An analysis of the Los Padillas Wildlife Sanctuary: A place-based environmental education model

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AN ANALYSIS
OF THE
LOS PADILLAS WILDLIFE SANCTUARY
A PLACE-BASED ENVIRONMENTAL
EDUCATION MODEL

Founded in the community of
Los Padillas, Bernalillo County, New Mexico

BY

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PROFESSIONAL PROJECT
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To my family; thank you for all your encouragement and for never letting me give up.
Executive Summary

The purpose of this professional project is to examine the history of the Los Padillas Wildlife Sanctuary (LPWS) program in order to formulate recommendations that will assist the school in making it more sustainable while ensuring that it is integrated into its curriculum and educational philosophy in a meaningful way. Despite the value this program brings to the school it has continued to struggle; it lacks necessary funding for staffing and administration and also suffers from low participation and involvement by school staff, students and community.

The project approach includes a detailed description of the development of the LPWS based on information gathered through interviews of key individuals involved with the program. This project identifies the factors that lead to the program’s success and failures over the last seventeen years. It also examines the Memorial Middle School Agriculture Science Center (MMSASC) an experiential, science-based learning program located in Las Vegas, New Mexico in order to compare strategies and identify a successful program model.

Through the analysis of the LPWS program I seek to identify why it has struggled to be successful, as well as discuss the importance of supporting an educational program that facilitates children’s contact with nature and place-based education. Based on this analysis, recommendations were established regarding how the school should move forward and ensure that the LPWS program is sustainable and supported.

This project is intended to be a resource for the school and community; as it documents their hard work and dedication over many years to gain support from
community leaders and ultimately build the LPWS facility. Through telling the story of how the LPWS came to be, it will provide a reminder of the significance this program has for their community and the value it brings to student learning.

Findings

The LPWS has a rich and inspiring history. It is a unique facility and educational model that celebrates the community’s environmental and social history. The varying levels of participation and support can be attributed to identifiable factors that are significant to the success of the program such as Albuquerque Public School (APS), Los Padillas Elementary School staff and administration, outside support and partnerships, teacher professional development, program funding, and community involvement and buy-in. These factors together are essential to making the LPWS program sustainable. One of the major issues is the school’s inability to find permanent funding for the Naturalist Teacher position. The school has pulled funding from other deserving programs, such as Title I Reading, and has received several grants; however the school continually struggles to identify reliable funding.

This is in contrast to the MMSASC program which has been successful in identifying permanent funding and support. Since the MMSASC program was developed in 2005, it has continued to grow each year, adding new infrastructure and expanding curriculum, staffing and grant funding. The MMSASC program has overcome this issue through its relationship with New Mexico State University (NMSU) and the Cooperative Extension Services program which focuses on creating relationships with rural, underserved communities in the areas of agriculture and community outreach. Local leaders along with NMSU staff have worked with their legislators to secure funding through the
state legislature as well as through private grants. There is much to be gained from following the MMSASC model. Los Padillas must find a way to acquire reoccurring funding for the Naturalist Position. As demonstrated by MMSASC, partnerships with entities such as NMSU can provide the support and resources to make this happen.

Los Padillas Elementary School also needs to make environmental, place-based learning a priority and integrate it into every classroom. The LPWS provides an opportunity to honor the experiences and knowledge that children bring to the classroom. The community has a very deep connection to the land, which should be tied back into the educational content. The LPWS provides students with experiences that will reinforce environmental or cultural sustainability. The Center for Ecoliteracy has initiated an innovative educational model called Smart By Nature: Schooling for Sustainability. The aim of the program is to inspire, inform and support K-12 educators and parents who are helping young people gain the knowledge, skills, and values essential to meeting the challenges of sustainable living. Los Padillas has an opportunity through the LPWS program to create curriculum that supports these principles and to offer educational lessons that facilitate schooling for sustainability.

In addition, studies have shown that environmental education and place-based learning contributes to innovative and meaningful education, particularly within minority communities. Experiential learning is especially important with multilingual students and the LPWS is an ideal facility for teaching new concepts to second language learners. This could be achieved by establishing a more integrated bilingual education approach to LPWS curriculum. Experiential learning can be the key for this population as it provides an opportunity for students to relate to educational content in a tangible way.
Organization

This paper is organized in a manner that meets the objectives of Sara Keeney, principal of Los Padillas Elementary School, as my client and also fulfills the requirements of this professional project. The first chapter provides an introduction of my project including identifying the problem, client and task. Chapter two establishes the context of the project by providing the history of the area and school. This chapter also offers my personal statement and how my childhood experiences lead to the creation of my sense of place and connection with nature. Chapter three describes the applied research methodology. Chapter four includes the LPWS program history and program analysis. Chapter four also offers a case study of a similar environmental experiential program which I used as a model for a successful program. Chapter five outlines the recommendations that will aid the Los Padillas Wildlife Sanctuary program in becoming sustainable and supported.
Personal Experience

As a child growing up in Los Padillas on a small farm my daily routines allowed me to develop a relationship and understanding of the natural world around me. Whether it was irrigating the fields, working in our family garden or caring for our animals, I was constantly reminded of my place within the natural world and my community. The work that my family put into raising animals or growing our fruit and vegetables gave me an understanding of where our food came from and developed my respect and relationship with the land that provided it. As I roamed the fields and acequias, I learned about the place around me and how I was connected to it.

I knew the life cycles of the living organisms and the changes that came with each passing season. I truly loved every aspect of our farm; the open fields, rural values, and the overwhelming freedom to play, explore and get dirty. I earned every bump and bruise, insect bite, and sun burn because with each injury I learned an important life lesson. It was my adventures chasing down frogs and crawfish as well as my lazy afternoons gazing into the sky while lying under a mature cottonwood, that I learned the most about my adolescent self. I developed confidence, physical agility, and a strong sense of wonder. My parents further developed my self awareness, as they constantly reinforced that I was a member of the community where we lived and that I must contribute through hard work and being engaged. I was an active member in my family contributing to daily chores, as well as in our larger community as I helped to maintain acequias and irrigate our elderly neighbor’s property.
It was these early life experiences that cultivated my worldview and allowed me to develop an understanding of the connections between people, places, and nature. It is because of my childhood experiences that I learned very early to value the place where I live and first recognized that place is powerful. I feel that knowing our place and being connected and accountable to it is ultimately what makes us responsible citizens and equips us with the values necessary to sustain our community and resources. Just as important is our need to know our history, to be aware of the events and people that have come before us and the ways that they have shaped our present world.

The South Valley

The rich history and culture of the South Valley is tied to the Pueblo Indians, and the Spanish and Mexican people that have inhabited the area for many centuries. Archeological evidence indicates that the first Pueblo builders entered the Rio Grande valley over 600 years ago, followed later by the Spanish expedition led by Francisco Vasques Coronado in 1540. The land use patterns found today in the valley began with the land grant communities established during the 1690s and early 1700s (Rosner, 2006). The early plazas and ranchos of Atrisco, Pajarito, and Los Padillas were established before the town of Albuquerque existed on land grants issued by the king of Spain to encourage settlement. Isleta Pueblo is Los Padillas’ southern neighbor. Their histories are intertwined as their communities have co-existed for centuries. The Pueblo people, descendants of the earliest people to enter the Americas, were the first to inhabit the Albuquerque area. The Pueblo of Isleta is home to the present-day descendants of the original settlers of the Albuquerque area, and as such their influence on the cultural heritage remains strong.
Following the Mexican-American War in 1848, New Mexico became a territory of the United States. In the 1890’s the United States Court of Private Land Claims, which was created to decide land claims guaranteed by the Treaty of Guadalupe Hidalgo, confirmed and mapped the Atrisco, Pajarito, and Los Padillas land grants. In 1880, rail service reached Albuquerque which contributed to rapid growth and the thriving agriculture communities of the South Valley began exporting sheep, cattle, and a variety of produce through the western United States. During the 20th century, the economic importance of the South Valley declined. During World War II Albuquerque began to emerge as an urban area and focus on agriculture began to decline with greater emphasis on the growing urbanization of the area. Throughout this time there was an influx of Anglo-American colonists which greatly changed the demographic make-up of the area.

By 1950, large-scale agribusiness and economic centralization supported by low transportation costs, weakened the economic viability of the South Valley’s agricultural base. The South Valley’s small scale farms were not able to compete successfully with food that was being imported from other large agricultural production centers and enterprises. As Albuquerque continued to grow as an urban center, people increasingly left the agricultural industry to seek employment in commerce and industry. Since the 1960’s the growth of Albuquerque’s population and the desire for low-cost land for residential development has brought pressure on the open areas and agricultural lands of the South Valley. Urban growth began in the north and has gradually spread south to Los Padillas. With this continued trend of developing on lower priced agricultural land, the farmlands which provide our rural character are being threatened. (Rosner, 2006)
Today the South Valley is just over 50,000 people with the population growth during the 1990s averaging 1.3 percent per year. 78 percent of the population identified themselves at Hispanic or Latino in the 2000 Census. Average annual earnings at South Valley establishments in 2006 were $28,812 versus $37,440 for Bernalillo County as a whole. An estimated 34 percent of families are living below the federal poverty level. Incomes in the area are generally lower than in the rest of Bernalillo County. Compared to the county, the South Valley has relatively more of its employment in agriculture, manufacturing, wholesale trade, transportation, warehousing and utilities. The dominance of the construction industry in this area (35.6 percent) far exceeds the county’s 10 percent. In general, the South Valley is underserved by private businesses, particularly retail trade, professional and business services, and employment in the area is dominated by jobs in the construction industry at a time when the economy is suffering and new construction is limited. (BBER, 2008).
Figure 1: Overview of Los Padillas

Photograph 1. Community of Los Padillas study area
The Community of Los Padillas

Los Padillas is the southern-most community in the South Valley and is one of the oldest communities in the Middle Rio Grande area. It borders the Pueblo of Isleta to the south, the black mesas to the west and the Rio Grande bosque to the east. Los Padillas’ history and the familial ties are deep-rooted. Many of the area’s families have lived in the community continually for over three centuries which is reflected in their strong sense of place and community pride. As changes have occurred throughout Los Padillas’ history, the people have successfully maintained their sense of place and identity.

Los Padillas’ ties to the land, the Rio Grande and *acequias*, its historic agrarian lifestyle and rich Indo-Hispano culture are still evident today but are increasingly being threatened by urban pressures. Historically, the Rio Grande floodplain was ideal for irrigation agriculture, and each family had access to enough arable land to maintain a largely self-sufficient lifestyle. These lands were later divided among family members into long strips running perpendicular to the *acequias*, a pattern still seen today. The mesa grasslands were held jointly by members of the community and used for grazing cattle and sheep. Today this area is being developed primarily for housing (UNM Center for Regional Studies, 2000).

Los Padillas residents continue to be the stewards of the natural resources contained in this part of the river valley. The community remains predominantly rural despite the growing pressures of urban sprawl. Residents must drive to the Rio Bravo commercial corridor for goods and services. The few commercial establishments within
Los Padillas are mostly small locally-owned businesses such as dairies, a general store, mechanic shops, and a gas station.

The community’s ability to protect its rural lifestyle over the years is due in large part to the strong agrarian lifestyle. Residents have lived in the community for many generations which has allowed families to pass down these rural values. In addition, their Isleta neighbors to the south have also helped to preserve the rural nature of the area. Isleta is a land-based community, which hasn’t welcomed large-scale development especially on their precious agricultural land. Their effort to restrict growth and to protect open space and traditional land practices has helped Los Padillas ward off large development and has created a buffer from Los Lunas, Peralta and Bosque Farms, their fast growing neighbors further to the south. Many Los Padillas residents live within homes that have been passed down in their family for generations. It is because of this traditional concept of land tenure that has aided in the development of a deeply rooted sense of place for Los Padillas residents. The community has also welcomed in recent years a fast growing Mexican population. *Mexicano* residents, although new to the Los Padillas community, also value the rural lifestyle, as they continue many of the area’s agrarian practices such as growing family gardens and raising livestock.

