus for class sign ups, unless they were in the hands of enthusiastic teachers or parents.

Once recruited, Teacher-docents also encouraged students to sign up. When sign up lists were generated, having students include their phone contact information provided a way for the Youth Program Coordinator to make a phone call to prospective youth to ascertain their interest and personally invite them to participate in the project.

The final result of this active recruitment was an ethnically diverse group of youth that enthusiastically participated in the program.

**Curriculum**

**Goals**
Our goal was to provide a unique and interesting after school program that included instruction in the use of audio and video equipment to collect oral history style interviews with scientists and local experts, as well as to document field trip experiences.

We hoped to teach the students fundamental recording and interviewing skills, to provide them with the chance to meet scientists working in the region and to help them develop some web publishing skills. As a result of this class structure, we ultimately hoped to provide a novel informal science learning experience intimately related to the local environment, both for the youth participants and for the adult docents attending our classes.

We also hoped to create and refine a useable curriculum with supporting materials that could be accessed by similar programs. These would take the form of a Teacher Notebook, a Student Workbook, and this Handbook of Best Practices.

**Class design for the eight week program:**
Week 1 – Introduction of Project and Topic – overview of class, media examples, paperwork
Week 2 – Equipment Rodeo
Week 3 – Interview Techniques and practice
Week 4 – First expert speaker and first Saturday field trip
Week 5 – Review of technique, second speaker
Week 6 – Third speaker and second Saturday field trip
Week 7 – Fourth speaker and begin student
Week 8 – Completion of student

Challenges
Originally students were going to participate in script creation. It was immediately apparent that there was simply not enough class time to include this. As an alternative, the curriculum included the creation of short slideshow compilations with audio clips posted on our web site that became the youth “student casts.” Scheduling time for this activity was also challenging.

There were challenges related to creating a high quality professional product through a youth enrichment program, as well as other challenges that related to creating a high quality experience for the youth. There is an extreme tension between collecting material for a professional, sophisticated product and keeping the class kid-friendly and fun, as well as instructionally sound.

In short, our challenges included how to make the class content interesting to the students (and fun), to help them to learn something new and different in the world of technology (not easy), to keep them interested in the topic chosen as the focus for the interviews, and to train the youth well enough that the interviews (both in the classroom and on location) would have useable material, and, finally, to help the students synthesize their experiences and learning into a student cast that has a satisfying look and feel to it.

Lessons Learned
The youth enjoyed the student cast activity and many created wonderful programs. It also became apparent that more time was needed to create a good quality program, and, even with adjustments in the schedule, some students were still unable to finish in the time allotted. To this end, Microsoft’s free software download, Photo Story 3, was a happy find, and very user-friendly. However, two of the schools we visited were Mac based and so we were forced to use Voice Thread – another free download that we found to be not as user-friendly. It is also necessary to have a classroom with enough computers so that students can work independently and that students can save their work on. Communication with the school site technology person is necessary for loading Photo Story software on school computers, an important activity to line up before the class starts. Additionally, most public school computers are heavily restricted and do not allow access to the Photo Story student-casts posted on our web site, so students cannot access these for critique or emulation purposes. In order to create a good Photo Story, students needed lots of scaffolding.

Finding the most kid friendly way to create a student cast was a big hurdle. It had to be quick and easy to learn (for both kids and teachers) and useable for our purposes. It had to look good and sound pleasing. Although we used podcasting products, the student compilations were not podcasts as defined as strictly audio programs that are subscribed to via RSS feeds. But the student casts had to give youth a venue for
interpreting what they found interesting in the class. The student casts offered youth a place to learn about their own voice, how to insert sound bites and a place to post their photos. It had to be a true culminating activity. We found that podcasting on Garageband was fairly simple – but some schools did not have Mac’s. We found that using podcast software on Voicethread was good because it is web based, but it is not as user friendly as Photo Story 3. We liked Photo Story 3 best because it has music embedded in the program and it is easy to add sound bites, pictures and narration, as well as text. The only drawback to this program is that it uses Microsoft software, so the computers must be compatible. The biggest effort in all these programs is the need to load photos on all the computers that the kids will be using and to edit and prepare sound bites to load on. It takes time, effort and skill to do this, and the kids need to have some planning time to block out their program and to say which sound bite they want to use. So, particularly, in a weekend workshop style program, it would be helpful to have an evening or a morning to put this together so it is ready to load when the kids are ready to produce their podcasts.

Communication with the site tech person is extremely important. Finding students in the class who have lots of computer savvy and who can help other students is wonderful. Having a teacher who can sit with students who need lots of help with editing and navigating the program is helpful. Giving kids ample time to put together a program is essential. To this end, good preparation for student cast production includes sifting through the digital photos taken by the class participants so that there are a limited number of good choices. Preparing sound bites for youth to use, and making sure that the proper microphones are available for student narration are additional considerations. Finally, close supervision of the process helps to ensure that projects are saved correctly. Making copies to a CD or thumb drive is another good idea. When youth stories were posted on the web site, the youth enrichment coordinator sent a postcard along with instructions on how to view the program, so that youth and their families could easily enjoy these projects.

An ongoing part of the curriculum was constant evaluation of the design, including research and refinement of class structure and materials. To this end, Internet searches provided a wealth of useful information.

Classes, especially ones where we had planned to conduct interviews, often did not afford time for student reflection or preparation for upcoming interviews. It is important to make sure that interviews end in a timely fashion so that equipment can be properly stored and a bit of time can be devoted to wrap-up.

Students often labor over their student casts and need more than the allotted time to complete their project. Be prepared to add a class session or stay late to allow for this need.
One unexpected lesson learned came from observing the students rise to the occasion during important interviews. During the recording sessions, youth showed an impressive ability to work as a team, troubleshoot, ask great questions and maintain quiet when necessary.

**Recording Skills and Equipment**

**Goals**
Our intentions included giving youth an opportunity to experience what it was like to be a reporter, to help them gain insight into the relationship between an interviewer and interviewee, to give them a hands on experience that also introduced them to STEM subjects related to the region they live in, and to provide an opportunity to use multimedia tools to share what they were learning with others.

We wanted to teach youth how to collect oral history interviews with digital audio and video recording equipment with enough precision that their recordings could be used to create professional audio programs in which the sound quality would not become a distraction for the listener. In our classes, students learned the entire process: how to set up, use, troubleshoot, break down, and store all of the equipment. In addition, they learned to use this equipment in real interviews, both indoors and outside “on location”.

As most classes attracted participants with a range of experience, we wanted to provide more experienced youth with an opportunity to learn more advanced computer skills as we prepared to produce our Photo Story studentcasts. This included downloading photos from digital cameras, downloading sound from the Marantz audio recorder, writing and recording their own narrations, using digital tools to manipulate photos, and adding graphic elements, including text overlays.

The youth program was to be offered with access to a traveling mobile lab (a minivan) for the collection of recordings. This idea represented the desire to bypass anticipated equipment inequities at the various schools in which classes would be held. Additionally, it would contribute to a novel, exciting experience that didn't feel so much like school. The resources at hand, however, were not sufficient to realize this goal.

**Challenges**
The equipment challenges were many and varied. We needed to purchase equipment that was capable of collecting high quality digital audio files to be sent to a professional studio for incorporation into our CD. The equipment we used included a video camera and tripod, digital audio recorders, professional grade microphones, headphones, boom pole, cables and consumer grade digital cameras. In addition, we needed to be prepared with tapes, batteries, memory cards and cases to complete the equipment list. The equipment had to withstand heavy use and occasionally rough handling, so it had to be
durable, suitable for indoor and outdoor recording, high quality and kid-friendly. As we planned to work with many different classes over several years, we needed to keep this equipment in good working condition.

Despite our best efforts and assistance from audio professionals, equipment occasionally has its quirks. The Marantz recorder was, and at this writing still is, the standard for high quality audio recording. Yet, the first Marantz recorders had manufacturer defects that created a hiss. For entry level equipment operators it was difficult to identify where the problem was coming from—operator or equipment. Marantz corrected the problem with their latest version of this recorder.

Another consideration is whether to record indoors or outdoors or, to mix recordings. Different surroundings create different sounds. For example, interviews that take place in a big empty room will sound different than interviews that take place in a recording studio or at an outdoor site. Mixing indoor and outdoor recordings is slightly distracting, though most listeners would not know why.

Audio editing software can correct many shortcomings, however recording levels are critical. In particular, over modulated interviews sound distorted and not much can be done to remedy the bad sound. Recording at very low levels can be amplified but, in doing this, background hum is generated.

Field recording is not as straightforward as are indoor interviews. On one occasion, an interview had to take place inside a minivan because of gusty winds blowing across the microphones. Other common audio problems include street noise and traffic sounds during outdoor interview sessions or something as seemingly simple as a ticking clock or a squeaking chair in an indoor location.

Encouraging students who only want to use only one type of equipment was also challenging, especially when it came to using the boom pole, an important but laborious job. As with any equipment laden endeavor, the emphasis on careful handling and safety was an ever-present challenge. Also, lugging all this equipment on a field trip (where there is plenty of dirt) was tedious, especially packing it all up, breaking it out and then putting it away.

**Lessons Learned**
One of the most important lessons learned was that redundancy is a good thing in recording situations. Several recordings were collected during each interview, including having a docent or staff member operate one of the recorders. This strategy paid off when one of the staff interviews failed, but the youth recording was problem-free.

Our approach was to take students through an equipment “rodeo” so that they learned how to use and care for each piece of equipment. Some students have had more experience with this type of equipment and/or are more adept than others, so we tried
to match them up with students that needed to gain confidence. The Marantz is the most complex and unfamiliar piece of equipment and, therefore, takes the most time to learn.

Working with an audio production company to provide expert assistance deciding what equipment to buy can be extremely helpful and timesaving. The audio production company we worked with made equipment purchase recommendations. In addition to choosing equipment that would result in a high quality professional recording, other factors for selection included cost and durability. We used a Marantz PMD660 Digital Recorder and a Panasonic PV-GSP series camcorder video camera. It is quite possible that equipment initially purchased will be replaced with upgrades, as we did with the Marantz PMD661 recorder. With these devices we used professional quality shotgun condenser microphones, which compress foreground and background sound, much like a telephoto lens compresses visuals. We also used lavaliere, or lapel, microphones. The, shotgun mics were used with the boom pole to keep microphones out of sight in video recordings. Students also learned about microphone wind socks and other useful accessories. Additional equipment included XLR cables for use with professional microphones and Nikon Cool Pix digital point and shoot cameras to collect photos for our Photo Story student casts.

An important consideration for any project would be to purchase the most up-to-date, tried and true, “bomb-proof” equipment available (within the budget). Ours has stood the test of time and multiple users. All of these recording devices require batteries when they cannot be plugged in, so it is well to anticipate lots of battery usage, and to be sure to charge up rechargeable batteries before every use. It is also important to explain the whys and wherefores of each piece of equipment to the class, so that they understand the rationale for winding up cords a certain way (which turned out to be a surprisingly challenging task for them) and other such details. One resource worth considering is the use of videos showing how to use equipment, for instance, we found a You Tube video with a demonstration of how to wrap a recording cable.

It worked well to present the equipment “rodeo” as a logical thinking and discovery exercise, so that students got lots of hands on activity as well as a chance to see how things work and how they might think through problems with them in order to trouble shoot. Another successful technique was to model good, patient, methodical workmanlike approaches to using the equipment and to provide plenty of time to practice setting up, recording and putting equipment away. There are many temptations to take shortcuts such as not using a tripod, not wearing headphones, and labeling tapes after recording, but they compromise the quality of the recordings. The youth naturally want to rewind and view their video recordings, but this can easily result in recording over parts of a previous interview.

Finally, mastery of the technical side of interviewing is also important. The format of the audio recording is critically important and a formal sound check must be conducted on
video cameras as well as audio recorders. Although WAV files are larger than MP3 and MP4 files, they retain more data. It is always possible to compress, or change files, but once the audio is converted to the lower level there is no turning back. Archiving high quality WAV form recordings is worth the effort if you are aiming for high quality programs.

Good class management also included double checking everything, especially on field trips, and emphasizing the teamwork aspect of getting a good interview. We created a chart and drew cards for jobs so that kids felt interview assignments were made in an equitable way and that everyone was given a chance to rotate and try each piece of equipment. Checking all the equipment before and after each use is time consuming and tedious, but well worth the effort.

It is more cost effective to repair equipment that to replace it, and, we have found, it is not difficult to find this service through an Internet search.

**Interviewing Skills**

**Goals**
The RH Design Team held the belief that the most authentic and engaging programs would result from empowering rural communities to discover and interpret the subjects that made up the final audio program. Youth from the local communities were given the role as key agents for the collection of interview content for the CD. Our goal was to teach students how to conduct an oral history interview that would result in interesting, useable material. Though we had some prior agenda items slated for each interview as it related to the production of the CD, we felt it was important for the students to formulate their own questions.

**Challenges**
Entrusting inexperienced youth participants with the critical role of interviewer, and with the expectation that this will result in a high quality professional sounding product, was risky and fraught with complications, not the least of which was mastering the art of the successful interview.

It takes many hours of practice to develop good interviewing skills and to develop a sense of how questions are formulated, sometimes “on the fly”, with appropriate follow up questions, as the interview progresses. Students needed information about the subject matter of the interview and background information about the interviewee. When it came to actually conducting the interview, many youth found the interviewer “job” intimidating and required some bolstering to get through it. That said, other students were naturals, having observed “Oprah” and other such interview programs on television and had an intuitive sense of what to ask and how to ask it. Finally, some youth discovered that they enjoyed this job in spite of their initial trepidation.
Once interviews had been recorded, they had to be downloaded, transcribed and properly archived for future use. During this process, listening to the quality of the sound was also important, to ascertain that the interview material could be used by the professional audio production company. The challenge here was taking the time to properly accomplish these time consuming activities in the midst of an already busy schedule.

**Lessons Learned**

Kids need direct lessons on oral history interviewing techniques. Having an expert, with oral history interviewing experience, visit the class to talk with the students about this process makes this lesson more interesting. One such expert described the importance of formulating follow up questions and then had students interview each other asking at least one follow up question. Lots of practice interviewing each other and conducting “mock” interviews, in which the teacher takes on the personality of an expert interviewee, are required to develop this skill. The first real interview with an expert should be one that is not of critical importance or done on location, just in case the interview doesn’t go well or the equipment presents technical difficulties...in spite of the best teaching and the most comprehensive planning. We have found the staff and docents can and should interject questions during the interview and, at its conclusion, all are invited to ask questions that have come up for them. This helps to fill in details that make the subject more comprehensible and accessible to the lay public.

Youth displayed a high level of engagement when they interviewed local legendary skier and ski resort operator, Dave McCoy. It was difficult to convince Mr. McCoy that he should set aside time to be interviewed by our students. The solution we came up with was to record a short video to send to him, in which each of the students said hello to him and told him one thing they would like to ask him. It took some effort, but ultimately he agreed to the interview and the students hung on his every word.

Youth must be involved in the interviewing process in order to have a sense of ownership and to truly engage in the project. In the few instances where the youth were not involved in conducting the interview, the team was less cohesive and more easily distracted.

Each class member should have the chance to assume the role of interviewer, just for the experience. However, the entire group can help formulate the questions to be asked and can be given a chance to ask questions when the prepared list is exhausted. The interviewer also was tasked with the job of making sure the interviewee signed the talent release, was apprised of the questions that were going to be asked, and was offered a small gift as a token of our appreciation (in this case, a refrigerator magnet handmade for Roadside Heritage by a local potter). The interviewer also assumed the role of point person for the team – asking for a sound check and initiating pauses in the recording when needed.
Every effort should be made to spend some class time reviewing basic background information about the topic being focused on in the interview. It is a good idea to include some pages in the student notebook with this information. Also, before each interview, it works well to brief the students about the speaker’s expertise and background. This kind of information helps students formulate good questions.

Some participants truly enjoyed this role and some were quite reluctant. As each class member took their turn in this capacity, it was a chance to experience leadership of the team throughout the interview. For most young people, this was an experience that they found a bit anxiety producing, but worthwhile and certainly self-esteem producing.

We found that purchasing a transcribing machine for our office staff made transcription easier. Also, it helped to note times on the transcription so that important pieces of the interview could easily be found. Proper transcription is tedious, as is proper notation and archiving of interviews; however this procedure is of utmost importance for ease in using these interviews. More information on how to proceed with these tasks can be found by researching oral history manuals and web sites.

Much of the interview material collected could not be incorporated in the audio programs due to the volume of interviews and brevity of the programs. A solution for including more of the compelling interviews was to post this information on the web site as “web extras”.

Audio Production

Working with Audio Experts

Goals
As previously stated, the goal of Roadside Heritage was to engage local scenic byway communities and, in particular, rural youth, in collecting the interviews and information to use as the raw material from which an appealing, high quality, professional audio program would be created. Our intention was to contract with an audio production company with the technical skills, equipment and resources necessary to make that possible.

