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August 15, 2007

MEMORANDUM

TO: Legislative Education Study Committee

FR: Eilani Gerstner

RE: **STAFF REPORT: THE OUTDOOR CLASSROOM INTIATIVE**

Introduction:

Concern over America's mathematics and science education and global competitiveness has continued to grow over the last decade, becoming the subject of nationwide education reform initiatives and legislation. Hands-on education has been touted by many educators and researchers as an ideal way to get students interested in science, technology, engineering, and mathematics fields. Outdoor, or environmental, education programs are seen by some as an ideal way to involve students in science as well as other disciplines across the curriculum. In New Mexico, the State Parks Division (State Parks) of the Energy, Minerals & Natural Resources Department (EMNRD) has been coordinating formal outdoor education programs for students since the late 1990s.

In response to Senate Joint Memorial (SJM) 24 (2005) calling for increased partnerships between the Public Education Department (PED) and State Parks, the two agencies presented a report, *Making Schools Work Outdoors: Educación al Aire Libre*, during the 2005 interim describing their proposed Outdoor Classroom Initiative. They testified that "outdoor, interactive education, based on natural and cultural resources can: increase student test scores, reduce discipline problems, increase teacher job satisfaction, and build resource stewardship."

The Legislative Education Study Committee (LESC) endorsed funding for the Outdoor Classroom Initiative in 2006 and in 2007, but it was not until 2007 that the Legislature appropriated $250,000 to PED and an additional $20,000 to EMNRD for this initiative. With this funding, PED and State Parks are partnering to formally pilot the first year of the initiative in

FY 08. According to the SJM 24 report, the mission of this initiative is to "improve academic achievement and encourage resource stewardship by engaging New Mexico's children in heritage education."[1] The initiative will provide expanded curriculum-based outdoor activities and service learning projects for students in grades K-12, teacher training, and transportation grants to schools for students to travel to outdoor education locations.

This presentation will address State Parks' existing outdoor education programs upon which the Outdoor Classroom Initiative builds; PED's and State Parks' plans for the initiative in FY 08; and examples of national and state-level environmental education programs and research. In preparation of this report, LESC staff contacted PED and State Parks to obtain information on existing State Parks outdoor education programs and the plans for the Outdoor Classroom Initiative in FY 08. Unless otherwise noted, the information presented in this report was obtained from these sources.

Existing State Parks Division Outdoor Education Programs:

Prior to receiving funding from the Legislature for the Outdoor Classroom Initiative in FY 08, State Parks implemented a number of educational programs and maintained a staff of educational instructors, called "interpreters," who provide educational programs to park visitors. Full-time in-park interpreters and seasonal interpreters are permanently assigned to specific parks, whereas regional interpreters are assigned to the northwest, northeast, southeast, or southwest regions of the state. Regional interpreters travel to parks in their region when an educational field trip is requested at a park that lacks a full-time interpreter. While two State Parks interpreters hold teaching licenses, all of the full-time in-park and regional interpreters have at least a bachelor of arts and most are Certified Interpretive Guides or Certified Interpretive Planners.[2] (See Attachment, *New Mexico State Parks, Interpretive Staff, and School Districts by Region*, for a list of the state parks, the interpreters available at each, and the school districts in each region.)

A survey conducted by State Parks of school participation in all 32 New Mexico state parks for school year 2004-2005 indicated that the size and extent of State Parks outdoor education programs varied widely. The largest was the Rio Grande Nature Center (RGNC) in Albuquerque, serving approximately 71 New Mexico public, charter, and state-supported schools. The smallest was Fenton Lake, which involved a single class visit by a tribal school in which the teacher provided the educational programming. The survey data indicated that approximately 167 New Mexico public, charter, alternative, and state-supported schools visited 27 of the 32 existing state parks to take part in educational activities provided by State Parks staff or teachers. State Parks interpreters also traveled to schools to provide in-school lessons to approximately 244 classes.

The Outdoor Classroom Initiative being implemented in school year 2007-2008 builds upon and expands on several previously existing State Parks education programs. One program that will be used as a model in the initiative is the RGNC's teacher training sessions.

In FY 05, the RGNC offered six training sessions for 136 educators, utilizing the *Bosque Education Guide*, a collection of field- and classroom-based activities focused on the Middle Rio Grande Bosque ecosystems. Activities in the *Bosque Education Guide* align with New Mexico's

[1] "Heritage education" refers to education focused on the history and archeology of a geographic region.
[2] The National Association for Interpretation provides a range of certification programs for park staff members who present and coordinate educational presentations for park visitors.

