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Red Rock Desert Learning Center & Wild Horse and Burro Facility: Oliver Ranch Feasibility Study

Yosemite National Institutes

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INTRODUCTION

Yosemite National Institutes (YNI) has completed a feasibility study for a residential science school at Oliver Ranch in the Red Rock Canyon National Conservation Area (RRCNCA), near Las Vegas, Nevada. The study evaluates the potential for educational programs focused on 10-13 year olds, but includes options for additional audiences.

BACKGROUND

Yosemite National Institutes, a private, non-profit national environmental education leader, has been running successful residential science programs in national parks for 30 years in partnership with the National Park Service. The mission of YNI is to provide educational adventures in nature's classroom to inspire a personal connection to the natural world and responsible actions to sustain it. Early in 2000 in Las Vegas, a new organization, the Outside Las Vegas Foundation (OLVF), was forming. The OLVF is dedicated to preserving the federal public lands surrounding Las Vegas, enriching the experience of its visitors, enhancing the quality of life for local residents and promoting community stewardship of these valuable resources. When the OLVF was investigating organizations to conduct the Oliver Ranch feasibility study, YNI was a natural fit. Blaine Benedict, Environmental Education Committee Chair for OLVF, contacted YNI in June 2000 to discuss their ideas. In July 2001, Alan O'Neill, Executive Director for OLVF, hired YNI to conduct a multi-stage evaluation of Oliver Ranch to identify the educational opportunities, market feasibility, financial requirements, administrative structure and site potential. YNI has worked with OLVF and the four federal land agencies – Bureau of Land Management (BLM), National Park Service (NPS), US Forest Service (USFS), US Fish and Wildlife Service (USFWS) – and other interested partnering agencies over the past year to complete the study. The results are presented in this document.

OLVF specified the following requirements for the Oliver Ranch feasibility study:

1. Needs to serve a diverse group of students of all ages (including seniors)
2. Has to have a residential component
3. Includes environmental education of all kinds, including art programs
4. Incorporates research and “real activities” into the student’s curriculum tied to local university and other groups
5. Supports the Clark County School District’s curriculum

OBJECTIVES

The objectives of the feasibility study are to evaluate the Oliver Ranch site as a potential residential science school from educational, financial, and market perspectives. Specifically, the study consists of the following components:

1. **Education and Program Analysis**
 - Describe curriculum and activity options at Oliver Ranch and other local and regional parks and open spaces
 - Identify educational partnerships, including the Wild Horse and Burro Program, The Planetarium at Community College of Southern Nevada, Desert Research Institute and Las Vegas Master Gardeners to identify curriculum opportunities
2. **Financial Analysis**
 - Develop a price and cost structure for the school
 - Create of pro forma operational budgets

3. **Market Analysis**

- Conduct primary and secondary market studies
- Identify economic status of the markets
- Perform demographic analysis of primary and secondary markets
- Conduct competitor analysis
- Perform transportation study
- Complete customer analysis

4. **Site Analysis**

- Identify impact areas
- Recommend building placement options
- Describe “green” building practices

METHODOLOGY

In order to meet the above objectives, we completed the following steps:

1. Physically inspected and analyzed the site in July 2001
2. Toured nearby locations, approachable by bus, as possible off-campus destinations
3. Met with Clark County School District Superintendents to discuss curriculum integration
4. Discussed roles and goals with educational partners
5. Created detailed financial models
6. Studied YNI campuses as models for primary and secondary markets for Oliver Ranch
7. Utilized YNI campus data to determine the target customers for Oliver Ranch
8. Analyzed demographic and economic status of the primary and secondary markets
9. Conducted focus groups with educators, parents and students
10. Surveyed elementary and middle school principals in Clark County
11. Analyzed findings from steps 1-10 and formulated recommendations regarding the residential Oliver Ranch Science School that will maximize the opportunities of the site

EXECUTIVE SUMMARY

Yosemite National Institutes (YNI) recommends the establishment of a residential science school based at the Oliver Ranch in the Red Rock Canyon National Conservation Area (RRCNCA) in Clark County, Nevada, for the following reasons:

THE NEED

- Nevada does not currently have a residential field science school that serves Clark County students.
- As the population of Clark County increases, the new residents will be interested in experiencing and learning about the fragile desert environment.

THE OPPORTUNITY

- Between 1990-2000 Las Vegas, the largest city in Clark County, grew by 55% and was the fastest growing metropolitan area in the United States (*US Census Bureau*).
- Oliver Ranch has superior access to this large population with only a 40-minute drive from downtown Las Vegas.
- The site has existing infrastructure, including trees, trails and a natural spring.
- Oliver Ranch has easy access to numerous and dramatic natural and cultural resources.

COMMUNITY SUPPORT

- The Outside Las Vegas Foundation has generated and will continue to generate strong financial and community support for a science school.
- Local educators, principals, parents and students – the primary customers/decision makers – have expressed support for Oliver Ranch Science School in recent focus groups and surveys.
- Clark County School District Superintendents strongly support the creation of the science school.
- A number of educational partners have expressed an interest in collaborating with the school, including the Wild Horse and Burro Program, the University of Nevada Astronomy Program, the Desert Research Institute, and the Las Vegas Master Gardeners Program.

ENROLLMENT AND MARKET AREAS

- By the fifth year, the science school will serve 14,400 students per year, of which 80%, or 11,520, would be 10-13 year olds.
- Overall the demand will be:
 - Approximately 60% from the Primary Market Area (PMA), which is Clark County
 - Another 30% from the Secondary Market Area (SMA), which is defined as the area within a 100-mile radius of RRCNCA
 - The remaining 10% of demand is projected to come from outside these areas

RECOMMENDATION SUMMARY

Education and Program Analysis

1. Make environmental education a requirement in the 5th grade curriculum, as mandated by state law.
2. Appoint a qualified educator to lead the curriculum development process with partnering agencies and the Clark County School District to create a program that is an experiential, field-science based curriculum integrated with a student-centered approach.
3. Define a Memorandum of Understanding (MOU) between all partnering agencies to clarify participation, communication and decision-making protocols.
4. Create the educational infrastructure to make it feasible for teachers to attend a residential program with their students.
5. Identify core education goals, to facilitate thematic instruction and curricular integration, in order to help the participants understand:
 - What a healthy desert ecosystem needs to survive
 - The complex interdependence of all elements in the desert
 - What actions each person can take to maintain a healthy desert

Market and Customer Analysis

1. In order to serve the diverse populations of both of the market areas, the school will need to offer scholarships to approximately 40% of the participants, because our findings have shown that:
 - In 2005 there will be a total of 225,551 10-13 year olds living in our Primary and Secondary Market Areas

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- In order to reach the target of 11,520 10-13 year olds, Oliver Ranch School will need to capture 5% of the total 10-13 year olds population in its Primary and Secondary Markets.
 - Out of the total population of 10-13 year olds, 133,841 (or 60%) could afford the proposed Oliver Ranch Science School tuition of \$157/3 day program.
 - Hispanic populations are growing rapidly in both the Primary and Secondary Market Areas.
 - The primary concern of all stakeholders is affordability.

Financial Analysis

1. In order to achieve economies of scale, a 250 bed campus is recommended.
2. Tuition is recommended at: \$157/student/3 day program and \$119/chaperone/3 day program.
3. In order to be able to offer scholarships to 40% of the students, significant and continuous fundraising will be necessary.

Competitor Analysis

1. Oliver Ranch Science School should be built without concerns of competition as no residential science schools currently exist in the Primary and Secondary Market Areas.

Governance and Management Structure

1. An operating organization at Oliver Ranch should partner with the Outside Las Vegas Foundation. This allows the operating organization to spend the bulk of their efforts on conducting successful programs, rather than managing relationships between the four sponsoring agencies.
2. A 250 bed facility is the most effective management model for the Oliver Ranch Science School.

Conceptual Site Design

1. The campus will reflect a sustainable eco-friendly design providing a tangible learning experience for participants.
2. The design focuses on the preservation of the physical site and its history.
3. The site plan will have minimal environmental impact by utilizing the existing structures, trees and footprint.

CONCLUSION

Oliver Ranch is truly a unique property located on the edge of one of the world's most famous and fastest growing cities. It has an ever-changing population with increasing environmental pressures and no local competition. To ensure that the local citizenry understands the complexity of decision-making to sustain a desert environment, we recommend that the Oliver Ranch Science School be built. While there are many specific management, financial, and operational details to work out, the Outside Las Vegas Foundation and the local community have demonstrated their commitment to implementing this vision. Clark County community needs and is interested in environmental science education and is dedicated to making it a reality.

EDUCATION AND PROGRAM ANALYSIS

INTRODUCTION

Assumptions

1. This study, conducted by Yosemite National Institutes, is based on 30 years of experience running non-formal science programs in partnership with the National Park Service, thus providing a qualified evaluation
2. Educational partners, expressing interest in collaborating on this project and participating in curriculum development, include the Wild Horse and Burro Program, the Desert Research Institute, the Planetarium at Community College of Southern Nevada, and the Las Vegas Master Gardeners
3. Clark County 10-13 year olds attending both public and private schools are the primary audience for the Oliver Ranch Science School

Operating the Oliver Ranch Science School effectively and successfully requires two primary components: **abundant educational opportunities** and **commitment from the educational community**. To understand the educational opportunity, YNI staff visited Oliver Ranch in July 2001 to conduct educational analysis by determining the cultural and natural history on and around Oliver Ranch. Since then, YNI has met with numerous potential education partners to understand the community commitment by discussing the roles and goals of individual public and private programs and gauging support from these groups.

