

Hawks Aloft, Inc. Education Programs: Annual Report 2009-2010



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EXECUTIVE SUMMARY

A key education objective at Hawks Aloft is to instill an appreciation for the environment and birds of prey among the public of New Mexico. We achieve this through corporate education, public outreach events and school programs. Our education programs encourage critical thinking and promote positive attitudes about the conservation and protection of natural resources. During the 2009-2010 school year, we offered two established programs for young people: *Living with the Landscape: Building a Future for Communities and Wildlife (LWL)* and the *Birds of Prey (BOP)* program. We also offered a new program aimed at younger children called *Reading with Raptors (RWR)*. A particularly innovative feature of these programs is that they involve live raptors to enhance the learning experience. These programs are funded by grants and private sources. Our grant funded programs focus on low-income, rural, or ethnically diverse school districts.

This report details school programs and public outreach for the 2009-2010 school year. Between August 2009 and August 2010, Hawks Aloft presented 156 programs to approximately 41,000 individuals. Grant funding enabled us to deliver 56 of these programs, reaching seven Title 1 schools and over 1,500 students across New Mexico. The LWL Program was received by seven classrooms and reached over 300 students in multiple program visits and field trips. The grant-funded Birds of Prey Program was presented to 28 classrooms and reached over 1,000 students through this single-visit program. We conducted 48 privately funded Birds of Prey programs, 4 privately funded Reading with Raptor programs and 18 private programs for adults, reaching a total of 3309 people. Hawks Aloft participated in 26 community outreach events that reached an estimated 34,000 people.

INTRODUCTION

Hawks Aloft, Inc. is a New Mexico based, non-profit organization dedicated to the conservation of indigenous wild birds and their habitats through research, education and cooperation with others. Our education and outreach programs, featuring non-releasable raptors, reach adults and children throughout New Mexico and into southern Colorado and eastern Arizona. Our avian ambassador hawks, falcons, and owls, help foster an appreciation of wildlife and environmental conservation. Hawks Aloft's programs reach a variety of audiences including the general public, corporate audiences and youth. Much of our focus is on K-12 students, particularly those in rural schools, low-income areas, or districts with below average academic achievement. With grant funds, we strive to deliver quality, engaging life science and conservation education to schools that would not normally have the resources for such programs.

During the 2009-2010 school year, we delivered three main categories of programs: grant-funded, privately funded, and public outreach. Grant-funded programs included our multiple visit *Living with the Landscape (LWL)* program, the single visit *Birds of Prey (BOP)* program and the single visit *Reading with Raptors (RWR)*. *LWL* was funded by Albuquerque Community Foundation, the New Mexico Department of Game and Fish Share with Wildlife Program, and the Middle Rio Grande Conservancy District through the Collaborative Forest Restoration Program. *BOP* and *RWR* programs were funded by Albuquerque Community Foundation, Hansen's Natural Beverage Company and the Middle Rio Grande Conservancy District through the Collaborative Forest Restoration Program. We delivered privately funded *BOP* and *RWR* programs to schools that did not qualify for low-income status and to youth and adult groups as requested. We also provided public outreach programs at special events and conferences in order to reach a broad spectrum of New Mexico's population. This report focuses on school programs and public outreach for the 2009-2010 school year.

Hawks Aloft's Educational Programs

In the 2009-2010 school year, Hawks Aloft delivered two established programs throughout New Mexico: *Living with the Landscape* and the *Birds of Prey* program. We introduced a new

program called *Reading with Raptors*, geared toward pre-school students. We also participated in numerous privately funded programs and community outreach events on an *ad-hoc* basis.

To accommodate different learning styles, we employ a combination of teaching methods, including a hands-on, interactive approach to learning through a variety of games and activities. We have found that the opportunity for personal interaction with our educational raptors results in a greater appreciation of birds, wildlife, and the environment. These methods can be used to illustrate a range of environmental issues, but also effectively underscore the importance of personal responsibility even for young people in the conservation of their environment.

Living with the Landscape

Living with the Landscape is a multiple visit program that commences in the fall and continues throughout the school year. It is designed to teach students about the importance of conserving the environment and focuses on the benefits to both humans and wildlife. Live, non-releasable birds of prey act as teaching tools to introduce students to ecological concepts. Field trips to local natural areas allow them to experience and observe those concepts first-hand. Although the program was designed specifically for rural populations, it is now offered to both rural and urban schools in New Mexico and has primarily served schools in low-income communities.

Birds of Prey

The Birds of Prey grant-funded, single-visit program is aimed at all grade levels. Privately funded Birds of Prey programs are conducted statewide. The majority of these programs occur within Albuquerque but also in rural regions of the state. The content of the visit is flexible and is tailored to the specific needs of the teacher. Topics usually include raptor behavior and biology, general conservation, and ecology. Two live raptors are presented as part of each program.