Although within Los Padillas you will still find many large alfalfa fields, orchards and family gardens that are watered by flood irrigation from the original Spanish and Native American *acequias*, you will also see that this land is being increasingly subdivided and developed. This farming community is being transformed and its traditional way of life is being threatened. Land value in Los Padillas continues to rise
predominantly due to the increasing land speculation from outside developers and big
city buyers moving south seeking the country life.

Los Padillas is experiencing a trend similar to that which has occurred in many
other low-income communities that suddenly become attractive to more affluent buyers:
residents must adapt to the effects of rising property values or be displaced. The act of
protecting not just a lifestyle or landscape but a community’s identity and existence is not
only difficult; it is overwhelming and at times impossible to achieve. There is little that
can ward off what many perceive to be the inevitable effects of development and growth.
The challenge for any community that seeks to control growth is to first be able to
identify and articulate what residents value and what it is that makes their community
uniquely their own. Once this is clearly defined, a community can influence the way
growth occurs so that it reflects their values. Los Padillas is not unlike other New Mexico
communities that struggle to stay rural and protect their land base. As landowners stop
farming, their children no longer explore the fields and acequias, their relationship with
the land quickly changes and their agrarian values are lost. When development occurs on
farmland, it sends the message that farming is no longer important, that development is
more important than open space and that growth and modern conveniences are desired at
any cost. This trend also removes the land semi-permanently from agriculture,
undercutting the previously intact nature of the natural landscape and ecology.

The South Valley is faced with falling victim to urban sprawl and being inundated
with chain restaurants and track housing subdivisions. Holding onto our way of life lies
in our ability to stay connected to our land, culture, and history. In order to survive we
must be able to make a clear distinction of our desired lifestyle and value system.
A land-based value system is developed through experiences gained from the world around us. It is difficult to conceive of how children can understand the natural processes that contribute to growing the food they eat unless they have relevant experiences. How can we as a people value the need to conserve and protect our natural resources without having a full understanding of what our natural resources are and the natural processes that create them? How will we know to value our rich history and culture unless we know and practice that culture? How will we develop future generations that are environmentally and socially aware and engaged unless they are given opportunities to develop these values at a young age? The LPWS provides these opportunities. When there are no longer family farms, acequias or open space, facilities such as the LPWS will become even more critical to our understanding and connection to the natural world and the development of sustainable communities.

**Los Padillas’ History of Community Organizing**

Los Padillas has a history of community organizing efforts as described in “Los Padillas, A Portrait” created by the University of New Mexico Center for Regional Studies, for the Los Padillas Elementary School centennial celebration. In 1965 concerned people of Los Padillas formed the Community Improvement Association. The main purpose of the organization was to improve the life of people in the community by addressing issues such as the expansion of infrastructure and community services into the area as well as encouraged community events and programs that supported the areas history and culture particularly for youth. The Association eventually became an affiliate of the Federation of Community Associations and was made up of subcommittees such as the Youth and Recreation Committee. The organization was extremely active in both
local and larger issues impacting Hispanic communities. Some of the issues the Community Improvement Association dealt with in the 1960’s included supporting the campaign to increase the state minimum wage law and also became involved with the United Farmworkers movement, led by Cesar Chávez in the late 1960’s. Local issues addressed by the Association included the expansion of gas lines into neighborhoods and the lowering of telephone rates.

Another important role of the organization was their support of youth programs and community events such as the Fourth of July Fiestas. It was felt that these activities “created better relations between the various active groups and [would] bring out the good works of the youth and older community residents” (UNM Center for Regional Studies, 2000). In the 1970’s the organization supported the construction of the Los Padillas Health Clinic. The community came together once again in the 1980’s to deal with another community issue associated with poor water quality, primarily due to faulty septic systems. This community organizing effort was the first major push on the part of residents to bring attention to this serious problem which eventually led to the recent expansion of water and wastewater infrastructure into the area by the Bernalillo County Water Utility Authority. The creation of the Los Padillas Wildlife Sanctuary is yet another accomplishment that can be attributed to the organizing efforts of the community.

**History of Los Padillas Elementary School**
Los Padillas Elementary School was constructed during the turn of the century and was an integral part of the community. The original building was considered an architectural monument, reflecting the mission style with Romanesque and Gothic influence (Center for Regional Studies, 2000). The school burned down in 1980 which was a great loss to the community as it was an important landmark and represented a significant time in the community’s history. It was the place where the community would gather for events like Christmas plays, recitals, and fiestas. Los Padillas Community Center was built at the site of the old school and opened its doors on July 17, 1982. The center has continued to be an important gathering place for the community. It provides recreational facilities, arts and craft classes, and educational programs for youth year round. The new Los Padillas Elementary School campus was constructed on the same street just west of the original building.

Presently, the total annual student population is approximately 250 students of those students 95 percent are Hispanic and about one-third of the student population is monolingual in Spanish and 90 percent of students have a primary home language other than English. The student body is considered 100 percent qualified for Free and Reduced Price lunch. About one-third of the school’s families live on nearby Pajarito Mesa, whose homes often are without basic services such as electricity and running water. Los Padillas has been a dual language school since 2000. The mission for Los Padillas
Elementary is to work together with families and community to provide academic excellence, bilingualism, community pride, diversity, and environmental education.

**The Los Padillas Wildlife Sanctuary**

The school is home to an educational facility known as the Los Padillas Wildlife Sanctuary (LPWS), which is a five-acre, outdoor, experiential learning education facility. Its story began in 1987 when then Los Padillas principal, Robin Hazen took notice of an undeveloped property to the west side of the school playground. Through the hard work of teachers, students, and community members, over six years the site would eventually become an outdoor classroom.

In 1992 Los Padillas Elementary School was successful in securing funding for the construction of the wildlife sanctuary from the New Mexico State Legislature. The prevalent groundwater quality problems within the South Valley, predominantly from faulty septic systems, were the catalyst to bringing the community into action. Even Los Padillas’ septic system and those of other area schools were experiencing sewage spills on their school playgrounds. The school along with community members organized around the water quality issue to bring attention, political support and ultimately funding for their unique educational resource. It is in the very manner in which the LPWS was born that reinforces its intrinsic value and importance. The LPWS fundamentally celebrates the school’s community history, lifestyle, environment, and people. Even more, it signifies a community that came together to
address a collective issue and in turn created a place that was a celebration of their community.

The Los Padillas Wildlife Sanctuary was developed to give students the tools they need to enhance their ties to the land and to recognize their role in preserving an environment in which their cultural ties are intrinsically bound. The history of how the LPWS was created is a reminder of the environmental justice issues that their community faced and how they became empowered and came together to address the water quality problems. Through the community’s efforts to bring this problem to the forefront they together with the Los Padillas staff mobilized and forced leaders to address a serious health and environmental issue and as a result found a way to reinvest in the community that they loved.

Prior to entering graduate school, I was a teacher at Los Padillas Elementary for five years and served as the school’s Naturalist Teacher for the LPWS for three of those years. I have first-hand knowledge of the history of this program and how it offers valuable contributions to the school and the community as a whole. I found that like my early experiences, children become alive when they are in the place that they know and loved. They are engaged when they have the opportunity to explore the world around them and can tap into the knowledge and experiences that they bring to the classroom. As a teacher you constantly work to find ways to engage students. What I found is that no matter the content of the lesson, if you frame the concepts in what they know and can relate to you’ve captured their attention. Children intuitively know and care about the place in which they live. If you validate the experiences that they bring to the classroom
whether it be their lifestyle, language, or culture you are demonstrating how what they are learning is relevant.

The LPWS creates educational relevance. For my students, the LPWS reflected their community and was an environment that they were familiar with. When we together discovered the information that allowed them to better understand the world around them they were empowered. Whether we were learning about the native plants and animals or discussing community issues, my students were engaged. They felt as though what we were learning could be directly applied to their lives. They could walk out of the classroom and take ownership of the knowledge they had just acquired. The lessons were no longer abstract and intangible, they were actively learning.

The ongoing challenge to get parents involved in the classroom was never difficult when teaching in the LPWS. Mothers, fathers, and grandparents felt comfortable being present and participating in this setting because it was not intimidating and it allowed them to share their own knowledge and experiences, it was common ground. The LPWS program can also act as a tool that brings much needed attention, recognition and funding to a school that is often overlooked. It could be an educational treasure for a community that at times has been overwhelmed with academic failure. This educational value is intrinsic to the program and should be integrated into the program’s mission and vision.
Photograph 5. 1992 Conceptual Design of the LPWS
Chapter Three
Qualitative Research Methodology

Methodology

Los Padillas Elementary School has struggled to gain funding for the program which is critical for the staffing of the Naturalist Teacher position. The program participation has greatly declined over recent years and the facility is in disrepair. The school principal, Sara Keeney, is seeking outside support and has requested assistance in planning for the future of the program specifically in the areas of administration and funding. The purpose of my project is to document the story of the LPWS program and to evaluate the program in order to make recommendations what will assist the school in making the program sustainable. In order to achieve this I used primary research which involved gathering information through interviews with key individuals involved with the LPWS program and through secondary research which involved the review of documents associated with the program such as newspaper articles, curriculum, Los Padillas teacher professional development files. I also evaluated the Memorial Middle School Agricultural Science Center (MMSASC) which is a similar educational program located in Las Vegas New Mexico as a comparative case study. The information associated with the MMSASC was primarily gathered through interviews I conducted with the program administrator, Dr. Peter Skelton. In addition, I researched various books and articles associated with environmental and place-based education which were used to further emphasize the significance that this educational model has on student learning.

The interviews I conducted were with key individuals involved with the development of the LPWS program as well as with current Los Padillas teachers. The use
of qualitative research offered the ability to gather the history of the program through the words of the individuals that were involved in the creation and management of the facility and educational programming. This research approach was intended to capture individuals’ recollections of specific events, experiences, and perceptions regarding the program’s successes and failures. The interviews were also intended to capture the LPWS story through the words of the individuals that were involved over the years. The retelling of the story was requested by Sara Keeney, Los Padillas Elementary School Principal as my project client and also provides the opportunity to reflect on the emotional triumphs and tribulations associated with the program, as well as identify the key partnerships, significant events and challenges that have occurred over the years. This is significant as it directly informs the analysis of the program as well as aids in the development of the conclusions and recommendations established for this project.

The interview participants consisted of Los Padillas Elementary School staff, administrators, and external partners that were involved with the LPWS program. The individuals identified to participate in the interview were intimately involved with the program. Some of the teachers interviewed were the first to see the value behind creating this facility and were responsible for reaching out to the community for involvement and support. Then Los Padillas Elementary School teacher, Dolores Varela-Phillips, was responsible for the original vision of the program and was the primary focus of the research. She along with former school Principal Robin Hazen worked together to garner the support of APS, students, parents, community members and elected officials. It is undeniable that without the vision, hard work and dedication of these two individuals the LPWS would never have come to fruition. Dolores Varela-Phillips provided detailed
information and supporting documentation reflecting the first ten years of the program. Varela-Phillips provided many documents for the purpose of this report including photographs, student work, maps, and correspondence with staff, parents, and APS as well as other significant documents that capture the LPWS history. I compiled and inventoried these materials in order to provide the school with valuable historical documents and so the many efforts that went into the creation of this unique program can be recognized. Important events and individuals were also indentified through the review of these documents.

Additional teachers interviewed represent the members of the original Ecology Committee, which was formed early on in the process and also participated in the Eisenhower Southwest Consortium for the Improvement of Mathematics and Science Teaching (SCIMAST) program. The Consortium did not assist with the development of the LPWS program. Instead, it served as an important funding source for teacher professional development. The courses provided to SCIMAST teachers focused on ecological principals using the LPWS as the primary instruction site.