Educational Opportunity

Walking along the dusty road that winds around Oliver Ranch, it is possible to envision a campus tucked among the trees. The “green” buildings will use sustainable technologies, thus minimizing the environmental impact per participant while teaching about the efficient use of the sun, water and wind that help fuel and cool the campus. The classrooms and laboratories will be full of students exploring different desert habitats and inhabitants, doing research and presenting findings in the outdoor amphitheater. Hiking groups will access the nearby trail system, enjoying stunning views of the expansive desert, or visiting the neighboring wild horse and burro facility. Everything about the Oliver Ranch experience will teach about the desert and how the community can live sustainably in an arid environment.

In addition to Oliver Ranch trails, groups can hike along scenic bluffs, through expansive valleys and in deep canyons at the Red Rock Canyon Visitor Center 8 miles away. Within two hours, students can explore Mount Charleston, Death Valley National Park, Valley of Fire State Park, Maopa Valley National Wildlife Refuge, Mojave National Preserve or Lake Mead National Recreation Area. Another few hours and they can be in Zion National Park, Grand Canyon National Park or Joshua Tree National Park (*see Appendix I-1 for a list of other Off-Campus Destinations*). The inspiring destinations are nearly limitless.

Community Commitment

These destinations, with the combination of mountains, valleys, meadows, springs, dunes, and lakes will expose participants to the complexity of the region, which is exactly the aim of the Outside Las Vegas Foundation. Many of the area’s new residents have arrived within one or two generations, usually without experience in the desert. As a result, they lack a sense of the fragility and history of the desert and aren’t aware of the many scenic parks and open spaces available to them. The numerous public and private agencies interested in partnering with the Oliver Ranch Science School

recognize the benefit of encouraging the community to embrace the desert and to preserve it as a gateway to the cultural and natural history of the region – an important resource for the future of the community, by attending Oliver Ranch and being exposed to other public lands. Agencies interested in the partnership include the Bureau of Land Management, National Park Service, US Fish and Wildlife Service, US Forest Service and the Clark County School District.

In short, the team identified numerous educational topics that could support a robust curriculum that could easily be correlated to local, state and national standards as well as a number of qualified agencies able to provide access to unique natural resources. **The challenge will be in focusing the curriculum and destinations**, as there is so much that is possible.

Joshua Trees, Steep Mountains, Dramatic Sky



EDUCATIONAL ANALYSIS

Las Vegas, one of the country's fastest growing cities in the United States, is located in the smallest and driest North American desert – The Mojave Desert – a fragile 125,000 square kilometer area comprised of dramatic mountains, expansive valleys and lush springs. While the desert looks on the surface to be void of life, it actually supports a web of plant and animal species, from Joshua trees and prickly pear cactuses to bighorn sheep and Gila monsters. The region's stark beauty has made it a highly prized destination for thousands of years, attracting Native Americans, missionaries, explorers, prospectors and homesteaders. These rich subject areas will be the basis for the Oliver Ranch curriculum, which will be correlated to CCSD curriculum, helping CCSD teachers to continue science education in the classroom.

Las Vegas Strip from Brownstone Canyon



The richness of cultural and natural history is endless therefore a summary of subjects is listed below, followed by descriptions of many of the topics.

List of Proposed Curriculum for Oliver Ranch Science School, correlated with 5th Grade Clark County Curriculum Overview

Subject	Subject Detail	CCSD Curriculum Correlation
Cultural History	Native American History	Social Studies: geography/history
	Ranching History	Social Studies: geography/history
	Mining History	Social Studies: geography/history
	Explorer History	Social Studies: geography/history
	Spanish History	Social Studies: geography/history
	Missionary History	Social Studies: geography/history
Natural History	Geology	Earth and Space Science: geology
	Topography	Earth and Space Science: map reading
	Desert Ecology	Life Sciences: ecology
	Native, Non-native and Naturalized Species	Life Sciences: ecology and adaptations
	Astronomy	Life Sciences: astronomy
	Diurnal and Nocturnal Animals	Life Sciences: adaptations
	Local Native Plants	Life Sciences: botany, ethnobotany
	Life Cycles	Life Science: life cycles
	Weather	Earth and Space Sciences: meteorology
	Species Interdependence	Environmental Sciences: interrelationships
	Ecosystems	Environmental Sciences: ecosystems
	Resource Use	Environmental Sciences: resources
	Scientific Process	Nature and History of Science: systematic investigations
	Inquiry-based Learning	Scientific Inquiry: process
Social Studies	Group Building	Social Studies: Civics
	Communication skills	Social Studies: Civics
Language Arts	Writing exercises	English Language Arts/Reading: writing
	Group Presentations/Discussions	English Language Arts/Reading: speaking and listening
	Scientific Study	English Language Arts/Reading: formulate questions
Math	Scientific Study	Math: basic math, problem solving, communication

Cultural History

Abundant fresh-water springs and vast wetlands, as well as rich mineral deposits have attracted numerous cultural groups over the years. The Red Rock Canyon is known to have been used by Native Americans for at least the past 5,500 years, possibly as long as 13,000 years.

Pictograph of a Shaman



Native American History

The history of native people in the Red Rock Canyon is still being studied and much still awaits further discovery. It is generally believed that the area was occupied by the Anasazi and Pinto/Gypsum (Archaic) groups in prehistoric times. More recently, the Patayan and Southern Paiute occupied the region. Today, the Southern Paiute continue to reside nearby. The area offers numerous opportunities to study Native American culture including remnants of tribal life such as agave roasting pits, rock shelters, pictographs, petroglyphs, and shards of pottery and tools.

Prospecting and Mining History

Numerous active and inactive mines and mining towns indicate the abundance of natural resources in the region. Nevada's long prospecting and mining history includes hard rock minerals such as gold, silver and copper as well as soft rock minerals such as sandstone and gypsum. Some mines remain open and active, like the local gypsum mine, while others are long since closed. Many mining remnants such as ghost towns, shafts and tools can be seen in the surrounding areas.

Ranching History

Ranchers started working the local land in the mid-1800's, providing miners with cattle, hay and food. With such extreme conditions, it's amazing that ranching had such a history in the area. Of particular educational interest is the restored ranch house (and livestock) located on the State Park land adjacent to Oliver Ranch.

Explorers, Missionaries and Settlers

Las Vegas, long undiscovered by travelers along the Spanish Trail, was a lush meadow rich with wildlife. It was home to Native Americans and a small group of Spanish settlers when the region was owned by Mexico. After the Mexican War, as groups made their way west to discover gold and new lands, Las Vegas became a Mormon mission.

Natural History

The dry and harsh Nevada landscape is a complex system capable of sustaining a wide variety of plants, animals, birds and insects, and even fish. Dominated by low, widely spaced shrubs, about 25 percent of the plant species found in the Mojave are endemics – found nowhere else. The diversity of plant life is due to the extensive variety of rock types, wide range of elevations, and the existence of microclimates. Besides the diverse plant life, there is significant animal life as well, including more threatened and endangered fish species than any other state.

Geology

The Red Rock Canyon area is known primarily for its stunning formations of 160 million-year old Aztec Sandstone and striking examples of thrust faulting, evidence of a dramatic past. Oceans covered the area during the Devonian and Mississippian Periods 600 – 310 million years ago and as the water receded, the area became rich with marine fossils and limestone. During the Mesozoic Era, 225 – 65 million years ago, uplifting occurred, causing water levels to drop and oxidation of the underlying rocks occurred, resulting in the red and orange colors. Petrified wood can be found as evidence of the fossils from this era. The Aztec Sandstone formed during the middle of the Jurassic Period approximately 180 million years ago by strong winds. The Cenozoic Era, 65 million years ago to the present, brought a time of extensive tectonic activity, causing many types of faults to leave dramatic evidence of their presence. Studying geology will be made easy since simply hiking at or near Oliver Ranch will expose students to numerous rock types, formations and geologic evidence.

Weather

Every region has unique weather patterns and Oliver Ranch is no different, where temperatures range from an average high of 101 degrees Fahrenheit in July to a low of 27 degrees Fahrenheit in January. The dynamic weather systems that are prevalent during the year include snow, flash

flooding, high winds and dust storms. Studying these patterns and learning how to recognize and respond to different weather is an important part of understanding the region.

Desert Ecology/Ecosystems

The presence of over 40 naturally occurring springs creates great biological diversity, and a stunning oasis in the otherwise arid desert landscape. RRCNCA contains a rich mammal life – over 45 mammal species. Numerous reptiles, lizards, amphibians and tortoise inhabit the area. Of special interest are the Desert Tortoise and the Gila monster, both listed as endangered species. The botanical diversity also deserves special mention. Because the RRCNCA includes broad diversity in soil type, elevation, sun and wind exposure, and precipitation, the area is home to an extraordinary collection of plant species. Few areas in the world support this level of bio-diversity within such a small area – within an hour's drive students will recognize a range of plants from the imposing barrel cactus to the magnificent ponderosa pines.

Native, Non-native and Naturalized Animals

With the rapid development of the Las Vegas area, the importance of teaching about threatened and endangered species should be a special area of curricular emphasis. According to the *General Management Plan*, the “RRCNCA hosts two federally-listed Threatened and Endangered species, and 43 other Species of Concern. Of these species, nine are Southern Nevada endemics, eight are Spring Mountain endemics, and four occur nowhere else on earth.” Of course, the presence of these species requires careful management to avoid foot traffic, as a result it will be important to identify areas of concern and take steps to mitigate impact. This can provide an important teaching opportunity by defining the campus' own stewardship strategies for its delicate surroundings.