Challenges
Interviews were conducted with several nationally recognized audio tour production companies. Clearly, Roadside Heritage did not fit the business model of most audio production companies, which typically conducted the research and interviews, then
produced a script, recorded the approved program, and retained ownership of the final program. In order to be successful, this type of operation is necessarily conducted as quickly and efficiently as possible. Roadside Heritage represented a three-year project and a long term relationship. In addition, none of these companies were located close to the project area and site visits would be expensive propositions.

Ultimately, the project found a good fit with a company based in Portland, Oregon. However, this presented another challenge as the subject of the program was the Eastern Sierra of California, – a huge regional difference. And, though the professionals visited our region, they did not truly have a “feel” for it.

One of the important contributions to Roadside Heritage made by the production company was expertise in creating scripts suitable to an audio medium that engaged the listener. They also gave us helpful strategies for interviewing and recording, access to resources such as music libraries, narrators and character voice dramatists, skill in mixing audio tracks and cleaning up less than perfect audio files. Everyone involved in the project did not always appreciate the special contributions the production company brought to the project, nor did the audio production people always appreciate the need for scrupulous attention to scientific and cultural accuracy. For example, the need to use authentic and appropriate Native American music representative of the people in this region was not well understood.

Everyone struggled with striking a balance between presenting STEM information in accurate scientific detail and creating colorful, entertaining audio programs. For example, including fun, comical material sometimes verged on trivializing the subject. And, in one conversation, the audio production specialists likened creating an audio tour with the involvement of youth, “like swimming with a ball and chain on your foot.” The audio specialists also expressed some discomfort with script approval coming from an advisory committee. With layers of approvals necessary, creating a workable process to production protocol was difficult and the project timeline was difficult to maintain.

It became apparent that script writing and working on a local project long distance was fraught with problems. Relying on outsiders to interpret the landscape resulted in generic scripts which included information gleaned from unreliable online resources. As a result, the lion’s share of the scriptwriting workload shifted to the already very busy Youth Enrichment Coordinator and Program Director. One idea that came up around this was to create a template for producing our audio stories. While the idea has merit, it would take some time to develop and has limitations. It is extremely difficult to reconcile the aspiration of creating a script that evokes an authentic, heartfelt portrait of a landscape with the drive to reduce this process to a seemingly efficient formulaic approach. Each subject and supporting interview materials require a unique perspective.

Logistics were also a challenge. It was necessary to share large audio files and transferring them was a time consuming process. Frequently errors were not caught the
first time a script was read or an audio file was listened to. Requests for last minute changes were an ongoing and expensive proposition. The length of the recordings exceeded what was allowed for in the contract.

**Lessons Learned**

We chose a company that is well known for its work in audio tours. The advice they gave ranged from technical issues to tutorials on choosing character voices. They were able to accommodate a long term relationship, did not demand rights to the audio programs, periodically participated in team meetings, had vast, high quality music and sound effects library, and a network of narrators to fill the role of character voices.

Collaborative scriptwriting did work, especially when we worked out a sensible order of operations in terms of script review and revision. To this end, a Design Team, composed of representatives for ESICE, LHS, UNR and the audio production company, was created to take the lead in reviewing story scripts for content, literacy, interest and scientific accuracy. This team determined the primary content objective for each episode, edited scripts, conducted research and identified experts from the scientific community who might be interviewed. Scientists who provided expert commentary also reviewed the scripts for accuracy. Once the Design Team and researchers finished their reviews, the drafted script was passed to the Advisory Committee for comment and approval.

In working with the experts, it soon became clear that the scripts should be written collaboratively in order to truly represent the Eastern Sierra region. While the task inevitably robbed time from other important activities, scriptwriting taken on by ESICE staff, with editing and embellishment done by the professionals resulted in a production very highly rated by the public, according to an independent survey. This worked well and made it easier to include the advisory committee and design team in the process by seeking their input before sending a final draft to the experts.

Sharing Roadside Heritage files, especially large audio files, necessitated setting up an FTP, or File Transfer Protocol site. This solved many of the problems of handling huge files and making data compatible for end users. It added to the learning curve but, once everyone learned how to use it, problems were no more serious that a forgotten password. The system made it possible to share unwieldy files with LHS web site designers and served as an online archive.

In order to send clean audio files to the experts, a back-up recording of each interview was collected at the same time the students were recording. This was accomplished by having an extra digital audio recorder operated by an experienced adult. In downloading multiple audio files to the hard drive, interviews were labeled with a note regarding who recorded the interview.

Working with a professional audio production company is the only way to ensure a professionally produced product. Shopping around for a good fit was worth the effort.
Speakers and Interviewees

Goals
Our goal was to find experts to interview for each of the 13 topics chosen for the audio program episodes. These experts were to include scientists working in the field that were available to visit the youth program to be interviewed by the participants during class or on a field trip. We also intended to interview knowledgeable local experts on the topics to make the programs more accessible to the general public. Our goal was to find knowledgeable interviewees, who were comfortable being recorded and were engaging speakers. The intent was to be as inclusive as possible, recording interviews with a full range of experts who could present diverse perspectives.

Challenges
The challenge was to find suitable experts, primarily scientists and researchers who were willing and able to be interviewed for the project, particularly on the days and at the times that would work for our classes. While experts on most of the topics chosen for the programs abound, many are not willing to be interviewed or are unable to be interviewed due to time, date or location constraints. It was also tricky at times to find a local expert that could add the engaging and colorful anecdotal information essential to making the audio programs appealing to the general public.

As our closest university partners, UNAE and RRC had been tasked with finding scientific experts. However they were not always able to find expert interviewees that were willing to travel to our class from Reno, or that were willing to be interviewed on the dates we needed them. In all cases, and for all topics, the great challenge was in finding interviewees who were current in their field, interested in explaining their field to the general public – especially to young people -- and who were willing to be interviewed. In some cases, it was difficult to explain to potential interviewees that we were most interested in interviewing them and that they did not need to prepare a detailed presentation or PowerPoint. Some insisted on bringing PowerPoint presentations, and their interviews are not as “friendly” or conversational as ones that are typical interviews. One quirky problem we encountered when interviewing scientists is that often they are accustomed to speaking with other scientists, so making concepts more accessible to non experts carries a stigma in the scientific community.

Lessons Learned
While expert in their scientific discipline and field of study, researchers may not necessarily be comfortable being interviewed and recorded nor able to speak to a public audience, while the groundskeeper at the local museum, who has pored over its history, can be a lively and compelling speaker. Generally, persons actively involved in educating others about the region – from National Park interpreters to lecturers to mountain guides – can often convey natural history information to both youth
participants and to the general public in a way that is easily understood and captures their imagination.

Although we tried to discourage PowerPoint presentations, it was enjoyable to have interviewees bring photos or objects to talk about with the classes. We did manage to interview a few experts from UNR and one interview for the project was accomplished as an adjunct interview, done at the UNR campus without class participants.

The most expeditious way to find interviewees for the youth program, and for each topic, was to brainstorm with the Design Team and the Advisory Committee to come up with names of local scientists, researchers and experts that might be willing to be interviewed. It was also helpful to utilize local governmental agencies such as the U.S. Forest Service, Bureau of Land Management, California Department of Fish and Game, California Department of Transportation (Caltrans), a local university research station and other resources agencies. The Internet also provided invaluable resource for locating experts. Field trips to state and national parks and monuments were also excellent sources for interviews with ranger interpreters, most of whom are accustomed to giving engaging talks to the public and interpreting subjects.

In a few cases, it was important to get a particular interview to round out the audio program, so some interviews were done outside of class in a variety of ways. A few were completed at professional audio recording studios for a minimal fee. Others were done by an interviewer who was able to travel to the institution or site where the interviewee could be interviewed. Still others were completed at ESICE or by RH staff on site. The project team also briefly considered recording interviews over the telephone, a common practice in radio. However, the team quickly determined that the poor sound quality would ultimately detract from the final product.

One of the most important payoffs of having kids interview the scientists (besides using it as an enticement to agree to be interviewed), was that it helped to encourage vernacular explanation of phenomena and research. Teaching kids to ask deeper questions about how things looked or felt to get a good “radio” description was also important for collecting useable material.

**Diversity and American Indian inclusion**

**Goals**
Roadside Heritage by its very name was obliged to present an inclusive portrait of the cultural history of the region and diverse perspectives. The goal was to include Native American perspectives in all 13 of the audio programs and to make science accessible to under-represented youth with diverse cultural backgrounds. To this end, we contracted with a Native American liaison to lead the development of audio content documenting
local Paiute Shoshone oral histories. Appropriate traditional Native American stories would be integrated with STEM content. Under the direction of the Native American liaison, youth would conduct research, interview elders, and record their own narratives.

Challenges
As program implementation got underway, the liaison felt that the Native program component and content should be integrated with the rest of the program. We found that, although the liaison knew of traditional stories and knowledge pertinent to the individual episodes, he had difficulty finding elders willing to share this knowledge. Youth participants were then invited to conduct interviews with the liaison. The liaison ultimately left the project, so alternate resources for contacting Native American interviewees for the programs had to be found. Local Tribal Historic Records Officers, Tribal Education Centers, Tribal School Liaisons and the local Indian health project were helpful in providing contacts. In many cases, it took a great deal of perseverance and effort to develop a relationship with potential interviewees from this community. A sensitive, respectful and patient approach to cultural differences is extremely important.

Lessons Learned
This element of the project vested much responsibility in one individual. When that team member left the partnership, it was a considerable setback for the overall program. In addition, the question of intellectual property rights became an issue that diverted energies away from the project. We have found that having so much of the project dependent on the relationship of one or two individuals proved problematic. Long before implementation, at the very early stages of program design, we find it is important that multiple Native American project partners (as well as other representative cultural groups that might be included) be invited to take an active role. For any program seeking to engage Native American communities, issues of intellectual property rights must be planned for, in particular addressing ownership of deliverables that might be construed to belong exclusively to an award recipient. Whereas RH developed talent releases for all youth and persons interviewed, a Native American interview release should be carefully constructed. We found that the Oral History Association has examples several such releases that address these very issues available on their web site. One of the key considerations is whether the release stipulates in what context the interviews can be used. One of the issues to be addressed in this context is whether or not the deliverables will be sold. It is important to note that individuals seeing a product available for sale may conclude that a profit is being made. ESICE staff worked with Native American partners to develop an agreement stipulating that any profit made for the sales of the CDs would be re-invested in the RH program.

We also learned that paying a Native American person to work on a program should be understood as paying the individual for their time and should not be construed as paying for information. In seeking advice to resolve the intellectual property rights
dispute, it was recommended that interview material be confined to information that has already been widely published and shared with the general public.

We found that personal acquaintances with individuals from Native American communities or working for tribal governments were the most promising places to begin constructing relationships. In initiating conversations with potential Native American partners, the dispute with the one key individual was openly acknowledged. In most cases, we found that the people we approached already knew of the dispute or knew of other instances in which such disputes arose.

We found that we were not alone in our struggles and that numerous cross cultural programs with similar goals and objectives also had similar difficulties. Among the many lessons learned, we found that developing sensitivity for other cultural constructs can help teams anticipate issues and avoid unwittingly antagonizing cross cultural partners. The corollary to this finding is that members of the dominant culture must accept that they will make cultural blunders if they are to make meaningful progress in this realm. Two sensitive issues with the Native American community we found were 1) do not go into a dialogue or begin designing a program with the mindset that Native Americans are human artifacts. Relegating Native American culture to the past denies that the cultures have adapted and not only persist but also are relevant in the 21st Century. 2) Do not assume there is a “Native American community”. These are multiple communities. If at all possible, it would be advantageous for implementation team partners to sit in on a cultural training session. A good deal can be learned by being privy to information provided in the formal education setting by Native American liaisons.

We also found that the cultural constructs of the dominant culture paradigms cannot be superimposed on non-dominant groups without becoming problematic. As an example, Roadside Heritage partners built a program design that imposed dominant cultural timelines and deliverables. We learned that attempting to get a Native American elder to speak about a certain subject was generally unsuccessful. We also learned that scheduling when information would be shared also led to disappointments. It was not necessarily that information was withheld; it was that the information was on a different topic or shared when the individual felt it was right and did not conform to a program timeline. In order to address this issue, we included Native American perspectives in the audio program content wherever there was an opportunity. Other Native American audio content was developed into a “Native Voices” section on the Roadside Heritage web site.

We found that working within the context of Tribal Education Centers put forward a positive step toward building relationships. In this kind of setting, individuals or programs from the non-dominant culture with similar aims have a place in which to begin to understand the objectives.
Through our interaction with Native American partners, we have also learned that inclusive program evaluation takes into consideration the perspectives of non-dominant communities about the success of program outcomes.

**Festival**

**Goals**
The creation of a hands-on science festival centered around and reinforcing the themes addressed in the audio programs would allow for Roadside Heritage to further expand its impact due to the wide demographics present at the festival’s proposed venues. This STEM-rich science festival was to be composed of portable kits enabling the festival to travel to local events, particularly those that are a major draw for tourists, providing access to nontraditional informal science education audiences. The festival was to be created by project collaborators from LHS, an institution with a wealth of experience in K-12 Education and the production of such portable hands on science exhibit kits. In addition, local community docents would be trained through a locally supported adult education program to support the festival activities and to effectively lead STEM content discussions.

**Challenges**
Though the festival is meant to provide a stimulating experience for the whole family, some of the festival stations are more attractive than others. As a result, some stations draw a crowd, and some are very quiet.

Some of the festival stations rely more heavily on consumables. This requires checking the stations and stocking the consumables before the festival goes out.

Stations that are very print-laden are less attractive or less accessible to some festival participants. Other stations require a certain amount of creativity, background knowledge and/or ability to charm the public on the part of the docent or volunteer. As an example, the 3D Archaeology Puzzle is small and can be easily overlooked unless the docent at that station enthusiastically guides the engaging critical thinking activity that can occur with it.

Each station has different infrastructure requirements, ranging from simple and stand-alone, to battery driven, needs an electrical outlet, or needs a water source. Each station requires a table top, and the entire festival, when set up, occupies a rather large space. Finally, a docent or volunteer is needed to run each station.
Transporting the festival kits to the chosen venue requires a large van, several sizable vehicles or several trips, which presents a challenge when the event is distant. Setting up and breaking down the festival requires extra time and care on the part of the docents and volunteers. An extremely well written and thoroughly tested festival manual was included in the creation of the festival. Each station comes with detailed instructions for these procedures; however, these activities still need to be supervised given the fragile nature of some of the equipment and the propensity of the docents and volunteers to rush through these tasks at the end of the event.

The festival needs to be well publicized prior to the event to insure good attendance. Good publicity requires a thoughtful and enthusiastic explanation of the nature and value of the festival. While offering this festival as a part of the myriad of events that draw tourists to the Eastern Sierra is an exciting way to introduce non-traditional participants to informal science education activities, the cost of bringing the festival to these venues can be quite high.

**Lessons Learned**
The creation and production of the hands on kits, which included a docent training manual, went through several trial periods and iterations. With each public staging of the festival, there was rigorous evaluation of public reaction to the stations as well as the effectiveness of docent training and use of the manual. The result of these evaluations was the production of a fun and engaging festival complete with instructions to make it fairly easy to set up and run with team of trained docents and volunteers.

Organizing the manpower to put on the festival is also labor and cost intensive. ESICE is fortunate to have a pool of docents to draw from, and providing a stipend for their work appears to be the best way to entice them to work at the festivals, ensuring a high quality experience for the public. As a courtesy, snacks and beverages were also made available to docents and volunteers during festival events. It goes without saying that there needs to be a head docent or staff member in charge of coordinating the festival—checking kits before they go out, purchasing consumables if necessary, publicizing the festival, making arrangements with the festival venue, organizing the docents, transporting the kits, and supervising the set up and breakdown, as well as keeping things running smoothly during the event.

At some events, particularly at local public schools, a mix of docents and volunteer teacher or parents works well. Docent training is best accomplished on site, as part of the setting up process just prior to the festival. Adult education classes for training docents might be a good way to complement background knowledge and program delivery, however, logistically it presents some difficulties.

To offset festival costs, it may be possible to offer the festival to public schools for a nominal fee. Another way to sustain the festival may be to seek corporate or private
sponsorship to cover costs associated with event fees, transportation, docents and consumables.

The festival provides an excellent adjunct to the audio programs produced by Roadside Heritage, as well as a captivating public interface with the STEM-rich themes addressed in these programs. Connecting the festival and the audio programs is still a challenge. One approach might be to have a listening station at each festival activity, where participants can listen to the audio program that is showcased at that activity. Another approach might be to have a download station as part of the festival.

Posters and brochures advertising the audio programs and web site should be prominently displayed.