Reading with Raptors

The Reading with Raptors single-visit program implemented this year is aimed at younger children from preschool through first grade. Reading with Raptors programs are conducted in the Albuquerque area and other regions of the state as requested. The content of the visit consists of a reading of a book (usually *Owl Babies* by Martin Waddell) accompanied by interactive puppets. One or two live raptors are also presented and basic bird and raptor facts are discussed. The interactive Build a Raptor game is used to teach correct anatomical names for basic body parts.

Community Outreach

Hawks Aloft provides *ad-hoc* outreach events throughout the year. These typically involve educating large groups of individuals about birds, wildlife, and conservation issues. Education occurs through exposure to our avian ambassadors and personal interaction with Hawks Aloft educators and trained volunteers. Such events reach a wide variety of people in a short period of time.

METHODS

Each program was conducted by a Hawks Aloft educator, sometimes assisted by trained volunteers. All programs followed a pre-determined outline, presenting broadly similar topics, but were tailored to meet the needs of each classroom. Standard features for each program included the presentation of two educational raptors, discussion sessions, technical vocabulary, and a range of hands-on activities presented in a manner appropriate to the audience. The key features of each program are presented in Table 1.

Table 1: Key features of the education programs offered by Hawks Aloft.

Program	Topics	Target audience	Delivery Method
Living With the Landscape	Environmental conservation & wildlife ecology	4 th and 5 th grade, focus on low-income urban and rural schools	6 visits: 3 classroom, 1 field trip, 1 conservation project, 1 family night
Birds of Prey Program	Raptor biology, adaptations; broad conservation issues	All ages from pre-kindergarten to high school, focus on low-income schools	1 classroom visit, usually one-two hours
Reading with Raptor Program	Basic bird and raptor biology and adaptations	Pre-kindergarten to first grade	1 classroom visit, usually one half hour to one hour.
Privately-funded Programs	As requested	As requested	As requested
Community Outreach	As requested	As requested	As requested

Living with the Landscape (LWL) Program

School selection was based on the following: financial need for adequate environmental education programs, teacher commitment to program and proximity to other participating schools, National Wildlife Refuges, State Parks or other public and private natural areas.

Hawks Aloft educators prepared a pre-packet for teachers and students. This contained vocabulary, lesson outlines, and games designed to prepare students for the program and enhance the teacher’s existing science curriculum. The pre-packets were sent to each classroom teacher prior to the program, along with general and logistical information addressing frequently asked questions about avian ambassador visits.

Programs consisted of three classroom visits, one field trip, and one conservation project per classroom. For one school, a school-wide family night concluded the *LWL* program. Although specific activities varied slightly for each school, the *Living with the Landscape* program curriculum broadly consisted of the following.

First Visit – classroom session

Prior to the program, students completed a pre-assessment questionnaire that was used to evaluate baseline knowledge and attitudes toward wildlife. Discussion sessions during the first classroom visit introduced students to conservation issues and provided a basic starting point to learn ecological concepts. Topics included: an introduction to conservation, physical adaptations of raptors, adaptations of plants and animals to their environments, migration, and habitat. These discussions were followed by related interactive activities and games (Appendix A).

- Animal Tag - introducing animal adaptations
- Bird Bits - comparing the physical adaptations of raptors
- Dress as a Raptor - illustrating the physical adaptations of raptors and other predators
- Migration Migraine - introducing challenges encountered during migration and encouraging students to think about solutions to environmental problems

We presented two live raptors during the first visit. A Swainson's Hawk (*Buteo swainsoni*), was usually presented to illustrate migration and compliment the Migration Migraine activity, because Swainson's Hawks make the longest migration of any North American hawk. We also presented a small raptor (e.g. American Kestrel (*Falco sparverius*)) to illustrate the diversity among raptor species and introduce other concepts, such as habitat, that were covered in the second visit.

At the end of the first visit, the educator conducted a brainstorming session with the class to identify a class project to help conserve something of importance to them in their community. Often, the teacher conducted a second, more in depth session with the students before the educator's next visit.

Second Visit – classroom session

The second visit occurred approximately one month after the first visit. It began with a review of the concepts covered during the first visit. We addressed ecology-based concepts such as habitats and ecosystems, food chains and food webs, and bioaccumulation. Students also learned about

the ecosystem types found in New Mexico and the concepts “specialist” and “generalist” with regard to habitat and diet. Humans’ role in shaping habitats was explored more thoroughly during the second visit.

These interactive games and activities supported the discussion sessions (Appendix A).

- Habitat Mix-Up - placing New Mexico plants and animals in likely ecosystems
- Food Chain Frenzy - building food chains or food webs
- Food Chain Tag - illustrating energy flow and bioaccumulation
- Guess Who - understanding food chain and habitat terms
- Web of Life - demonstrating dependencies and connectivity within food webs

Two live raptors illustrated ecological concepts such as food chains, habitat preference, and environmental issues such as habitat loss and pesticide poisoning. A Peregrine Falcon (*Falco peregrinus*) was usually presented during this visit to both illustrate the concept of bioaccumulation and tell the story of the Peregrine’s recovery from DDT contamination--an example of how society can work toward solving environmental problems. A smaller raptor, often a Merlin (*Falco columbarius*) or Western Screech-Owl (*Megascops kennicotti*), was used to illustrate variation among raptors in size, diet, and habitat.