In addition to the endangered and threatened animals, there are a number of other native animals, all with incredible adaptations, such as water conservation and heat protection, in order to survive in the arid desert environment. Otherwise, general predator/prey interrelationships, camouflage and other habitat behaviors provide endless topics for discussion and curriculum. Besides the native animals, the non-native and naturalized animals, such as wild horses and burros, play an important role in the region. They provide interesting conversation and activity options such as exploring how these species arrived and how they've managed to survive.

Feral Burro near Oliver Ranch



Native and Non-native Plants

Plants in the desert respond to imposing challenges such as low water, high winds, and poor soil by being drought resistant, having short life-cycles or lying dormant for a large portion of the year. These and many other adaptations are visible in the variety of plants in the region. In addition to native plants, there are some non-native species that students will be able to identify.

Water

The only thing all deserts of the world have in common is very little water, less than ten inches of rain on the average. So how does the region support so much life? The Colorado River plays a major role. The way that the river has been channeled provides water in places where it doesn't flow naturally. The study of the river and the ways that technology has been used to harness water and its energy is an integral part of understanding today's challenges of living in a desert community. Equally important is how water has influenced the basic geography of the desert. Possible areas of study could include the water cycle, water micro-habitats in the desert and how water has shaped the geography of the area.

Astronomy

Oliver Ranch is a great place to watch the sky, whether during the day or at night. The lights of Las Vegas are blocked by the nearby ridgeline, exposing the night sky to curious eyes. Current astronomical events, stellar formations, the solar system and the moon could be studied on campus using basic equipment such as binoculars.

Nocturnal Adaptations

Night is the active period for many desert dwellers. As a result, nighttime walks around the Oliver Ranch site can provide a peek into the mysteries of the night in a safe and enjoyable manner. Nocturnal sight, hearing and predator/prey interactions provide an interesting contrast after studying diurnal behaviors.

As students explore the area with their Oliver Ranch teacher, they will become familiar with this tapestry of histories and come to understand how each has been influenced by the other over time. This will help them to build an appreciation for the desert and to make choices in the future to help sustain it.

Student Projects

Student projects are a wonderful way to build ownership among participants. Whether students contribute data to an ongoing study or work with their hands to improve a native habitat, they will be more motivated to want to stay connected to Oliver Ranch. In addition, these are useful skills that students can apply to their classroom experience and beyond.

Restoration Projects

The Red Rock area offers numerous opportunities for student involvement in restoration activities, as a way to provide awareness of a healthy habitat and training for restoring it, including removing non-native tamarisk plants, restoring the natural springs on campus, and replanting native plants.

Research Projects

In addition the existing Oliver Ranch acid rain monitoring station, other bio-monitoring projects including air quality, water quality and habitat quality, can be developed so students can participate in scientific study, learning important research techniques in the process.

Acid Rain Station and Oliver Ranch



PROGRAM ANALYSIS

As will be described in the Competitor Analysis, there are very few programs in Nevada that are similar to the proposed Oliver Ranch Science School. As a result, this residential field-science school will be a new experience for many participants. This will provide both an opportunity and a challenge. To ensure successful implementation, it will be important to consider ensuring a positive and safe experience for participants. The Oliver Ranch teacher using the outdoors, instead of indoors, as their classroom, will guide students to learning, encouraging questions and focusing them on the educational goals of the day, providing a safe and enjoyable experience. Hikes can be tailored to the specific needs of the teacher or school and to the specific needs of the hiking group. Groups are comprised of about 15 students, plus a chaperone, to ensure optimal student attention and oversight.

Pedagogy/Teaching Approach

Student engagement is a challenge for any teacher. However, when the classroom is a scenic trail or an open field, the task is made easier due to the fact that learning has suddenly become fun. This is the key to engaging students is by ensuring that every lesson is not only appropriate developmentally as well as intellectually, but that it is both challenging and relevant. In addition, using techniques such as discovery-based learning, inquiry-based learning, multiple intelligences and group challenges, makes learning accessible as well as enjoyable (*see Appendix I-2 for a Description of Different Teaching Approaches*). The Oliver Ranch experience will change the way that students perceive learning and how teachers approach teaching. Both will be exposed to new attitudes and methods and will be inspired as a result.

The following hikes have been identified from Oliver Ranch and Red Rock Canyon Visitor Center. Activities can be planned during the course of any of these hikes. Each hike should be scouted for “teachable moments” as well as safety precautions.

From Oliver Ranch, the following round-trip day hikes are possible, but many other options exist.

Name of hike	Mileage	Approximate time	# Groups possible
Black Velvet Canyon	4-8 miles	1 day	2-3
Spring Mountain Ranch	3-5 miles	1 day	2-3
Wheeler Springs	3 miles	1 day	1
Bluff hikes	3-6 miles	1 day	2-4

From the Loop Road at RRCNCA, the following round-trip day hikes are possible, but many other options exist.

Name of hike	Mileage	Approximate time	# Groups possible
White Rock Loop	4-6 miles	1 day	2
La Madre Spring	4-8 miles	1 day	2
Lost Creek Canyon	2-3 miles	1/2 – 1 day	1
Ice Box Canyon	4 miles	1 day	2
Pine Creek Canyon	4 miles	1 day	2
Juniper Canyon	6 miles	1 day	2
Calico Vista Trail	4 miles	1 day	2-4

Program Length

The planned program length of three days and two nights has been determined to enable 250 students per week, the optimal financial model. It should be noted that it is feasible to have fewer students from a program perspective. In addition, program length can be as short as two days and as long as five days. One day programs are not encouraged, due to the fact that it is extremely challenging to cover material in any depth, plus there are a number of one day programs in the area. Longer programs are encouraged, as more curriculum can be covered. However, groups may have concerns, especially when the program is young, that may take time to overcome.

Oliver Ranch



Sample Three Day Program (5th grade)

Day 1: Theme: Sense of Place
Educational Focus: Learning Abiotic, Biotic, and Cultural Aspects of Desert Ecosystem
Destination: Area near Oliver Ranch

Morning	Afternoon	Evening Program
<ul style="list-style-type: none"> ➤ Arrival ➤ Orientation ➤ Group Challenge- Name game – Get to Know You ➤ Campus Scavenger Hunt – Orient to campus resources 	<ul style="list-style-type: none"> ➤ Lunch ➤ Desert Environment: Exploration Hike ➤ Journal Activity – Writing/Drawing exercise – who lives here? ➤ Water conservation game 	Astronomy

Day 2: Theme: Sense of Place/Interconnections
Educational Focus: Animal, Plant, and Human Adaptation to Desert Ecosystem
Destination: Bonnie Springs Horse/Burro Facility

Morning	Afternoon	Evening Program
<ul style="list-style-type: none"> ➤ Animal Adaptations: Classroom exploration - physiological, behavioral, geographic distribution ➤ Professor Hike: Plant adaptations to desert environments 	<ul style="list-style-type: none"> ➤ Lunch ➤ Wild Horses and Burros of the Area – adaptations and preservation ➤ Native Americans of the Mojave Desert. ➤ Western settlement and migration along Mormon Trail 	Night hike – Focus on nocturnal adaptations

Day 3: Theme: Stewardship
Educational Focus: Change is the Only Constant
Destination: Oliver Ranch

Morning	Afternoon	Evening Program
<ul style="list-style-type: none"> ➤ Habitat Study - Data collection from spring 	<ul style="list-style-type: none"> ➤ Habitat Restoration Project – native plant restoration ➤ Closing activity – Letter to Yourself – what does the desert mean to you? 	Students have gone home

Provide a Safe Experience

It is essential to consider safety before implementing any activity or curriculum, especially considering the potential hazards of a desert environment. All hikes, destinations, activities and equipment should be evaluated to ensure that it is safe for the intended audience. A number of safety and risk management concerns are identified, but could be mitigated through careful planning, observation, and staff/student training.

Strengths of Safety/Risk Management at Oliver Ranch

1. Good Emergency Medical System (EMS). Response time is usually less than 20 minutes and there is close proximity to a major hospital
2. Good visibility for helicopters in case of emergency evacuations
3. Emergency phones are located at all pullout spots on loop road and there is good cell phone coverage

Safety Challenges and Areas of Potential Injury at Oliver Ranch

1. Hyperthermia and dehydration in hot weather and hypothermia in cold weather (*see Appendix I-3 for Average Temperatures at Oliver Ranch*)
2. Altitude illness when visiting high-elevation destinations
3. Puncture wounds from cactus
4. Kicking and biting animals and stinging and biting insects
5. Proximity to urban center
6. Flash flooding occurs during summer months
7. Rock fall potential along the base of high cliffs and bluffs

EDUCATIONAL COMMUNITY AND PARTNER SUPPORT

Since the first meeting with the OLVF, there has been enthusiastic support for the concept of a residential field-science school at Oliver Ranch. One of the distinguishing characteristics of this project is the complex network of partnering agencies, including the Bureau of Land Management, the National Park Service, the National Fish and Wildlife Service, and the Department of Fish and Game, the Wild Horse and Burro Program, the Planetarium at Community College of Southern Nevada, the Desert Research Institute and Las Vegas Master Gardeners, each contributing expertise in a specific field. In addition, the vision for the program is to interweave the experience with other local educational groups to build a web of educational experience for students over the years. This will facilitate the development of a deep understanding of the desert environment on many levels with additional opportunities for deeper study. In addition to these partners, the CCSD Superintendents enthusiastically support the concept of the Oliver Ranch Science School. They understand the benefit of a non-formal science school on their formal education efforts in the classroom. **The challenge will be to focus the energies of so many agencies to ensure that a guiding vision is clear and that everyone is contributing to achieve that vision.**

Participating Federal Land Management Agencies

Because Oliver Ranch is located in such close proximity to a large number of state and public land and resource management agencies, there is an excellent opportunity to integrate these lands as part of the Oliver Ranch experience. Whether visiting the Red Rock Canyon Visitor Center, Desert National Wildlife Refuge, Lake Mead or Mount Charleston, students will understand the purpose of public lands and their common wildlands

practices, such as Leave No Trace – common on many public lands encouraging visitors to leave only footprints, take only pictures – thus preserving the site for others to enjoy.