A few of these individuals are presently teaching at Los Padillas Elementary School and have witnessed the program evolve over the years. These teachers are capable of defining the obstacles to the LPWS program from the perspective of an educator. The current school principal Sara Keeney was also interviewed as well as UNM faculty member Dr. Quincy Spurlin, as an instructor for the SCIMAST program and who has continued to support the LPWS program over the years. Dr. Spurlin also administered the UNM Science Academies funded through Lockheed Martin and the Department of Energy (DOE) from 2001-2007. Dr. Spurlin created the science academies in an effort to
provide meaningful professional development opportunities for teachers that would strengthen their environmental understanding. Teachers from around New Mexico attended the Science Academies in two year cohorts. The Science Academies program was structured as intensive two- to three-week sessions during the summer, that placed teachers outdoors so that they may experience environmental education first had. LPWS acted as one of the instruction sites for the Science Academy program.

The interview participants were also selected because of their ability to provide a perspective that reflects at least one of the significant time periods of the LPWS program. These time periods have been divided into three categories including early, mid and recent years.

By establishing the three significant time periods, I am able to delineate the different approaches to educational programming, the impacts that the various school administrators and teachers had on the program as well as identify the key relationships and events that led to the successes and failures of the program.

The interviews varied in size and included sessions with individuals as well as with focus groups. They were guided, following a set of open-ended questions that allowed for group discussions and allowed participants to recreate the history of events as well as offer their perspectives. The qualitative research associated with this project was approved by the UNM Institutional Review Board (IRB) process for human research. A list of interview participants and questions can be found in the appendices of this document. Most interviews were audio recorded and resulted in approximately 15 hours of tape recordings that were then transcribed. The interviews were coded according to the following criteria:
There were various periods in the LPWS history in which the program was successful, in transition or struggling. In order to identify contributing factors to program successes and failures, I coded the interviews into three critical time periods in order to distinguish the contributing factors.

- Identification of significant events that took place over the last 17 years that lead to the success or hindrance of the LPWS program
- Identification of significant people, of whom played an important role in the development or administration of the program
- Identification of significant partnerships with individuals or organizations that supported the program through the development of the facility, curriculum, professional development or funding
- Community support and participation is a desired outcome of LPWS program and it is also an indicator of program success. By identifying times in the program history in which community support and participation was high, I can then isolate the factors that facilitated this outcome.
- Funding is critical to the program success. Using the presence or absence of program funding was used to formulate the three significant time periods. In addition I documented the various funding sources the school acquired over the years in order to identify the best methods for creating a sustainable funding structure.

Through this coding method, I was able to evaluate the program according to criteria which allow me to distinguish patterns or themes that reveal why the program has struggled. The main themes were then used to develop recommendations that directly
relate to the program’s strengths and issues. The individuals interviewed were also provided the opportunity to offer their own opinions as to why the program has struggled as well as make recommendations for how the program can be improved. This information elicited from interviewees was integrated into the final recommendations.

Lastly, a similar experiential, science-based program located in Las Vegas, New Mexico was analyzed as a case study in order to compare strategies and develop a model for implementing a successful program. The Memorial Middle School Agricultural Science Center program is also analyzed using the same criteria applied to the LPWS program. This program was selected as a comparative case study because it was similar to the LPWS in its approach to use hands-on, place-based teaching techniques in order to enrich student learning. Similar to Los Padillas, the MMSASC program is located in an agricultural community that is predominantly Hispanic. By doing this I am able to identify why the program has been successful and then correlate this directly to the significant events, people, partnerships, and funding that has been in place and led to the success of the program.

The recommendations established for the LPWS are based on the development of a “successful” program. The definition of success was established jointly with the school principal Sara Keeney and are dependent on the ability to establish a sustainable and supported program that is wholly embraced by the school and community. The criteria for success as it pertains to this project are as follows:

1. Sustainable – The LPWS program is regularly used by Los Padillas students on a weekly or monthly basis for science or other humanities
purposes and is integrated into the school culture as a meaningful educational resource.

2. Funding – Permanent funding for the staffing of a Naturalist Teacher and for program administration.

3. Curriculum and Professional Development – Ongoing development of activities, research, curricula, and continued growth of learning opportunities for students and teachers.

4. Documented Change – Documented growth in student knowledge about ecological, cultural and community concepts, and improved emotional bonds and outlook with nature.

5. Community Involvement – Dynamic and vital community connections and involvement by parents, community members, teachers, students, other schools, businesses, and volunteer groups.
Chapter Four

Findings

Introduction

The LPWS timeline is based on the information gathered through interviews conducted for this professional project. The history has been organized into three main periods that were significant to the program. Each time period begins with a summary of the individuals that were significant for their involvement and contributions to the LPWS. The first period referred to as the Early Years, reflects the efforts and events that led up to the LPWS being established as well as provides information regarding the formation of the facility and overall programming. Once the LPWS was established the program had gained momentum and had attracted a great deal of attention and support, including a large multi-year grant which financed programming and professional development opportunities. Participation by school staff, community members and external partners was very high during this time. The Mid-Years captures the time period when the program was in transition primarily due to changes in school leadership, staffing, and funding. During this time, the critical multi-year grant funds were coming to an end which resulted in a considerable impact on the school. The final time period discussed reflects the most recent years in which the school has struggled to find funding for the program; and much of the attention and momentum associated with the LPWS has diminished.

An overview of the MMSASC program follows the LPWS case study and includes information related to how the program has developed over the last 5 years and identifies the factors that led to its success. The MMSASC case study provides an
alternative model for environmental, place-based education. This agriculturally based program shares many similarities to the LPWS program including community demographics as well as their shared rural and farming lifestyles.

**LPWS Case Study**

**Early-Years - Significant People, Programming and Funding**

*Dolores Varela-Phillips* – Los Padillas Elementary School teacher that was the founder of the LPWS facility. She was the main organizer and advocate for the program.

*Dave Johnson* – An employee with NM State Parks and Recreation and was the designer that planned the original outdoor classroom. Craig Campbell, the contracted architect followed Dave’s original design.

*Robin Hazen* – Principal at Los Padillas at the time the LPWS was created.

*John Mondragon* - Assistant APS Superintendent during the late 1980’s and early 1990’s

*Jack Bobroff* - APS Superintendent during the late 1980’s and early 1990’s

*Bob Robie* - Facilities Planner for APS, who was a huge supporter of the LPWS facility.

*Judith Phillips* – Landscape architect that worked with Craig Campbell. She completed the landscape design and plant selection for LPWS.

*Betty and Perry Wilkes and Julie Stevens* – Community activists who were very concerned about the water quality issue in South Valley and brought the idea of creating a constructed wetlands to the Ecology Committee.

*John Dufay* – APS Maintenance and Operations (M&O) manager that was involved with the constructed wetlands project.

**Fall 1987 – The LPWS Concept is Born**

The LPWS was started as a result of combined efforts of then principal Robin Hazen and teacher Dolores Varela-Phillips. Robin Hazen took Dolores for a tour of the school property shortly after she came to work at Los Padillas and showed her a 5-acre area behind the school with native vegetation that belonged to APS. Dolores immediately recognized this area for the potential it held as an outdoor learning facility. Dolores had always loved the outdoors and often integrated environmental science into
her lessons.

In 1987 Dolores recognized that the valley was becoming gentrified and was also becoming more suburban. She saw the outdoor classroom as a mechanism for teaching students about the natural world. She wanted students to learn the same appreciation that she had developed for the valley. Principal Hazen in loved the idea and asked Dolores to form a committee to explore the idea further. As a result, Dolores along with other Los Padillas staff formed the Ecology Committee and began to pursue the development of an outdoor education facility.

**1987–1989 Los Padillas Elementary School Ecology Committee Forms**

Approximately six teachers volunteered to participate with the ecology committee, all of whom had an appreciation for the outdoors. The teachers were unaware of how to establish an outdoor classroom, and as a result they decided that the first step for the committee was to develop a curriculum guide so that they could begin to teach students in the undeveloped 5-acre site. The committee began to meet once or twice every week and spent most of their time brainstorming as to how they should begin establishing an outdoor classroom. They quickly developed an activity book for the Sanctuary which included lessons pertaining to plants and animals. The first concept for the LPWS that the teachers developed included a trail, seating area and pond. Dave Johnson, an employee with the NM State Parks and Recreation Division of the Energy, Minerals and Natural Resources Department, soon became involved. Dave’s work included designing recreational facilities and trails. The Ecology Committee requested
that the State Parks and Recreation Division loan Dave to them to work on the design of
the LPWS. These early concepts that the committee worked on with Dave ultimately
became the final design. The teachers were committed to making sure the LPWS design
served the educational purpose. Beginning in 1989 and
ending in 1993, the Ecology Committee held an annual
Earth Week during the month of April in order to create
curriculum and educational activities as part of the LPWS.
Each year the students promoted a different theme such as
threatened and endangered species, alternative energy, and
water.

**Ecology Committee Reaches Out**

The Ecology Committee on Dave’s advice began to reach out to the community.
One afternoon committee members visited every home around the perimeter of the school
and informed residents of their efforts. Through this process the Ecology Committee was
able to gain support from residents surrounding the 5-acre lot. Robin Hazen gave Dolores
time off from her teaching duties in order to continue to move things forward.

**1989 – 1990 Teachers, Parents, Students and Community Members Take Action**
Not being successful in finding funding to develop the site plan, the Ecology Committee decided to do the work themselves. They began by putting in trails and a pond following Dave Johnson’s site design. The school received volunteer labor and donated materials from parents, community members and area businesses. Students took notices home to solicit parent workers. Many parents particularly fathers, school staff, and other project supporters worked every weekend over several months to develop the trails and other facility infrastructure. Clyde Phillips, Dolores’ husband, used his back hoe to carve out the trail that exists now. Schollenberger Lumber Company from Bernalillo supplied the treated lumber used for delineating the trail. Another local company donated truck loads of gravel.

Clyde Phillips dug the original pond which was filled using ground water. A couple of weeks after the pond was dug, APS Maintenance & Operation (M&O) employees came to the school without notification and filled in the pond. APS covered the pond indicating it posed a threat to the community because it exposed black water. Principal Robin Hazen immediately informed Dolores that the pond was being filled in and stayed with her class while she went out to deal with the situation. Dolores was able to stop the work temporarily. She quickly went back to her classroom to get her students who surrounded the pond so that M&O was unable to continue work. Dolores and her students were
successful in stopping the work that day, however, the pond was eventually filled in by APS a few days later.

Dolores had initial permission from APS to dig the pond but she didn’t get it in writing. Ultimately APS covered up the pond because water quality tests showed fecal coliform bacteria present and it also had concerns of hepatitis contamination. Dolores felt that APS had filled in the pond in part due to the water quality results of the pond, but also because they were aware of the problems Los Padillas and other South Valley schools were experiencing with their septic systems.

The School and Community Organize Around the Water Quality Issue

The Ecology Committee and community members used the water quality problem as the catalyst for requesting funding for the LPWS. The community was discontented with the reoccurring ground water quality problems that plagued the area. Area residents were also concerned about the general lack of attention to the public health issue on the part of their elected officials and Bernalillo County. Several community members including Mr. and Mrs. Perry Wilkes and Julie Stevens, approached the teachers with the concept of constructed wetlands. APS was not receptive to the concept, and the Ecology Committee along with community members had to educate and convince APS of the validity of having a constructed wetlands. It was viewed by the school and community that a constructed wetlands would not only provide an alternative method for dealing with the school’s septic problems, they also saw the wetlands as an educational tool that
could demonstrate alternative methods for dealing with black and grey water. At this time the community of Los Padillas was entirely served by individual septic systems and residential drinking water wells. The area had been plagued for years with problems associated with faulty septic systems. The community dealt with poor water quality conditions including very high nitrate levels that were monitored by the New Mexico Environment Department.

During this time the larger South Valley community was experiencing widespread issues with septic systems. In 1991, Pajarito Elementary School, a school located a few miles north of Los Padillas, was having severe problems with their septic system. Untreated wastewater was seeping up into the school’s play ground exposing the students to human waste. This created a great deal of concern among parents, school officials and community members. They were outraged by the situation and claimed that the infrastructure of South Valley schools had once again been neglected by APS, which put children in harm’s way. The issue received city-wide attention making local news. This problem served as the impetus behind persuading APS to build the constructed wetlands at Los Padillas. Community members and school staff came out in large numbers to attend an APS School Board Meeting in which the Wilkes and Julie Stevens made a presentation regarding the concept of constructed wetlands. It was this push from the community and school, along with the septic problem at Pajarito Elementary School that led to APS’ decision.