Docent Recruitment and Training

Goal
The Roadside Heritage docent program was conceived as an additional way to engage the local community in informal science education specifically created for the unique Eastern Sierra setting. The intention was to use a docent program developed for another outdoor science education program, the Eastern Sierra Watershed Project (ESWP), to engage these veteran volunteers and new recruits in the youth enrichment program and portable science festivals.

The original plan called for development of continuing education classes (2 to 3 weekends in length) designed to address Roadside Heritage themes. These classes, co-sponsored by the University of California White Mountain Research Station were going to be offered through the local adult education program.

Docents, specifically trained for festival kit activities and youth programs, would receive training in specific STEM content mirroring the youth enrichment program and festival kit development.

Challenges
The challenge presented by expanding the current pool of docents associated with ESWP is directly related to the size of the local community. While the ESWP docent program does attract new volunteers, some also leave, resulting in a sizeable (for this community) but steady number of excellent, enthusiastic volunteers. However, this docent program works because docents are offered a modest stipend for the “volunteer” work that they do. Given today’s economy and the demographics of the docents (retired teachers, young job seekers and those who have recently moved here),
expecting well trained and educated people to volunteer is unrealistic.

Just as Roadside Heritage was about to be implemented, the local adult education program was discontinued. With the program already underway, a decision was made to offer docents the same training as the youth received through the Youth Enrichment Program. Requiring docents to attend a seminar would put additional demands on their time and would make the program more complex and expensive to replicate.

**Lessons Learned**

Docents working at science festivals and as part of youth enrichment classes contributed greatly to the success of the project. Their enthusiastic love of science, learning and sharing new knowledge with others was apparent as they worked with the public and with class participants. Their feedback invariably included commentary about the value of this project as a place for them to learn about and share with others the amazing scientific heritage of this region.

For Youth Enrichment Program Classes, it worked best to find a teacher already working at the school where the class was to be held. This expedited arrangements for classroom and computer use, as well as student recruitment and communication, including paperwork distribution and collection. On site teachers also acted as school/project liaisons and ambassadors, often spreading positive words about Roadside Heritage.

For the Science Festival, it worked well to recruit docents from the existing ESWP pool of docents. When the festival was held at local public schools, it worked well to request that the host school provide six to eight volunteer teachers or parents to work alongside trained docents. The thorough and well-written festival manual makes it easy for volunteers to understand how to set up, run and break down festival stations. However, a mix of trained docents and volunteers, along with a lead docent greatly contributes to successful running of the festival.

Offering a stipend also helped to acknowledge the value of the docents’ contribution and offset the cost of travel, childcare, and taking time off work.

**Dissemination of Deliverables**

**Goals**

The project’s outreach and dissemination activities were many and varied. Efforts in this regard outlined a four-tiered approach that began with collaborating with the local community, next engaging professional tourism entities, then connecting with the traveling public. In support of those objectives the fourth element was to develop
materials for public outreach and joint tourism promotion. One of our goals in this area was to broaden the local tourism organizations’ assessment of regional assets. We hoped they would consider scientific achievement among the cultural attributes to promote in support of their mission to attract visitors.

The Roadside Heritage plan anticipated the development of strong community partnerships and integration of Roadside Heritage products with the marketing activities of local tourism groups. If the strategy was effective, the costs of promoting and popularizing Roadside Heritage products would be shared and the sustainability of the program improved. In addition, tourism promoters would have a unique and novel offering to take to outdoor recreation shows, link to on their web sites, and put in the hands of visitors wanting to know what there was to do.

The local media covered the program providing time and ink to announce our activities to Eastern Sierra communities. Presentations to spread the word were delivered to chambers of commerce, service groups, tourism councils, and government divisions from transportation and parks and recreation depar

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**Challenges**

ESICE as an organization was not well known by some members of the community and was a new entrant in the tourism sector. A hint of territoriality existed and the program did not match the communities’ expectations about who should be engaged in tourism activities.

Developing awareness with larger tourism and travel entities has taken considerably more time and effort than at the local level. It is difficult to reach key individuals and there is a general apprehensiveness that seems to stem from the fear of a request for funding.

High profile organizations, such as *Sunset* magazine, the American Automobile Association, and the California Travel and Tourism Commission are approached relentlessly by myriad promoters. Returned phone calls are infrequent and email replies are slow to arrive, if they are forthcoming at all. Sending out expensive press packets without making follow up phone calls proved ineffective. There is also intense competition to get a mention in major newspapers, such as the *Los Angeles Times*.

Two open house celebrations recognizing the contributions of partners, including students who participated in the Youth Enrichment Program, were wonderful gatherings, yet not well attended.

Roadside Heritage had envisioned working with the National Scenic Byway program to disseminate the program and to support reaching a wider audience. The local scenic byway had not applied for a national designation, however, and the agency staff has
restricted their interactions to representatives of existing national byways or those applying for designation.

Lessons Learned
Fierce competition for tourism dollars can turn allies into competitors and fan the flames of territorialism. Rural tourism organizations may be at odds over issues such as the distribution of transient occupancy taxes or rankled over government agency regulatory decisions. In this frequently contentious atmosphere, an effort was made to differentiate Roadside Heritage framing it as a value added enhancement for the campaigns led by tourism partners. Joining the local chamber of commerce, building relationships with recreation providers, and offering support for government agency personnel was largely successful in strengthening existing ties and establishing new ones.

The first Roadside Heritage cultural history CD release was extremely well received and built anticipation of the next releases. The staffs of the chambers of commerce and visitor centers have been strong supporters of Roadside Heritage. People who have picked up CD’s and listened to the program have written to say they learned much from the program and that their plans include spending time on a return visit at places they learned about through the program.

Developing in kind support from local tourism organizations has been one of our biggest successes. Articles have appeared in numerous visitor guides and vacation planners, motor touring brochures, extending the program’s reach to geographic target markets and niche audiences such as heritage tourism travelers. Written articles have run verbatim both in these publications and local media.

Given the place-based nature of the project, efforts have received the most attention at the local level. We have, however, been successful in getting announcements in an American Automobile Association publication and the Los Angeles Times. UNR public relations specialists succeeded in promoting a Roadside Heritage road trip and multi-part series on a televised nightly news program in Reno. After three years of persistence, the California Travel and Tourism Commission will run an article on Roadside Heritage in its Fall 2010 publication. One of our future strategies is to work with freelance writers who have been successful writing for travel and outdoor recreation publications.

Phone calls and emails have resulted in 30 organizations providing links to the Roadside Heritage web site, most notably the nationally-known Lonely Planet and Trip Advisor web sites, and the home page of the Caltrans District 9 web site.

Roadside Heritage was an exhibitor at the 2009 National Scenic Byway and actively supports a local initiative to designate the U.S. 395 Eastern Sierra Scenic Byway as a national scenic byway. In an effort to connect with existing nationally-recognized
byways, we have conducted outreach to both Yosemite and Death Valley National Parks, where motoring routes have achieved national byway designations. This level of outreach led to Yosemite interpretive ranger interviews and an invitation to join the Yosemite Gateway Partners -- a coalition of government agencies, non-profit organizations, individuals and companies with vested interests in Yosemite National Park. The result of this concerted effort has been much broader awareness of the program.

Other outreach successes include participating in community events with a booth featuring selected Roadside Heritage hands on festival activities. The events held by ESICE, such as our open house, have been important gestures of appreciation to the local tourism groups and partners, and have generated goodwill for the program. ESICE has included information about Roadside Heritage in its fundraising campaigns and sponsorship initiatives. An email newsletter has also been well received and kept our network of partners and collaborators and interested supporters informed about program activities.

A Business Plan outlining activities, including sponsorship campaigns, to support Roadside Heritage projects, is available by sending a request to info@esice.org.

Web site

Goals
Our goal was to create a visually appealing interactive companion to our audio programs. The web site would also serve as a place where programs could be freely accessed and downloaded, and as a venue for youth program student casts. It also features web extras such as “Native Voices”, where interviews that could not be incorporated into the audio programs are available.

Challenges
While the site is beautiful and extremely well executed, it was created by a team of experts and then handed off to our organization to maintain. This presented a challenge on two levels: expertise and cost.

Lessons Learned
Having a wonderful web site is a source of great pride. However, a simpler, more manageable web site might have been a better choice for the long run.

Having the web site built by an “outside” entity does not mean that there will be no work involved for the “commissioning” organization. We found that appropriate photos
had to be found, text had to be written and many conversations were had concerning the organization and inclusion of materials.

**In Retrospect...**

Most certainly, it would have been easier for a small project team to independently make decisions, interview experts, write scripts and produce a professional audio program and web site without engaging multiple community partners. However, community participation and partnership in the project were guiding principle for RH and that approach opened doors and enriched the final products. Whether it was a researcher who took time out of a busy day or a member of the Native American community who had children or grandchildren participating in the program, the results of this project’s welcoming and diverse community participation were positive and worthwhile.
Resources

Oral History Resources

These sites are helpful in searching for oral history publications, scholarly articles, ideas for talent release and other oral history forms.

American Association for State and Local History
www.aaslh.org/publicat.htm

American Folklife Center
lcweb.loc.gov/folklife

American Folklore Society
afsnet.org/index.html

International Oral History Association
www.filof.uba.ar/Institutos/ravigni/historal/loha.htm

Oral History Association
www.baylor.edu/~OHA/Othersites.html

Oral History and Curriculum Resources

These sites have oral history information, audio story examples, curriculum ideas, and technical and equipment information.

Storycorps
www.storycorps.org

Generation PRX (The Youth Radio Producers’ Hub)
www.prx.org

This American Life
www.thisamericanlife.org

Vermont Folklife Center
www.vermontfolklifecenter.org
Youth Media International – Youth Radio
www.youthradio.org

Transom – A Showcase and Workshop for New Public Radio
www.transom.org

Veterans Oral History Project (Library of Congress)
www.loc.gov/vets

Informal Science Education Resources

These sites have information about informal science education – links, curriculum, conferences, scholarly articles and other resources.

Center for the Advancement of Informal Science Education (CAISE)
www.caise.insci.org

National Research Council
www.nationalacademies.org/nrc
On this site you can access two print resources of interest:
  •  *Surrounded by Science*
  •  *Learning in Informal Environments*

Student Cast Resources

Microsoft Photo Story 3 for Windows
www.microsoft.com

Microsoft Photo Story Tutorial
www.jakesonline.org

Photo Story Tutorial
www.millie.furman.edu

Voicethread
www.voicethread.com
**Audio Story Resources**

This site has great examples of all kinds of audio stories.

Third Coast International Audio Festival
[www.thirdcoastfestival.org](http://www.thirdcoastfestival.org)
Roadside Heritage

AUDIO AND VIDEO PRODUCTION WORKBOOK

Name ____________________________________
WELCOME
To
ROADSIDE HERITAGE PROJECT

This is your workbook. The first part of the workbook contains the class objectives and schedule. It also contains information on the different jobs associated with conducting interviews including:

- How to be an Audio Engineer
- How to be a Camcorder Sound Technician
- How to be a Digital Recorder Sound Technician
- How to be a Videographer
- How to be an Interviewer

The Second part of the workbook contains information on some mining and mineralogy topics including:

- The Candelaria Mine
- Mineralogy

The workbook contains a journal which you will use to write down questions you have, your thoughts about your experience in the class, interview material that you liked, and the script that you will make your podcast from.

The workbook also contains information on how to put together your podcast using Photo Story. This will be a chance for you to choose pictures, music and soundbites along with your narration and composition, to create a story to put on our website.

CLASS OBJECTIVES

- Students will use digital recording equipment and interview techniques.

- Students will collect meaningful digital audio interview recordings on and develop understanding of regional mining engineering and history, and mineralogy topics.

- Students will create podcasts from interview, script, graphic, music content.
CLASS SCHEDULE

We will meet each Thursday from 2:30-4:00 in Mr. Wylie’s classroom unless otherwise instructed. NOTE – There will be one class meeting on Friday the 29th afterschool, instead of Thursday the 28th.

2/07: Class 1 - Introduction to Roadside Heritage, audio tours, podcasts, and recording equipment training

2/14: Class 2 - Continue practicing with equipment and interview techniques

2/21: Class 3 - Interview with Terri Geissinger about mining history

2/29: Class 4 - We meet on Friday this week. Interview and lecture with Dan Taylor, from University of Nevada, Reno

3/01: *Saturday Field Trip to Candelaria Mine

3/06: Class 4 - Interview with Ted Holloway, a mule teamster

3/08: *Possible Saturday Field Trip - TBD

3/13: – NO CLASS

3/15: Class 6 – Interview and Saturday Field Trip - TBD

3/20: MEETS 12:30 – 2:00 - Class 7 – Class wrap up and Podcasts

3/27: No class – Easter Break

4/03: Class 8 – Final class for podcasts.
Class Ground Rules

(to be discussed and listed during first class session)

1.

2.

3.

4.

5.
Mining History of Candelaria, Nevada

Candelaria, Nevada: A band of roving Spanish prospectors in 1863 first discovered Candelaria's silver. In 1873, the Northern Belle, the camp's richest and oldest mine, began production. The town of Candelaria was established in August 1876. The area was reported to have produced an estimated $7 million, mainly in silver.

During 1881-83, the mines reached their peak production and the town supported 1500 residents with a bank, telegraph office, school, dry goods and furniture store, two breweries, three doctors, lawyers, a newspaper, and over two dozen saloons. Freight had to be teamed in from more than 100 miles, so prices were astronomically high. Wood cost $12 a cord, alkali-laden water cost 4 ½ cents a gallon and a bath cost two dollars.

Even with all its attributes, Candelaria had a reputation for being lawless and uninviting. Isolated from centers of law enforcement, this became one of Nevada’s toughest camps. The local paper once boasted, "No one killed or half-murdered during the past week." In fact, the Pickhandle Gulch, which is located ¾ of a mile to the south of Candelaria, derived its name from the most popular weapon used for settling disputes.

There are also stories about a stage robber who buried his loot in the area before being captured. The bandit never revealed the location of his cache, and many of the area’s visitors and residents have searched for the treasure.
Mineralogy

Here are some cool websites to visit to learn more about minerals, crystals, and the rock cycle.

Mineralogy for Kids – Rockin’ Internet Site:
http://www.minsocam.org/MSA/K12/K_12.html

Going for the Gold
http://www.blm.gov/education/going_4_the_gold/gold_poster.html

Rocks and Minerals
http://alex.edfac.usyd.edu.au/BLP/websites/Hibba/

Mineral Properties
http://www.minsocam.org/MSA/K12/properties/minpropindex.html

Identifying Minerals
http://www.rocksforkids.com/RFK/identification.html

Mining town Description – “Rough and Ready, CA”
http://www.malakoff.com/roughnr.htm
SECTION ONE

EQUIPMENT
AUDIO AND VIDEO EQUIPMENT CHECK OUT

**You must get checked out and signed off on each piece of equipment**

Tripod ________________________________
- Level
- Pan and Zoom – getting dizzy
- Tilt
- Video Camera Attachment

Video Camera_____________________________
- Mounting
- Functions – opening LCD Screen, buttons and switches
- Audio – converter, headphones, switches
- Taping over your own work

Microphones_____________________________
- Lavalier
- Boom Pole – shock mount, cable wrap, pole and handling techniques
- Shotgun
- XLR Cables – winding up

Audio Recorder (Marantz)___________________
- Functions
- Set up
• Sound levels – over modulated audio, setting levels, monitoring levels

Communication and Team Work ________________

• Hand Signals
• Laughing without Laughing
• Trust
Audio Engineer

Equipment Check list: ✓
Digital Recorder _____
2 erased Memory Cards ___
Headphones ___
extra batteries ___

Before the Interview:

- Make sure Recorder is turned on and in RECORD/PAUSE mode
- Plug in headphones
- Make sure batteries are full
- With the Sound Tech, test mic. Lavaliere Mic should be plugged into first output of recorder

Audio Level Check _____

After sound technician places lavaliere microphone on person to be interviewed, press REC PAUSE and check audio level with interviewee counting to ten. Set audio levels low. Lighting up three green lights is good.
- Press REC when interviewer is ready to ask the person her or his name.
- Press REC PAUSE to stop without recording a pop, then press stop
- Press PLAY/PAUSE to check recording. Adjust level if needed.
The Interview:

- When levels are set enter REC PAUSE mode again, then press REC and watch monitor to make sure the levels are good. Remember to press REC PAUSE if you need to stop.
- Keep an eye on the battery to see if it is running low.
- If the recording stops, the sound level suddenly changes, or you hear a distracting noise in the background such as a dog barking or the person’s clothes scratching the microphone make the TIME OUT – “T” Signal to the interviewer and correct the problem.