The class discussed the conservation project ideas generated during the first visit, and chose a project which was designed to benefit their community, the environment, and wildlife.

Third Visit – field trip

The third program visit typically occurred in March or April. Hawks Aloft educators took students on a field trip to experience first-hand what they learned in the classroom, putting theory into practice. During the field trip, students had the opportunity to observe specific habitat types, identify adaptations of plants and animals, learn about native and non-native species, and observe human impacts to ecosystems.

Students were given field journals to record the flora and fauna they observed while exploring the area, and a scavenger hunt sheet to help them find certain natural history features during a nature walk.

If time and location allowed, some classes participated in other activities (Appendix A). These included:

- Mouse and Owl - a game exploring predator/prey interactions
- Crystal Lake -an activity about the importance of water resources and human impacts
- Water quality monitoring

Fourth Visit – second field trip / conservation project

The fourth visit, typically in April or May, was another field trip to a National Monument, State Park, or other public, tribal and private natural area. This often was an opportunity for students to complete their classroom conservation project. Activities included: planting native trees and shrubs for habitat restoration, removing non-native species, removing litter, and creating schoolyard habitat (See Appendix D for additional projects).

When constraints on the teacher's classroom schedule or bus scheduling only allowed for one field trip, the conservation project was completed during a longer, single field trip.

Fifth Visit – final classroom session

The final program visit was conducted in May. Two live raptors were presented at this visit. Students were asked to describe them in terms of the concepts and ideas they learned in the earlier visits. This visit also involved activities designed to reinforce the concepts learned during the previous classroom visits and field trips. These included:

- Jeopardy - a question and answer review game linking Living with the Landscape program components that were presented throughout the year
- Predator/Prey Tag - a fast-paced game introducing the concept of population cycles

We monitored student and teacher reactions to field trips and program activities. Students and teachers completed a post-assessment questionnaire used to evaluate change in knowledge and attitudes and measure the effectiveness of the program.

Birds of Prey Program

Teachers received a curriculum guide that included supplemental information and enrichment activities that complemented the Hawks Aloft presentations. The packet contained vocabulary, lesson outlines, and games that prepared students for the program and could be used to enhance the teacher's existing science curriculum.

Preference for grant-funded programs was given to schools with low-income status (i.e., Title 1) in the Albuquerque area. The Birds of Prey program consisted of one classroom visit, which varied in length and content according to the age and ability of the students. We presented one large raptor and one small raptor to demonstrate adaptations unique to their species, and to explain how species interact with their habitats. Feathers, wings, bones, and feet of raptors were passed around so students could feel and see adaptations of predatory birds, and learn about the physical differences between hawks and owls. Other aspects of the visit were tailored to the class grade as follows:

Pre-Kindergarten to Third Grade

These programs typically lasted one hour and focused on the basic adaptations of raptors to their environment. Discussion sessions were held on raptor adaptations that are essential for survival. Students frequently participated in the activities Build-a-Raptor (Appendix B) and Bird Bits (Appendix B). We often read an educational story to pre-kindergarten and kindergarten students before the relevant bird was shown. Two live raptors illustrated raptor adaptations.

Fourth to Sixth Grade

These programs lasted approximately two hours and focused on differences between birds of prey and raptors, bird migration, food chains, and habitats. We reinforced discussion sessions with the following program activities and games (Appendix A).

- Dress as a Raptor
- Migration Migraine
- Habitat Mix-Up
- Food Chain Frenzy
- Bird Bits

Each visit began with a short discussion about Hawks Aloft, what conservation is, and how biologists play a role in conservation. Two live raptors illustrated ecological concepts such as food chains, habitat preference, and migration. Each visit concluded with a discussion about the habitat requirements of all organisms and how students can help conserve wildlife and protect the environment within their community.

Reading with Raptors

Aimed at children from pre-kindergarten through first grade, this program typically lasted 30 minutes to one hour and focused on the basic adaptations of raptors to their environment. An educational story (usually *Owl Babies* by Martin Waddell) was read to the students and interactive puppets were used to engage them in the program. One or two live raptors, at least one of which was a small owl, were presented and used to illustrate basic bird and raptor facts.

Privately Funded Programs

These single-visit programs were conducted at daycare centers, private schools, after-school programs, youth clubs, birthday parties, camps, and public school classes that requested the

Birds of Prey program after all grant funds had been expended. These were presented to students of all ages from pre-kindergarten to high school and typically consisted of 15-50 students per program.

The program visit was similar in content and structure to those in the Birds of Prey Program, unless the teacher requested a specific topic or concept.