Content Standards and Benchmarks and Performance Standards for science, mathematics, social studies (geography and history), language arts, and visual arts for grades K-12. State Parks funds two full-time interpreter positions for the RGNC, who coordinate the park's educational activities. The RGNC also offers other educational programs such as Nature Discovery for Kids, Early Childhood Outdoors (ECHO), Babes in the Bosque, Wednesdays in the Wild, Sense of Wonders, Junior Rangers, and the Rio Grande Ecology Institute that are not necessarily tied to standards.

Another existing program that will be expanded as part of the FY 08 Outdoor Classroom Initiative is the Kids to Parks transportation grant program. Beginning with the 2005 New Mexico Personal Income Tax (PIT) return, taxpayers have been able to make a voluntary donation to State Parks to fund Kids to Parks transportation grants for schools to participate in educational field trips outdoors. State Parks reports that in spring 2007, transportation grants were awarded to one school district, seven public schools in four districts, and one private school, allowing 1,024 students in grades 4 through 9 to travel to outdoor education programs at state and national parks and monuments and municipal locations. The PIT donation will continue to provide Kids to Parks transportation grant funds in future years.

In addition, State Parks indicates that the division has been working with other agencies to increase outdoor education programming in New Mexico. As part of their response to SJM 24, PED and State Parks proposed partnering with other state and federal agencies that have curriculum-based outdoor education programs and facilities in areas not served by State Parks. Since 2005, State Parks has worked with state, federal, nonprofit, and private partners including the Sierra Club, National Park Service, US Fish and Wildlife Service, Environmental Education Association of New Mexico, New Mexico Department of Game and Fish, New Mexico State Land Office, and New Mexico State Forestry, among others. As part of the Outdoor Classroom Initiative, State Parks and PED will be convening an advisory committee which will include members of many of these partner agencies.

As an indication of student participation levels, the SJM 24 report stated that 5.0 percent of New Mexico public school children in grades K-12 visited state parks during school year 2004-2005. After a review of the data by LESC staff, it appears that the percent of New Mexico public school students participating may have been over-stated since students from other than public schools were included in the 5.0 percent. Other entities such as universities, headstart and pre-kindergarten programs, community center groups, and private, home, and out-of-state schools were also included in the count of students that participated. To address this issue in the future, State Parks reports that the division will implement new record-keeping procedures as part of the Outdoor Classroom Initiative that will require all parks to document the number of students attending from each school each month.

To date, State Parks has not evaluated the effect of its outdoor education programs on student achievement. However, studies done elsewhere suggest a relationship between outdoor education and student achievement (see "Program Evaluations" below).

New Mexico's Outdoor Classroom Initiative in FY 08:

The appropriation of $250,000 to PED for the Outdoor Classroom Initiative in FY 08 will fund four projects proposed in the 2005 response to SJM 24: Outdoor Education Institutes, a Teacher Resource Program, Kids to Parks Grants, and Service Learning Project Grants. State Parks and

PED will formally pilot these programs at parks in the following four regions of the state in order to reach as many students as possible: Clayton Lake in the northeast; Navajo Lake in the northwest; Mesilla Valley Bosque in the southwest; and Bottomless Lakes in the southeast. In 2007, the Legislature also provided a separate appropriation of $20,000 to EMNRD to support a statewide public school outdoor classroom program. According to State Parks, this money will be used to provide Kids to Parks transportation grants to every 5th grade class in Doña Ana County that wishes to participate.

A draft FY 08 budget provided to LESC staff by PED and State Parks indicates that, of the $250,000 appropriation, $83,000 will go to PED and $167,000 will go to State Parks to provide for the following programs:

- Outdoor Education Institutes: State Parks and PED's Rural Education Division and Math and Science Bureau will collaborate on this project, which will expand on the RGNC model to provide short teacher training sessions, develop curriculum-based programming at the four parks, and build partnerships between park staff and teachers.

- The Teacher Resource Program: State Parks and the Rural Education Division will collaborate on this program, which will provide hands-on teaching materials for children, expand the State Parks Junior Ranger program, develop online curriculum resources, and augment staffing to deliver the programs.

- Kids to Parks Grants: State Parks and PED will collaborate to award grants to schools for bus transportation to state parks and other outdoor education locations.