Afterward:

During breaks you can play back the audio to check it. Turn off the recorder and put the equipment away.
Sound Technician

Equipment Check list:
Boom Pole ____
Headphones__
Lavalier Microphone ____
Shotgun Microphone __
Headphones __
Extra Batteries ___

Before the Interview:

- Make sure the lavaliere mic is turned on and has a battery.
- Make sure the mic is connected to the digital recorder with an XLR cable and plugged into the Mono side of the recorder.
- Make sure the shotgun mic is on, the second switch is set to “V.”
- Test both mics with the Audio Engineer listening in the headphones.
- Place lavaliere mic on person to be interviewed at about collar level or a little lower. This is a hot mic.
- Ask the person to count to ten and check the audio levels with the audio engineer.
- Place the shotgun mic in the boom pole and wrap cable around pole leaving some slack. Plug into first input on XLR Pro attached to video camera.
- If it is windy, make sure the foam windsocks are on the mics.
The Interview:

Keep the headphones on. If you hear distracting or irritating sounds make the time out signal and resolve the problem
• Hold the boom correctly and keep mic handling noise to a minimum
• Keep track of your cords.

Afterward:

Turn off the mics and stow gear.
Videographer

Equipment Check list:
Video camera _____
Extra Videotape___
Tripod, pen & paper____
Power Adapter____
Headphones ___
Charged Batteries ___

Before the Interview:

- Set up Tripod making sure that it is level, legs are locked and that you can pan and tilt the camera, but that the camera will stay in place (see users manual in kit for adjustments).
- Install tripod mount on camera.
- Put video camera on tripod; Clean Lens?!
- Put the name, date of event and number of tape on your tape. Put the tape in the camera. If you think you will use a second tape have it ready to go with a label.
- Make sure batteries are charged
- Plug in headphones. Turn on the camera and turn the mode dial to video camera. Check headphones for audio.
- Turn on camera and record the event, date and place.
- Playback (by changing mode dial) to make sure recording is good. If the color looks funny or something seems not quite right- let someone know.
The Interview:

- Frame the person so their shoulders and head fill the screen.
- If subject is walking use a wide angle shot
- Keep Panning and zooming to a minimum. When it is necessary to do so-do it slowly.
- If the person is holding something special make sure you record it.

- Check the battery to see if it is low.

*If something seems wrong make the time out sign and check out the problem.*

Afterward:

Take tape out of camera, turn camera off & stow gear.
Camera Set Up Instructions:

- Make sure camera is not in SP mode and not on 12 bit audio.
- Label and insert tape.
- Set up Tripod.
- Mount camera onto Tripod (from side)
- Push lever to lock.
- Make sure cable from XLR Pro is plugged into Mic input on FRONT of Camera
- Get out headphones and connect to headphone jack next to MIC Input, Front of camera
- Get out lavaliere mic and turn on.
- Get out thick XLR cable and plug green end with holes into base of lavaliere mic.
- Plug prong end of XLR cable to input 1 of XLR pro.
- Apply lav mic to interview subject at top button or collar position, using strain relief on cable.
- Take out shot gun mic and turn on; making sure the second switch is in “v” position.
- Plug XLR cable end with holes to shot gun mic.
- If using boom pole, screw shock mount on boom pole
- Install Shotgun Mic onto Shock Mount, cross-wrapping bands around shotgun on both sides for a more secure fit. Be CAREFUL not to break bands.
- Make sure mic is turned on.
- Wrap cable around boom pole leaving some slack on mic end.

Tripod has bubble to check for level
• Secure free end of cable off boom pole with fingers for less handling noise.
• Plug prong end into input 2 of XLR Pro, make sure XLR is in stereo mode.

To RECORD:

• The Power Switch is on the back of the camera, set switch to on.
• Next to the Power Switch is the mode dial. Set it to Tape Recording Mode, the icon that looks like an old fashioned camera.
• Check audio levels of both mics through headphones, first with the lavaliere mic on, then off.
• Open the side I CD display
• Press the recording Start/Stop Button
• Press the recording Start/Stop Button again to pause.
• To check recording press the curved arrow button on the side next to the I CD screen. The camcorder automatically returns to the play/pause mode.

When FINISHED:

• Make sure batteries are set aside for recharging.
• Switch off both microphones and camera.
Digital Recorder Sound Technicians

Recording takes at least 2 people; three is better.

1. First student clips the lavaliere microphone to the subject’s shirt at about the first button level or a collar with the mic pointed at the subject’s mouth.

2. Find a good place for the recorder where you can see it but not bump it. Bumping noise will be recorded. Turn off the shot gun mic temporarily.

3. Put on headphones. Check to make sure lavaliere mic and recorder are turned on. On the top of the recorder press “REC PAUSE”. This setting allows you to check the audio levels without recording.

4. Second student watches the monitor on the front of the recorder. Try to get monitor to light up in the mid range. If the “over” light comes on the recording is too loud and will sound bad.

5. Third student holds the shotgun mic about 1 foot away from the subject’s mouth. Temporarily turn off the lavaliere mic and turn on the shotgun mic. Listen through the headphones to make sure the shotgun audio is coming through. Second student watches the monitor. If the range is too low turn up the dial next to the monitor.

6. Turn the microphones both back on. You are now ready to record. Press the red “REC” button on the recorder to begin recording. Press the “REC PAUSE” to stop and then press the
“STOP” button. The reason for using the pause button first is because pressing the STOP button causes a pop to be recorded.

If you need to stop, press the “REC PAUSE” button. You can start recording again by pressing the record button.

7. The display on the top of the recorder also tells you if you are recording. If you are paused you will see a circle flashing with a triangle and two parallel lines. When you are recording the circle stops flashing and the parallel lines disappear.

8. The recorder starts a new track every minute. To play back the last track press play pause. You can also listen to earlier tracks by using the track jump buttons. The recorder will not record over earlier tracks, so when you are ready to begin recording again, you do not need to find the end of a track. You simply press REC PAUSE, check your audio levels and press REC when you are ready to resume.

WHEN YOU ARE FINISHED:

Turn off the recorder and both microphones. Take the battery out of the shotgun microphone, unscrew the long capsule and put away in box. Put the lavaliere mic back in its black cloth pouch. Stow the cables and the recorder in the audio kit case.
SECTION TWO

INTERVIEWER
Interviewer

Equipment Check list: ✓
Pencil/Pen
Notepad
Questions

Before the Interview:

- Research topic and know a little about the person you are interviewing
- Write a list of questions. Think about what answers you might get and how to follow up with another question
- Think of questions involving all the senses (example: vivid sounds or smells person recalls)
- Practice interviewing with family or friend.
- Be on time
- Tell the interviewee what to expect. What subjects will you be asking about? How long will the interview be? Can they take a break? (yes)
- Tell the interviewee how the recording will be used and ask them to sign the talent release.
- When the sound people are ready, ask the interviewee to count to ten for the audio level check.

The Interview:

- When the tape is rolling, say “we are now recording an interview for the Eastern Sierra Audio Tour.” Next state your name, the date & location.
• Ask the interviewee to pronounce and spell their name (and optional information such as when and where they were born).
Active Listening Tips

Developing good stories requires that a Producer/Interviewer be a good listener. Listen deeply to what is—and is not—being said. Help your storyteller find their voice and develop a personal story that engages us.

* * * *

Warmth and Caring – being concerned, accepting, and friendly.

Empathy – trying to understand how it feels to be in someone else’s shoes and showing that you want to understand.

Non-judgmental Acceptance – not being shocked or judging someone. Accepting the person and their feelings.

Respect – allowing someone the dignity of having the right to feel any emotion and the free choice to choose any action.

Genuineness – being real, not just someone “playing a role” or going through the motions.

Limit Your Own Talking – you can’t talk and listen at the same time.

Clarifying – if you don’t understand something, or feel you may have missed a point, clear it up by asking a relevant question.

Summarizing – periodically check back with the person that you have heard them correctly by summarizing the main points of what has been said.

Questions – always use open-ended questions, i.e. questions that cannot be answered by just a “yes” or “no”. Be careful not to interrogate.
Don’t Interrupt – a pause, even a long pause, doesn’t mean the person has finished saying everything they want to say.

Turn Off Your Own Words – personal fears, worries, problems not connected with the person easily distract from what they are saying.

Don’t Assume or Jump to Conclusions – don’t complete sentences for the person either verbally or in your mind.

Listen for Overtones – you can learn a great deal from the way the person says things and what they do not say.

Concentrate/Attention – focus your mind on what the person is saying. Practice shutting out distractions.


**AUDIO DOCUMENTARY INTERVIEW RECORDING GUIDELINES**

“When an old person dies, a whole library disappears.”  **African Proverb**

Part of living is constantly re-examining the past, looking for inspiration, guidance, illustrations, and ideas that might clarify today’s world.  History is not the past, but what people say about the past.

Before the interview, do some research about your subject and the topic you are going to be discussing so that you ask appropriate and interesting questions.  Be sure to ask open ended questions, rather than questions that will be answered with a “yes” or “no”.

When the person being interviewed arrives, introduce yourself, and chat briefly about your project and the topics you want to cover.  You might even deliver a list of questions to the subject, before the interview begins.

First impressions are important for getting a good interview.  Be on time.  Have all your equipment (consult your checklist).  Dress appropriately and be polite.  Introduce yourself and review the interview process you will be using.  Bring a small gift and let them know how much you appreciate getting the chance to talk with them.  Make the subject as comfortable as possible.

1. **Practice using the equipment.**
   - Always wear headphones when recording – what you hear in the headphones is exactly what is being recorded.  Use them to adjust the microphone position for the clearest sound.  If you hear anything weird, stop the recording and figure out the problem.
   - Hold the microphone close – about 7 inches (roughly a hand’s length) from your subject’s mouth and slightly off to the side.  Before your start the interview, test the mic.  If the sound is too loud, lower the volume on the recorder instead of moving the mic.
   - Be careful of microphone handling noise – avoid that low rumbling sound by using a light touch and not shifting around too much.  If you must move the mic, wait until your subject has finished speaking.
   - Avoid popping “p” and sharp “s” sounds – if you hear either, move the mic farther to the side of the subject’s mouth.  Work on this when you practice with each other before interviewing a “real” subject.
2. **Choose a quiet interview location:**
   - A carpeted room works better than a large, empty room.
   - Close the door, unplug the phone, turn off anything that is making noise, including the television or radio and cell phones.
   - Listen and adjust during the interview. Let the subject know if she/he is making noise.

3. **Test the equipment:**
   - Set up the equipment as early as possible and make sure you have practiced enough to be comfortable with it, so you can focus on the interview rather than the equipment.
   - Before you begin the real interview, have your subject sign the Talent Release, then record your subject talking (have them count to ten) to make sure everything is working and set up properly.
   - Take all the time you need to adjust your microphone placement and eliminate background noise. Stop, rewind and listen to make sure everything is alright.

4. **Begin the interview:**
   - Make sure you have pressed “Record”
   - When the tape is rolling, say “We are now recording an interview for the Eastern Sierra Audio Tour.” Next, state your own name, the date and the location of the interview. Then, have the subject state their name and the proper spelling of their name.
   - Start with warm-up questions or small talk to put your subject at ease. Know the physical limitations of the subject. If the person is hard of hearing, speak loudly and clearly.
   - Don’t make any noise when your subject is talking. Don’t say, “uh huh”, or laugh or interrupt when something interesting or important is being said. Instead, use visual cues like nodding your head or smiling.

5. **Get great stories:**
   - Listen closely. Stay interested and engaged. Look at your subject with good eye contact. Everyone should be paying attention to the interview at all times.
• Stick with the good stuff. If you hear something good – talk about it more. If it isn’t interesting – steer the conversation somewhere else. Keep things moving, but don’t rush. Let the person being interviewed set the pace.
• Ask one question at a time. Use brief, simple questions.
• Help the subject to be more descriptive. Ask what things looked like, smelled like, tasted like, sounded like.
• Pursue details by asking for examples and descriptions. Clarify odd words or things you are not sure about.
• Respect other peoples opinions, even if you don’t agree with them.
• Don’t be afraid to record again. If something isn’t clear, ask the subject to repeat the story, the ending, or whatever you need.
• Be curious and honest. Great things will happen.

6. Wrap it up:
• Before you turn off your recorder, ask the subject if there is anything else he or she wants to talk about.
• Be sure to thank the subject for his or her time and generosity.
• Make sure that the Talent Release has been signed.
• Chat for a moment with your subject, confirm any future appointments, explain what is going to happen to the interview.
• Write down any notes from the interview right away, so that you don’t forget them.
• Listen to the interview right away. Listen with a critical ear and learn from your mistakes.
• Transcribe the tapes when possible.
• Your subject may want a copy of the interview.
• Label and write-protect your tapes. Store them in a cool place out of the sun.
INTERVIEW CHECKLIST

1. Things to bring to the interview
   - Question list
   - Recording device
   - Microphone
   - Cords and cables
   - Extension cord
   - Headphones
   - Extra batteries (use a power cord if possible)
   - Pre-labeled tapes or discs (twice as many as you think you will need)
   - Pen or pencil and note pad
   - Watch or clock
   - Small gift for the subject (candy, flowers, etc)
VIDEO INTERVIEWS

Videotaping the interview adds a new dimension to oral history. The final video can juxtapose the interviewee to an object or setting that is the subject of the interview. The combination of sight and sound allows for a clearer perception of the interviewee or subject.

Not every interview is suited for a video format.

Video recording places greater responsibility on the interviewer, who must now be a director as well. The video camera should not be used simply as a tape recorder that also takes motion pictures. This creates what is known as the “talking heads” syndrome.

Assess the interviewee’s discomfort level before taping. For some, the experience is too overwhelmed and results in “stage fright.” The intimacy and openness of a simple audio taped interview is nearly impossible, primarily because of the distractions caused by a video crew.

Use a tripod. Position it a few feet from your interviewee. Focus primarily on the interviewee’s face and avoid frequent use of the zoom feature on your camera.
ORAL HISTORY INTERVIEW TECHNIQUES

Use your check sheets:
- Equipment (sound technician, videographer)
- Forms (talent release)
- Questions
- Notes (eg. Spelling of names, etc)

Be on time.
Maintain an atmosphere of respect and trust.
Make some small talk before beginning. Explain how the process will work. Make the person being interviewed feel important.
Bring a gift.
Be sure to thank them for their time.
Give them a copy of the tape.
On tape:
- Introduction (thank you)
- Name and spelling
- Where born
- When born
- Address (where the person lives)
- Date of interview
- Where interview is taking place
- Which side of the tape this is on
- Why this person is being interviewed

Be sure to be quiet during the taping.
SECTION THREE

CLASS NOTES
RECORDING ORAL HISTORY FOR SOUND BITES

INTERVIEW

Name of person interviewed:

Date of interview:

Location of interview:

My job at this interview:

Questions to ask:

What I learned from the interview:

The most interesting thing to me:

Best sound bite:

Anything else I learned:
SHOOTING AND RECORDING ON LOCATION

FIELD TRIP

Field Trip Location:

Date of Field Trip:

My job on this field trip:

Expert to be interviewed:

Questions I would like to ask:

On the Field Trip, I learned:

To me, the most interesting thing was:

Best soundbite:

Other things I learned:
WHAT MAKES A GOOD DIGITAL STORY?

The first step in learning to create your own Podcast is to understand what makes a memorable Digital Story. The best way to do this is to watch existing examples of strong Digital Stories, and to discuss and evaluate them.

As you discuss and evaluate, and create your own story, look for these elements:

**Character:** Who or what is the story about? What kind of characteristics describe the person or thing the story is about?

**Context:** How, when and why did the character do what they did?

**Unique Experience/Defining Moment:** What sets the storyteller’s experience apart from other people. Is there one event, moment, person or situation that is most memorable?

**Reflection/Message/Theme:** What is the storyteller’s reason for telling the story? What is the message that he or she wants to share? Is there a theme that runs through the story?

**Voice:** Is the story mostly told in the first person (I or We)? Does the storyteller use their normal speaking vocabulary?

**Details:** Does the storyteller provide enough details to help the audience share in the experience (e.g. color of the sky, sounds, smells, emotions)? Does the storyteller provide too much detail?

**Thoughts/Emotions:** does the storyteller share what they were thinking and feeling, not just what was happening around them? Are you able to relate, even in some small way, to the storyteller’s feelings?

**Appropriate Visuals and Audio:** Does the story include images, sound effects and music that enhance the storyteller’s words? Are they appropriate, or are they distracting.
YOUR RADIO PERSONALITY VOICE

Speaking in a monotonous or tired voice is a real communication killer. When the variety of your voice’s pitch doesn’t vary, it is impossible for your listener to stay interested in what you are saying – no matter how great it is. And, if you have a tired voice, your speech just doesn’t convey the appropriate emotional shadings and vitality that make people’s voices interesting and pleasant to hear.

Everyone can change their signature voice to some degree. It just takes some practice and exercise.