Wild Horse and Burro Program

Wild horses and burros are naturalized species common within the RRCNCA. The Oliver Ranch site is currently an active Herd Management Area, with horses and burros living nearby. Now a natural part of the surrounding area, their survival is threatened by human disturbance caused by a lack of awareness of the animal's basic survival needs. In addition, the adoption program, which places gentled animals in private homes, is not well known in the area. Oliver Ranch participants will have three levels of learning opportunities related to the Wild Horse and Burro Program. First, the corral with the live, gentled animals will pique student's interests about these animals. Secondly, these animals are likely to be encountered in the field either by actual sightings or through tracks or scat on the trails, providing the "teachable moment." Thirdly, the Wild Horse and Burro facility, located nearby at Bonnie Springs, will be a destination for groups to see the actual gentling and adoption program.

The Planetarium at Community College of Southern Nevada

The Planetarium at Community College of Southern Nevada plans to support an observatory located on the Oliver Ranch site. Equipment such as binoculars and high-powered telescopes will allow students to gaze into the cosmos, observing stars, galaxies and other celestial bodies first-hand and providing meaningful data to ongoing research efforts. Computers on campus will be set up so that students can enter relevant data into a database via the Internet using GIS and GPS systems. This experience will demystify the study of astronomy and will encourage understanding of the expansive universe. The planetarium plans for development of a more robust observatory will provide additional exciting study opportunities.

Desert Research Institute

The Desert Research Institute (DRI), part of the University and Community College System of Nevada, proposes to conduct applied environmental research at and around the proposed Oliver Ranch site. DRI has a national and international reputation for basic and applied environmental research, and its research scientists can add a tremendous amount of value to curriculum development at Oliver Ranch. Authentic, socially relevant environmental research is important for all students and teachers. Students of all age groups and K-12 teachers will be able to participate in actual research, and use the results in their own classrooms. The research is further designed to help fulfill research and monitoring needs of the BLM and other federal partners supporting the Oliver Ranch school.

Master Gardeners

The Las Vegas Master Gardeners, a volunteer group that works to replant areas is also interested in helping to operate a greenhouse on the Oliver Ranch site and to provide the required expertise on local plants and native habitats. The greenhouse will provide the plants used in restoration projects and working with the Master Gardener volunteers will expose participants to community projects that they or their classes can get involved in.

Clark County School District

The CCSD Superintendents face daunting challenges – tight budgets, expanding enrollments and teacher turnover. Despite these challenges, they recognize the value of non-formal education in supporting the efforts in classrooms. The Superintendents recognize that in addition to basic reading and writing skills, a strong background in science is a key to students continuing their education. They believe that an integrated field-based education is a realistic and successful part of the solution (*see Appendix I-5 for the CCSD Superintendents Letter of Support*).

RECOMMENDATIONS

1. Make environmental education a requirement in the 5th grade curriculum, as mandated by state law
2. Appoint a qualified educator to lead the curriculum development process with partnering agencies and the Clark County School District to create a program that is an experiential, integrated field-science-based curriculum with a student-centered approach
3. Define a Memorandum of Understanding (MOU) between all partnering agencies to clarify participation, communication and decision-making protocols
4. Create the educational infrastructure to make it feasible for teachers to attend a residential program with their students
5. Identify core education goals, to facilitate thematic instruction and curricular integration, and help the participants to understand:
 - What a healthy desert ecosystem needs to survive
 - The complex interdependence of all elements in the desert
 - What actions each person can take to maintain a healthy desert

MARKET ANALYSIS

ASSUMPTIONS

1. Target Customers are 10-13 year old students
2. Primary Market Area (PMA) is within 30-mile radius from Oliver Ranch
3. Secondary Market Area (SMA) is within 100-mile radius from Oliver Ranch
4. Determining factors: Population of 10-13 year olds, Income of households with 10-13 year olds, and Economic status of the market

OLIVER RANCH AND ITS MARKET AREAS

Oliver Ranch is a 300-acre site acquired by the Bureau of Land Management (BLM) in 1993 and added to the Red Rock Canyon National Conservation Area (RRCNCA). This site is located on State Highway 159 adjacent to the Spring Mountain Ranch about 40 minute drive from downtown Las Vegas. Oliver Ranch is situated in a natural alcove surrounded by limestone outcrops and backed by the high sandstone cliffs of Red Rock Canyon.

Our Primary Market Area (PMA) is a 30-mile radius from Red Rock Canyon National Conservation Area and encompasses Clark County, Nevada. Approximately 60% of the participants will come from this area. The Secondary Market Area (SMA) is an area within 100-mile radius and includes Lincoln and Nye Counties in Nevada, San Bernardino and Inyo Counties in California, and Mohave County in Arizona. An additional 30% of the participants will come from this area. The remaining 10% will come from outside of these areas. These market areas were chosen based on YNI's

Headlands Institute, which is the most similar campus to Oliver Ranch. Headlands Institute, as well as Oliver Ranch, is close to large metropolitan areas, has an easy and quick access to a large airport, and is located on federal lands (*See Appendix II-5 for PMA and SMA Transportation Costs*).

The Competitive Market Area (CMA), an area where most of the potential competitors for Oliver Ranch Science School reside, consists of two regions - one within a 30-mile radius from Las Vegas and the other in southern California. Within a 30-mile radius there only are day science programs. The closest competitors providing residential science programs are Astrocamp, SeaCamp, and Catalina Island Marine Institute (CIMI) - all in Southern California - and they are respectively 178, 251, and 253 air miles from Oliver Ranch. Oliver Ranch faces virtually no competition in its Primary and Secondary Market Areas. (*See Appendix IV-1 for list of all the competitors*)

TARGET CUSTOMERS

Oliver Ranch's target customers are 10-13 year old students and they will make up approximately 80% of the total customers. For this reason, this study focuses on analysis of 10-13 year olds.

PRIMARY MARKET AREA (PMA) - 30 mile radius	Clark County, NV
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Clark County, Nevada's largest county, had a population of 1,375,765 in 2000, making up 69% of Nevada's total population of 1,998,257. Between 1990-2000 Las Vegas, the largest city in Clark County, was the fastest growing metropolitan area in the US with a growth rate of 55% (*Commerce Department's Census Bureau*). According to the *US Census*, the population in Nevada is predicted to grow by almost 16% between 2000 and 2025.

Nevada's population through 2025

2000	1,998,257
2005	2,070,000
2015	2,179,000
2025	2,312,000

POPULATION OF 10-13 YEAR OLDS IN CLARK COUNTY

The first variable to consider in determining if Oliver Ranch Science School would be successful, is the population of its target customers – 10-13 year olds – in the Primary Market Area, which is Clark County.

Population of 10-13 year olds in Nevada and Clark County

Year	Nevada	Clark County
2000	112,523	77,608
2001	116,673	80,834
2002	120,464	83,605
2003	122,969	85,246
2004	123,892	85,870
2005	126,549	87,956
2006	129,976	90,886
2007	134,073	94,898
2008	139,144	100,112
2009	143,658	104,977
2010	147,165	108,896

Clark County	2001-2005	2005-2010
Average Total Population Growth	2.7%	1.9%
Average 10-13 Population Growth	2.5%	4.4%

Source: UNLV, Center for Business and Economic Research, 1999

According to the table above, between 2001 and 2005 the population of 10-13 year olds is growing by about the same rate as the total population of Clark County. Between 2005 and 2010, however, this trend changes and the population of 10-13 year olds will grow at a much faster rate than the total population of Clark County (4.4% compared to 1.9%). Therefore, based on these projections, there will be a continuous growth of 10-13 year olds between 2001 and 2010. (*See Appendix II-1A&B for more data*)

Ethnicity of Clark County

According to a November 2000 *Las Vegas Review Journal* article by Lisa Kim Bach, minority students constitute an enrollment majority, representing 50.1% of Clark County district's student body and this trend is expected to continue with the Hispanic population growing an average of 2% annually. Caucasian students are still the single largest group within the population – 49.9% (down from 72.4% in 1985), but Hispanic students now account for 28.8% of public school enrollment and this trend is likely to continue with Census projections that by 2020, one in every four Nevadans will be Hispanic. **Over the last 15 years the Hispanic population has grown steadily in Clark County.** In 1985 only 7.2% of district's students were Hispanic. The number of Asian students is also on the rise, at 6.6% in 2000 from 3.4% in 1985. On the other hand, the percentage of African American students has declined slightly in the past 15 years, and in 2000 they represented 13.8% of the student body (down from 15.3% in 1985). Shifting demographics are especially evident among elementary school children. **More than a quarter of Clark County residents speak a language other than English at home**, up from 14.2% in 1990, according to the *Las Vegas Review Journal* from May 2002. Depending on the school district's approach to this trend, Oliver Ranch Science School might consider bilingual programs in order to serve the local residents.