Community Outreach

Community outreach events were tailored to specific event requirements and included a minimum of two live raptors at each event. These events, including outreach booths and presentations at meetings, enabled us to educate large groups regarding birds and conservation issues, through personal interaction with live raptors and conversation with Hawks Aloft educators and trained volunteers. Such events reached large, diverse audiences and provided information on a wide array of topics of concern to the general public.

RESULTS

Between August 2009 and August 2010, Hawks Aloft presented 156 programs and outreach events to over 41,000 individuals. Grant funding enabled us to deliver 56 of these programs, reaching over 1,500 students across New Mexico and seven Title 1 Schools. Seven classrooms received the LWL program, reaching over 300 students in 30 program visits and 4 field trips. The grant-funded Birds of Prey Program reached 28 classrooms and over 1,000 students through single-visit programs. We conducted 48 privately funded Birds of Prey programs, 4 privately funded Reading with Raptors programs, and 18 programs for adults that reached over 3,300 people. Hawks Aloft participated in 30 community outreach events that reached over 34,000 people.

Living with the Landscape (LWL) Program

This multi-visit program was offered to seven classrooms that received a total of thirty programs. All were Title 1 schools in Albuquerque and Belen. The LWL program increased student awareness of ecology, environmental stewardship and conservation through classroom visits, the implementation of a variety of conservation projects, and field trips.

While working on conservation projects, students experienced hands-on learning, cooperation with their peers, and achieved a sense of accomplishment, while benefiting their communities. For instance, educators often addressed invasive species in our programs, especially when teaching students about riparian ecosystems and the changes that might have occurred in those habitats. Specific field trips and projects for each class are shown in Appendix D.

A test was administered at the beginning of the Living with the Landscape program, and the same test was administered again at the end of the program. These tests were a quantitative way to measure the effectiveness of the program. Analysis of the test results showed that most classrooms had an improvement of 1 to 2 points on the post test. A graph of results for the tests is shown in Appendix E. Teacher and student letters provided a valuable opportunity to evaluate program success from a personal perspective. Students that participated in the Living with the Landscape program often sent thank-you letters to grant funders. While we encouraged teachers and students to send letters to our program funders, we did not track how many ultimately sent letters.

Birds of Prey Program

We delivered the grant-funded Birds of Prey Program (single-visit) to 1245 students (7 public schools in 28 program visits) throughout New Mexico in 2009-2010 (Appendix E). We were also given a donation from Ann Rhodes in order to deliver the Bird of Prey Program to all students at Washington Elementary School in Gallup. The donation funded 8 classroom visits and we were able to reach 262 students.

The BOP program provided the opportunity for students to discuss ways to protect birds and their habitats within their own communities. This program also introduced broader ideas of conservation and habitat requirements. Some classes discussed picking up litter around their schools, teaching people about the value of birds, putting up birdfeeders, and conserving water in their homes. Survey data was not collected.

We observed consistently positive student and teacher responses to these programs. During the programs, most students were engaged and asked high-quality questions for their grade levels. Afterwards, students often inquired about how they could become a biologist or an educator, an indication that they were inspired by the program. Thank you letters from students expressed their desire to learn more about wildlife and nature. Teachers who received the program often requested it in subsequent years and verbally expressed their positive impressions about the program's quality and relevance.

Reading with Raptors

This was a new program implemented during the summer of 2010. We conducted four privately funded Reading with Raptors programs for two different schools, reaching 120 students. The pre-kindergarten through first grade students were taught about basic bird and raptor adaptations through a story book (usually *Owl Babies* by Martin Waddell) and interactive puppets as well as other interactive games. Students were able to closely view the live raptors brought to the program and compare them to the story we read in class. This new program has few results to date, but feedback from teachers has been positive. We hope to expand this program in the future.

Privately Funded Programs

In 2009-2010, Hawks Aloft delivered 42 single-visit, privately funded programs that reached nearly 3,000 students (Appendix F). Eighteen private programs were presented to adults, reaching 871 individuals. Due to fewer restrictions on funding requirements for these programs,

we were able to reach groups not served in any of the other programs, including colleges, environmental groups, corporations, and after-school programs.

Community Outreach

In addition to classroom programs, Hawks Aloft staff reached over 33,000 individuals through 26 community outreach events (Appendix G). Staff and volunteers answered questions from the public and provided information about our education department, research projects, educational raptors, volunteer opportunities, and conservation efforts. Visitors frequently asked questions about the birds displayed, and described similar raptors they had encountered. Many visitors expressed appreciation for the ability to view the animals up close. From visitor responses, we concluded that our community outreach programs improved visitor appreciation and awareness for birds of prey, wildlife, and environmental issues within the community. Further evidence of our outreach success is the continued and growing demand for our presence at public events. Some events that we attended included the Navajo Nation Zoo Raptor Day in Arizona, Xeriscape Expo, Bosque del Apache Festival of the Cranes, Monte Vista, Colorado Festival of the Cranes and Weems Artfest. Additionally, community outreach events enable Hawks Aloft to distribute newsletters to a wide audience, recruit volunteers, and promote our educational programs and research activities.