Practice saying these sentences out loud as if you were ecstatically happy:

1. I just go a call saying that I won a vacation in Las Vegas.
2. I’m going to have to change that light bulb
3. Our town has a new recycling program.
4. My next door neighbor is moving out next week.

Now say the same sentences out loud as if you were extremely sad.

Practice saying these next sentences out loud as if you truly believed the statement:

1. This is definitely a once in a lifetime opportunity.
2. What I’m doing now is the best thing I’ve ever done.
3. I am the best at what I do.

Now say the same sentences out loud as if you didn’t believe what you were saying.

Some tips to remember:

- Speak with a smile – it brightens your pronunciation
- Enunciate each word individually – don’t rush or squeeze
- Say it like a song
- Know what the sentence is really trying to say
- Listen to professional TV commercials or news people
Warm up before you speak. Here are some ENUNCIATION EXERCISES:

1. Open and close your mouth easily as you repeat: Fah Fah Fah Fah Blah Blah

2. Loosening your jaw: Sah Kah She Fah Rah Pah Kah She Fah Rah Wah Kah She Fah Rah Bah Kah She Fah Rah Dah Kah She Fah Rah

3. Loosening your lips: www www www bbb bbb bbb wbw wbw wbw

4. Combination loosening: Ill Idl www Idl wlwd

5. Phrases for precise articulation:
   - The tip of the tongue, the teeth and the lips
   - Lah lee loo lee Zip e do da
   - Repetition, repetition, repetition
   - We’ll weather the weather whateer the weather whether we like it or not.

Practice with tongue twisters:

- An elephant was sphyxiated in the asphalt
- Five fuzzy French frogs frolicked through the fields in France
- There was a minimum of cinnamon in the aluminum pan.
- A bloke’s back brake block broke.
- I saw a saw in Arkansas, that would outsaw any saw I ever saw, and if you got a saw that will outsaw the saw I saw in Arkansas let me see your saw.
- I wish to wish the wish you wish to wish, but if you wish the wish the witch wishes, I won’t wish the wish you wish to wish.
- Picky people pick Peter Pan Peanut-Butter, ’tis the peanut-butter pickle people pick.
- How much caramel can a canny cannonball cram in a camel if a canny cannonball can cram caramel in a camel?
- Seven slick slimey snakes slowly sliding southward.
- Big black bugs bleed blue black blood but baby black bugs bleed blue blood.
Create Your First Photo Story

Opening Photo Story

To begin a new story, open Photo Story from the Start menu.

To open Photo Story

1. Click Start, point to All Programs, and then click Photo Story 3 for Windows.
2. On the Welcome page, click Begin a new story, and then click Next.

Importing and arranging your pictures

First, add the pictures that you want to use in the story, and then arrange them in the order that they will be viewed.

To add pictures to your photo story

1. On the Import and arrange your pictures page, click Import Pictures.
2. In the File Browser dialog box, browse to My Documents\My Pictures\Sample Pictures.
3. Add all of the pictures listed.
To add more than one picture at a time, press and hold the CTRL key and click on the pictures you want to add, and then click OK.
All of your pictures should now be present in the filmstrip, as shown in the following screen shot.

The filmstrip in Photo Story is a great place to quickly make changes to your pictures and story. For example, you can drag a picture in the filmstrip to change the sequence. You can click a picture in the filmstrip and click Edit to change the appearance of the picture by rotating it, adjusting the color, fixing red eye or adding effects. You can also right-click a picture in the filmstrip to perform these actions. Try adding an effect to one of the pictures to see what they look like.

4. When you are finished making changes to your pictures, click Next to continue.
Adding a title to your pictures
With Photo Story 3 you can add text to a picture to create a title for your story.

To add text to your pictures
1. On the Add a title to your pictures page, click the first picture, and then type My first photo story in the text box to the right of the picture.
2. Click the Select Font button.
3. In the Font dialog box, under Font style, click Bold, and then click OK.
4. Click the Align Top button to move the title up on the page.
Repeat steps 1 and 2 to add text to another picture, and experiment with different text styles, sizes, and alignments, using different formatting buttons.
5. When you are finished adding text to your pictures, click Next.

Narrating your pictures
You can add narration and custom pan and zoom effects to your photo story to make it more unique and personal.
To add narration to your story you need to have a working microphone attached to your computer and set up correctly. A wizard will help you set up your microphone to record narration. There is also a text input area to create cue cards which can be a helpful memory aid when narrating your pictures.

To add narration to your story
1. On the Narrate your pictures and customize motion page, click the Microphone button.

   This will launch the Sound Hardware Test Wizard. Complete the wizard by following the onscreen instructions. Once you have completed the wizard, your microphone should be ready to record narration.
2. Click a picture in the filmstrip.
3. Add any desired text in the cue card area.
4. Click the Record Narration button to start recording narration. The red dot in the record button will flash indicating recording is taking place. A timer is provided to help you keep track of your narration length.
5. When you have finished narrating the picture, click the Stop Recording button.

6. Repeat steps 2 thru 4 for each picture for which you want to add narration.
   Note: Narration for each picture can not exceed 5 minutes.

7. Once you have added narration, click the first picture in the filmstrip, and then click Preview to see how your story looks and sounds.

8. Close the preview window, and click Next to continue to the next step.

**Adding background music**

With Photo Story 3 you can add music to your story by using Windows Media Audio (WMA), MP3, or WAV files or by using the Create Music option to create custom music that suits your story and taste.

**To add pre-recorded music to your story**

1. On the Add background music page, click the first picture in the filmstrip and then click Select Music.
2. On the File Open dialog box, click My Documents from the left menu.
3. Browse to My Music\Sample Music, click Beethoven's Symphony No9 (Scherzo).wma, and then click Open. The music you just added is shown as a colored bar above the picture in the filmstrip, as shown in the following screen shot. This helps you determine which pictures will be shown for each piece of music you add. This is particularly helpful when you add more than one song to your story.

**To create music for your story**

1. Click the third picture in the film strip, and then click Create Music.
2. In the Create Music dialog box, in the Genre drop-down list, scroll down and select Soundtrack.
3. In the Style drop-down list, select Soundtrack: Mysterious Cave.
4. You can leave the default Bands and Moods, or choose different ones.
5. Click Play to hear what the music will sound like.
6. When the music has finished playing, click OK to close the Create Music dialog box. There are now two different pieces of music shown as colored bars above the pictures in the filmstrip.

7. Click the first picture in the filmstrip, and click Preview, to see how well your music fits the story. You may need to adjust the music volume levels to accommodate your narration. To do this, simply click the picture in the filmstrip and then adjust the music volume using the volume slider bar. You may need to adjust the volume and preview your story a few times to get it just right.

   Click Next, to move on to the final steps.

**Saving your story**

When you save your photo story, all the pictures, narrations, and music are compiled into a video file that you can view in Windows Media Player. Since you will play this photo story on your computer, you can use the default options when saving your photo story.

**To save your photo story for playback on your computer**

1. On the Save your story page, verify that Save your story for playback on your computer is selected in the activities list.
2. Click Browse to specify the location and file name of your story.
3. On the Save As dialog box, browse to My Documents\My Videos.
4. In the Filename text box, type My First Story.wmv.
5. Click Save, and then click Next.

**Viewing your story**

When your story is built and saved, the Completing Photo Story 3 for Windows page will appear. You can view your newly created story or begin a new story from here. To see what you have created, click View your story. Windows Media Player will open and your story will begin to play.
Create a Story from a Single Still Photo

You can use the panning and zooming effects built-in to Photo Story 3 for Windows to add life to any of your still photographs. Photo Story 3 automatically assigns a straight path between the start and end positions for a picture, but you have the option to customize the picture motion by selecting a different path between the start and end positions. You can create this customized picture motion by importing the same picture multiple times and then selecting the motion and duration for each copy of the picture and the type and duration of the transitions that occur between the picture copies.

By using this method, the motion can traverse different parts of the picture, creating a more complex path (rather than a straight line) over the picture and enabling you to create a mini story based on a single picture. You can also create a "viewing window" into the picture. For this viewing window, the size of the start and end positions for the picture's motion is the same (pure panning motion). This viewing window magnifies the parts of the picture that you select to the full size of the resulting video.

To create your own mini story

1. Open Photo Story 3 for Windows. On the welcome page, click Begin a new story, and then click Next.

2. On the Import and arrange your pictures page, import the same picture three times, and position the three copies of the picture next to each other on the filmstrip.

3. To customize the motion for the first copy of the picture, on the Narrate your pictures and customize motion page, click the first copy of the picture on the filmstrip, and then click Customize Motion.

4. On the Motion and Duration tab, complete the following tasks for the first picture:
   • Select the Specify start and end position of motion check box.
   • For the Start position, move the position rectangle to select the area where you want the motion for the first picture to begin.
   • To create a pure panning motion for the first copy of the picture, select the Set end position to be the same as start position check box.
This option ensures that the rectangle for the start and end positions is the same size.

- For the End position, move the position rectangle to select the area of the picture where you want the motion for the first picture to end.
- To save the motion for the first picture, click Save.

5. To set the motion for the second copy of the picture, click the Next picture arrow button at the bottom of the Customize Motion page.

6. On the Motion and Duration tab, complete the following tasks for the second copy of the picture:
   - Select the Specify start and end position of motion check box.
   - Select the set start position to be the same as the end position of the previous picture check box.
   By setting the starting position for the second copy of the picture to be the same size and position as the end position for the previous copy of the picture, you create continuous motion over the picture.
   - To continue creating a pure panning motion, select the set end position to the same as start position check box, and then move the position rectangle for the end position to the location where you want the motion for the second picture to end.

7. To ensure uninterrupted motion between the first and second pictures, remove any transitions between them. To do so, click the Transition tab, clear the Start current picture using a transition check box, and then click Save.

8. To set the motion for the third copy of the picture, click the Next picture arrow button at the bottom of the Customize Motion page.

9. On the Motion and Duration tab, complete the following tasks for the third copy of the picture:
   - Select the Specify start and end position of motion check box.
• Select the Set start position to be the same as the end position of the previous picture check box.
• To have the picture motion expand to the entire picture (rather than a specific part of the picture) at the end of your story, double-click the position rectangle for the end position.

10. To remove any transitions between the second and third pictures, click the Transition tab, clear the Start current picture using a transition check box, and then click Save.

11. You have successfully created a mini story using just one picture! To preview your mini story, click Preview.
EIGHT EASY STEPS FOR CREATING A PHOTOSTORY

1. START STORY
   • Open Photostory 3: “Begin a New Story” Next

2. IMPORT AND ARRANGE PICTURES
   • Click Import Pictures, browse, select images to use, OK.
   • Click and drag or use arrows to reorder images in timeline
   • To remove borders: click Remove black borders. Click Yes to All, OK.
   • Use editing tools if desired (rotate, crop, autofix, special effects)
   • Save, Next

3. ADD TITLES
   • Select slide, type title into the window, use tools to change font, font color
   • Click Next

4. RECORD NARRATION
   • Plug in microphone, click microphone icon to configure
   • Select image, click record sound button (red dot), record narration, stop button
   • Click Preview to listen. To delete, click undo button. Repeat for other images.
   • To set image times automatically along with narration, click each image at the appropriate time in the narration.

5. CUSTOMIZE MOTION
   • Select image, click Customize Motion button.
   • Click “specify start...” box, use resizing handles to select sections for the image for the desired effect (zooming, panning)
   • Preview effect, save

6. ADD TRANSITIONS
   • Click Transition tab
   • Scroll to preview and select transitions, Save
   • Click arrow to move through images; add motion and transitions as desired
   • Close effects window
7. **ADD BACKGROUND MUSIC**
   - Click desired slide, then Select Music, navigate to desired audio file, Open
   - OR – click Create Music, select genre / band / mood
   - Click Preview, adjust volume, OK, Next

8. **SAVE STORY**
   - Select playback mode, browse for location for saving. Next
   - Click View your story
How to Play Your Story

- Load the CD – your computer needs Microsoft XP or better to read your Photostory. And, I am sorry, but it will not work on a Mac.

- When the Photostory program comes up – click on “next” until you get to the “Save Your Story Page”

- Click on “next” and your story will be “built”, then click on “View My Story”

- Enjoy
PHOTOSTORY PLANNING WORKSHEET

The story you want to work with – make sure it is a very specific topic:  *For example* – *Adaptations of Big Horned Sheep*

**MY STORY:**

**Introduction:** How will I get the viewer interested? A question? A statement?  *For example: Did you ever wonder how big horned sheep survive in such a harsh environment?*

**MY INTRODUCTION:**

**Sound bite** you want to work with. No longer than one minute and preferably 30 seconds or less. Two short sound bites may be used.

**MY SOUND BITE:**

How will you introduce the sound bite? Who, what, when, where, why, how. Let your viewer know who they are listening to and what qualifies them as an expert.  *For example: Thea Wang, a wildlife biologist researching yellow bellied marmots talks to us about the adaptations of these members of the squirrel family.***

**MY SOUND BITE INTRO:**

**Conclusion:** A short ending statement, comment or question.  *For example: Alpine animals are often related to desert animals because they are both adapted to harsh, dry environments.*

**MY CONCLUSION:**
PHOTOSTORY PODCAST SCRIPT

Choice One

Hello! My name is ____________________________

I am a student in the ________ grade

My program is about ____________________________

I learned about ____________________________ from ___________________________, who is a ___________________________ at __________________________.

Choice Two

Hello! My name is ____________________________

I am a student in the ____________ grade

Have you ever wondered ____________________________?

_____________ who is a ___________________________ with the ____________________________, met with our class and explained to us about ____________________________
### STORYBOARD LAYOUT SUGGESTIONS

<table>
<thead>
<tr>
<th>TITLE PAGE</th>
<th>BY-LINE</th>
<th>INTRODUCTION</th>
<th>TEXT/PHOTO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Photo or Color Slide</td>
<td>Photo or Color Slide Name Date</td>
<td>Text or Narration</td>
<td>(narration?)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SOUND BITE INTRO</th>
<th>PHOTO/SOUND BITE</th>
<th>PHOTO/SOUND BITE</th>
<th>CONCLUSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Text or Narration</td>
<td></td>
<td>Can continue soundbite from previous slide</td>
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I. Executive Summary

The creation of the Roadside Heritage® Business Plan coincides with the completion of the National Science Foundation award and the evolution of the business relationship between the Eastern Sierra Institute for Collaborative Education (ESICE) and its primary collaborators: the University of Nevada, Reno Academy for the Environment and Raggio Research Center for STEM Education; the University of California, Berkeley, Lawrence Hall of Science.

This collaboration resulted in a series of STEM-rich audio programs that describe the natural, cultural, and scientific heritage of the Eastern Sierra, available as CDs and downloadable files via the www.roadsideheritage.org website, which hosts interactive maps and downloadable audio programs, as well as the creation of the Family Science Festival, which teaches STEM-rich content using portable hands-on education kits. This Business Plan outlines the process wherein ESICE will sustain Roadside Heritage, and assure that the aforementioned products, and new ones, are available in the future.

ESICE’s established relationships within the community and position as a leading local provider of STEM-based educational resources make it ideally suited to lead Roadside Heritage going forward. Having dedicated locally based personnel responsible for project management and disseminating the products and programs further strengthens the program. We intend to leverage our excellent reputation and successful project history to attract the resources necessary to keep the current Roadside Heritage content available and add new products in the future.
II. Outreach and Dissemination Plan

Roadside Heritage collaborators conducted more than three years of research and negotiation in the pre-award period, including a six-month intensive planning period funded by an NSF planning grant (ISE #0520319). This planning period allowed project developers to test key components in Roadside Heritage with a pilot out-of-school program, audiocasts, and a one-day festival activity. Following the NSF planning grant period, a second round of local funding began in 2006, allowing us to refine the student activities and to professionally produce and distribute CDs in Inyo and Mono counties. Incorporating the lessons learned from these pilot ventures, Roadside Heritage represents an innovative approach to disseminating locally developed, STEM-rich audio programs and informal science education that is strengthened by real-world experience.

The project also went through many stages of planning and development in working with our local and regional dissemination consultant, Jefferson Lanz of City Concierge, allowing all collaborators, staff, and the advisory committee members to weigh in on the direction and focus of dissemination and distribution efforts. Key decisions included:

- To focus dissemination efforts on the actual audio stories collected through interviews and oral histories
- To disseminate content using the most widespread, state-of-the-art technologies
- To innovate programming distribution channels through partnerships with an array of local, state, and federal entities

Our goal was to reach the traveling public, mostly individuals on vacation. The same approach would also capture the general traveling public just passing through. Initially, we divided our audience by age into three primary user groups:

- Children and teens on vacation. To provide vacation fun, our approach needed to emphasize exploration, discovery, and a “cool factor” while avoiding sounding “preachy” or “educational.”
- Adults (20–50) with children on vacation. These consumers are primarily looking for a means to entertain children; they also value spending time together on family outings. Content for this audience needs a relaxed and adventurous feel as an organic part of the travel experience, with patriotic and cultural appeal.
- Adults (40–60) without children on vacation. This audience relates to a cheerful approach but also has sophisticated tastes and stronger interest in cultural or ethnic heritage.