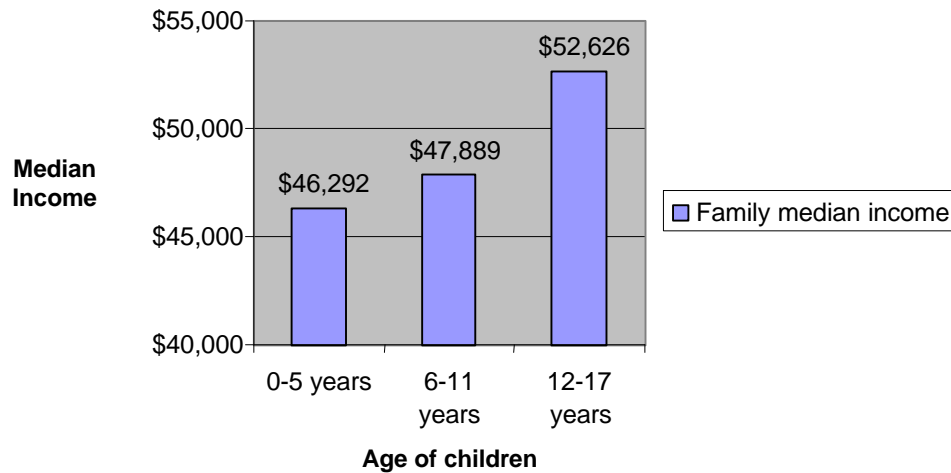
INCOME OF CLARK COUNTY HOUSEHOLDS

Assumptions

1. Minimum household income to comfortably afford the Oliver Ranch Science School tuition of \$157/3 day program is \$40,000/year

The second variable to consider in assessing the success of Oliver Ranch Science School is the income of families with 10-13 year olds. According to *Census 2000*, the median income for Clark County families with children of any age is \$48,886. The table below demonstrates that the median income for Clark County families lies between \$47,889 and \$52,626 and therefore \$48,886 can be adopted as an accurate estimate of median income for families with children 10-13 years old.

Clark County Family Median Income in 2001



In 2001, out of 44,683 households with 10-13 year olds living in Clark County, 63% or 28,293 households earned over \$40,000/year. (See Appendix II-2A-D for calculations and further information) **Therefore, out of 87,956 10-13 year olds projected to live in Clark County in 2005, 63% or 55,412 should be able to afford the science school tuition.** From our Customer and Competitor Analysis we can conclude that only about 5% of Clark County 10-13 year olds participate in a residential science school programs. That leaves **95% or 52,641 10-13 year old students from Clark County that can afford the tuition of \$157/3 day program at Oliver Ranch Science School and are not currently participating in any residential science program.**

ECONOMIC STATUS OF CLARK COUNTY

In 2001, a soft economy and the tragic events of September 11 combined to continue an economic downturn in Las Vegas. According to the study by the *Milken Institute of Los Angeles*, however, **the pattern of rapid job growth Las Vegas experienced over the past decade prior to September 11, will have almost completely returned by 2004.** This projection is even more significant, since in percentage terms, Las Vegas' loss of actual and potential jobs is the worst in the country. In real numbers, the 41,000 fewer jobs is the fourth highest total in the nation, behind just New York, Los Angeles, and Chicago. *The University of Nevada, Las Vegas' Center for Business and Economic Research* reported in December 2001 that the Las Vegas job market was likely to shrink by 0.6% in 2002, compared to expectations of 4.9% growth made in July 2001. They also predict that the economy in Las Vegas will be bumpy, but most of the job losses will have already occurred, and Las Vegas will not going to see a lot of job creation. In general Las Vegas should benefit if the national economy begins recovery in mid-2002 as expected. (*David Strow, Las Vegas Sun, Study predicts Vegas rebound through 2004*).

Also, the 2002 annual *Forbes/Milken Institute* study of the best places to do business and advance a career in America, rated Las Vegas as number three (right after San Diego and Santa Rosa, CA) out of nearly 300 U.S. metro areas. These were ranked according to wage and salary growth, job growth and high-tech output growth, among other criteria. In 2002, the study included a "job momentum" category that tracks employment during the first quarter of 2002 to gauge how metro areas were dealing with the effects of the slowing economy. **The five-year job growth in Las Vegas is the best in the U.S. at 32 percent.** *Forbes and The Milken Institute* used the most current statistical data available in all measurement categories - primarily from the federal government - including job growth, earned income and technology output.

SECONDARY MARKET AREA (SMA) – 100 mile radius

San Bernardino County, CA
Mohave County, AZ
Nye County, NV
Inyo County, CA
Lincoln County, NV

County	Pop of 10-13 year olds in 99	Est Annual Growth rate for 99-05	2005 Projections
San Bernardino (CA)	114,698	3.08%	137,595
Mohave (AZ)	6,850	3.63%	8,484
Nye (NV)	1,733	3.20%	2,094
Inyo (CA)	1,009	2.90%	1,198
Lincoln (NV)	356	- 2.87%	299
Total	124,646		149,670

Sources: US Census 1999

Arizona Department of Economic Security, Population Projections; California Department of Education, Enrollment in California Public Schools; Nevada Department of Education

Assumption

1. San Bernardino County is representing the Secondary Market Area, since all other counties in the SMA have very small populations.

SAN BERNARDINO COUNTY

About 90% of the county is desert, the remainder consists of the San Bernardino Valley and the San Bernardino Mountains. In addition to being a popular winter sports area, San Bernardino County is also home to East Mojave Scenic Area, Death Valley National Monument, Joshua Tree National Monument, and San Bernardino National Forest.

San Bernardino and Riverside counties comprise what is commonly known as the “Inland Empire”, one of the fastest growing metropolitan regions in the nation. San Bernardino, the largest county in the United States, encompasses over 20,000 square miles and according to the *2000 Census* has population of more than 1.7 million, an increase of 20.5% or 291,000 persons over the 1990 Census. Overall, **San Bernardino ranks as the fourth most populated county in California**. Projections estimate that by the year 2020, San Bernardino County will be home to more than 2.8 million residents, an increase of 65% over current figures (*San Bernardino County Snapshot*).

San Bernardino County	2001-2005	2005-2010
Average Total Population Growth	2.5%	2.3%
Average 10-13 Population Growth	2.7%	0.4%

Between 2001 and 2005 the population of 10-13 year olds is growing proportionally to the total San Bernardino population. Between 2005 and 2010, the population of 10-13 year olds is growing at much smaller rate, 0.4% compared to 2.3%, than total population in San Bernardino. (*See Appendix II-3 for more San Bernardino projections*)

Ethnicity of San Bernardino County

According to the *2000 Census*, the Hispanic population now represents the largest ethnic group (41%) in southern California, followed by Caucasian (39%), Asian (10%) and African American (7%). Los Angeles and San Bernardino Counties have no majority (over 50%) ethnic group. San Bernardino County has 44% Caucasian, 39% Hispanic, 9% African American, and 5% Asian population.

INCOME OF SAN BERNARDINO COUNTY

Assumptions

1. Overall, families with any children have the same income levels as families with 10-13 year olds
2. Minimum household income to comfortably afford the Oliver Ranch Science School tuition of \$157/3 day program is \$40,000/year

According to Census 2000, the median income for San Bernardino County families is \$44,655. In 2000, 57% of families in San Bernardino County earned over \$40,000/year and therefore **out of 137,595 10-13 year olds projected to live in San Bernardino County in 2005, 57% or 78,429 should be able to afford the science school tuition.** For family income comparisons for San Bernardino and Clark Counties, please see *Appendix II-4*. According to a *1998 study by Cale Siler of Yosemite National Institutes*, 54% of southern California 10-11 year olds already receive

residential science education. Assuming that this percentage is the same for 10-13 year olds, **San Bernardino County will have 46% or 36,077 10-13 year olds in 2005 that are not receiving residential science education and could afford it.**

ECONOMIC STATUS OF SAN BERNARDINO COUNTY

San Bernardino's diverse economic base is lead by services, government, retail trade, and manufacturing. Services is the largest industry in the county, accounting for more than 25 percent of total employment. *The UCR Forecasting Center* in their December 2001 report states that **the Inland Empire job growth continued at a fairly steady rate, despite declining jobs in the rest of the US and in parts of California.**

Sales held up better in both counties (San Bernardino and Riverside) in early 2001 than they did statewide. Also, job growth in both Riverside and San Bernardino counties was significantly higher in 2001 than in other metropolitan areas. The Inland Empire experienced 3.6% job growth in 2001 compared to -1.3% throughout California, -1.4% in Los Angeles, and -1.9% in Oakland. Similarly, the local retail held up very well after September 11. The relatively more favorable performance of local industries is also reflected in the performance of Ontario Airport after Sept 11. While passenger traffic there has also fallen, its drop was much milder than those seen at Los Angeles International and other local airports.

Riverside and San Bernardino counties finished 11th among 200 metropolitan areas surveyed by *Forbes magazine and Milken Institute*, as best places to do business and advance a career in America. The ranking – up from 27th a year ago – reflects the region's expanding economy and the ability of employers to pay higher wages (*The Press Enterprise May 15, 2002*).

CONCLUSION

10-13 year old students in 2005	PMA	SMA	Total
# of students	87,956	137,595	225,551
# of students whose families could afford the tuition	55,412	78,429	133,841
# of students whose families could afford the tuition & who are not participating in residential science programs	52,641	36,077	88,718

In 2005 in the Primary and Secondary Market Areas, there will be a total of 133,841 10-13 year olds that could afford the tuition of \$157/3 day program and 88,718 who could afford it and are not currently receiving any form of residential science school education.