DISCUSSION

Living with the Landscape (LWL) Program

The Living with the Landscape program excels at presenting students with information about how ecosystems function, laying a foundation for ecological literacy and promoting stewardship in a way that is fun and exciting for students.

Teacher evaluations and student letters indicated a positive effect of our programs. Many critics of environmental education programs have argued that few programs actually encourage responsible environmental behavior because they do not actively involve students in the issues (Mordock and Krasny 2001). Our education programs encouraged a high level of involvement from both students and teachers. We have found that it is more effective to seek answers to questions in the form of an activity. For example, rather than reciting facts about migration, we enabled students to re-enact obstacles that birds may encounter during migration, and experience the benefits of a successful journey through an interactive, role-playing activity. The topics discussed in our programs increased student knowledge of conservation issues in their communities and introduced the challenges of managing human impacts on the environment. The program's combination of discussion sessions and hands-on learning enabled students to make educated decisions based on the information presented to them. We also give a survey before and after the Living with the Landscape program that helps us gauge changes in knowledge among the students. Appendix E shows a graph of the results of the surveys for 2010, which show an improvement of between 1-2 points for most classes.

It is essential that students have the opportunity to develop a sense of ownership and empowerment (Hungerford and Volk, 1990), so they become responsible, active citizens (Palmburg and Kuru, 2000). The conservation projects enabled students to work together to benefit their environment and improve their community. It also gave students a chance to apply their newly acquired knowledge within the community and taught them about protecting wildlife. Through the conservation projects, they improved one of the environmental issues that they studied.

Birds of Prey Program

Visibility and proximity are two of the most important factors that influence children's attitudes toward wildlife (Kidd, Kidd, & Zasloff, 1995). Even in a single-visit program, bringing live birds into the classroom benefits both students and teachers. Students participated in the Birds of Prey program discussions by sharing ideas they had to help birds and wildlife in the community.

Many teachers reported positive effects they observed among students and the ease of integrating the program into the schools' existing science curriculum.

Reading with Raptors

This is our newest program aimed at younger children. Given the young age of the students involved, this program does not provide-in depth scientific vocabulary, but, by using a stories, puppets, and live raptors, illustrates basic concepts that instill an interest in science at a young age. The presence of the live birds made the experience memorable. This program will be continued during the 2010-2011 school year in order to gather more information on its effectiveness.

Privately Funded Programs

In order to qualitatively evaluate the effectiveness of these programs, Hawks Aloft collected teacher evaluations and encouraged feedback from students in the form of student letters. Based on this feedback, it is evident that Hawks Aloft increased awareness of the environment and promoted stewardship. Many program participants have requested programs for multiple years, another indication of the success of our curriculum.

Community Outreach Events

Demand for Hawks Aloft's presence at festivals and community events remained strong during the 2009-2010 school year. Our participation at such events enabled us to share knowledge about wildlife and a range of conservation issues. Community outreach events, by virtue of being open to the general public, allowed Hawks Aloft educational efforts to reach a broad and diverse demographic, extending well beyond the scope of the classroom-based education programs.

CONCLUSIONS AND RECOMMENDATIONS

The qualitative feedback of our programs indicates that Hawks Aloft's programs have increased participants' awareness of the value of the environment, and shifted attitudes toward becoming more environmentally responsible. Sixteen years of experience has taught us that the personal interaction with live raptors is an enduring experience that participants carry with them long after the program has ended. The multiple-visit nature of the Living with the Landscape program allows students to participate in stewardship projects, and gaining a sense of accomplishment, empowerment, and responsibility for their local environment.

Feedback from teachers suggests that both the Living with the Landscape and Birds of Prey programs enhance the life science curriculum and help students retain information. Community outreach events allow us to promote our mission of conserving indigenous birds and their habitats. Displaying live raptors gives us the opportunity to engage audiences in discussions of conservation issues for the species presented as well as birds in general. We are confident that the success of our programs relies heavily upon the opportunity to have experiences with animals that have emotional impact on the audience and also create momentum for discussions of scientific facts and conservation issues.

In the 2009-2010 school year, the Living with the Landscape program was funded by PNM Foundation, the Middle Rio Grande Conservancy District-Collaborative Forest Restoration Program, the New Mexico Department of Game and Fish-Share with Wildlife program, and the Albuquerque Community Foundation. A cornerstone of success for the LWL program is the motivation and dedication of teachers participating. We will continue to cultivate teacher relationships and attempt to sustain the program's availability in the Albuquerque metro area and on tribal lands, while maintaining our funding for rural schools and our relationships with those teachers.