WestEd, our contracted external evaluator, conducted a survey after the release of the first audio CD that clearly demonstrated that the Roadside Heritage brand and stories appealed to an older demographic. Children and teens also enjoyed the stories, but were less likely to pick up audio programs on their own; rather, they listened primarily if their parents also listened.

We decided to continue the original brand name of “Roadside Heritage,” which communicates the place-based nature of the content, its relation to travel, and its personal
significance to consumers. A tagline was added—“Audio Stories from the Eastern Sierra”— to let audiences know exactly what we were delivering. This tagline also points toward the project’s rich STEM content without sounding “educational,” a potential deterrent for consumers with little background in interpretive science.

The phased approach to implementing Roadside Heritage, culminating with the three-year NSF award period, allowed us to create a distinct image for Roadside Heritage along with a core mission for this brand: “Develop programming along with a sustainable brand that is applicable to any culturally rich highway.” Branding work has focused on creating a sustainable product that could include multiple editions and become “evergreen,” or reusable in multiple contexts through the years, as well as a model for similar cultural heritage; Science, Technology, Engineering and Mathematics (STEM); and natural history programs in other locations.

To achieve our goals in dissemination, we followed a four-tiered approach: 1) collaborating with the local community; 2) engaging with professional tourism entities; 3) connecting with the traveling public; and 4) developing promotional materials for public outreach through joint tourism promotions.

1) Collaborating With Local Community
In order to gain the support of the local community and begin collaborating on joint promotions, Roadside Heritage made presentations to business entities, government agencies, user groups, and community associations that reside along the Highway 395 corridor. Our intention was to demonstrate the benefits of the project, gain supporters, promote the brand, and build sustainability, in order to gain widespread distribution of both physical products and web products through individual consumer networks while building overall community awareness.

This effort included popular organizations such as Friends of the Inyo, Mammoth Mountain Ski Resort Interpretive Center, High Sierra Committee, and various business organizations. Other participants included: The Sierra Business Council, Eastern Sierra Cultural Heritage Alliance, Local and Federal Scenic Byway Program, Mono County Schools, Inyo County Schools, Mono Basin Historical Society, Bishop Historical Society, Coalition for Unified Recreation in the Eastern Sierra (CURES), Eastern Sierra Watershed Program, Friends of Bodie Interpretive Association, Big Pine Indian Education Center, Eastern California Museum, University of California White Mountain Research Station, Eastern Sierra Interpretive Association, Bridgeport Chamber of Commerce, University of California 4-H Youth Development Program, Nevada Department of Transportation, California Highway Patrol, CARMA (Combined Array of Research in Millimeter Wave Astronomy), Bureau of Land Management, Los Angeles Department of Water and Power, and Caltrans, the agency governing California Transportation.

The strong enthusiasm and support that this program has received from participating local community members has confirmed the value of developing local community involvement with a project of this nature. As detailed below, we have also pursued partnerships with large state and federal bureaucracies involved in transportation and cultural heritage; for
the most part, however, the concrete benefits of these partnerships have yet to materialize. We have determined that keeping a project of this nature alive requires a saturation effort at the local level to produce a brand on which local tourism relies.

In Year 3 of the grant, dissemination and sales efforts in the local community included the following:

1. Bi-annual e-newsletters were sent to CD distributors, supporters, program participants and the advisory committee, updating them on audio CDs, science festival events, and related website content. Recipients have expressed appreciation of being kept abreast of developments in the program and have been very complimentary of the audio CDs. Several visitor center staff members mentioned that they make a point of handing out Roadside Heritage CDs to visitors who express specific interest in the topics covered by the CDs.

2. ESICE expanded Roadside Heritage partnerships in Year 3, working with 21 distributing entities throughout Inyo and Mono County to bring free CDs to the public. All of these distributors were chosen for their role in the community as educational sources for the traveling public, including all major museums, chambers of commerce, and visitor centers in the two counties. The remote Walker/Coleville area of northern Mono County doesn’t have a separate chamber of commerce building; in this case, a motel on the main highway filled the role by making literature available to travelers and distributing Roadside Heritage CDs. Publicity posters and CDs were sent to Inyo and Mono County CD distributors. Staff at these sites indicated that they felt the audio CDs were a definite value-added component in their outreach to the public, especially because its content relates so specifically to the eastern Sierra region.

3. The Mono County Local Transportation Commission helped to fund production of the Traditions, Travel, Tales of Mono CD. We worked closely with them to develop CD artwork that reflected their interests in the project, and to expand our distribution sites to include additional key locations in Mono County. Because this partner has some intellectual property rights to the content used in making this CD, we negotiated the right to use the interview materials and audio stories in a “sustainable” product by pairing two audio programs, Paiute, Prospectors, Pioneers and Traditions, Travel, Tales of Mono, as a 2-CD set that can be sold as a means of keeping the CDs available to the public. The Native American community raised a concern that any profits from sales of CDs should go strictly toward reproductions costs of the CD and educational purposes. This required formal agreement by the County of Mono, which we secured, as well as permission to use interview materials in developing content for the final audio CD.

4. Roadside Heritage participated in local community events as a public awareness/outreach effort to help establish name recognition with other community groups and with the public. These events included: Banff Film Festival, Community Connections (Bishop City Park), Eastern Sierra Land Trust Wildlife Festival, the Rainbow Days Festival, and local chamber of commerce events.

5. ESICE hosted two Open Houses (June 2009, March 2010) to bring together all the various entities who participated in Roadside Heritage: students from the
audio/interview classes, teacher/docents, local advisory panels, staff from local distribution sites (museums, chambers of commerce, visitor centers), local media and politicians, and speakers who were interviewed for the audio stories. The events showcased various features of the programs with slideshows, the prototype kiosk (described below), CD displays, and science festival kit displays. These gatherings provided an opportunity for participants to meet each other and see how the project has progressed over time. It also provided us with an informal opportunity to get additional feedback on the program from a range of participants.

6. As a way to sustain availability of program content to the public, ESICE consulted with various local business owners and Debbe Eilts at Eastern Sierra Interpretive Association about the feasibility of selling the “sustainable” 2-CD compilation of the first two audio programs in visitor center bookstores and local businesses. They were uniformly supportive of the project, helping us to establish plans for dissemination and distribution, and to determine a realistic pricing scheme including retail markup.

7. ESICE developed a relationship with local distributor Peak Productions for purposes of selling the “sustainable” CD set throughout Inyo and Mono Counties, including local bookstores, museum and visitor center bookstores and gift shops, gas station convenience stores, etc. Distribution began in December 2009. This arrangement provides several advantages in that the distributor keeps records of all retail outlets carrying the CD and does all stocking and billing for all retail sites. Working strictly as a wholesaler allows us to avoid having to collect and report sales taxes from each retailer.

8. ESICE supervised four audio productions: Paiutes, Prospectors, and Pioneers; Traditions, Travel, Tales of Mono; Exploring Extreme Environments, and the “sustainable” compilation of Paiute Prospectors Pioneers/Traditions, Travel, Tales of Mono. To develop and produce the CD artwork design, we worked with graphic artists, City Concierge, local museums and agencies (Eastern California Museum, Mono Lake Committee, Forest Service), and Caltrans. For audio production, we partnered with Audiolandscapes/StudioBard. Caltrans generously developed the topographical map used on the inside cover of Exploring Extreme Environments. For the cover art of this CD, we contracted with well-known author/illustrator John Muir Laws. Based on his popular book, The Laws Field Guide to the Sierra Nevada, we felt using his artwork was a way of branding our product with a recognizable look that related the CD content to the concept of a field guide.

9. ESICE developed program awareness with local community groups through news stories in local media and blog sites as well as program advertisements in local publications such as Friends of the Inyo, Inyo Register, Sierra Reader, Eastside Magazine, and Mammoth Times. Presentations about Roadside Heritage were made to the Mono County Tourism/Film Commission, the Rotary Club, and the Eastern Sierra Cultural Heritage Alliance. Paula Williams attended the Cosmic Serpent Conference, where commonalities between western and native science were explored. Paula Williams has met with Lisa Isaacs who is heading up the public lands partnership coordination program between the Inyo National Forest, Bishop Field Office of the Bureau of Land Management, and the Eastern Sierra Interpretive Association. Their mission is to assist
agencies in educational, historical, scientific, and interpretive activities undertaken throughout the Eastern Sierra region. Contacts like these are valuable in developing ongoing and future projects and collaborative partnerships.

10. Local program outreach extended beyond the eastern Sierra Nevada region, with Roadside Heritage representative, Rachel Hartsough, making community contacts on the western side of the Sierras, and ESICE presenting the program to the gateway communities on the west side of Yosemite National Park, as well as to Yosemite Park staff. Jan Rhoades of the ESICE staff emailed 4-H groups in the western Sierra about the role 4-H has played in the program in the eastern Sierra. Efforts are currently underway to share the program with Death Valley National Park, Devil’s Postpile National Monument, and the surrounding local communities including tribal communities.

11. Regional outreach included engaging KOLO News from Reno, Nevada in a news series highlighting Roadside Heritage. A KOLO News team traveled down to the eastern Sierra Nevada area to videotape relevant landscape and interview scientists involved with the project. Topics included vulcanology, mining/mineralogy, terminal lakes, and plant and animal adaptations to extreme environments.

12. A local manager for Comfort Inn put Roadside Heritage audio stories on the hotel’s telephone answering system for callers to hear while they’re on hold. He expressed interest in distributing the audio CDs to select guests, and to key travel agents who specialize in sending people to the eastern Sierra region. Local shuttle service operators also play Roadside Heritage programs while taking their customers to various destinations in the Eastern Sierra. This suggests a future direction to explore with outreach.

13. Roadside Heritage is supporting Mono County in pursuing recognition of Highway 395 as a National Scenic Byway. We have also conducted outreach to Yosemite and Death Valley National Parks, which include Scenic Byways, as well as the Yosemite Chamber of Commerce, which is seeking an extension of the present Hwy. 120 Scenic Byway. Being associated with this national program would be a boon to Roadside Heritage; unfortunately, Congress has not reauthorized funding to the Federal Highway Administration for the Scenic Byway program, although they granted a five-month extension in February 2010.

2) Engaging With Professional Tourism Entities

One early goal of Roadside Heritage was to engage with local tourism and professional entities that have established promotional practices to attract visitors to the area. This includes local chambers of commerce and visitors’ bureaus (CVBs), including Mammoth Lakes and Bishop, along with local tourism and recreation commissions. Audience acceptance of Roadside Heritage has affirmed and reminded these entities of the fact that a segment of the traveling public is interested in cultural and heritage–oriented vacations. For these tourists, Roadside Heritage audio programs become a “tour companion,” like a ranger or tour guide in the car, explaining not just the surrounding geography and landmarks, but the deeper history, geology, science, and research that are intrinsic in a
location. In addition, we produce all-original, site-specific content rather than simply repurposing commonly found travel guides, enhancing the willingness of these tourism entities to connect Roadside Heritage productions with information they produce themselves.

As part of this process, Roadside Heritage staff worked with tourism and professional organizations to assist with joint promotional efforts of the scenic Highway 395 area relating to the key points most likely traveled by the public. Working with these organizations and their existing audience relationships gave Roadside Heritage easier access to the public and wider promotional efforts and distributions. Roadside Heritage received many “in-kind” advertising trades, where cross-promotion of each other’s brands complemented Roadside Heritage or complemented the already established means of tourism promotions. For instance, our relationship with the Mammoth Lake Tourism office led to Roadside Heritage CDs being used in an outreach to Virgin Air, in exchange for being listed as supporters in our promotional materials.

Roadside Heritage built a particularly solid relationship with the Mammoth Lakes Tourism office, the largest of all professional tourism agencies local to Highway 395, which promotes Roadside Heritage programming as one of California’s 15 Welcome Centers, as a local US Forest Service visitor center and through its widely distributed visitor planning guides. The Bishop Chamber of Commerce followed suit. Active participation on the local Mammoth Tourism and Recreation Commission by Roadside Heritage representative Jefferson Lanz of City Concierge helped to facilitate introduction and adoption of Roadside Heritage into Mammoth, which offered further evidence that a local presence and relationships will help the project flourish.

Regionally, the tourism offices of Mono County and Inyo County supported Roadside Heritage with grant monies and in-kind promotional efforts. These two county agencies encompass the entire stretch along Highway 395 that is included in Roadside Heritage programming. Mono County was particularly useful in providing their own research data to help us determine the kind of information that might appeal to travelers coming into their county.

Roadside Heritage worked with the California Travel and Tourism Commission (CTTC) office in Sacramento to participate in the agency’s rural tourism programs, and similarly with a state subdivision, the High Sierra commission, with the goal of joint localized area promotions. Roadside Heritage was featured in the Bureau of Land Management (BLM) widely disseminated motor touring guide, which features scenic stops along Highway 395. Roadside Heritage partnered with the US Forest Service on its local annual summer guides and centennial publications. Roadside Heritage reached out to other communities, including those surrounding Death Valley and Yosemite national parks. Both locations have routes that are national scenic byways, and could benefit from the existence of Roadside Heritage as travelers utilize Highway 395 to get to either or both of the parks. Included in the Yosemite outreach were local National Park Service staff, the Yosemite Gateway Partners Group, and Delaware North Corporation, the park concessionaire.

Additional developments in Year 3 of the grant period:
1. Program information was placed in local tourist publications such as vacation planners, the annual Mule Days program, *Inyo County Visitor Guide, Mammoth Lakes Visitor Planner, Mammoth In Resort Guide*, and the *Eastern Sierra Adventure Guide*. The combined projected viewership from these publications is 583,500 people.

2. The Bishop Chamber of Commerce distributed brochures on where to pick up a free audio CD at the Fred Hall show in Long Beach, one of California’s largest tradeshows featuring outdoor vacations and activities.

3. We provided CTTC with PR materials about Roadside Heritage CDs, and discussed how CTTC could promote awareness of the program. An article entitled “U.S. 395 Roadside Heritage CD-ROM” appeared in the Summer 2009 *What’s New in California*, CTTC’s quarterly newsletter distributed to 3,500 domestic and international media. CTTC’s Rural Tourism Development Manager expressed interest in promoting Roadside Heritage through CTTC’s Vacation Planners, which circulate at 500,000 copies a year, and *California Road Trips*, which circulates 1,000,000/year, half of those in the July *Sunset Magazine*, as well as additional online exposure on their website, [www.visitalicifornia.com](http://www.visitalicifornia.com). In addition, plans are underway to present Roadside Heritage at the CTTC annual statewide three-day Cultural and Heritage Tourism Symposium and to participate in CTTC’s quarterly conference calls to Scenic Byways partners.

4. County and city tourism officials have indicated that they believe Roadside Heritage contributes to their goals of promoting the Eastern Sierra to the traveling public. The Bishop City Council gave CDs to participants of the 2008 League of California Cities conference. The Bishop Chamber of Commerce included Roadside Heritage CDs and/or brochures in packets given out to all California High School Rodeo finalists that came to Bishop in 2009. The County of Mono has included the *Traditions, Travel, Tales of Mono* CD in educational packets provided to grade school students in Bridgeport, California who are studying the county.

5. A professionally designed Roadside Heritage display was developed for use at conventions and meetings where opportunities exist to network, develop potential program partnerships, and display materials showcasing Roadside Heritage. The design graphically implies the connection between MP3 listening technology and Roadside Heritage audio stories about cultural and scientific heritage, with a message about our program fundamentals: “Using Audio to Inform the Traveling Public, Engage Students, Empower Local Communities.” Roadside Heritage was presented to a national audience at the National Scenic Byway Convention in Denver, and the Oral History Association Conference in Kentucky.

6. We worked with the Mammoth Lakes Visitor Center arranging for them to host a prototype kiosk containing science videos about the Eastern Sierra.

7. We have also participated in the California Recreation Roundtable on Recreation, Parks, and Tourism ([http://calroundtable.org/index.html](http://calroundtable.org/index.html)) as a regional outreach measure.

8. Mono County Economic Development staff gave the keynote speech at the California Preservation Foundation 2010 Conference in May, featuring the Roadside Heritage Project.
9. Roadside Heritage has been mentioned in the AAA magazine *VIA* and in the *Reno Gazette*.

3) Connecting With Traveling Public

In order to reach out most effectively to our primary audience, Roadside Heritage needs to be visible when vacations are planned, when consumers are on vacation and for follow-up after vacations end. Roadside Heritage used a wide variety of dissemination media to connect with the target audiences and gain awareness. The initial reach was through local tourism publications commonly called “vacation planners,” which are distributed by CVBs during the vacation planning stages. Articles appeared on a range of topics covered by Roadside Heritage, along with stories on the creators of the product, the classroom students who recorded interviews and shot video on site. These stories were coupled with traditional promotion of the locations where audio CDs could be acquired.