The Ecology Committee along with community members approached their state legislators for assistance in funding the LPWS. The community’s two legislators, Representative Kiki Saavedra and Senator Manny Aragon, agreed to help the school acquire legislative funding. Together the legislators committed $120,000 to fund the construction of the wetlands. Dolores Varela-Phillips tracked the bill and was able to coordinate a student field trip to the state legislature in Santa Fe in order to have students testify during the legislative hearings. Dolores worked to get parents to sign permission slips in advance so that students could go up immediately upon receiving notification of when the bill was scheduled to be heard. A community member drove students and Dolores up to the legislature, while Principal Robin Hazen stayed with those students who remained at school. Unknown to the school their legislators included an additional $125,000 in order to fund the entire LPWS facility as an outdoor classroom. The school had received just under $250,000 for the LPWS from the state legislature which exceeded the school’s expectations. With this funding along with a few other grants the school was well on its way to building the outdoor classroom that they had been working towards for years.

Photograph 12. Students planting in the LPWS
With the legislative funding, Los Padillas Elementary School was able to hire architect Craig Campbell to design the LPWS facility. The scope of work included his participation with the Ecology Committee in order to integrate their ideas and teaching needs into the design. He also interviewed students in order to get their input on the project. Craig Campbell was able to draft the design without deviating far from the intent of the Ecology Committee and was able to integrate Dave Johnson’s existing designed. Once APS committed to supporting the LPWS project, they offered assistance. Then APS M&O Manager John Dufay provided valuable input on the design of the constructed wetlands. Prior to constructing the facility in 1992, the Ecology Committee once again went door-to-door to visit with neighbors surrounding the LPWS in order to inform them of the project in an effort to keep the community involved and supportive of the project. Students contributed to the work as they assisted with the plantings of new vegetation within the various life zone landscapes.

The original facility contained constructed wetlands and wildlife sanctuary with a lily pad-laden pond, and five ecological zones including the Great Meadow with wild flowers and grasses, piñon-juniper woodland, cottonwood riparian...
zone, mesa arroyo area and sandhill ecosystems.
Principal Analee Maestas and Dolores Varela-Phillips described the LPWS in an Albuquerque Journal article dated Saturday, September 25, 1993 as “the fulfillment of a community dream at least six years in the making, culminating in an outdoor classroom behind the school where students can learn about nature and the environment in which they live. It’s also a welcome addition to the school in a practical way: With a burgeoning school population, the constructed wetlands will be better able to handle the increased sewage output than the old leach mound system the school relied on.” Ms. Maestas further stated in the article that “the school is seeking funding for a naturalist to help other teachers learn how to get the best educational use out of the new wildlife sanctuary, especially minority students.”

The school held their ribbon cutting ceremony in September 1993 and invited community members, parents, students, staff, APS administrators, elected officials, and all others that assisted with the development of this outdoor classroom. The event was a celebration of their hard work and dedication and the new prized facility that resulted from it.

**LPWS the Mid-Years**

**Transitional Years - Significant People, Programming and Funding**

*Analee Maestas – Principal at Los Padillas for 4 years after Robin Hazen.*

*Terry Dunbar – APS Science Coordinator who became involved with LPWS in 1994 and co-instructed with Clo for the SIMSE training.*
**Clo Mingo** – Science coordinator from University of New Mexico (UNM) along with Terry Dunbar as instructors for teacher trainings focused on using the outdoors as a learning lab.

Sue McGuire - Museum of Natural History – helped develop LPWS curriculum and also helped Dolores complete the SCIMAST grant application.

*Eisenhower Southwest Consortium for the Improvement of Mathematics and Science Teaching (SCIMAST) Grant* – A five year, $95,000 grant used to train teachers on-site in science curriculum.

Dr. Quincy Spurlin – UNM College of Education professor that taught Los Padillas teachers involved in SCIMAST. Also implemented UNM Science Academy from 2001-2007.

Margie Aragon – Los Padillas principal for 4 years after Analee Maestas. She was supportive of the LPWS program and Naturalist Teacher position.

Steve Vigil – Began at Los Padillas as an Educational Assistant after retiring from the United States military. Steve eventually worked on his teaching license and became a regular education and Naturalist Teacher at Los Padillas.

Mariana Padilla – Began teaching at Los Padillas in 1999 as a regular education teacher. Mariana’s interest in the LPWS quickly led to her team-teaching with Steve Vigil and sharing the Naturalist Teacher position. Mariana eventually became the full time Naturalist Teacher and provided instruction to the entire student body as a regularly scheduled elective class.

Sara Keeney – Current Los Padillas Elementary School Principal who began with the school in 2001.

**1993-1994 Post Construction of the LPWS: Los Padillas Elementary School**

**struggles with programming and lack of use of the facility**

After the construction of the LPWS facility, the school was faced with the predicament of having a beautiful facility but teachers were not using it. Principal Analee Maestas and Dolores came up with the idea of creating the Naturalist Teacher position in an effort to provide a designated teaching position that could focus on outdoor instruction. Analee identified a way to release Dolores from her full time classroom by hiring MaryAnn Romero as a permanent substitute teacher to take her place in the classroom. MaryAnn was a certified teacher that lived within Los Padillas. She eventually became a full time teacher at the school. With the new position, Dolores began
visiting classrooms with an outdoor curriculum and took students and teachers out to the LPWS for instruction focused on environmental education curriculum. These efforts resulted in classes getting out to the LPWS, but did not result in teachers developing an interest in taking their students on their own even though lessons were demonstrated and simple activities were left for teachers to do follow-ups. It was decided that Dolores should not be the science teacher but facilitate teachers in getting their own students out. Dolores began working on teacher trainings and professional development opportunities to demonstrate how to integrate outdoor education into their classroom instruction. The instructional documents created by Dolores, the school staff, community members and partnering consultants and organizations include:


Curriculum was also created by community members such as Annabelle Saavedra, a Los Padillas Elementary School parent who created a lesson in 1998 focused on remedios (healing plants). Mrs. Saavedra was known to the school as the community ethnobotonist and story teller. She developed a presentation in which she would dress up as her grandmother and would tell stories she heard as a child. The stories were about the community and the plants that her grandmother and others in the community used as remedios. Her presentations were interactive as her audience was treated to experiencing
the scents and flavors of the plants. Mrs. Saavedra would end her lesson by requesting that her students go home and ask their parents and grandparents for a story. The stories for each *yerba* (herb) continued to grow, as her hope was to compile a story for every native *yerba* in the community so that these histories would be passed on to future generations.

### 1994 Los Padillas Receives Grant Funding for Teacher Professional Development

In 1994 the school received a $95,000 professional development grant to retrain 11 teachers and Principal Analee Maestas in science and math over five years. The grant was awarded to Los Padillas from the Eisenhower Southwest Consortium for the Improvement of Mathematics and Science Teaching (SCIMAST) which was funded through the United States Department of Education’s Eisenhower Program. SCIMAST was operated by the Southwest Education Development Laboratory (SEDL) which is a private, nonprofit education research, development, and dissemination-corporation based in Austin, Texas. The grant seemed to be the answer to the school’s dilemma, as it provided the opportunity for teachers to access the expertise of professional partners including science and math experts Terry Dunbar and Dr. Clo Mingo, Tim Aydelott from the New Mexico Museum of National History and Science, and Dr. Quincy Spurlin from UNM. The grant provided funding to train teachers in ecological principles and best teaching practices and philosophy right on the school site. The SEDL grant in collaboration with the University of New Mexico allowed
participating teachers to complete coursework in order to earn an endorsement in science or to apply as graduate credit towards a Master’s or Doctorate degree. The tuition and materials for participating teachers were paid for by the SEDL grant. The participating teachers worked after hours on evenings and weekends to build their capacity in science education. The SEDL program offered teachers an opportunity to work on their professional growth as educators and allowed them to develop a support network that included fellow teachers as well as outside experts in education and science fields. The SEDL grant offered a unique opportunity for teachers to improve their educational practices in a way that was relevant to their student population.

After just a year of the SEDL grant, teachers became more confident and competent in teaching in the LPWS. In the summer of 1995, Los Padillas teacher Maria Velasco began offering a water quality class at LPWS through the New Mexico Natural History Museum. That year Los Padillas Elementary School organized a large Science Fair held at the community center. The student participation and community interest was so widespread that the event received national media attention, and was aired on CNN. The school viewed the Science Fair as a huge success that could be attributed to the school’s focus on science instruction.

**1997 New People and Perspectives**

Margie Aragon became principal of Los Padillas in 1997 and hired Steve Vigil, a retired United States Air Force mechanic who began work at Los Padillas as an educational assistant dedicated to the maintenance of the LPWS. In
October, 1998 Dolores Varela-Phillips retired from teaching and Steve moved into the Naturalist Teacher position and with his handy man abilities he was able to make infrastructure improvements on the outdoor classroom. He extended drip irrigation to new plants, improved the information station signage, and conducted general maintenance of the facility. He offered much-needed time and attention to keeping up the facility. In addition to the physical improvements to the LPWS, Steve developed his own activities and lessons for instruction in the outdoor classroom. Despite not having his teaching license, Steve took the lead as the school’s Naturalist Teacher and served as the main advocate for the LPWS program. Due to the encouragement of school Principal Margie Aragon, Steve earned his teaching license and eventually became a teacher at Los Padillas.

By December 1998 Steve continued to familiarize students and teachers with the LPWS. Steve was providing tours and focused on demonstrating lessons. Steve began to create his own lessons for the outdoor classroom such as the Dinosaur Dig which he used with first and second grade classes. The lesson was intended to teach young students about science related professions while developing their inquiry skills as they dressed up like paleontologists and worked to excavate and examine cow and deer bones he buried in a designated site. He also developed agricultural lessons that involved water issues such as acequias (irrigation canals) and water quantity and allocation, remedios, and water ecology. Dolores Varela-Phillips had informed Steve about the history of the Sanctuary before she left the school which he later developed into his own write-up on the facility.
Principal Margie Aragon began having Steve take students with extreme behavior problems out to the LPWS to help with maintenance such as cleaning the trails or pulling weeds. This was done often times with students who had in-school suspension. Steve recalls these students not exhibiting any behavior problems while in the LPWS. The students were not only well behaved they very much enjoyed being outdoors and often were eager to help out with cleaning. At times they also took on a peer teaching role and helped to remind other students to respect the plants and animals encountered. Steve stopped taking students to the LPWS as a punishment because they enjoyed their time outdoors and it was not viewed as a negative consequence. In general, the time spent with Steve Vigil seemed to have a lasting positive affect on students especially for those that had considerable behavior problems. Many of these students had learning disabilities such as Attention Deficient Hyper-Activity Disorder and also experienced mental health challenges.

Steve was the primary user of the LPWS during this time. In 1999 Steve began taking courses at UNM for a post-bachelor degree in teaching as a result of the encouragement he received from Principal Aragon, in addition to his new found pleasure in teaching. During this time the school acquired an $8,000 grant from the U.S. Fish and Wildlife Service (USFWS) for the LPWS. Steve, along with parents from the school, used the USFWS funds to build the information stations which described the various ecological life zones represented in the LPWS. In addition, the USFWS funds were used to label various plants throughout the LPWS with both their common and scientific names. Up until this time Steve did not recall there being much community involvement. He started making contacts with other schools from as far south as Carlsbad to schedule
field trips to Los Padillas in order to receive lessons in the LPWS. Steve made contacts with other student teachers while working on his teaching license at UNM and helped to recruit student teachers to the school.