By the end of the previous school year, there was substantial demand for the LWL program that could not be met with the available grant funding. This demand was measured by the sheer number of teacher requests for the program and by the diversity of grade levels that requested it. The LWL program was requested by teachers in grades two through twelve. A goal for 2009-2010 and beyond was to develop and fund multi-visit programs that are compatible with a

broader range of grade levels, enabling us to integrate the LWL program into entire schools. We were able to get funding for 3 different schools to receive the LWL program, and that funding also allowed us to provide single visit Bird of Prey programs for the other classes in those schools that weren't receiving the LWL program.

We recommend the continued delivery of Hawks Aloft education programs to as large a population as possible. Without support from our education funders, Hawks Aloft would be unable to bring the captivating power of raptors to a diverse audience of bright and appreciative students and teachers. By conducting education programs and public outreach, Hawks Aloft is working to improve quality of life in New Mexico by better informing the public and conserving New Mexico's unique natural heritage.

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This report was written by Amelia Porter. It was reviewed by Gail Garber. Peggy McCormick, Gail Garber, Liz Roberts, and Kristin Madden conducted the educational programs.

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Appendix A. Descriptions of Activities Conducted During HAI Educational Programs

NOTE: Appendix A provides descriptive text for games used in educational programs. Full instructions will be provided upon request.

Animal Tag: Adaptation Game

Grades: 4-6

Objectives:

- ◆ Teach students about adaptations and how they help animals to survive

Description:

Interactive physical game of tag with players enacting predator-prey interactions and illustrating animal adaptations.

Bird Bits

Grades: K-Adult

Objectives:

- ◆ Students will learn about some of the adaptations of raptors
- ◆ Students will learn to distinguish some of the differences between hawks and owls and mammals and birds

Description: Sit-down game where bird feathers, bones, and body parts are passed around and students describe what adaptations those parts are used for.

Crystal Lake

Grades: K-6

Objectives:

- ◆ Learn about watersheds
- ◆ Learn about human impacts on waterways

Description: Illustrative game where students learn about the effects of human interference, pesticides and other chemicals on a watershed habitat.

Dress as a Raptor

Grades: K-6

Objectives:

- ◆ Teach students about the important features of a raptor and their uses
- ◆ Explain that without one or more parts working properly, a raptor would not be able to survive in the wild
- ◆ Good program starter to break the ice and get the students involved

Description: Dress up game where students learn the basic features of raptors.

Food Chain Frenzy

Grades: 4-6

Objectives:

- ◆ teach students about the necessary pieces of a food chain
- ◆ have students construct food chains for two different habitat types

Description: Card game where students learn about food chains.

Food Chain Tag

Grades: 3-8

Objectives:

- ◆ Illustrate concepts such as bioaccumulation and the movement of energy through a food chain or web
- ◆ Demonstrate that animals at the top of a food chain are often those most affected by environmental toxins
- ◆ Illustrate that animals at the top of the food chain rely on many of those below them even if they don't eat them directly

Description: Interactive tag game where students act as animals in a food chain and learn about concepts such as bioaccumulation and the different levels of a food chain.

Activity from: *Flying WILD: An Educator's Guide to Celebrating Birds*. Council for Environmental Education, 2004.

Guess Who

Grades: 4-12

Objectives:

- ◆ Teach students food chain, food web, and habitat terms
- ◆ Prepare students for the Web of Life activity

Description: A yes or no question game to transition between the topics of food chains and food webs.

Habitat (Ecosystem) Mix-up

Grades: 4-6

Objectives:

- ◆ Teach students about the unique properties of New Mexico ecosystems
- ◆ Discuss the difference between generalists (species able to live in many environments) and specialists (species with limitations on where they can live)

Description: Card game used to discuss habitat concepts.

Jeopardy Review Challenge

Grades: 3-6

Objectives:

- ◆ Review concepts learned during the multiple visit LWL program
- ◆ Facilitate discussion about unclear concepts or concepts that deserve more time to examine

Description: Question and answer game used at the end of the program to review concepts learned throughout the year.

Migration Migraine

Grades: 4-8

Objectives:

- ◆ Teach students about the dangers of migration
- ◆ Teach students what they can do to reduce the risks during migration

Description: A base running game to illustrate migration and the challenges birds face.

Mouse and Owl

Grades: K-6

Objectives:

- ◆ Teach students about the challenges of predators and prey
- ◆ Teach students about the special hunting adaptations of owls

Description: A blindfold game that illustrates how an owl hunts.

Predator Prey Tag

Grades: 4-12

Objectives:

- ◆ Learn about predator-prey population cycles
- ◆ Learn about pesticide contamination

Description: Tag game similar to flag football. Used to illustrate predator-prey interactions and pesticide contamination.

Web of Life

Grades: 4-8

Objectives:

- ◆ Learn about the complexities of a food web
- ◆ Learn about what happens when pieces of the food web are removed

Description: Illustrative game using yarn to demonstrate how a food web works.

Appendix B. Schools Participating in the Living with the Landscape Program 2009-2010.