In order to reach the goal of 11,520 10-13 year olds (which will make up approximately 80% of the total enrollment), the Oliver Ranch Science School would need to serve 6,912 students from PMA and 3,456 from SMA (the rest will come from outside of these areas). *Please see Appendix II-5 for a graph of Yearly Capacity at Oliver Ranch.* Assuming that both of these market areas will need approximately 40% in scholarships, the school would need to attract 4,147 and 2,074 students that can afford the programs and are currently not participating in any residential programs from PMA and SMA, respectively, which in percentage terms is 7.9% from the PMA and 5.7% from the SMA. The science school will probably need to incorporate bilingual programs into the curriculum as both of these market areas have Hispanic population. **Both Clark and San Bernardino Counties have strong potential for future growth and are excellent sources for Oliver Ranch Science School's customers.**

CUSTOMER ANALYSIS

This study focuses on 10-13 year olds as the target customer for the Oliver Ranch Science School. Therefore teachers (educators), principals, parents, and students were identified as the major stake holders for this analysis. Focus Groups with educators, parents and students were conducted in Clark County to get their input on the establishment of the residential science school at Oliver Ranch. Clark County principals from elementary and middle schools were also surveyed. Below are summaries of all the analyses (*See Appendices II-7-10 for details of the surveys and focus groups*)

EDUCATORS:

- 100% of the participants would be interested in attending the science school if it were in their area
- Funding for students was the major concern for 65% of the educators
- 82% thought that \$150-\$300/5 day program is a fair price but they thought that only 45% of their students could afford it

PRINCIPALS:

- 30% of the surveyed schools have participated in a residential science school program
- The most popular destinations were Catalina Island Marine Institute, SeaCamp, and Astrocamp (all in southern CA)
- 77% believe that \$150-\$300/5 day program is a fair price

-
- 44% thought that their students' families would be willing to pay this price; the same percentage, 44%, thought they wouldn't

PARENTS:

- 91% of parents would be interested in having their children attend a residential science school if it were in their area
- Supervision and safety were their major concerns
- 55% of the parents thought that the most Clark County families would be willing to pay \$150-\$300/5 day program

SUMMARY OF EDUCATOR FOCUS GROUP

METHODOLOGY

There were total of seventeen (eleven females and six males) participants in this Focus Group, ranging from 30-62 in age. Six of them were teaching 4th-5th grade, four 6th-8th grade and three 9th-12th grade. Three of them were involved with special projects and weren't currently teaching. All of the teachers were from public schools and two were from low-income schools. Thirteen of the participants were from Las Vegas and four from Henderson. The Focus Group took place on December 6, 2001 at a Las Vegas public library and lasted for two hours with one fifteen-minute break.

FINDINGS

- 94% took their students on a field trip in the past
- The most popular destinations were Red Rock (9) and Lake Mead (5)
- Other popular locations were Zion National Park, Valley of Fire, Corn Creek, Grand Canyon, and Yucca Mtn
- 71% have taken students before on an overnight program - Zion National Park, Astrocamp and Catalina Island Marine Institute were the most popular destinations
- 29% took their students to a residential science school and some of the remarks about these programs were: "Phenomenal, motivating, rewarding, magical" and "Wonderful experience for students and adults".
- 100% would be interested in taking their students to a residential science school if it were in their area

- Some of the most interesting responses as to why, were: “Incredible experience for students” and “Hands-on experience is more meaningful to students”
- 100% would like to see astronomy, geology programs and teacher training workshops at the school
- Funding for students (65%), teacher’s prep and personal time (24%), and special-needs students (18%), were some of the concerns regarding the participation in a residential science school
- 82% thought that \$150-\$300/5 day program is a fair price, but they thought that only 45% of their students could afford this tuition
- 53% thought that their school would assist with the cost
- 82% thought that the parents would be supportive of this program
- 76% thought that the program should be 3 days
- 100% of the participants would like to see on-going relationship with the science school
- All of the participants also think that this type of school would help them with their teaching - the main reasons why it would help them with teaching were: increase in motivation for students and teachers and hands-on experience

CONCLUSION

The educators support the concept of the Oliver Ranch Science School. Tuition cost was their primary concern. Overall the educators thought that only 45% of the Clark County students could afford the program.

SUMMARY OF PRINCIPAL SURVEYS

METHODOLOGY

Surveys were sent to the 263 principals, representing all of the elementary and middle public (207) and private (56) schools in Clark County. 43 (16.3%) of the surveys were returned, 33 of which were from public and 10 from private schools.

FINDINGS

- 70% of the schools have participated in a field science educational programs, which means that about 70% of the students from Clark County received some form of field science education
- The most popular destinations were Red Rock (19), Lake Mead (16), and Catalina Island Marine Institute (3)
- 30% have participated in a residential outdoor educational program and the most popular programs were Catalina Island Marine Institute, Sea Camp in San Diego, and Astrocamp
- The most common reasons why the other schools didn't participate were the cost and time of investigating program options as well as actual travel time and expense
- 86% would consider a residential science school as a valuable experience for their students
- 74% would consider attending this type of school if it were in their area
- 56% think that \$150-\$200 is a fair price for 5 day program and 21% think that the price should be higher, \$250-\$300; overall 77% believe that \$150-\$300 is a fair price

- Scholarships for lower income students were recommended
- 44% thought that their students' families would be willing to pay the price and the same percentage thought that their students' families wouldn't - the sole reason for not willing to pay was low-income
- 35% thought that their school would be willing to assist with the cost and 37% thought that their school wouldn't

CONCLUSION

The principals also support the concept of a residential science school at Oliver Ranch. Their primary concern was the cost. 44% thought that their students couldn't afford the tuition. Scholarships will need to be part of the price structure to make this program available for all Clark County students.

SUMMARY OF PARENT FOCUS GROUP AND SURVEYS

METHODOLOGY

A focus group was conducted in March 2002 in a Clark County library, but only five parents attended. Thereafter surveys were distributed to parents through existing contacts in Clark County, but drew only an additional six responses. This analysis is based on the comments from eleven parents, most of whom are from mid-high income households, therefore the responses might not be representative of the Clark County population.

FINDINGS

- All of the respondent's children have participated in field trips; the number of field trips varied from 1-5/year
- Museums and exhibits/shows at the casinos were the most common field trip destinations
- 45% noted that their children went to either the Red Rock or Lake Mead programs
- 73% would feel comfortable sending their child on an overnight program; the others didn't feel comfortable for reasons of supervision, safety and content
- 64% of parents never had their children participate in a residential science program
- The ones that participated went to SeaCamp (3) and Guided Discoveries (2)
- 91% of parents would be interested in having their children participate in a residential science school if it were in their area

- 45% thought that the price of \$150-200 was fair and 55% thought that the \$250-300 range was more appropriate; all 11 parents would be willing to pay this price (this is the area where the information can be skewed because it doesn't represent parents from lower income families)
- 55% thought that most Clark County families would be willing to pay this amount
- 55% thought that their school would be willing to assist with the cost
- 82% thought that the teachers/faculty and school would be supportive of this type of program
- The preferred program length was three or more days and the main reason was for the students to get comfortable and settle in

CONCLUSION

The participating parents support building the residential science school at Oliver Ranch and would be interested in having their children participate. Their primary concerns were content, safety and supervision. Three or more days was the preferred program length. Additional research is recommended to gauge support for the program and its affordability.

SUMMARY OF STUDENT FOCUS GROUPS

METHODOLOGY

A total of twenty-five 5th graders, eleven boys and fourteen girls, from Mabel Hoggard Elementary School, participated in two Focus Groups. Each Focus Group lasted for about 50 minutes. Income levels of participants' households ranged from \$24,000-\$62,000/year, with the median income at \$45,000. Mabel Hoggard School is a very diverse school with 30% African American, 30% Caucasian, 24% Hispanic, and 8% Asian students. Student responses may be skewed because Mabel Hoggard School is a science magnet school and the students may be more science focused than an average Clark County 5th grader.

FINDINGS

- 76% students responded that they are interested in the environment and nature
- When asked why, some of the responses were: "It keeps us alive and safe" and "Gives us a place to play"
- All of the students participated in field trips at least 3x/year; the most frequent trip was to Red Rock Canyon
- 44% of the students participated on an overnight program at Catalina Island Marine Institute (CIMI) and the trip took place during spring break
- The reason why the other students didn't participate was that the trip was too expensive or they had other plans for the Spring break
- The students that did participate on the CIMI program enjoyed the most living on the boat, kayaking, and snorkeling

-
- 84% of all of the students would like to go on an overnight program (the ones that didn't want to go had personal reasons, such as "mom is sick" or "I want to be with my mom", for not wanting to go)
 - 88% of the students have been to Red Rock Canyon and also the same percentage would be interested in attending an overnight program there
 - The reasons why they would like to participate, the most popular answers were: learn (5), hike (3), and meet new people (2)
 - The most popular activities were: hiking (6) and studying plants and animals (6)
 - 80% of the students suggested that the program should be at least three days long (40% thought that the program should be five or more days because they would like to go to more places)

When asked if there is something else they would like us to know, they said:

"Definitely build it"

"Let us stay for a long time"

"Hands-on"

"Have 2-3 computers for email"

"Make sure it's very safe"

CONCLUSION

The students were highly supportive of the Oliver Ranch Science School. They had high quality input on what the program should look like and were very excited about this school being created. They should be interviewed further for more specific program components as the project moves forward.

RECOMMENDATIONS

1. In order to serve the diverse populations of both of the market areas, the school will need to offer scholarships to approximately 40% of the participants, because our findings have shown that:

- In 2005 there will be a total of 225,551 10-13 year olds living in our Primary and Secondary Market Areas
- In order to reach the target of 11,520 10-13 year olds, Oliver Ranch School will need to capture 5% of the total 10-13 year olds population in its Primary and Secondary Markets.
- Out of the total population of 10-13 year olds, 133,841 (or 60%) could afford the proposed Oliver Ranch Science School tuition of \$157/3 day program.
- Hispanic populations are growing rapidly in both the Primary and Secondary Market Areas.
- The primary concern of all stakeholders is affordability.