Over the course of the project, we developed the Roadside Heritage website ([www.roadsideheritage.org](http://www.roadsideheritage.org)) into a mega-site hosting all audio stories from the three CDs, allowing the public to download audio stories prior to travel or en route for free, as well as to inform the public about the area in detail with interactive, content-rich maps, photos, travel route planners, video, kids’ activities, podcasts by youth who participated in the Youth Enrichment classes, and press/media information, all using the most contemporary web tools. The website also aids us as a follow-up tool after a vacation, if individuals seek out additional information on an historic site they experienced because of Roadside Heritage.

For vacationers in transit, our most effective means to reach the widest audience was a billboard at the entrance to our scenic highway corridor. The billboard directs the public to our CVB partners and 16 distribution points where custom-fabricated point-of-sale (POS) displays hold Roadside Heritage materials. Additionally, we provided local visitor center staff at each location with information fact sheets about the project, with specific information to manage customer questions. Informational brochures were placed strategically in other roadside stops, such as gas stations and mini-marts along the corridor, to aid in raising awareness in the traveling public and to put something in their hands to carry with them. The brochure contained distribution points for the CD and our web address to find additional information or use our web-based CD maker to create customized audio.

To create other means to acquire the audio stories besides the more common MP3 download via a website, while also utilizing the latest technologies, we constructed a prototype audio listening center with video kiosk. Conceived as a listening station like those seen in record stores and equipped with downloadable MP3 files, the kiosk was a self-contained entity. Complications emerged related to downloading files, as consumers use a wide range of MP3 players with different proprietary software. Additionally the lack of space in the local CVB locations in an additional challenge that has not yet been fully addressed. However the prototype installed at the large official California Welcome Center office in Mammoth Lakes receives high marks from the staff.
Additional developments in Year 3 related to connecting with the traveling public:

1. Beginning in July 2009, we released 5,900 copies of *Traditions, Travel, and Tales of Mono* to the public at 21 museums, chambers of commerce, and visitor centers in Inyo and Mono Counties.

2. We released 4,800 copies of *Exploring Extreme Environments* in the spring of 2010 through the same 21 distribution sites.

3. Through arrangements with City Concierge and WestEd, 200 CD copies of *Exploring Extreme Environments* were distributed to southern California residents traveling to the eastern Sierra Nevada.

4. In the first three months of 2010, there were 3,820 visits to the Roadside Heritage website.

5. The brochure detailing where travelers can pick up the audio CDs was distributed throughout the year in tourism brochure racks located in local businesses, restaurants, galleries, and other public places throughout Inyo and Mono Counties.

6. Press releases were sent out to California and Nevada media following the release of each audio CD program, resulting in press and radio coverage in the local and regional media. Local press also showcased the Roadside Heritage CDs and website in a story about the Science Festivals held in various school locations in the eastern Sierra during the past year. With much of the visitation to the Eastern Sierra coming from the Los Angeles area, Roadside Heritage received a very beneficial mention in the *Los Angeles Times* travel blog. The Roadside Heritage website received 355 visits the day they ran a story on Roadside Heritage. Local radio coverage by KSRW showcased the program and played excerpts from *Exploring Extreme Environments* on the air. KMMT aired a five-minute interview with Paula Williams about Roadside Heritage in March 2010. KOLO TV News in Reno, Nevada did a five-part series on Roadside Heritage that aired on the evening news in May 2009, broadcasting to a large section of rural Nevada as well as the Carson City/Reno area.

7. We established web links to the Roadside Heritage website on sites where the traveling public might look for information on the eastern Sierra Nevada, including Caltrans District 9, the National Geographic Sierra Nevada geotourism site, White Mountain Research Station, Eastern Sierra Regional Airport, a local realtor site, Laws Railroad Museum, and www.easternsierra.us.

8. We sent bi-annual e-newsletters about the latest audio CDs, science festivals, and updated RH website to program supporters and visitor contacts, and frequently received enthusiastic responses.

9. To boost our online presence for travelers, Roadside Heritage has placed an article about the program on the Wikipedia site, and is negotiating the purchase of Google AdWord sponsored links which would enable us to reach travelers while in the planning stages of road trip. We plan to link to the search function using appropriate key words, so that a Roadside Heritage link would appear on Google searches for terms such as “Eastern Sierra Vacation,” or “Sierra Audio Tour.”
4) Promotional Materials for Public Outreach through Joint Tourism

To minimize the cost of creating large-scale outreach promotions, yet be widely recognized, Roadside Heritage found it valuable to collaborate on local tourism outreach programs, specifically trade shows. For instance, the Fred Hall Show, California’s largest consumer trade show, is oriented around summer vacation and predominately geared toward outdoor activities. Roadside Heritage materials were used at several annual consumer shows to engage the visitors and provide unique local area information. Participation allowed us to gain creditability with the general public through our association with proven CVB entities and direct contact with consumers who had not started their vacations or been to the area before, or who might be planning a return trip. In some cases, Roadside Heritage gathered information when giving away CDs, and offered iPod giveaways to customers taking our product surveys so we could monitor our results.

During the three-year grant process, Roadside Heritage created several localized promotions with business vendors in town. With the lodging industry, the largest single business group along Highway 395, Roadside Heritage promoted our programming through individual networks of guests with confirmed upcoming reservations. Dissemination also included multiple feature articles in local newspapers, press releases, and widely distributed publications including the five-city Inyo-Mono Guide, Eastern Sierra Adventure Guide, Mammoth Sierra Magazine, local CVB vacation planner guides, the local USFS Forest Service Guide, radio and local television outlets, posters for display at the local retailers, and appearances on local radio.

Additional developments in Year 3:

1. Roadside Heritage updated and distributed a professional press packet to contacts for the purpose of media coverage and potential collaborations. A database of California and Nevada media contacts was maintained and updated throughout the project.

2. Roadside Heritage printed 12,500 brochures for Year 3 distribution, announcing the locations of all distributors giving out free CDs and showing the locations on a map. We placed these brochures in tourism information racks throughout Inyo and Mono Counties.

3. A billboard in southern Inyo County on Highway 395 announced the free CDs to southern California travelers and local residents driving through the region. Caltrans supplied statistics showing that 3,401,618 people had the opportunity to view this billboard during its 18-month existence.

4. Development of the “sustainable” CD set offered for purchase allows for continued public access to the first two audio programs through local bookstores such as Spellbinder Books and the Booky Joint, visitor center bookstores in Inyo and Mono Counties, and the California Welcome Center at Mammoth Lakes. This product is also available to local tourism entities, should they want to purchase it at cost and give it out as a promotional item in their tourism promotional efforts.
5. A concerted effort was made to place Roadside Heritage web links on distributors’ websites, as well as on other regional sites that tourists might visit. This resulted in program exposure on a variety of Eastern Sierra websites, including the Eastern Sierra Regional Airport, Caltrans District 9, Eastern Sierra Realty, Inyo County, many of our local CD distribution partners (museums, visitor centers, etc.), and several Eastern Sierra web guides and blogs.

6. A banner announcement widget developed by Lawrence Hall of Science is being offered to regional websites as value-added content for their sites, allowing the public to directly download audio stories that relate to their travel destination.

7. Roadside Heritage was nominated to be part of the Sierra Nevada geotourism project website developed by National Geographic (www.sierranevadageotourism.org) and can be viewed at: http://www.sierranevadageotourism.org/content/roadside-heritage-395/sieBE6A07DE73CD8AECE. This project acquaints tourists with local culture and traditions, offering in-depth opportunities to enjoy the area's unique natural beauty and biodiversity. In addition, the Sierra Nevada Conservancy and Sierra Business Council have partnered with the National Geographic Society to capture the history and heritage of the Sierra Nevada Region through the interactive website and print map. The site receives 4,000 unique visitors per month from 61 countries.

8. We placed announcements promoting Roadside Heritage audio CDs and website in key print media such as vacation guides and local outdoor-related magazines targeting the traveling public and outdoor enthusiasts. The value of this program to local tourism was made clear by a focus group survey of people who received one of the Roadside Heritage audio CDs: 79.5% of the respondents stated that they would extend their vacation in order to visit one of the locations mentioned on the audio traveling companion. Nearly 90% of adults indicated that they would modify their trip itinerary to visit locations described on a track, while 51% stated they would modify their trip because of something they saw on a website.

III. Product Sponsorship, Fundraising and New Product Development Strategies

Roadside Heritage Business Sponsorship Campaign
The Roadside Heritage Business Sponsorship Campaign leverages ESICE’s excellent reputation with local educators, families, and the business community along with the Roadside Heritage products of STEM-rich audio programs available as CDs and downloadable files, the www.roadsideheritage.org website, and the Family Science Festival portable education kits.

ESICE actively partners with financially troubled regional school districts to make Family Science Festival kits available to the broadest possible audience at little or no cost. Additionally, ESICE has been seeking funds to bring projects modeled after Roadside Heritage to underserved Native American youth programs and 4-H groups throughout the region.
Leveraging the quality and portability of the Family Science Festival kits, the desirability of the custom-designed trip planner audio program widget, and the potential benefits of high-profile corporate philanthropy, we are offering local business and large corporations opportunities to “sponsor” Roadside Heritage. By customizing existing Roadside Heritage products for the business community, ESICE hopes to maximize its ability to sustain the program and attract new program funding from diverse sources.

The following is an excerpt from the Business Sponsorship Packet, describing sponsorship benefits:

1. A direct “Sponsors” link to the Roadside Heritage website, an interactive and user-friendly resource for travelers with Free Downloadable Audio Stories. The tales of Paiutes’ keen knowledge of the natural world, of Mark Twain’s mistaken idea of an Eastern Sierra Dead Sea, of the study of “extremeophiles” that provide clues about life on other planets will be made available to customers or guests to download, in order to create their own CDs or load to their MP3 players. This unique website can be viewed at: http://www.roadsideheritage.org

2. Traveling Festival Kits Events: developed by the renowned Lawrence Hall of Science to explain the dynamic forces at work in the Eastern Sierra Landscape, these delightful, interactive natural history and science installations can be displayed temporarily in your place of business. Trained docents will be provided to ensure quality experiences for your customers or guests. Logistical requirements apply, not suitable for all locations.

3. Customized copies of our two colorfully packaged and informative Audio Tour CDs, retailing at $8.95 each, for you to offer your customers or guests. Sponsorship includes custom labels with your logo.

Implementation of the Sponsorship Plan
The Roadside Heritage Business Sponsorship Campaign maintains and increases the momentum built over the total five-year life of the program. Utilizing a simple process of prospect research, cold calls, and the development of a Sponsor Packet, ESICE is systematically approaching locally based business with sponsorship opportunities. Prospects include all tourism-related businesses and over 300 regionally based businesses with a sales volume of over $1 million. Interested prospects receive Sponsorship Packets and multiple follow-up calls until they respond. To date, over 175 companies have been contacted directly, receiving multiple calls, 130 companies are still considered active leads and 15 companies have requested complete sponsorship packets and follow-up. Another 150 companies are targeted for the next round of introductory calls.

Annual Fundraising
Roadside Heritage is a fully integrated component of the programming at ESICE. Therefore, the program is supported by all of our annual fundraising activities: targeted, proposal writing, and outreach to individual donors.
Proposal Writing

The following local and national private institutions have been approached for funding of future Roadside Heritage Projects:

- The Annenberg Foundation
- Donald and Ruby Branson Foundation—private local educational foundations
- Owens Valley Tribal TANF Program—government programs for at-risk populations

Description of Roadside Heritage has been added to all of ESICE’s promotional and fundraising materials, and the program has been prominently featured in our direct-mail appeal letters and other fundraising activities. Links to the Roadside Heritage website have been added the ESICE website and the web address is included in all ESICE publications.

Strategic Partnerships/Reaching Beyond Local

Dissemination and sales efforts oriented toward local tourism have been most effective in sustaining Roadside Heritage. At the same time, the program had some unique opportunities to build larger regional and national audience awareness of our products. For example, we created programming for Garmin, the manufacturer of GPS systems, in order to include map-based audio content for their application. Using their technology to upload key map points, the consumer can hear our audio content when passing by GPS coordinates, which automatically activate based on the consumer’s geoposition, creating a customized experience while motoring.

Next steps include directly approaching US-based GPS companies with strategic partnership opportunities to both utilize the existing Roadside Heritage products and underwrite the creation of new products. 56 GPS Companies were thoroughly researched and 26 qualified prospects were identified. Subsequent steps will include an approach letter and submittal of product samples, followed-up by phone calls to decision makers within the company.

Roadside Heritage also approached national businesses such as Enterprise Rent-A-Car to look at partnership opportunities to place our audio in cars headed for the Highway 395 region. We contacted the local PBS television network in Los Angeles to reach cultural or heritage-oriented travel shows, discussing strategies that might engage viewers who are interested in unique travel experiences.

Widespread embracing of Roadside Heritage continues. Even as this grant winds down, the California Travel and Tourism Commission has once again approached Roadside Heritage for programming content for its own program that promotes culture and heritage-oriented travel.

Outreach to national or larger regional businesses takes time to blossom, as their marketing plans have a longer lead time; however, more local organizations create marketing plans in a short season window. Web-to-web cross-promotion beyond link exchanges needs to have specific directives and managers to succeed, as getting new systems integrated takes time.
VI. Appendices

1) Roadside Heritage: Informal Science Education in the Eastern Sierra
   Sustainability License Agreement

LICENSE AGREEMENT

This License Agreement (the “Agreement”) is entered into as of February 1, 2010, (the “Effective Date”) by and between The Board of Regents of the Nevada System of Higher Education on behalf of the University of Nevada Reno (“University”) and the Eastern Sierra Institute for Collaborative Education (“ESICE”).

A. As part of the Roadside Heritage: Informal Science Education in the Eastern Sierra project, funded by National Science Foundation grant #ESI-0610236, University has collaborated with ESICE to create digital audio stories about the unique cultural, natural, and scientific legacy of the Eastern Sierra, a community hands-on festival, and an interactive website (collectively, the “Work”). The Work is described in attached Exhibit A, incorporated herein by reference. University owns certain rights with respect to copyrighted materials and activities and other works in the Work, including rights to certain text, graphics, educational processes, and related material appearing therein.

B. ESICE disseminates to the public science information, hands-on science activities, and follow-up materials. ESICE wishes to obtain, and University wishes to grant to ESICE, a license to use the Work in ESICE’s programs.

NOW, THEREFORE, in consideration of the mutual covenants, conditions and terms hereinafter set forth, and for other good and valuable consideration, University and ESICE agree as follows:

1. License to ESICE.

   1.1. License Grant. University hereby grants to ESICE a non-exclusive, royalty-free, revocable, and nontransferable right and license to reproduce, distribute, and sell all of University’s rights in the Work, and to publicly perform and authorize other to perform all or portions of the Work for ESICE’s public audiences in California and Nevada, and on the Internet throughout the world.

   1.2. Restrictions and Exclusions. The Work as used by ESICE will conform in look and feel to the Work described in Exhibit A. ESICE agrees it will not create derivative works based on the Work, including, among other things, translations, dramatizations, fictionalizations, motion picture versions, sound recordings, art reproductions, abridgments, condensations, musical arrangements, or any other forms in which a work may be recast, transformed, or adapted. If ESICE wishes to make a derivative work, such proposed changes will be submitted to University at the address set forth below for University’s prior review and written approval. ESICE will not be required to obtain University’s prior approval for updates, revisions, or additions to the interactive website described in Exhibit A, nor will ESICE be required to obtain University’s prior

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approval for corrections and updates to the audio programs and exhibit components, provided such changes conform in look and feel to the Work described in Exhibit A and ESICE provides University with a report of such changes.

1.3 Sublicense and Assignment. ESICE may sublicense or subcontract, in whole or in part, directly or indirectly, the rights and licenses granted to ESICE by University under this Agreement, without the prior express written consent of University, but each such sublicense or subcontract must comply with all applicable provisions of this Agreement and must not include the right to grant any further subcontract or sublicense. ESICE may not assign its rights under this Agreement without the prior written consent of University.

1.4. Channels of Distribution. ESICE is authorized to host the Work primarily at ESICE, in schools as part of educational outreach, and in other educational venues, such as community centers and libraries, throughout the State of California and Nevada only. ESICE may charge a fee in connection with its presentation of the Work.

1.5. Consideration. ESICE will send periodic written reports detailing the use, attendance and efficacy of the Work at ESICE. ESICE agrees that all expenses incurred or related to the program support, reporting and licensed uses of the Work, including storage, maintenance, repair and replacement, will be ESICE’s sole responsibility.