Los Padillas teachers were generally not using the LPWS without Steve taking the initiative to schedule lessons. Some teachers at Los Padillas were not comfortable with the outdoors, and as a result relied on Steve to take their students out to the LPWS often times without them. Even those original twelve SCIMAST teachers still remaining at the school were not utilizing the LPWS as they once were. This was due in part to the new school-wide language arts and science-based curricula that had been adopted. Many teachers struggled with incorporating the LPWS into very structured curricula. The majority of instruction that was occurring in the LPWS was with classes from outside of the school, with field trips scheduled a year in advance.

Steve’s approach to instruction in the LPWS was to teach students their history and culture focusing on agriculture and traditional Indo-Hispano practices such as using native plants as *remedios*. Steve grew up in the South Valley playing in the fields and *acequias* and he wanted to share this with his students. He viewed the LPWS as an opportunity to offer real life experiences and brought in a new educational approach as he focused on cultural relevance.

Steve describes students’ learning experiences in the LPWS as phenomenal. While learning in the LPWS, students were in their element and were free to explore. Students took the initiative with their own learning and would often pick things up themselves and experiment. Students never had behavior problems and were so intrigued and engaged no matter the age. He recalls teaching an agriculture lesson to first graders.
They began having an argument about water rights because the farms closest to the reservoir used all the water and the farmers located further away from the reservoir did not receive water. Steve was amazed at how well these young students were able to grasp the concept of having a limited water source and the repercussions of not utilizing water responsibly so that there is enough for all users.

During this time dignitaries, such as the APS superintendent and other educational professionals visiting from Washington D.C., came to the school in order to visit the LPWS and to learn about the program. There was a great deal of interest in the water purification process and what the school was doing to treat wastewater. Steve recalls viewing APS as more of a hindrance regarding the running of the facility. He handled all maintenance other than for the constructed wetlands. APS also conducted the ground water monitoring which was a requirement by the New Mexico Environment Department to ensure that the constructed wetland was properly cleaning the schools wastewater.

In 1999 I started as a first year teacher at Los Padillas upon graduating from UNM. It was important to me to teach in the community where I grew up and as a result, I only applied to Los Padillas. Shortly after graduating I scheduled an appointment with Principal Aragon to introduce myself and express my interest in teaching at the school and was offered the position. My first year I taught a third grade class which was made up of students with varying academic abilities ranging from pre-kindergarten reading levels up to a select group of students reading above grade level. Not only were the majority of my students below grade level in all subject areas, they also had significant behavior problems.
As a new teacher I found it extremely difficult to work with such challenging students. The school as a whole was under-performing academically and in the process of entering into corrective action. I found myself overwhelmed and I sought out every possible strategy for reaching my students. It was during this time that I began taking them to the LPWS which seemed like a risk as I thought it would be more difficult to keep my students focused. To my surprise I found that taking them outdoors for instruction eliminated the negative behaviors and engaged them in the lessons. I no longer struggled to get their attention or respect; we had finally found our common ground. I could share my love of the outdoors and the South Valley with my students as we explored the natural world together. Not only were they more interested in science but journaling outdoors was also highly effective in getting even those with the lowest abilities willing to write. In this time I first realized the power of teaching students outdoors.

The following summer Steve and I participated in the UNM Science Academy in order to build our capacity in teaching ecological concepts. This greatly increased our scientific understanding but more importantly provided us with educational resources, curriculum, and support we needed to improve our skills as educators and to take on leadership roles at Los Padillas as Naturalist Teachers. In addition to teaching, we began leading professional development for school staff. At the beginning of every year the teachers were taken out to the LPWS and given a presentation on the history of the program as well as discussed ideas regarding how they could integrate the LPWS curriculum into their classrooms. We also made an effort to hold activities with the
greater community outside of school hours such as family star gazing, gardening, and community clean up days.

At the end of the 2000 academic school year, Principal Aragon allocated a portion of the school’s Title I Reading program funding to the Naturalist Teacher position. She encouraged Steve Vigil and me to team-teach so that we could share the Naturalist Teacher position and also teach a third grade class. At summer, prior to the start of the following school year, Margie Aragon left Los Padillas and Sara Keeney became the school’s principal. Sara Keeney saw the value that the Naturalist position offered instruction at Los Padillas and continued to support us in our team-teaching arrangement. We alternated months, splitting our time evenly between the Naturalist Teacher position and the third grade class. Principal Aragon had designed the team-teaching arrangement which allowed for both of us to work on instruction and curriculum development in the LPWS while utilizing both of our strengths to grow the program.

This arrangement proved to be a great success. Steve and I also participated in the last year of the SCIMAST program which further improved our professional development in place-based science education. In general, teachers participating in SCIMAST were most supportive of the LPWS program as they too received valuable professional support especially for Dr. Quincy Spurlin. During this time the UNM Science Academies funded by Lockheed Martin Corporation and Department of Energy were established to offer professional development that deepened science content knowledge and strengthened inquiry skills and habits while emphasizing the need to focus learning on local context. The Science Academies were administered by Dr. Spurlin. Teachers from around the New Mexico took part in the program, including Steve
and I. The LPWS was used as one of the instruction sites which further broadened the programs exposure and strengthened the school’s focus on environmental, place-based education.

Steve and I worked as a team to make improvements to the LPWS, to reach out to the community for support and involvement, encourage usage of the facility, seek grant funding, conduct professional development for teachers, and provided the overall student instruction and administration of the program.

Each year it was a challenge to find funding for the Naturalist Teacher position. Often times the school budget was not finalized for several months into the school year until enrollment numbers were verified. During the 2001-2002 academic year, Sara was unable to identify funding through APS for the position. As a result, Steve left the Naturalist Teacher position and began teaching fourth grade full time. At this time I began graduate school at UNM in the Community and Regional Planning program. The school was able to acquire a one-time grant through the Sierra Club which allowed me to work as the school’s Naturalist Teacher on a part-time basis and paid for equipment and transportation costs for one school year. The intent of the grant was to teach Los Padillas students to engage in ecological studies as they observed various life zones within the Sevilleta Wildlife Refuge. The intent of taking students to the Sevilleta was to get them out of a controlled educational facility and allow them to conduct investigations in a natural environment, they were allowed to go out into the “wild” and apply ecological
monitoring techniques. Students worked with scientists from the Sevilleta Wildlife Refuge to gather transect data on grassland burn sites, creosote and mesquite desert shrub lands, as well as upland mixed conifer forests. The LPWS was used to teach students ecological monitoring data collection techniques prior to traveling to the Sevilleta. I resigned from Los Padillas Elementary School in 2004 and continued as a full time graduate student. At this time I applied to the UNM Water Resources Program in order to further strengthen my knowledge of the natural world particularly as it related to water issues.

2004-2009 Recent History and Current Status of the LPWS

**Recent Years Significant People, Programming and Funding**

*Sara Keeney* – Current Los Padillas Principal who began with the school in 2001.

*Louise Gerstle* – Served as the Los Padillas Elementary School Naturalist Teacher from 2007-2008 when funding was available. Retired from teaching in 2009.

*LPWS Advisory Board Members* – Chairperson Mariana Padilla, Vice-Chair Steve Vigil, Secretary, Senator Linda Lopez, Jerry Jaramillo, Quincy Spurlin, Miriam Martinez, Paul Tatters, Louise Gerstle, and Maria Velasco.
**2005-2006 Academic Year**  Los Padillas did not have a staffed Naturalist Teacher dedicated to the LPWS program during this time which affected the overall use of the facility. However the school was able to take advantage of an art project designed to teach students about water and water catchment, which was funded by a 21st Century grant through the Rio Grande Educational Collaborative. The 21st Century program wanted to sponsor an art project in a low-performing and low-income school, and selected Los Padillas Elementary School. As part of the project the school added a water catchment sculpture to the LPWS which was designed jointly by students and a group of Santa Fe artists, including Chrissie Orr, Rico Eastman, Rose Simpson and Gabe Romero. The artists took student drawings and designed the steel structure which is a series of bowls stacked to pour into the lower bowl. Future plans for the sculpture include integrating student poetry about water onto stones that will line the walkway to the sculpture. In addition, the school plans to integrate a garden at the foot of the sculpture’s runoff.

**2007-2008 Academic Year**

Louise Gerstle returned to Los Padillas to teach in 2007 when she became aware that the school was seeking a Naturalist Teacher. The position was short-term with no assurances that the funding would be available the following year, however she decided to transfer to Los Padillas in April despite this risk. Shortly after she started at Los Padillas she quickly scheduled field trips for other schools to visit during the last months of the school year. During this time the school received funding from the McCune
Foundation to help pay for bus transportation intended for other schools to come to the LPWS for instruction. As part of this effort there were approximately 30 classes totally 750 visitors to the LPWS.

The following year, the school once again did not have funding for the Naturalist Teacher position. Louise took a position in a first grade class until March at which time Principal Sara Keeney was able to identify funds for the position. Louise taught lessons in the LPWS for teachers that were interested. Most of her efforts were once again focused on classes from other schools. Louise found it difficult to persuade Los Padillas teachers to take their classes out to the Sanctuary; however there were two teachers, Irene Gonzales and Miriam Martinez, that regularly utilized the LPWS on their own without Louise’s involvement. During the spring semester, Louise was also very involved with organizing the school’s Science Expo as well as worked with classes on instruction that focused on the scientific method and science inquiry. While serving as the school’s Naturalist Teacher Louise did not offer professional development workshops for teachers that focused on instruction in the LPWS similar to what occur in early years. In recent years there has been limited parent involvement with the LPWS other than with a select group of teachers whose parents still participate in the school’s fall and spring community clean-up days. This is due in large part to the lack of programming and overall disregard of the LPWS on the part of teachers and administrators. There are also fewer community events associated with the LPWS aside from periodic fall and spring cleaning and pruning within the LPWS.

2009 – 2010 Academic Year
The school currently does not have funding for a Naturalist Teacher or for educational programming. The school received a $25,000 grant from the New Mexico Legislature sponsored by area legislators Kiki Saavedra and Linda Lopez. The school plans to use the funds to make upgrades to LPWS constructed wetlands, which was built in 1992. The wetlands have not received upgrades or improvements over the years which has resulted in the system deterioration. In recent years APS has been concerned about the ability of the dated wetlands to properly clean the schools septic water. According to APS M&O maintenance and monitoring records for the LPWS, the nitrate levels for the constructed wetlands were too high. At the time system was constructed the requirements for nitrates were not as stringent as they are today. In addition the ammonia test showed that levels within the wetlands were three times higher than acceptable levels and was double the acceptable levels at the pond. The expansion of wastewater infrastructure into the community by the Albuquerque Bernalillo County Water Utility Authority, APS chose to remove the school from the constructed wetlands. Louise Gerstle retired in 2009 from APS despite her interest in continuing on as the LPWS Naturalist Teacher.

Educational participation in the LPWS is at an all-time low and the overall facility maintenance has been neglected. With the recent expansion of wastewater infrastructure into the area, APS disconnected the constructed wetlands from treatment of the school’s black and gray water in 2009. This was a huge blow to the program as the wetland had continually been the focal point of the LPWS
facility and one of the main educational features. Shortly after this occurred, Sara Keeney felt that it was critical to garner support from external partners and as a result formed the LPWS Advisory Board in April 2007. Sara utilized grant funding to hire a consultant to initiate the formation of the Advisory Board including the development of the organization’s purpose and objectives as well as the identification and recruitment of board members. The Board composition was designed to include science professionals, school staff, community members, educators, elected officials and non-profits organizations. The scope of major responsibilities for the LPWS Advisory Board including: 1) determine the LPWS mission, vision and purpose 2) assist in conducting a needs assessment for the LPWS 3) ensure effective planning for the LPWS for developing guidelines for expanded use of the Sanctuary 4) Ensure adequate resources for the LPWS by assisting in identifying funding sources 5) Identify potential partnerships with community organizations, businesses, government agencies, and educational institutions, 6) Advise the staff on the effective management of resources 7) Advise on determining and monitoring the LPWS programs and services 8) Promote and enhance the public image of the LPWS 9) Serve as an advocate of the LPWS and its mission 10) Attend regularly scheduled quarterly Advisory Board meetings 11) Assess its own performance. The board continues to meet and has worked on projects focused on the maintenance of the facility such as noxious weed issues as well as the redesign of the constructed wetlands.
Despite the absence of a Naturalist Teacher and the lack of use of the facility by teachers and students, there have notable achievements associated with the LPWS program in recent years. The school has held community clean-up events in which students, parents, teachers, community members and LPWS Advisory Board members participated. The formation of the Advisory Board is also a significant step towards establishing outside support and partnerships.