School	Classrooms	Classroom Visits	Field Trips/ Conservation Projects	Students
Central ES	2	3	1	98
Santo Domingo ES	2	2	0	79
Zia ES	3	7	1	128
Totals	7	12	2	305

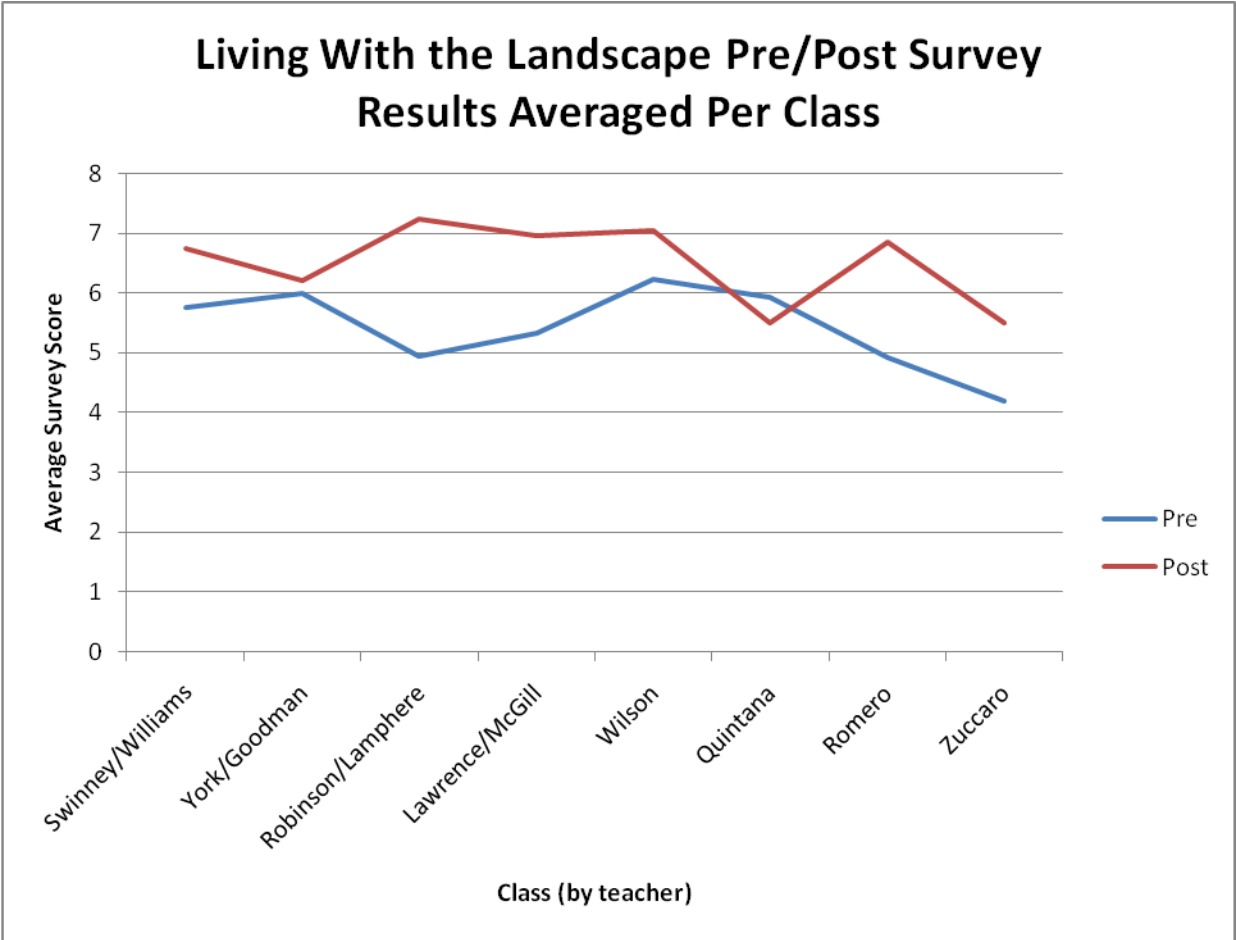
Appendix C. General Description of Activities and Projects for the Living with the Landscape Program 2009-2010.

	First Visit	Second Visit	Third Visit	Fourth Visit	Fifth Visit
Key Concepts	Conservation, raptor biology, adaptations, intro to habitat, migration	Habitat and ecosystem types, food chains, changes to habitats	Field trip	Conservation Project	Classroom review, human roles in the environment, what you can do to help, post test
Activities and Birds	Pre-program test, animal tag, dress as a raptor, migration migraine <i>Educational Birds: Swainson's Hawk American Kestrel</i>	Habitat Mix-Up, Food Chain Frenzy, Guess Who, Web of Life <i>Educational Birds: Peregrine Falcon, Screech-Owl or Ferruginous Hawk</i>	Field Trip	Conservation Project	Jeopardy Review <i>Educational Birds: Red-tailed Hawk and Merlin</i>

Appendix D. Activities and Projects for the Living with the Landscape Program 2009-2010.