1.6. Rights Reserved to University. Any and all rights, title and interest in and to the Work, and to any text, graphics, activities, and related material therein not included in this Agreement, and not expressly and specifically granted to ESICE, are expressly and without limitation retained by University.


2.1 Acknowledgement. ESICE will acknowledge University’s participation in creation of the Work.

2.2 University Trademarks. ESICE will not use the name of the University of Nevada Reno, or any abbreviation thereof, or any name of which "University of Nevada" or “Nevada System of Higher Education” is a part, or any trademarks of the University, in any commercial context, such as may appear on products, in media (including web sites) and print advertisements in cases when such use may imply an endorsement or sponsorship of ESICE, its products or services. All uses of the University’s name and trademarks, therefore, must first receive prior written consent of the University.

2.3 Warranty. University represents and warrants that it has obtained in writing all necessary rights including, but not limited to, copyright, trademark, rights of publicity, and other intellectual property rights, associated with the use of the Work and other technologies, equipment and materials contemplated by this Agreement and that their use does not violate the intellectual property or other rights of any third party. This Section and its provisions will survive the expiration or earlier termination of this Agreement.
3. **Mutual Indemnification.**

3.1. **Indemnification.** To the extent authorized by state law, each party will defend, indemnify and hold the other party, its officers, employees and agents harmless from and against any and all liability, loss, expense, including reasonable attorney’s fees, or claims for injury or damages arising out of its performance under this Agreement, but only in proportion to and to the extent such liability, loss, expense, attorney’s fees, or claims for injury or damages are caused by or result from the negligent or intentional acts or omissions of the indemnifying party, its officers, agents, or employees.

3.2 **Claims Procedures.** With respect to any claims falling within the scope of Section 3.1 (“Indemnification”): (a) the indemnitee agrees promptly to notify the indemnitor of any such claims, allow the indemnitor to control the defense and settlement negotiations, and fully cooperate with the indemnitor in such defense and related settlement negotiations (unless party assumes control of the defense as described in Section 3.1; (b) the indemnitor must keep the indemnitee fully advised with respect to such claims and the progress of any suits in which the indemnitee is not participating; and (c) the indemnitee will have the right to participate, at its expense, in any suit instituted against it.

3.3. **Limitation of Liability.** IN NO EVENT WILL UNIVERSITY BE LIABLE OR OBLIGATED TO ESICE OR ANY THIRD PARTY IN ANY MANNER FOR ANY SPECIAL, NON-COMPENSATORY, CONSEQUENTIAL, INDIRECT, INCIDENTAL, STATUTORY OR PUNITIVE DAMAGES OF ANY KIND, INCLUDING, WITHOUT LIMITATION, LOST PROFITS AND LOST REVENUE, REGARDLESS OF THE FORM OF ACTION, WHETHER IN CONTRACT, TORT, NEGLIGENCE, STRICT PRODUCT LIABILITY, OR OTHERWISE, EVEN IF UNIVERSITY HAS BEEN INFORMED OF OR IS AWARE OF THE POSSIBILITY OF ANY SUCH DAMAGES IN ADVANCE.

4. **Termination and Survival**

4.1. **Termination.** This Agreement may be terminated by either party upon sixty (60) days’ written notice to the other of a material default or violation of any term or condition of this Agreement, which default remains uncured. In addition, University may terminate this Agreement immediately if the Work is not used within a period of at least 12 months, or ESICE ceases to do business, or ESICE becomes subject to any voluntary or involuntary order of any governmental agency involving the Work.

4.2 **Effect of Termination.**

4.2.1. Termination of this Agreement will be without prejudice to any rights or claims that either party may otherwise have against the other party.
4.2.2 Upon the termination of this Agreement by any party for any reason, ESICE will immediately and permanently discontinue using the Work and any material that incorporates the Work.

4.2.3 Upon termination of this Agreement for any cause, all rights granted to the ESICE hereunder will revert to University for its use at any time, and no additional activities from the Work will be presented, except that ESICE may be permitted to fulfill any outstanding performance obligations incurred prior to termination. University will be reimbursed for any expenses and will be paid for any work performed prior to termination. ESICE will return all materials provided by University to University within 30 days of termination. ESICE will execute all documents necessary or appropriate to revest all rights to University.

5. **Miscellaneous Provisions.**

5.1. **Compliance with Laws.** Nothing contained in this Agreement will require or permit University or ESICE to do any act inconsistent with the requirements of any United States law, regulation or executive order as the same may be in effect from time to time. ESICE will, at ESICE’s expense, obtain all necessary governmental approvals, permits, and licenses, and comply with all laws, rules and regulations applicable to the production, distribution, and use of the Work, including without limitation, any safety studies. ESICE will have sole responsibility for any site design, warnings and instructions as to its use of the Work.

5.2. **Independent Contractors.** The relationship between University and ESICE is that of independent contractors. University and ESICE are not joint venturers, partners, principal and agent, master and servant, employer or employee, and have no other relationship other than independent contracting parties. Neither party will have the power to bind or obligate the other party in any manner other than as is expressly set forth in this Agreement.

5.3. **Governing Law; Venue; Jurisdiction.** This Agreement will be governed by, and construed and enforced in accordance with, the laws of the United States and the State of Nevada without regard to its conflict of laws provisions.

5.4. **Headings.** The headings for each section in this Agreement have been inserted for convenience of reference only and are not intended to limit or expand on the meaning of the language contained in the particular section.

5.5. **Severability.** Should any one or more of the provisions of this Agreement be held invalid or unenforceable by a court of competent jurisdiction, it will be considered severed from this Agreement and will not serve to invalidate the remaining provisions thereof. The parties will make a good faith effort to replace any invalid or unenforceable provision with a valid and enforceable one such that the objectives contemplated by them when entering this Agreement may be realized.

5.6. **No Waiver.** Any delay in enforcing a party’s rights under this Agreement or any waiver as to a particular default or other matter will not constitute a waiver of such party’s
rights to the future enforcement of its rights under this Agreement, excepting only as to an express written and signed waiver as to a particular matter for a particular period of time.

5.7. Notices. Any notice, report or statement required by this Agreement will be in writing, will specifically refer to this Agreement, and will be sent to the respective addresses set forth below unless subsequently changed by written notice to the other party given in accordance with this section. Such notice, report or statement will be deemed given: (i) ten (10) days after being sent by certified mail, return receipt requested; (ii) when delivered in person; or (iii) when sent by facsimile transmission with the original sent by overnight mail or courier service.

UNIVERSITY: Richard A. Bjur
Interim Director
Office of Sponsored Projects Administration
Mail Stop 325
University of Nevada, Reno
Reno, NV 89557
Fax: (775) 784-6680

ESICE: Paula Brown-Williams
Executive Director
Eastern Sierra Institute for Collaborative Education
512 N. Second St.
Bishop, CA 93514
Fax: (760) 873-7659

5.8. Entire Agreement; Modification. This Agreement sets forth the entire agreement and understanding between the parties as to the subject matter set forth in this Agreement, and supersedes all other agreements, whether oral or written, between the parties relating to such subject matter. There will be no amendments or modifications to this Agreement, except by a written document signed by both parties.

5.9. Authority to Sign. The persons who have executed this Agreement represent and warrant that they are duly authorized to execute this Agreement in their individual or representative capacity as indicated.

5.10. Counterparts; Facsimile Signatures. This Agreement may be executed in one or more counterparts, each of which will be deemed an original and all of which will constitute one and the same Agreement. A fax signature will be treated as an original.

IN WITNESS WHEREOF, the parties have executed this Agreement by their duly authorized representatives as of the Effective Date.
By: _________________________________
Name: Paula Brown-Williams
Title: Executive Director

By: _________________________________
Name: Richard A. Bjur
Title: Interim Director, Sponsored Projects
EXHIBIT A

DESCRIPTION OF THE WORK

Roadside Heritage: Informal Science Education in the Eastern Sierra Nevada Byways, is a program designed to engage the traveling public in the science, technology, engineering and mathematics (STEM) content embedded in the Eastern Sierra landscape. University has contributed to the following (the “Work”):

- Thirteen STEM-rich digital audio programs providing the traveling public with access to the scientific legacy of the Eastern Sierra.

- The Traveling Festival Kit used at festivals and public events to address STEM themes unique to the Eastern Sierra through interaction with tabletop manipulative exercises.

- The Roadside Heritage Interactive Website providing access to STEM content photos, videos, audio interviews and map-based collections of points of interest.

- The Roadside Heritage Interactive Kiosk providing travelers with en route access to Roadside Heritage content including maps, audio programs, and additional information.
### SPONSORSHIP FACT SHEET

#### CONTACTS:
Sponsorship and Media Inquiries: Paula Brown-Williams (760) 873-9855, paula@esice.org

#### WHO:

**Lead Project Partners:**

**Eastern Sierra Institute for Collaborative Education**

The mission of the Eastern Sierra Institute for Collaborative Education, established in 1997, is to create educational opportunities for people of all ages that celebrate the unique natural and cultural resources of the Eastern Sierra. ESICE programs support local communities as they address real-world environmental and social issues, using educational methods based on collaborative, creative problem solving, and commitment to our community. ESICE supports the development of critical thinking skills, interpersonal communication and team building, and stewardship of natural resources.

**University of California, Berkeley, Lawrence Hall of Science**

Designed and generated festival kits and the project website ([www.roadsideheritage.org](http://www.roadsideheritage.org)), which present the science of the area’s extreme environments as an interactive experience.

**University of Nevada, Reno, Academy for the Environment**

Established connections to university faculty members and scientific researchers with pertinent field research in the Eastern Sierra.

**Audio Landscapes**

Worked with student recordings and ESICE production staff to ensure the development of a high-quality audio product. Created audio files for CD or MP3 format.

#### WHAT:

Roadside Heritage is seeking Sponsors to continue and expand our programs.

Some of the most colorful stories in the history of the American West were written in the landscape known as the Eastern Sierra. Yet only the smallest fraction of visitors realizes the riches of the stories hidden in the scenery. Roadside Heritage aims to change all that by bringing engaging, authentic stories from one of the most beautiful areas of the United States, California’s Eastern Sierra, as told by those who live here.

#### WHERE:

Highway 395 through the Eastern Sierra

#### WHY:

The Roadside Heritage Project lends voice to people who have made this country their home for generations. The project is designed to engage the traveling public in the region’s impressive natural and scientific history.
CORPORATE SPONSORSHIP OPPORTUNITIES

1. **A direct “Sponsors” link** on your company website to the Roadside Heritage website, an interactive and user-friendly resource for travelers with **Free Downloadable Audio Stories**. The tales of Paiutes and pioneers, railroad barons and boomtowns will be made available to your customers or guests to download to create their own CD or load to their MP3 player. This unique website can be viewed at [http://www.roadsideheritage.org](http://www.roadsideheritage.org)

   **SPONSORSHIP: $1,500**

2. **Traveling Festival Kits**: developed by the renowned Lawrence Hall of Science to explain the dynamic forces at work in the Eastern Sierra landscape, these delightful, interactive natural history and science installations can be displayed temporarily in your place of business. Trained docents will be provided to ensure quality experiences for your customers or guests. *Logistical requirements apply, not suitable for all locations.*

   **SPONSORSHIP $2,500 PER KIT FOR 5 HOURS**

3. Customized copies of our two colorfully packaged and informative **Audio Tour CDs**, retailing at $8.95 each, for you to offer your customers or guests. Sponsorship includes custom labels with your logo.

   **SPONSORSHIP: $3,500 FOR 200 CUSTOM LABELED COPIES**

4. Installed **Custom Multimedia Mural with an accompanying Audio Story** to entertain and educate your customers. You will work with our program team to select a fascinating story from the region, and we will create an original work for your place of business. *Logistical requirements apply, not suitable for all locations.*

   **SPONSORSHIP: $3,000–$5,000**

5. **12 Months of Sponsor Recognition**, including banners, distribution of your logo material, patron discounts and incentives and customized recognition, at our community programs and outreach activities, 2010–2011 include:
   1. 3 Large school-based Science Fairs in Bishop, Lone Pine, and Death Valley, California
   2. Bridgeport 148th Annual July 4th Festival from July 1 to July 5, 2010
   3. Lone Pine Film Festival, October 8–10, 2010
   5. Family Science Day, patterned after of Watershed Project, Summer 2011
   6. Bighorn Sheep Encampment Weekend, Summer 2011

   **SPONSORSHIP: $5,000**
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<tr>
<th>Community Sponsorship Opportunities</th>
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<td>Your company’s community leadership will be recognized as part of ECISE’s educational programs and outreach activities in 2010–2011</td>
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<tr>
<td>Bighorn Sheep Encampment Weekend, Summer 2011</td>
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Dear [Contact Name]:

On behalf of the board of directors of the award-winning Roadside Heritage® audio traveling companion series, I am excited to introduce our innovative travel-centered audio programs, and to share our vision for future products designed for Information Communications Technology-driven systems. Roadside Heritage® has spent the past five years producing site-specific audio for motorists traveling U.S. 395 as it winds its way along the eastern edge of California’s Eastern Sierra. Access to our all-original, road-tested audio content would add tremendous value to your brand for travelers in this region. In addition, I hope [Company Name] will consider using this opportunity to partner with Roadside Heritage in developing new content.

I enclose a CD sample of *Paiute, Prospectors, Pioneers*, audio tales for travelers in Inyo County. Each of these stories, including “Early History of the Owens Valley,” “Adventures on the Slim Princess,” and “Mining and the Rise of Cerro Gordo,” has been chosen and shaped around the growing demand for travel experiences related to culture, heritage, and natural science.

Imagine a family on vacation driving Highway 395 through the Owens Valley, near Little Lake, California. As they near the Coso Hot Springs, the car’s GPS system signals that an audio story is available. They push a button, and hear a woman’s voice ask, “Have you ever wondered why the hot springs are found in some places and not in others? Scientists explain they are produced by the emergence of geothermally heated groundwater from the Earth's crust. But Dorothy Stewart, an elder from the Big Pine tribe, remembers learning the Paiute legend of the origin of the hot springs.”

Next Ms. Stewart tells the story of a great snake that took all the water from the springs in its mouth and wouldn’t give it back. When the snake’s belly was tickled, it laughed, sending hot water in all directions: wherever it landed became a hot spring. The story continues, explaining the sacred nature of these hot springs to the Paiute, with music and sound effects to draw listeners into the story.

The family enjoys “Paiute Legend of the Hot Springs,” and several more messages along their route. In effect, the device creates a customized tour, interpreting the landscape around them wherever they happen to be. They’re intrigued enough to check [Company Name]’s documentation for the system, which directs them to the Roadside Heritage website (www.roadsideheritage.org). There they can access the full library of audio stories and detailed...
information about the area, with interactive, content-rich maps, photos, travel route planners, video, kids’ activities, and podcasts by students who helped create the audio programs.

Roadside Heritage currently owns [approximately 3] hours of licensed, road-tested audio content, featuring first-person interviews with a variety of experts on the landscape, culture, and science of the Eastern Sierra. Each story is keyed to a particular stretch of highway in Inyo and Mono Counties. Roadside Heritage distributes this content via multiple technologies, including CDs, roadside listening stations, and customized driving tours using downloadable MP3 files. Local travel and tourism businesses, chambers of commerce, and visitors bureaus also offer Roadside Heritage CDs as a value-added incentive for preferred customers. One enterprising hotel owner plays our travel programs to telephone callers on hold!

Roadside Heritage is an initiative of the Eastern Sierra Institute of Collaborative Education (ESICE), a non-profit organization that creates educational opportunities for people of all ages celebrating the unique natural and cultural resources of the Eastern Sierra. Both Inyo and Mono Counties, University of Nevada, Reno Academy for the Environment and Raggio Research Center for STEM Education; the University of California, Berkeley, Lawrence Hall of Science and the National Science Foundation supported development of Roadside Heritage, which gives school-age youth in rural communities access to cutting-edge audio technology in order to gather authentic oral histories from community members. Local students learn to create audio content, which they then weave together to create audio stories and programs, in collaboration with media professionals. These programs serve as “traveling companions” for motorists, engaging them in the invisible stories in the scenery.

Roadside Heritage audio content is not necessarily keyed to a particular geoposition, rather it relates broadly to the landscape and, for the most, can part be keyed to coordinate way points – the interactive maps on the website show what is possible. The content is available to commercial distributors of Information Communications Technology-driven audio systems and vehicles equipped with these devices. In addition, our Roadside Heritage Business Sponsorship program offers [Company Name] the option of customized audio content and collaborative opportunities on the development of future audio programs for Information Communications Technology-driven custom tours of Highway 395.

Please take a moment to sample a few tracks from the enclosed CD. I know you’ll agree that this content would make an exciting addition to your product line for travelers in the Eastern Sierra. A Roadside Heritage representative will contact you next week to answer questions about our products and explain the advantages of our Sponsorship program.

Very truly yours,

[NAME]
[TITLE]
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