**LPWS Program Findings**

In analyzing the information gathered through interviews and research, I have identified the following findings regarding the most significant factors of the programs failures and successes.

**Factors that Supported the Success of the Program**

1. **Naturalist Teacher**

   At the beginning of the LPWS program there was a full-time teacher, Dolores Varela-Phillips, who was extraordinarily passionate about the LPWS program, and served as the program’s advocate and spokesperson. In addition to teaching and developing curriculum she also reached out to community partners and was successful in garnering support. In later years, when Steve Vigil became the Naturalist Teacher, he continued to be successful due to his love for his community, ability to connect with students and parents, and construction related skills that allowed him to make improvements to the facility.

2. **Supportive Administration**

   During years when the LPWS was being used and supported by teachers, students and community members, principals that were very supportive of the LPWS program were also in place. Various principals have played significant roles in securing program
funding which allowed for the Naturalist Teacher position to be filled as well as to offer staff with valuable professional development opportunities. In examining the program’s history, it is apparent that the role of the principal is essential to ensuring that teachers are encouraged to incorporate the LPWS into their classroom as well as for the recruitment of teachers and identification of funding.

3. Professional Development and Training

Early on in the program there was a large team of teachers and outside educational professionals that provided support and training. This support made teachers feel comfortable with experiential learning and outdoor education which was critical to broadening educational professional development and strengthening teaching paradigms and enriching the quality of teaching and curriculum development.

Factors that Hindered the Success of the Program

1. Funding Constraints: Absence of Naturalist Teacher

The issue of limited funding has been the program’s largest hindrance. In recent years the school has not had funding for the Naturalist Teacher and as a result, the program has come to a halt. The LPWS is rarely used and the facility has been neglected.

2. Lack of Focus on Science Based Curriculum

Teachers have indicated that the lack of professional development in environmental and place-based education has deterred their use of the LPWS. These content areas do not receive adequate attention at the universities’ College of Education or district level and as a result many teachers are not properly equipped to teach this content. Some teachers have indicated that they perceive science and social studies content areas being pushed aside in order to focus on language arts and math.
Over the years there has been limited use of the LPWS by the Los Padillas teachers. This is due in part to the constraints that No Child Left Behind has had on teachers’ flexibility to teach creatively and to incorporate lessons and approaches outside of the school’s adopted programs -- during the late 1990’s and early 2000’s, when the school was on or bordering academic corrective action this was of greater concern. Another factor is many Los Padillas teachers are neither science-oriented nor willing to teach outdoors.

3. **Limited Support from Administration including APS**

Over the years the school has received very limited support from APS for the program. Dolores Varela-Philips recalls that APS had an unfavorable outlook towards the program, which she attributed to the perceived financial obligation and safety liability the facility created for the district. The decision to disconnect the constructed wetlands from the school’s wastewater system is an indication of the lack of commitment and support on the part of APS. If the LPWS was viewed as a worthy educational resource, there may be more willingness to accept the operating expenses.

4. **Los Padillas Elementary School Should Seek Outside Support**

The LPWS Program has become too much for Los Padillas Administration to manage alone. In light of the many pressures and demands that a school principal and staff must handle on a daily basis; promoting a program even as worthy as the LPWS can be extremely difficult. In recent years it seems as though this issue has become even more critical.
B. Memorial Middle School Horticulture Program – Case Study

The Memorial Middle School Agriculture Science Center program is discussed in this section in order to analyze a similar environmental, place-based educational program in New Mexico, that has successfully gained support from outside sources and has allowed the program to thrive. Of particular interest is the program’s ability to secure reoccurring funding for full time teaching staff, continued facility improvements, and educational programming. This section includes an overview of the MMSASC program including its administration, funding, partners, and curriculum. The intent of this case study is to provide Los Padillas with a successful model that can be replicated.

Memorial Middle School (MMS) is located in Las Vegas, New Mexico within the Las Vegas City School District. The MMSASC program is the product of a joint partnership between the Las Vegas City Schools and New Mexico State University (NMSU). The science center is a participatory learning and experiential education program that can be integrated across core curriculums. Similar to Los Padillas, this program is a participatory learning site that is intimately connected to the local Hispanic traditions deeply rooted in agricultural practices. The MMSASC mission is to “develop a teaching and learning model of excellence for agriculture and natural resource sciences that complements in-class instruction by providing context to content through hands-on learning opportunities” (P. Skelton and T. Dormody). The five-acre science center was established in 2005 through a special legislative appropriation and became operational in
2006. It is primarily a horticulture- and ecology-based science program that focuses on participatory and experimental education. The horticulture program is administered by Dr. Peter Skelton, a faculty member of NMSU, through the Cooperative Extension Service Agricultural Experiment Station program.

The purpose of the NMSU Cooperative Extension Service program is to provide New Mexico communities with educational programs delivered at the county, area, and state level. Dr. Skelton has a background in agro-forestry with a Masters degree in Agriculture Extension from NMSU and a PhD from The University of Nebraska in Natural Resources Sciences. Dr. Skelton was hired by NMSU in 2005 to administer this program and to function as the program educator. Dr. Skelton is responsible for educational programming, grant writing, and is also responsible for academic contributions including data collection for measuring the program’s impacts on student learning within the school. Dr. Skelton’s interest in agriculture stems from his family’s history of farming in southwest Texas. His family still farms in El Paso, where they have done so for over a century.

The program was born out of a conversation held by a local state representative, Senator Pete Campos, who is also a prominent educator within Las Vegas, and the NMSU Dean at the time, Paul Gutierrez. Senator Campos wanted to develop a program that reflected the history of the area and also provided the agricultural focus of NMSU. Memorial Middle School was the logical location for the horticulture program. It is located on the northern end of the city and is surrounded by agricultural fields and acequias to the east and west of the school. NMSU Extension College focuses on creating
relationships with rural, under-served communities in the areas of agriculture and community outreach. The City of Las Vegas was a logical location for the Agricultural Science Center; in that it is rich in agricultural heritage and is generally an economically challenged and underserved community. The MMS student population is 89 percent Hispanic; 66 percent are economically disadvantaged; and 27 percent are considered special needs students.

In developing the MMSASC program, Dr. Skelton worked with school staff to identify three primary areas in which their students needed academic improvement: understanding of the scientific method, general knowledge of agriculture and natural resources, and investigative opportunities and thought. Together they have used the MMSASC program to develop instruction and project-based learning components to address these three content areas. Experiential learning is a significant component of instruction. They focus on learning through direct experience. MMSASC draws upon unique programming, facilities, and relationships with NMSU staff to deliver meaningful learning opportunities for students.

The school has constructed a green house that contains a small room for storage and a white board for instruction. Students can grow plants year around which allows teachers the opportunity to integrate horticulture into their instruction throughout the academic term. The green house has two cisterns as well as the school’s larger concrete cistern, which are all used for outdoor watering. They also provide

Photograph 24. Plants grown by students in the MMSASC green house
educational benefits in demonstrating water catchment for students. The facility also has solar panels which provide electricity for the buildings. The plants that are grown in the greenhouse are currently donated to local projects or planted on school grounds.

San Miguel County is in the process of creating a pedestrian and bicycle trail adjacent to the school. There are plans to utilize plants grown by students for landscaping along the trail. The intent of the school and county is to have students assist with the planting and maintenance of the landscaping in order to increase their ownership of the trail and further create a link between the school and community. In the future, the school may consider selling plants in order to raise funds to supplement program costs or for infrastructure improvements. The school has not pursued the sale of plants due to restrictions placed on public schools. In order to sale plants grown by students there would need to be a separate entity such as a non-profit organization that could be responsible for plant sales and overall fundraising for the program.

To the east of the greenhouse, a nature trail has been constructed by community volunteers, including a local nonprofit organization called New Mexico Volunteers for the Outdoors. The school received a $5,000 grant from Comcast which provided the financial backing to get the project started. The school also received additional donated construction materials from local businesses. The trail meanders through an open field that is divided by a riparian area created by an acequia, which also provides opportunities for water ecology studies. Dr. Skelton has
plans to construct an outdoor classroom for student instruction within the nature trail area.

The school has *acequia* water rights which are essential for the agricultural projects. There are two farming projects located on the school grounds including row crop farming on a third of an acre plot of land as well as a fruit orchard located on one and a half acres. The students grow various types of produce which is donated to local food banks. This project provides students the opportunity to engage in the historic practice of farming including irrigation of the fields and caring for their crops. To date, students have not been involved in the community’s annual cleaning of the *acequias*, which is a traditional activity practiced in Hispanic communities around New Mexico. In the future, Dr. Skelton would like to see students engaging in this traditional practice as stewards of this important resource. The intent is to work this into a social studies curriculum that is taught by one of the school’s teachers on *acequia* culture. MMS has also integrated a community service component, as they donate produce to local food banks. This allows students can see their hard work benefit those in need within the area.
MMS has recently expanded the agriculture program to include an alternative energy project. Dr. Skelton has plans to make MMS an alternative energy educational demonstration site. In May, 2008 MMSASC connected the school’s greenhouse solar panel to the Public Service Company of New Mexico’s grid in an attempt to give students the opportunity to see other alternative energy sources work. Dr. Skelton is interested in teaching students about sustainability and renewable energy and plans to have 100 percent of the energy used in the greenhouse produced by sustainable means. Currently the solar panel produces 750 watts of electricity for the greenhouse. The Center has smaller solar panels that run water pumps from the schools rainwater recycling system. The school will soon be installing wind turbines to further expand their renewable energy efforts.

**Curriculum Development**

Dr. Skelton works with MMS teachers to identify curriculum needs and then develops lessons that can be integrated into the science center. He works as the catalyst for inquiry instruction and then partners with other teachers. This collaborative teaching approach is voluntary and has resulted in interdisciplinary teaching.

**Memorial Middle School Agricultural Science Center Successes**

Memorial Middle School’s education efforts have been successful in administering a well funded and supported program because of strong relationships with
community organizations, NMSU, as well as because of the support of local elected
leaders. The school has had the perfect mix of community support, committed school
educators, influential partners, as well as an ideal school campus which provides access
to water resources and open space. The program was further supported by an agricultural
community. Its balance of support and partners has made this program successful. It
continues to develop and improve as infrastructure is added and the curriculum is
expanded. The MMSASC also plays a role in professional development by providing
workshops for teachers from the Northern New Mexico School Network, which
represents 23 school districts in New Mexico in agricultural and natural resources science
areas. It is an obvious model for other place-based education programs.

Local Leaders and Outside Support

An integral component of this program is the role of Dr. Skelton as the program
administrator and educator. He has provided a higher level of knowledge in the science
content area and is able to focus exclusively on the horticulture program. Dr. Skelton has
remained an NMSU employee and therefore is not required to take on additional roles as
determined by the Las Vegas City School District. The program administrator and
educator position is essential to the success of the program. Dr. Skelton has been able to
be an advocate for the program and focus on bringing attention to the value that the
program brings to learning at MMS. He has also proven to be successful in linking to the
surrounding community. He has lived in Las Vegas for 4 years and has become an active
member of the community.

Relationships with local nonprofits, foundations, environmental and social service
organizations, and governmental entities, such as Tierra Monte Soil and Water
Conservation District have been invaluable to the success of the program. Through many of these partnerships MMS has been able to expand the facility and improve the agriculture infrastructure. In addition, the MMSASC has received positive press coverage by local and regional media outlets. This visibility has allowed the program to receive attention, further identify potential partners, access additional funding, and ensure continued support from the school district as well as elected officials.