- Service Learning Project Grants: State Parks will award grants to other agencies to coordinate resource-related service learning projects for students at state parks and other outdoor education locations.

- Evaluation and Reporting: State Parks will create evaluation tools and an end-of-year report on the Outdoor Classroom Initiative.

- Travel Reimbursement: Members of the Outdoor Classroom Initiative Advisory Committee will be reimbursed for travel expenses.

National and International Outdoor Education Programs in New Mexico:

The following national and international outdoor education programs have been in place in New Mexico for a number of years. These programs are coordinated at the state level and, like New Mexico's Outdoor Classroom Initiative, they offer cross-curricular activities tied to academic standards, workshops for teachers, and service learning opportunities for students.

- Project Learning Tree (PLT) is an international project of the American Forest Foundation that provides teacher training programs focused on elementary and secondary curricula and state and national education standards. New Mexico's PLT program is coordinated through the State Forestry Division of the EMNRD and the New Mexico office of the US Forest Service.

- Project WET (Water Education for Teachers) is an international, interdisciplinary water science and education program for K-12 educators. New Mexico Project WET is sponsored through the former Waste-management, Education, and Research Consortium (WERC), now known as WERC: A Consortium for Environmental Education and Technology Development, which is administered through New Mexico State University. WERC provides curriculum-based materials and educator workshops for New Mexico teachers participating in Project WET.

- Roots and Shoots is an international, interdisciplinary environmental education program founded by Dr. Jane Goodall that focuses on service learning projects for youth. New Mexico is one of two states with a designated Roots and Shoots coordinator, who is based out of the Roots and Shoots four corners regional office.

- Project WILD (Wildlife in Learning Design), sponsored at the state level by the New Mexico Department of Game and Fish, is a national program of the Council for Environmental Education that provides conservation and environmental education workshops for K-12 teachers and service learning activities for secondary students. Project WILD publishes curriculum and activity guides for participating teachers and documentation on how the program supports the *No Child Left Behind Act of 2001*.

Coordinators of PLT, Roots and Shoots, and Project WILD have been invited by State Parks to participate in the Outdoor Classroom Initiative Advisory Committee.

Outdoor Education Programs in Other States:

To determine the status of environmental education among the 50 states, three entities (the National Environmental Education Advancement Project (NEEAP), the Environmental Education Association of Washington, and the Environmental Education and Training Partnership (EETAP) at the University of Wisconsin-Stevens Point) conducted a survey of federal, state, and nonprofit agency environmental education coordinators in 2004[3]. The survey results indicated that:

- 43 states had environmental education programs that correlated to state education standards or were developing such programs;
- 29 states had environmental education programs with learning objectives for science, social studies, mathematics, language arts, art, economics, and/or heath; and
- 21 states had enacted legislation to support environmental education.

Two states, Texas and California, have established outdoor education programs through legislation.

Legislation enacted in Texas in 2007 establishes "a project for the development and implementation of a nature science curriculum for public school students." The legislation requires that the Texas State Board of Education work together with Texas Tech University and South Llano River State Park to develop a nature science curriculum for grades 6 through 12.

[3] The study, *Results of a Longitudinal Survey: Status of State-Level Comprehensive EE* [Environmental Education] *Programs*, was sponsored by the US Environmental Protection Agency office of Environmental Education, the EETAP, and the NEEAP.

The law allows for the program to be implemented in any state park and the curriculum must be tied to the Texas Essential Knowledge and Skills for science and for mathematics, social studies, and language arts to the extent that those subjects are relevant to nature science studies. Texas Tech University will provide staff development courses and resources for classroom teachers and state park employees.

In 1999, the California Legislature established a funding mechanism and eligibility criteria for the California Department of Education's curriculum-based residential outdoor science school program. In order to be certified by the department of education, resident outdoor science schools must demonstrate that they (1) provide written curriculum tied to science standards; (2) are operated by a local education agency (a school district); (3) are held at an outdoor site away from the community of service; (4) maintain personnel and facilities appropriate for the feeding and lodging of students and teachers; and (5) "allow students to experience environmental phenomena to the best advantage." California students and teachers may travel to resident outdoor science schools for four or more consecutive days of activities that must relate the natural environment to multiple disciplines.

Legislation enacted in 2003 required that the outdoor science school program undergo an empirical evaluation of its effect on students' academic achievement and social skills (see "Program Evaluations" below) and required that the outdoor science schools:

- serve primarily at-risk youth;
- encourage collaboration with other entities in the provision of services;
- promote outdoor educational activities;
- provide a curriculum that fosters stewardship of the environment and an appreciation of the importance of the wise use of natural resources; and
- include service learning and community outreach components for the purpose of building partnerships between participants and local communities.