Schools and Teachers	Field Trip	Project	Project Partners	Funder
Zia Elementary School Teacher: David Wilson, 4th/5th grade	Rio Grande Nature Center Park. 5 activity stations.	Installation of Blue Bird boxes	n/a	ACF
Central ES Teacher: Therese Williams, 5th grade	Whitfield Wildlife Conservation Area. Field journals and binoculars.	n/a	Whitfield Conservation Center	CFRP
Santo Domingo ES Contact: Rachel Henderson	n/a	Installation of Blue Bird boxes	n/a	SWW

Appendix E. Results of Living with the Landscape Program Pre and Post Tests 2009-2010.



Appendix F. Schools Participating in Grant-funded Birds of Prey Programs 2009-2010.

School	Number of Programs	Number of Hours	Number of Students	Funder
Bel-Air ES	2	2.5	118	Hansen's
Jaramillo Community School	8	8	447	CFRP
Matheson Park ES	2	1	117	Hansen's
Mountainair ES	2	1.5	39	Hansen's
Santo Domingo Schools	6	4.5	216	CFRP
Van Buren MS	1	1	51	Hansen's
Zia ES	7	6.5	257	ACF
Total	28	25	1245	

Appendix G. Single-visit (privately funded) Programs 2009 – 2010 (Adult and Youth).

School/organization	City	# Programs	Hours	People
21 st Century Public Academy	Albuquerque	1	1.5	35
Bandalier ES	Albuquerque	2	2	87
Canyon Gate Real Estate	Bernalillo	1	2	43
Chamisa ES	Albuquerque	2	2	51
Children's Center	Albuquerque	2	1	60
Children's Choice	Albuquerque	2	1.5	46
Cielo Azul ES	Rio Rancho	4	5	219
Compadres of Corrales	Corrales	1	1	30
Corrales ES	Corrales	2	2	167
Eldorado HS	Albuquerque	1	.75	70
Embudo Valley Library	Dixon	1	1.5	76
Friends of the Bosque Del Apache	Socorro	4	9	175
Grants Agriculture Day	Gamero	1	6	614
Immanuel Lutheran ES	Albuquerque	3	2.5	181
Inez ES	Albuquerque	2	1	169
International Boundary Water Co	El Paso, TX	1	6.5	85
Lil Squirrels Preschool	Albuquerque	2	2	60
Los Padillas ES	Albuquerque	3	2	271
Manzano Day School	Albuquerque	2	2	66
Mesilla Valley Bosque State Park	Mesilla	1	2	86
Montessori of the Rio Grande CS	Albuquerque	2	2	90
Ntl. Hispanic Environ. Council	Alexandria VA	1	1.25	35
Private Birthday Party	Albuquerque	1	1	15
Private Birthday Party	Albuquerque	1	1	18
Santa Ana Head Start	Santa Ana	1	.5	27
Santa Ana Say H2O	Santa Ana	1	1	70
Santa Fe Audubon	Santa Fe	1	2.5	35
S Y Jackson ES	Albuquerque	2	2.5	103
The Sierra Club	Richmond CA	3	4.75	53
UNM Dept. Of Planetary Science	Albuquerque	1	2.25	10
Washington ES	Gallup	8	5.75	262
Total		60	77.75	3309

Appendix H. Community Outreach Events 2009 - 2010.

Event Name	Location	People reached	Hours
BBC Filming For Animal Planet	Vermejo Park Ranch	10000	5
Cottonwood Classical Prep Volunteer Fair	Los Ranchos	272	2
Downtown Las Cruces Partnership	Las Cruces	175	3.5
Dry Heat Gallery	Corrales	20	3
Esther Bone Library Photo Exhibit	Rio Rancho	200	3
Festival of the Cranes	Bosque del Apache NWR	500	13
Festival of the Cranes	Monte Vista, CO	1000	14
Gila Cliff Dwellings Ntl Monument	Silver City	142	4
Jefferson Middle School Pride Night	Albuquerque	200	2
Kids Fishing Day	Jemez	100	5
Leasburg Dam State Park	Radium Springs	40	3
Museum of Natural History Open House	Albuquerque	250	3
Navajo Nation Zoo Raptor Day	Window Rock, AZ	6450	6
Navajo Nation ZooFest	Window Rock, AZ	200	8
Open Space 25 th Anniversary	Albuquerque	25	1
Open Space Visitor's Center	Albuquerque	65	2
PNM Commercial	Albuquerque	1000	1
PNM Lineman's Rodeo	Albuquerque	300	5.5
PNM Volunteer Fair	Albuquerque	125	2
Renaissance Fair	Farmington	500	14
Santa Ana Pueblo	Santa Ana Pueblo	200	4
US Army Corps of Engineers	Albuquerque	100	1
Weems Artfest	Albuquerque	1400	26
Wild Birds Unlimited	Las Cruces	200	7
Wild Friends/Madison MS	Albuquerque	250	2
Xeriscape Conference	Albuquerque	10000	16
TOTAL		33714	156