Gaining Support of Elected Officials

This program is the result of a combined effort of two individuals, Senator Campos and Paul Gutierrez, that not only offered community influence but also who have the ability to provide financial support. Senator Campos is currently the superintendent of Las Vegas City Schools and has had a long career as an educational administrator within Las Vegas. As a state senator he has the ability to provide annual capital funds to the school for infrastructure and capital purchases through the state legislature.

MMSASC Program Funding

The MMSASC’s primary funding source is through the New Mexico State Legislature General Fund. NMSU Cooperative Extension Services receives $50,000 as reoccurring funds that pay for a professional staff position for the Agricultural Science Center. Dr. Skelton has successfully written and been awarded over $130,000 in grant funding. Grant writing is one of Dr. Skelton’s main roles as administrator of the program.

In addition to the General Fund appropriation, MMSASC has received legislative funds sponsored by Senator Pete Campos for capital purchases. As part of Dr. Skelton’s position he is required to apply for additional grants to supplement the program funding. The MMSASC program has received $40,000 a year for three years from the New
Mexico Public Education Department Service Learning Program. The Service Learning grants are provided to assist in developing high quality service learning programs in elementary and secondary schools that provide youth with opportunities to learn and develop skills through service learning applications. MMS uses the greenhouse to engage students in service learning activities that fosters respect for the natural environment, promotes community service, and enriches their academic experience (NMSU, 2009). Through the agricultural program, MMS offers the produce they grow in their school orchard, crop farming and greenhouse to local food banks.

MMSASC has been awarded monies from the Los Alamos National Laboratory (LANL) Foundation, which was created to enhance the vitality of the region by investing in education, learning and community development. Since 1998 the LANL Foundation has provided over $26 million in 1,600 grants for schools, nonprofit organizations, local governments and Pueblo and Tribal communities. The Foundation supports organizations addressing critical public education needs in the areas of science, technology, engineering and mathematics (STEM), including teacher and curriculum enhancement, educational technology and student support. In 2007 MMSASC received $2,843.39 to purchase educational wind turbine kits to teach students about alternative energy systems.

MMSASC has also received one time grants of $200 from programs such as the Healthy Sprout Award for gardening supplies. This program provides funds for projects that teach about nutrition and hunger issues in the United States.

**Partnership with New Mexico State University**

The involvement of New Mexico State University has also been vital to the success of the program. The University has provided a faculty person, which has moved
to Las Vegas and is dedicated to the educational programming. With assistance from legislative funding, NMSU pays for Dr. Skelton’s salary and also provides a continual link to a higher education institution, which offers an invaluable technical resource that is hugely beneficial to MMS teachers. For grade school teachers, it can be challenging to provide the technical instruction to make an environmental education program successful. Science education especially the specialized field of horticulture is a content area that many teachers are intimidated and unequipped to tackle on their own. As seen at Los Padillas, teachers can feel overwhelmed and unprepared to teach higher level science content. NMSU is the state’s land grant university, and as such, is the leading educational institution for agriculture, business, engineering, health sciences, and home economics, as well as educational programs in liberal arts and natural sciences. This land grant mission makes the school an ideal partner for Memorial Middle School. Dr. Skelton’s role as program administrator is defined by NMSU. His main responsibilities include curriculum development and educational programming, grant writing, and contributions to peer review publications. Dr. Skelton is accountable to the Las Vegas School District based on the instruction that occurs at the school as well as through the curriculum collaboration with teachers.

*Tapping into the Community History and Knowledge*

Developing a horticulture program at MMS was ideal as it reflects the community that the school serves. As a farming-community the infrastructure that was needed to build the program, such as *acequias*, was already in place. By creating a program that is reflective of the area’s culture and history, the school is able to tap into the knowledge of the residents. It creates an opportunity to involve parents and community into student
learning. The people of the community offer a valued knowledge base which the school reaffirms by acknowledging this expertise as it is integrated it into the school’s curriculum. Many schools struggle to find ways to get parents involved in school activities. By integrating agriculture into the school curriculum, MMS hopes to gain more parent involvement in the future.

**MMS Agriculture Science Center Program Challenges**

The program would benefit from strengthening relationships with the Las Vegas City School District. The autonomy of MMSASC allows flexibility in program development but it has also created a disconnect between the program and school district. NMSU, as the administrating entity, is responsible for providing oversight for the MMSASC programming, funding and staffing. The flexibility that NMSU has offered MMS in the development of the program has allowed for quick start-up and integration into the school. Similar to the LPWS’ experience as an independent program, increased guidance and involvement from NMSU could offer Dr. Skelton more direction, a clearer definition of objectives, and reassurance with the educational approach and overall program planning. According to Dr. Skelton, some of the bureaucratic processes for procurement through NMSU have been a challenge, at times creating long delays in the purchasing of educational materials and equipment for the school.

To date, there have not been significant efforts at encouraging parent involvement in the Agriculture Science Center due primarily to a lack of staffing. With additional staffing, the intent is to work on coordinating parent volunteer networks.

**Measuring Academic Achievement**
In the near future the NMSU Agricultural Experiment Station will begin studying the impacts that the MMSASC program has on teaching and learning. They will be conducting research to determine if the MMSASC model makes a difference over a traditional educational approach. NMSU, Las Vegas City Schools, and West Las Vegas School district are cooperating on a four-year quasi-experimental study to compare science achievement, agricultural, food and natural resources (AFNR) achievement, leadership life skills development, and career interests between students participating in MMSASC learning activities for three years of middle school and students at a control middle school who receive their instruction without the agricultural science center enhancements. This research is expected to show if the program truly makes a difference in student learning and career choice. Los Padillas nor APS have conducted similar research related to the impact the LPWS program has had on student learning, however Los Padillas has seen notable increases in science test scores during years that a Natural Teacher is present at the school.

**MMSASC Lessons Learned**

The MMSASC and LPWS programs have demonstrated success in their ability to impact student learning and have proven to be assets to their school and community. The LPWS program has been in place for almost two decades and has experienced highs and lows in the program’s success. Since the MMSASC program was developed in 2005, it has continued to grow each year, adding new infrastructure and expanding curriculum, staffing and grant funding. The most critical area in which these programs differ is their ability to acquire reoccurring funding for a full time educator/program administrator. Los Padillas has struggled to fund the Naturalist Teacher position since the program was
established in 1993. The school has pulled funding from other deserving programs, such as Title I Reading, and has been successful in receiving grant funding, however the school continually struggled to identify reliable funding. This is the LPWS program’s most significant challenge. One major distinction between the two programs is the length of time they have been operating. Similar to the MMASAC program, the LPWS has seen times in which it was successful in receiving funding, media attention and support. A key difference is MMASAC’s ability to receive a reliable reoccurring funding source and permanent teaching staff. In fact, the program is expanding their teaching staff, with plans to hire additional personnel.

The MMSASC program has overcome this issue through its relationship with NMSU. The University has worked with area legislators to secure funding through the state legislature as well as through private grants. Despite the state’s current financial constraints, the program has been able to rely on NMSU to ensure funding is in place. There is much to be gained from following the MMSASC model. Los Padillas must find a way to acquire reoccurring funding for the Naturalist Position, as demonstrated by MMSASC, partnerships with entities such as NMSU can provide the support and resources to make this happen.

The LPWS has a rich and inspiring history. It is a unique facility and educational model that celebrates the community’s environmental and social history. The varying levels of participation and support can be attributed to identifiable factors such as APS and school administration, school staffing especially the presence of a Naturalist Teacher, outside support and partnerships from educators and science professionals, educational training and professional development, funding and community involvement and buy-in.
These factors together are essential to making the LPWS program sustainable.
Chapter Five

Recommendations

LPWS Program Recommendations

- The role of a full time Naturalist Teacher is imperative to the program’s success. This position must be staffed with the right educator that is driven to uphold the vision of the program and ideally that is from the community or has understanding and appreciation of the history and culture of the area.

- Supportive school administration is necessary to the success of the LPWS program. The principal must champion the program and make every effort to advocate for the LPWS. This includes supporting programming, professional development, and teacher recruitment as well as retention of experienced teachers capable of place-based, outdoor education.

- The community of Los Padillas needs to reclaim their influence and investment in the program. This can be achieved through their participation on the LPWS Advisory Board, establishing an events calendar to include community-based lectures and lessons, and through the development of a community entrance.

- The school and LPWS Advisory Board must look for other opportunities for funding and support. This may require the board acquiring the 501(c)(3) nonprofit organization status in order to engage in fund raising activities.

- Los Padillas may want to investigate the possibility of designating the school as a science and traditional arts magnet school in order to assist with teacher recruitment and funding.

- The school staff and administration should dedicate time to identifying barriers for usage and then address them at the school level so that teachers will be encouraged to incorporate the LPWS into their classrooms. The staff may also need to redefine the vision for the LPWS program in order to obtain by-in.

- The school needs to pursue professional development for teachers in programs such as SCIMAST or the UNM Teacher Science Academies in order to empower teachers with science-based knowledge.

- Los Padillas needs to develop a strong relationship with UNM and NMSU in order to recruit Science and Bilingual endorsed teachers.

- When developing the program’s vision it is important to involve children. Students should be involved in as many aspects of the LPWS program as possible including the LPWS Advisory Board as well as in education.

- The support that Los Padillas has received from their state legislators has been critical to securing funding for capital and infrastructure funding. The school needs to ensure that they have strong relationships with their state legislators and encourage them to act as advocates for the program.
• The composition of the Board is important as it should represent organizations and stakeholder groups that not only have an investment in the school and community, but should also involve individuals that are able to provide resources and access to funding and other opportunities that are not typically available to schools.

• In order for the program to have community buy-in and support it is essential to have local representation on the LPWS Advisory Board.

• In order to enrich the LPWS program and insure that it incorporates social studies, environmental science, literature, and culture in a meaningful way, it is imperative to integrate the community into the curriculum. The LPWS should function as a model for cultural preservation and South Valley identity.

• Los Padillas should base their curriculum and educational programming in NAAEE standards, a nationally proven approach to environmental education.

• Identify environmental programming and initiative such as Smart By Nature: Schooling for Sustainability that can act as a guide for the LPWS program.

• There is a need for experiential learning especially with a multilingual population. The LPWS is an ideal facility for teaching content to second language learners.

• Los Padillas Elementary School needs to make place based learning a priority in a way that integrates it into every classroom.

Role of the Naturalist Teacher/Program Administrator

The role of a full time Naturalist Teacher is imperative to the program’s success. The teacher/administrator not only provides instruction, professional development, and content expertise, this person also works as the advocate, speaking on behalf of the value that the program brings to learning. In order for the LPWS to be successful it is necessary to have this position permanently funded and integrated into the program.

Over the years we have witnessed the impact of not having this position staffed, the program suffers, participating declines and it essentially becomes defunct. It is unlikely that APS will never have the capability or interest to permanently staff this position. As a result, the Los Padillas Principal and LPWS Advisory Board must look for other opportunities for funding and support. The logical partners are NMSU and UNM with additional support from legislators and private foundations and grants. Higher
education institutions are more likely to see the value in environmental and place-based education. Educational research supports this type of programming making it less necessary to convince universities to support these efforts. It seems as though a program such as the NMSU Cooperative Extension program and its focus on community outreach and environmental education is a logical partnership. Like with the MMSASC program, NMSU can offer a full time educator/administrator and can provide curriculum and science content expertise. Regardless of the avenue that the school and advisory committee choose to pursue for identifying funding for the Naturalist Teacher, it is imperative that this position be staffed with the right educator that is driven to uphold the vision of the program.