Program Evaluations:

The legislation enacted in California in 2003 required the California Department of Education to contract with an independent evaluator to assess the outdoor science school program and to report the results to the California Legislature in 2005. As a result, the department contracted with American Institutes for Research (AIR) to conduct an empirical evaluation of the effect of outdoor science school participation on students' personal and social skills, stewardship of natural resources, and knowledge and understanding of science concepts. The study, *Effects of Outdoor Education Programs for Children in California*, focused on 255 sixth grade students in four elementary schools in which Hispanic students comprised 64 to 89 percent of the school population and 81 to 100 percent of students qualified for free or reduced-fee lunch. Fifty-eight percent of all students participating in the study were English Language Learners (ELL).

In order to maintain as many demographic similarities as possible, the sixth grade students in each school were divided by classroom into the treatment group (the students who attended the science schools) and the control group (the students who were scheduled to attend science schools after the study was complete). Students and teachers in the treatment group attended one of three department-certified outdoor science schools for one week. Since the students in the control group were scheduled to participate in the outdoor science schools when the study was complete, they were not deprived of the experience as is often an issue of concern when

conducting empirical studies in educational settings. Researchers administered pre- and post-tests of science skills to the treatment group and pre- and post-surveys to students, parents, and teachers in both groups. Two rounds of post-tests and post-surveys were conducted: one round immediately following a trip to an outdoor science school and one round six to 10 weeks later.

AIR found that participation in the outdoor science schools impacted the students in several ways:

- Knowledge and Understanding of Science Concepts: The post-test science scores of students who participated in the outdoor science schools increased by 27 percent over the pre-test scores, and the increase was maintained six to 10 weeks after participation. The increase was statistically significant, meaning that there was a less than 5.0 percent chance that the increase in scores was random. Researchers did not measure science achievement of the control group because the two groups did not necessarily cover the same science content during the study; however, measures of attitudes showed that students in the control group showed significant losses in their attitude toward science. The treatment group showed no significant change in attitude towards science.

- Social and Personal Skills: Six to 10 weeks after participating in the program, the students who attended an outdoor science school showed significantly larger gains than the control group in cooperation, conflict resolution, self-esteem, relationship with peers, problem solving, motivation to learn, and behavior in class.

- Stewardship of the Environment: The treatment group showed increases in concern about conservation and environmentally positive behaviors such as recycling, whereas the control group showed significant losses in environmentally positive behaviors.

- Benefits for English Language Learners: Compared to their non-ELL peers in the treatment group, the ELL students showed significantly larger gains in cooperation, leadership, relationship with peers, and motivation to learn.

Anecdotal comments and observations gathered from the teachers of students in the treatment group were generally positive:

- "Many students are auditory/verbal or kinesthetic learners. Many who do not do well in a classroom setting, excel at outdoor science school. They are able to gain a wealth of background knowledge we use for nearly every other academic area."

- "It [outdoor school] provided language for my English Learners and reinforced vocabulary for other students."

- "Students are outdoors doing physical as well as mental work. [The program is an] opportunity for them to shine."

Many teachers and outdoor science school staff stressed the positive impacts of the program and reported that students with disabilities, special needs, or other at-risk factors were able to "shine" in ways that they did not in the traditional classroom such as by speaking up, collaborating with peers, and generally showing more involvement in activities than usual.

The California study is especially significant because those students share demographic similarities with New Mexico students; that is, large proportions of the students were Hispanic, ELL, and qualified for free or reduced-fee lunch. The goals of California's outdoor science school program are also similar to those of New Mexico's Outdoor Classroom Initiative in that the activities are curriculum-based and tied to state education standards. California statute also requires that the outdoor science schools collaborate with other entities and provide service learning projects for students, as will New Mexico's Outdoor Classroom Initiative.

Another research study, *Closing the Achievement Gap: Using the Environment as an Integrating Context for Learning*, focused on 40 schools nationwide that participated in environmental education programs and suggests similar benefits as the California study. The study, conducted in 1998 by the State Education and Environment Roundtable (SEER)[4], relied heavily on surveys of over 250 teachers and administrators on the effect of outdoor education on participating students. Fourteen of the schools also conducted 39 comparative studies of standardized achievement data and grade-point averages of participating students; however, the methods used to collect and analyze these data were not necessarily as rigorous as those in the California study.