FINANCIAL ANALYSIS

ASSUMPTIONS

1. A 250 bed campus provides most successful financial model
2. The engineering study will verify that the Oliver Ranch site can support 250 beds
3. Due to climate limitations, field science programs can operate 36 weeks per year from Sept. 15 through June 15
4. Due to attrition and the need to balance multiple school groups, projections are based on 80% of total capacity
5. With a 250 bed capacity, the 80% figure will be reached in Year 5
6. All projections are based on 2002 dollars
7. 50% of the science programs will be 3 days, two nights and 50% 2 days, 1 night
8. Tuition rates are planned at:

	<u>Students</u>	<u>Adults</u>
3 days, 2 nights	\$157	\$119
2 days, 1 night	\$ 95	\$ 72

9. Household income levels from the Primary Market Area require that 40% of participants will receive 100% scholarships
10. On-going fundraising will be required to support this level of scholarships
11. A year of development will be required before the campus opens with \$307,000 of operating expenses to be funded by fundraising

12. While other programs are possible including elderhostels, adult seminars, family programs, the financial projections are based on science school classes

FINDINGS

The financial projections at the end of this section plan for one year of preparation before the school opens and a five-year build up to 80% of capacity (*See Appendix III-A,B & C for more detailed projections for a campus of 250, 150 and 50 beds*). In Year Five, when 80% of capacity is reached, 14,400 field science participants are projected to be served.

Year Five tuition is projected at:

PROJECTED TUITION REVENUE - GROSS	\$1,772,676
LESS: SCHOLARSHIP @ 40%	(709,070)
PROJECTED TUITION REVENUE - NET	<u>\$1,063,606</u>

Direct expenses in Year Five total \$504,810 and include the cost of instructors, campus hosts, kitchen staff, food and transportation. Indirect expenses total \$790,599 and include the costs of school and program management, travel, training, facilities, supplies, etc. Modest revenue from retail sales of hats, T-shirts, etc., and scholarship fees are projected to total \$54,360. Please refer to *Pro forma Budget Summary* at the end of this section.

Fundraising revenue is projected at \$591,530. This is the amount of fundraising that would be necessary to support scholarships. Economies of scale are achieved with a campus of 250 beds. A fulltime Development Associate is planned for the campus with related costs of \$51,000. The plan projects a performance bonus at 5% of salaries and wages.

	50 BED	150 BED	250 BED
	CAMPUS	CAMPUS	CAMPUS
FUNDRAISING REVENUE AT 80% OF CAPACITY	\$ 388,964	\$ 629,348	\$ 591,530
ANNUAL PROJECTED NUMBER OF PARTICIPANTS	2,880	8,640	14,400
FUNDRAISING REVENUE PER PARTICIPANT	\$ 135.06	\$ 72.84	\$ 41.08

The plans are based on the assumption that the school will be part of a larger organization that will provide such services as accounting, payroll, financial management, human resources management, development management, etc. An “Administrative Transfer” is budgeted at 15.25% of total expenses. Surpluses are needed to build financial strength to manage threats and opportunities. Surpluses of 8% of non-development revenue are planned.

CONCLUSION

A science school that truly serves the school children of Clark County will require scholarships for under-resourced populations. In order for the Oliver Ranch Science School to be financially viable, it would require significant and continuous fundraising for operations. If there is sufficient school district and community support, this school can be financially viable.

RECOMMENDATIONS

1. In order to achieve economies of scale, a 250 bed campus is recommended.
2. Tuition is recommended at: \$157/student/3 day program and \$119/chaperone/3 day program.
3. In order to be able to offer scholarships to 40% of the students, significant and continuous fundraising will be necessary.

COMPETITOR ANALYSIS

ASSUMPTIONS

1. Competitors are organizations that provide experiential science education in an outdoor setting for Clark County students
2. The “Distance from Las Vegas” category below is calculated as highway mileage, not air miles

For the purposes of this analysis, approximately twenty outdoor education programs were reviewed (*see Appendix IV-1*). The five most significant competitors are highlighted below because they either are day science programs that lie within a 30-mile radius of Las Vegas or residential programs serving Clark County students. A more detailed description of these programs is available at the end of this section. There are no residential science programs in the Primary and Secondary Market Areas.

Day Science Programs Serving Clark County Students

The two most popular programs that lie within a 30-mile radius of Las Vegas are the environmental education field studies offered at Red Rock Canyon National Conservation Area (Red Rock) and Lake Mead National Recreation Area (Lake Mead). Both offer two-hour programs that cover a variety of topics – desert ecology, geology and hydrology. Red Rock serves approximately 10,000 participants comprised of grades K-5 and Lake Mead 4,600 in grades 1-5. The vast majority of program participants come from Clark County.

Residential Science Programs Serving Clark County Students

The most popular residential programs for Clark County students are in southern California and are represented by Catalina Island Marine Institute (CIMI), Astrocamp and SeaCamp. They serve 33,000, 16,000 and 2,500 participants per year respectively. CIMI and Astrocamp are owned and operated by the same non-profit organization, Guided Discoveries. SeaCamp is a for-profit corporation. As their names imply, SeaCamp and CIMI are marine-based programs that include marine biology and ecology, oceanography, tide pool exploration and, to some extent, water-based sports. Astrocamp is located in the San Gabriel Mountains near Idyllwyld, CA. Likewise, its name describes its program, which focuses on astronomy, telescope viewing, space exploration, geology and earth science. It also offers a variety of sports/activities such as an indoor climbing wall, swimming, a ropes course and day hikes. As mentioned below in greater detail, Guided Discoveries draws the vast majority of its participants from southern California and only a small percentage (estimated to be approximately 2%) from Nevada. SeaCamp draws about 500 participants per year from Nevada. Guided Discoveries attempted to start residential science programs in Nevada, but suspended its efforts due to lack of appropriate facilities.

The Great Basin Outdoor School (Great Basin) is the only residential science program in Nevada, but is not considered a significant competitor due to the small scale of its operations and distance from Las Vegas. Great Basin is based in Reno, NV and conducts its programs primarily in the Lake Tahoe and Carson City, NV areas. Serving primarily 4-6 graders, it is a relatively small program with approximately 750 students during the school year. It is closed during the summer. Over 90% of its participants come from the Reno/Carson City area. Its program areas are approximately 450 highway miles from Las Vegas.

CONCLUSIONS

- The Red Rock and Lake Mead programs lie within a 30-mile radius of Las Vegas and reach a significant number of Clark County students, approximately 15,000. However, because these programs are two-hour day programs, they inherently lack the ability to offer the depth and breadth that a multi-day experience at Oliver Ranch would provide. Moreover, these programs do not necessarily cover the same target audience as Oliver Ranch. Red Rock serves students K-5, while Lake Mead serves grades 1-5. Given that Oliver Ranch Science School would seek to serve 10-13 year olds (5 – 8 graders), the impact or competition for participants from these proximate programs would seem to be negligible.
- Southern California programs are a significant distance from Las Vegas - approximately 280 miles - and offer programs that are significantly distinct, i.e., marine and astronomy focused, from a desert-based environmental education program. In addition, SeaCamp and CIMI offer programs for a wide spectrum of age groups - 1st grade through college. With factors such as distance, clearly distinguishable curricula, different environmental settings, and lack of an apparent draw from Clark County to their programs, the southern California programs cannot be characterized as significant competitors for Oliver Ranch Science School.

RECOMMENDATIONS

1. The Oliver Ranch Science School should be built because there are no competitors that provide a residential environmental education program for the majority of 10-13 year old Clark County students.

COMPETITOR INFORMATION

RED ROCK CANYON NATIONAL CONSERVATION AREA

Organization Type: Managed by the Bureau of Land Management

Program Location: Approximately 25 miles west of Las Vegas

Distance From Las Vegas, NV: Approximately 25 miles

Program Description: This is an environmental education field program that explores the natural and cultural wonders of the Mojave Desert. Serving school groups K –5, programs vary based on grade and include desert climatology, biodiversity, flora and fauna.

Program Length: 2 hours

Tuition and Scholarships (if any): Free

Population Served: K-5th grade

Origin: Primarily from Clark County

Number of Participants: Approximately 10,000/year

Plans for Expansion: None

LAKE MEAD NATIONAL RECREATION AREA

Organization Type: Managed by the Lake Mead National Recreation Area

Program Location: Lake Mead

Distance From Las Vegas, NV: 30 miles south of Las Vegas

Program Description: This ranger-led program explores the Mojave Desert. It offers two program tracks, *Desert Connections* and *Adaptations*, to allow for greater flexibility and variety for teachers and students and to ensure that repeat visits will be fresh and exciting for students each year. *Desert Connections* highlights the desert ecosystem's diverse plants, animals, and people, which are closely interdependent upon each other and their

environment for survival. *Adaptations* focuses on the climate and how the variety of life adapts to make the most of unpredictable, and often scarce, resources in this extreme environment. These programs support Nevada's Clark County School District curriculum essentials framework for 1-5 grades. Programs are offered from mid-October through December and February through April.

Program Length: 2 hours

Tuition and Scholarships (if any): Free

Population Served: Grades 1-5

Origin: Primarily from Clark County and southern NV; western AZ; and southeastern CA

Number of Participants: Approximately 4,600/year

Plans for Expansion: None

GUIDED DISCOVERIES

Organization Type: Private non-profit

Program Location:

Astrocamp: In the San Gabriel Mountains near Idyllwyld, CA

Catalina Island Marine Institute (CIMI): Encompasses 3 camps and a tall-ship sailing program and is located approximately 25 miles off the southern California coast near Los Angeles.