The NMSU Agricultural Science Center (ASC) located in Los Lunas is another potential partner for Los Padillas. The ASC conducts research for agronomic and horticultural crops native to the area. Located on over 200 irrigated acres, four miles south of Los Lunas, the ASC evaluates crop performance, crop adaptability, and related cultural practices such as irrigation, pest management, plant growth, and regulation and propagation techniques. Also located at the ASC facility is the USDA-NRCS Plant Materials Center (PMC). This division of ASC's operation addresses high-priority conservation problems. Some of the uses for the plants developed by the PMC include rangeland improvements, reducing cropland erosion, wildlife habitat improvement plantings, and stabilization of critical areas that include surface-mined lands, highway slopes, gullies, and windbreaks (NMSU, 2008). The inclusion of agricultural programs including crops farming and greenhouses could allow the LPWS program to assist with
growing plants for various land conservation and restoration projects throughout the region.

*School Leadership*

The role of the principal is also critical to the success of the program. In looking at the history of the LPWS program the school principal has always played a significant role in how the LPWS is incorporated into the school and community. Principals have brought the LPWS programming to the forefront making every effort to identify funding and also provide the necessary support for teachers to integrate the LPWS into classroom instruction. They have also deemphasized science instruction which has worked as a deterrent to the program.

The principal, as the leader of the school, sets the tone and direction for the school and can also act as gatekeepers, by controlling access to educational or professional development or by changing the school’s educational focus. In order for Los Padillas to successfully adopt and implement a place-based environmental science program, the school principal must champion the program.

*Curriculum development*

Los Padillas Elementary School needs to make place-based learning a priority and integrate it into every classroom. Instruction at Los Padillas needs to honor the experiences and knowledge that children bring to the classroom. The community has a very deep connection to the land, which should be tied back into the educational content. People of all ages are inspired by their environment, whether it’s natural or otherwise.

Experiential learning is especially important with multilingual students; the LPWS is an ideal facility for teaching content to second language learners. This could be
achieved by establishing a more integrated bilingual education approach to LPWS curriculum. Experiential learning can be the key for this population as it provides an opportunity for students to relate to content in a tangible way.

**Community and student involvement**

LPWS grew out of a dynamic and cooperative effort. It took the involvement of many, including school staff, students, administration, elected officials, and community members in order for the LPWS to come to fruition. At the time LPWS was established, community involvement was at an all time high. Today, community and student involvement has declined. They do not feel connected nor show ownership of the program.

The core of the program is invested in the community’s unique history and culture. This becomes the content for incorporating social studies, environmental science, literature, and culture. Otherwise the program simply functions as an environmental science facility. The school needs to develop a model for teaching that is directly tied to the community. The school can actively work to engage the community of Los Padillas by implementing the following strategies:

- Ensure that the LPWS Advisory Board involves community members so that programming represents community concerns and interests. In the 1960s the Community Improvement Association used Los Padillas Elementary School to highlight issues and efforts and to foster community pride by integrating community events such as the 4th of July Fiestas. The LPWS originated through shared efforts of the school and community, this shared relationship should be celebrated and encouraged. This program needs to integrate the community,
history and traditions into the curriculum and administration of the program in as many ways as possible, including participation on the LPWS Advisory Board. It is important to develop this community model first.

- Create a community entrance gate. This will not only encourage use, it is also symbolic and reinforces that the facility is a community resource.
- Establish community docents and caretakers and engage students through service learning projects.
- Establish an annual calendar for the LPWS that sets the activities and events for the year. Events that should be included are:
  - Facility maintenance schedule
  - Community clean-up days in the spring and fall
  - Weekend and evening educational events in the LPWS i.e. star gazing parties, agricultural and water quality workshops, etc.
  - Community art classes
  - Tap into the community history, culture and people and highlight it throughout the year through LPWS events, lectures, and curriculum
  - Establish an annual LPWS celebration to continue public relations and networking for the program and also recognize community members, outside partners, teachers, students, parents, business, and elected officials that have played a part in the program’s successes each year.

**LPWS Advisory Board**

The LPWS Advisory Board offers an important support network and partnership opportunities for the program. The Advisory Board was established in 2008 and includes
members representing school staff, community members, UNM faculty, science professionals, Explora Children’s Museum, and elected officials. The composition of this Board is important as it should represent organizations and stakeholder groups that not only have an investment in the school and community, but also involves individuals that are able to provide resources and access to funding and other opportunities that typically aren’t available to the school. In order for the program to have community buy-in and support it is essential to have local representation on the board.

Ideally the LPWS Board should have representation from the following stakeholder groups: Los Padillas community members, parents, youth, school staff and principal, and members of the greater Albuquerque community. This greater Albuquerque community can include UNM, NMSU, Central New Mexico Community College, New Mexico Natural History Museum, Explora Children’s Museum, science professionals, members of the fine arts community, Bernalillo County Open Space, Rio Grande Nature Center, and non-profit organizations such as the Albuquerque Wilderness Alliance. It is also beneficial to have elected officials represented on the Board even as affiliate members. The support that Los Padillas has received from their state legislators has been critical to the programs success. Senator Linda Lopez has served as an active member of the LPWS Board and has provided not only access to legislative funding but has also provided a link to other organizations and projects within the South Valley that Los Padillas may partner with in the future. Representative Kiki Saavedra, has also been an advocate for the program and has provided much needed funding over the years. Los Padillas along with the Advisory Board need to work together on a public relations effort for the LPWS in order to seek out additional support, partnership, and funding for the
program. There needs to be a coordinated effort to inform people of the significance of the program.

**Overcoming Barriers to LPWS Program Participation**

Los Padillas needs to develop a strong relationship with UNM in order to recruit Science and Bilingual endorsed teachers. The intent is to attract teachers that are comfortable teaching hands-on science based content.

The lack of use of the LPWS facility is a real issue that must be addressed. One of the first tasks the school must take on is to identify why this is occurring. The school staff and administration should dedicate time to identifying barriers for usage and then address them at the school level so that teachers will be encouraged to incorporate the LPWS into their classrooms. The staff may also need to redefine the vision for the LPWS program in order to obtain by-in.

According to responses received from interviewees, usage of the LPWS was much higher when there was science and place-based professional development for teachers. The school needs to pursue professional development for teachers in programs such as SCIMAST or the UNM Teacher Science Academies in order to empower teachers with science-based professional knowledge. Allowing teachers to develop professionally results in increased confidence in their abilities and establishes support systems among teachers. Providing this support for teachers allows them to assert themselves in a positive way to address the kind of education that needs to be taking place in their classrooms. This would further be supported by reestablishing the Ecology Committee. This committee can also assist with the professional development and teacher usage issues and can further enable teacher leadership within the school. The Advisory
Board should ultimately support the efforts of the school and work collaboratively with the Ecology Committee to establish the long range planning and vision of the LPWS program.

The school may also want to investigate the possibility of designating Los Padillas as a science and traditional arts magnet school. This designation could position the school to attract more resources for the LPWS program and to integrate innovative educational curriculums. In addition, this designation could also help in recruiting teachers that are supportive and skillful bilingual, environmental and place-based educators. It is important to re-examine the program and identify its purpose and function before a magnet school designation is established, so that the identity of direction of the school and LPWS program is clearly established through a combined effort among school staff, students, community members and the Advisory Board.

Another option available to the school is to pursue shared management of the LPWS. This could be a cooperative relationship with APS, Bernalillo County Open Space, or NMSU in order to garner the support for long-term funding as well as programmatic and curriculum support.
Conclusions

The Significance of Environmental Education

Los Padillas cannot afford to ignore the current situation facing the LPWS program related to lack of use, funding, and overall interest and support. With the recent decision to disconnect the constructed wetlands from the school’s wastewater system, APS has further separated itself from the facility. At a time when national education efforts are focused on test scores and prepackaged curriculums, it is even more important to support programs that create educational success and foster not only a love for learning but also a connection to place and the natural world. The greater South Valley community has many socio-economic challenges that are reflected in low test scores and high drop out rates. The LPWS provides an opportunity to celebrate the community’s strengths and to offer educational experiences that are meaningful and that help to cultivate children that are thoughtful and compassionate; and are knowledgeable of the dynamic world around them.

Human ecology includes both social and environmental sustainability. Students are not having experiences that will reinforce environmental or cultural sustainability. The South Valley is facing issues of urban sprawl and gentrification and loss of open space. LPWS provides the mechanism to taking relevant community issues and integrating them into classroom education. The LPWS can further support cultural preservation and South Valley identity.

Studies have shown that environmental education and place-based learning contributes to innovative and meaningful education, particularly within minority communities. It also demonstrates how important it is to support an educational program
that facilitates children’s contact with nature. Today’s children have developed what has been referred to as a “nature-deficit disorder” due to their limited interaction with the outdoors. Studies have shown that this nature deficiency has hindered the development of children’s physical and emotional health. Exposure to nature has even shown to reduce the symptoms of Attention Deficit Hyperactivity Disorder (ADHD), and can also improve a child’s cognitive abilities as well as their ability to deal with stress and depression (Louv, 2005).

As our communities are developed and improved to incorporate many modern day conveniences and as children spend the majority of their waking time indoors plugged into technological devices, there are fewer and fewer opportunities for children to engage in outdoor activities. Scientific studies continue to provide the data that shows the negative impacts that this has on children. In order to undo this deficiency we must look for opportunities in our communities, schools, and homes to bring back outdoor experiences and to regain this important connection to the natural world and communities.

The authors of a study by the National Environmental Education Foundation estimate that only 1-2 percent of Americans can be considered environmentally literate. They found that the average American adult, regardless of age, income, or level of education, mostly fails to grasp essential aspects of environmental science.

David Orr, one of the nation’s leading environmental educators and professor and chair of the Environmental Studies Program at Oberlin College, asks us to recognize that the ecological crisis is in every way a crisis of education because, he contends, all education is environmental education. David Orr believes in education that values
students, teachers, the curriculum and the school itself as interconnected parts of the learning process. Orr is part of a growing, world-wide eco-schools movement that views the world as the optimal learning environment. Whether tending a school garden, designing a neighborhood recycling program or restoring local habitat, students learn in a setting where they can see the effects of human actions – and learn that their actions matter. The teachers who are part of this movement have shown that when education is rooted in a deep knowledge of place and students understand the ecology of that place, natural responses naturally occur.

The “nature-deficit disorder” phenomenon is concerning and something that shouldn’t be taken lightly. As Alfred North Whitehead, described “the goal of education is to help young people fall in love with the world. In our case it’s fall in love with the natural world. And that’s not something that happens from as he called it third-handed book learning. It happens in direct contact with the world.” David Orr believes that education should value students, teachers, the curriculum and the school itself as interconnected parts of the learning process. This is a philosophy that we should all hold to be true, it is what we should model all educational programs after, it is what the LPWS could provide for Los Padillas if it is fully supported and integrated into the school’s educational model.

The Center for Ecoliteracy in Berkeley, California defines a sustainable community as “one that is able to satisfy its needs and aspirations without diminishing the chances of future generations.” After more than a decade of leadership in the eco-schools movement, the Center launched another innovative education initiative it’s called Smart By Nature: Schooling for Sustainability. The aim of the program is to inspire,
inform and support K-12 educators and parents who are helping young people gain the knowledge, skills, and values essential to meeting the challenges of sustainable living. Los Padillas has an opportunity through the LPWS program to create curriculum that supports these principles and to offer educational lessons that facilitate schooling for sustainability. Los Padillas should utilize the North American Association for Environmental Education (NAAEE) standards to define the school’s environmental education philosophy. Since 1971, NAAEE has been actively promoting quality environmental education and supporting the work of environmental educators. NAAEE believes that such education must go beyond consciousness-raising about major environmental issues, and prepare people to think together about the difficult decisions they have to make in terms of serious environmental stewardship. The NAAEE standards will provide guidance and will allow Los Padillas to base their curriculum and educational programming in a nationally proven approach to environmental education.

Providing educational relevance is important as the school seeks to garner support. Every student has some science they’re fascinated by, the LPWS can be used as the hook to excite students. This approach will take a student who has no interest at all in coming to school to being engaged and eager to learn.

There are many successful environmental science and place-based educational models that Los Padillas should utilize as the program moves forward. The community has through their own efforts created a unique educational program that has proven to have a significant impact on the quality of education available to students and that celebrates their community, culture and way of life.
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