Based on the survey results, over 90 percent of teachers and administrators reported that participating students showed improvements in mastery of language arts, mathematics, science, and social studies; critical thinking and problem solving skills; and interpersonal abilities. Over 93 percent of teachers also reported that when they were involved in outdoor education they experienced increased enthusiasm and commitment to teaching; better working relationships with their colleagues; and more opportunities to explore new subject matter and use innovative teaching techniques.

These studies suggest that New Mexico's Outdoor Classroom Initiative has the potential to positively impact students and teachers in the state.

Policy Options:

- Because of the limited funding available, the Outdoor Classroom Initiative could be targeted to schools in need of improvement.

- PED's student ID (identification) should be used to identify students who participate in Outdoor Classroom Initiative programs and State Parks should work with PED to determine appropriate methods to link participation to student achievement.

- PED and State Parks could work together to incorporate extended outdoor education activities by providing multiple visits for individual classes throughout the year and building upon previous activities.

- If the LESC wishes to ensure that the Outdoor Classroom Initiative continues in the future, the committee may want to consider endorsing legislation that would incorporate the program into the elementary science curriculum.

[4] SEER is a cooperative of 16 state departments of education focused on integrating the environment into K-12 curricula.

ATTACHMENT

New Mexico State Parks, Interpretive Staff, and School Districts by Region

August 2007

Parks and Interpretive Staff	Districts
Region 1: Northwest New Mexico (One regional interpreter based out of RGNC)	
Bluewater Lake	Albuquerque, Aztec, Belen*, Bernalillo, Bloomfield, Central, Chama Valley, Cuba, Dulce, Española, Estancia, Farmington, Gallup-McKinley County, Grants-Cibola County, Jemez Mountain, Jemez Valley, Los Alamos, Los Lunas, Mesa Vista, Moriarty, Pecos, Pojoaque Valley, Rio Rancho, Santa Fe, Zuni
El Vado Lake	
Fenton Lake	
Heron Lake	
Hyde Memorial (one seasonal interpreter)	
Manzano Mountains	
Navajo Lake (one seasonal interpreter)	
Red Rocks (becoming a park in August 2007)	
Rio Grande Nature Center (RGNC) (two in-park and two seasonal interpreters)	
Region 2: Northeast New Mexico (One regional interpreter based out of Sugarite Canyon)	
Cimarron Canyon	Cimarron, Clayton, Des Moines, Las Vegas City, Logan, Maxwell, Mora, Mosquero, Peñasco, Questa, Raton, Roy, San Jon, Springer, Taos, Tucumcari, Wagon Mound, West Las Vegas
Clayton Lake	
Conchas Lake	
Coyote Creek	
Eagle Nest Lake	
Morphy Lake	
Storrie Lake	
Sugarite Canyon (one seasonal interpreter)	
Ute Lake (one seasonal interpreter)	
Vietnam Veteran's Memorial (became a park in 2005) (one in-park interpreter)	
Region 3: Southwest New Mexico (One regional interpreter based out of Doña Ana State Parks office)	
Caballo Lake	Animas, Belen*, Carrizozo*, Cobre, Deming, Gadsden, Hatch Valley, Las Cruces, Lordsburg, Magdalena, Mountainair, Quemado, Reserve, Silver, Socorro, Truth or Consequences
City of Rocks	
Elephant Butte	
Leasburg Dam	
Mesilla Valley Bosque (became a park in 2006) (one in-park interpreter)	
Pancho Villa (one in-park interpreter)	
Percha Dam	
Rockhound	
Region 4: Southeast New Mexico (Two regional interpreters based out of Oliver Lee Memorial & Living Desert Zoo)	
Bottomless Lakes (one seasonal interpreter)	Alamogordo, Artesia, Capitan, Carlsbad, Carrizozo*, Cloudcroft, Clovis, Corona, Dexter, Dora, Elida, Eunice, Floyd, Fort Sumner, Grady, Hagerman, Hobbs, Hondo Valley, House, Jal, Lake Arthur, Loving, Lovington, Melrose, Portales, Roswell, Ruidoso, Santa Rosa, Tatum, Texico, Tularosa, Vaughn
Brantley Lake	
Living Desert Zoo	
Oasis	
Oliver Lee Memorial	
Santa Rosa Lake	
Sumner Lake	
Villanueva	

*Denotes districts that span two regions.