Distance From Las Vegas, NV:

Astrocamp: 274 miles

CIMI: 310 miles (this includes a 25-mile ferry trip from San Pedro, CA to Catalina Island)

Program Description:

Astrocamp: Physical science, earth science, and astronomy

CIMI: Marine science, oceanography and astronomy

Tall Ship Sailing Expeditions: Oceanography and sailing skills (the tall ship program is based at CIMI)

Program Length: 3 or 5 days

Tuition and Scholarships (if any):

Astrocamp: 3 days - \$143

5 days - \$288

CIMI: 3 days - \$168
5 days - \$313

Scholarships are not offered, but individual schools are encouraged to seek grants to underwrite program costs.

Population Served: 4-8 grade and a small number of high school students

Origin: Vast majority from southern California, with a small % from Arizona and Nevada

Number of Participants: Approximately 50,000/year. Of that number, approximately 16,000 attend Astrocamp and the remainder attends programs at CIMI.

Plans for Expansion: There are currently no plans for expansion.

SEACAMP

Organization Type: Private for-profit

Program Location: San Diego, CA

Distance From Las Vegas, NV: 331 miles

Program Description: SeaCamp is a marine-based program that began in 1987. Specific programs vary based on participant age desired program length and program components. Activities include: tidepool exploration, oceanography, marine biology, shark ecology as well as water-based activities such as kayaking, boogie boarding and snorkeling.

Program Length: SeaCamp offers 1, 2 and 5 day programs during February –June, September-November as well as summer camp programs

Tuition and Scholarships (if any):

2-day program: \$200

5-day program: \$500

1-day programs: Vary in price from \$10 - \$60/day/student depending on type of activity.

Scholarships are not provided, however teachers are encouraged to seek grants from foundations, etc.

Population Served: 1st graders through college students

Origin: 50% from Colorado, 20% from Arizona, 20% from Nevada, and 10% from Texas and California.

Number of Participants: 2000 – 3000/year

Plans for Expansion: There are no immediate plans for expansion

GOVERNANCE STRUCTURE

ASSUMPTIONS

1. The governance structure is based on Yosemite National Institutes' 30+ year successful partnership with the National Park Service
2. The Outside Las Vegas Foundation is the facilitating agency, managing the relationship with the four federal agencies: Bureau of Land Management, National Park Service, Fish and Wildlife Service and Forest Service
3. The Bureau of Land Management is the senior partner of the Oliver Ranch Science School
4. The operating organization will manage the day-to-day operations of the Oliver Ranch Science School
5. A structure of cooperation should benefit the four federal agencies that oversee Oliver Ranch as well as the operating organization

Cooperative Agreement Options

A cooperative agreement outlines the roles and responsibilities of the parties involved in the Oliver Ranch Science School to assure effective and efficient operations. The ultimate decision about who will be the facilitating agency is recommended to be made based on available resources and expertise managing multiple partners.

Option 1

The operating organization will enter into a cooperative agreement with the senior partner, the Bureau of Land Management.

Option 2

The operating organization will enter into a cooperative agreement with the facilitating agency, the Outside Las Vegas Foundation.

Both options described above are feasible, considering that both the BLM and the OLVF are both committed to the success of the school.

Background on Cooperative Agreements

Cooperative Agreements are designated by legally binding contracts and Public Laws. For example, Public Law 91-383, 84 Stat. 826 (16 U.S.C. 1a-2(g)) authorizes the National Park Service to enter into cooperative agreements with appropriate organizations in order to provide park programs, as long as the programs are expressly to further the mission of the sponsoring federal agency. (*See Appendix V-1 for Yosemite National Institutes' Cooperative Agreement between Headlands Institute and the National Park Service*)

The Cooperative Agreement document goes into copious detail relating to the responsibilities and roles of each party entering into the agreement. Key sections include:

Statement of Work: Details the federal agency's overall stewardship responsibilities to the operating organization

Institute Autonomy: Details the role and identity of the operating organization in relation to the federal agency

Services and Program Presentation: Details the nature of programs that are allowed on federal properties

Institute Personnel: Details the role the operating organization's personnel play on federal land, as well as the housing responsibilities for these personnel

Technical Assistance: Details the laws that allow the federal agency to assist with issues that lay outside the operating organization's expertise

Term of Agreement: Specifies the length of agreement, typically 20 or more years

Facilities Utilities and Maintenance: Details the specific role of both parties relating to maintenance, utilities and facilities. For example, in order for the operating organization to make modifications to buildings, written approval must be obtained from the federal agencies designated Director (i.e. Park Superintendent).

Insurance and Indemnity: Details the operating organization's responsibilities toward providing general, liability and property insurance that is in accordance with the wishes of the federal agency

Program and Maintenance Account: The operating organization must set aside specific funds to be held and utilized for maintenance as advised by the federal agency

Termination of Agreement: Details the terms of agreement dissolution

General Provisions: Covers topic such as ADA accessibility, non-profit status, nondiscrimination policies, etc.

RECOMMENDATIONS

1. The operating organization at Oliver Ranch should partner with the OLVF as the facilitating agency. Since they are currently managing all partnering agencies, already acting in this role and performing successfully, it seems reasonable to expect continued success. In addition, OLVF will be fundraising for Oliver Ranch. This requires close communication to ensure effective and efficient development and program planning. The senior partners and other partners, while effective at managing specific programs, have not yet demonstrated expertise in managing the stakeholders. Should they wish to do so, we have every confidence that it is feasible. The goal in the end is to allow the operating organization to focus their efforts on running successful programs, for the facilitating agency to focus on raising funds and managing partners and for the partners to focus on providing resources and support in their areas of expertise. *(See Appendix V-2 for a chart of this structure)*

MANAGEMENT STRUCTURE

ASSUMPTIONS

1. The management structure takes into consideration different size models proposed for the campus (50, 150, 250 beds)
2. These models are based on Yosemite National Institutes' management structure
3. The operating organization managing Oliver Ranch Science School will operate in conjunction with a facilitating agency, like OLVF or BLM

MODEL A (50 Beds)

Within this model, there would be 5 key management positions: Executive Director, Business Manager (Half-time), Education/Program Director, Food Service Manager and Facilities Manager. This group would receive additional support from a Development Associate who would be expensed through a separate development budget. *(See Appendix V-3 for an organization chart)*

MODEL B (150 Beds)

This model includes the positions described above, but increases the Business Manager to full-time, as well as adding an Administrative Assistant and custodial staff. *(See Appendix V-4 for an organization chart)*

MODEL C (250 Beds)

This model includes the previous positions, as well as delineating the Education Director and Program Director positions. This allows the Program Director to focus on client logistics and service, and the Education Director to focus on program and instructional quality. This model also adds a Marketing Coordinator as well as additional Facilities, Food Service, and Teaching Staff. Both Models B and C assume the necessary continuation of the Development Associate position as well. (*See Appendix V-5 for an organization chart*)

BRIEF DESCRIPTIONS OF MANAGEMENT ROLES

- **Executive Director** The primary communicator of the program. The Executive Director must be an effective manager as well as an excellent communicator to external constituencies. In the early months, the Executive Director will spend considerable time fundraising, friend-raising, and serving as the project manager.
- **Business Manager** The Business Manager works directly with the Executive Director to make certain that all contracts and fiduciary relationships are being carefully attended to. They work in conjunction with the facilitating agency to reconcile all financial records and relationships. The Business Manager also serves as the Human Resources representative for the employees of Oliver Ranch Science School.
- **Education Director** The Education Director manages the overall quality of the program and the teaching staff. This position works in close coordination with the Program Director to make certain that expectations are exceeded for clients and employees.
- **Program Director** The Program Director is responsible for managing the reservation system and client database, ensuring that teacher and student needs are attended to during their visit, and scheduling program staff. The Program Director works closely with the Education Director to ensure a seamless experience for clients and a manageable work schedule for staff.

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- **Marketing Coordinator** The Marketing Coordinator spends a great deal of time out of the office doing presentations for schools and parent groups. The Marketing Coordinator also works with the Executive Director to network the school with local businesses and civic groups.
 - **Administrative Assistant** The Administrative Assistant will work in close cooperation with the Executive Director and to some extent with the Program Director. The Administrative Assistant will serve as receptionist, handle all mailings, and tend to general office needs.
 - **Food Service Manager** The Food Service Manager is responsible for the overall quality, preparation and distribution of meals to program participants. The Food Service Manager will work with vendors, manage budgets and manage additional kitchen staff, as necessary.
 - **Facilities Manager** The Facilities Manager oversees all aspects of the physical operation. This includes managing custodial work, construction, outside contracts, and vehicles.

RECOMMENDATIONS

1. The 250 beds model is the most effective management model for Oliver Ranch Science School. This model shows the most promise from a financial stand-point, since the indirect costs do not differ dramatically between the 150-bed model and the 250-bed model. While the task will be more complex, it is still manageable with a similarly sized staff.

APPENDICES

Appendix I – Education and Program Analysis

- I-1 Other Off-Campus Destinations
- I-2 Explanations of Different Teaching Approaches
- I-3 Average Temperatures at Oliver Ranch
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Appendix III – Financial Analysis

- III-A Pro forma Budgets at 250 beds
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Appendix IV – Competitor Analysis

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- V-1 Cooperative Agreement Between Headlands Institute and National Park Service
- V-2 Proposed Oliver Ranch Science School Governance Structure
- V-3 Proposed Oliver Ranch Science School Management and Organizational Chart (Based on 50 participants)
- V-4 Proposed Oliver Ranch Science School Management and Organizational Chart (Based on 150 participants)
- V-5 Proposed Oliver Ranch Science School Management and Organizational Chart (Based on 250 participants)

Appendix VI – Conceptual Site Design

- VI Preliminary Budget and Program

Appendix VII - Other Uses for the Oliver Ranch Science School

- VII Other Uses for the Oliver Ranch Science School

The Beautiful Desert

