

Final Report: NWF Schoolyard Habitat Project 2010-2012

What is a Schoolyard Habitat (SYH)? According to the National Wildlife Federation (NWF), this program assists schools in developing outdoor classrooms called *Schoolyard Habitats*®, where educators and students learn how to attract and support local wildlife. These wildlife habitats become places where students not only learn about wildlife species and ecosystems, but also outdoor classrooms where they hone their academic skills and nurture their innate curiosity and creativity.

NWF has encouraged conservation through wildlife habitats since 1973. In 1996, the *Schoolyard Habitats*® (SYH) program was created to meet the growing interest and needs of schools and districts in creating and restoring wildlife habitats on school grounds. The SYH program focuses specifically on assisting school communities in the use of school grounds as learning sites for wildlife conservation and cross-curricular learning.

Schoolyard Habitats® is a part of the National Wildlife Federation's *Be Out There*™ initiative, which aims to inspire families across America to open the door and get outside.

For more information, visit the [NWF website](#).



Source: NWF. Webb Middle School Rain Garden

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Why Schoolyard Habitats? NWF recognized that low science and mathematics achievement were issues in our public school systems throughout Texas and the nation. They believed that the Schoolyard Habitat program could contribute to the success of the hard work being done by schools and teachers everywhere to raise youths' mathematics and science achievement.

The AISD SYH project was a collaboration with elementary and middle schools from 2010-2012. NWF had the following goals for the SYH project:

1. Improve science and math learning through Schoolyard Habitats in grades k-8.
2. Increase the use of outdoor space for inquiry-based science instruction.
3. Reduce achievement gaps based on race or ethnicity and gender.

In researching science and mathematics academic achievement in k-8 students, NWF identified the following problems (a) low student interest in science and math, (b) low student motivation, (c) lack of designated outdoor classroom space, (d) lack of location for field investigations that did not require field trips (which are time intensive and expensive), and (e) a lack of available curriculum that teachers can use to conduct outdoor lessons.

NWF had prior success helping schools build and use outdoor learning spaces, which achieved the objective of increasing students' science and math knowledge and motivation. Figure 1 illustrates how the Schoolyard Habitat project was designed to support AISD's science and mathematics instruction. Before and after photos for each campus are located in the Appendix.

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Figure 1. NWF Schoolyard Habitat Logic Model

GOALS	OBJECTIVES	ACTIVITIES	OUTPUT MEASURES	OUTCOME MEASURES	
				Short term	Long Term
<ul style="list-style-type: none"> • To improve science/math learning through SYH K8 • Increase use of outdoor space for inquiry based instruction • Reduce achievement gaps based on demographic performance 	<ul style="list-style-type: none"> • Increase science knowledge and motivation in students 	<ul style="list-style-type: none"> • Obtain approval from AISD facilities for all SYH locations • Create SYHs • Provide professional development to teachers who will be using SYH • Align “Access Nature” and “The How-To-Guide” with AISD science curriculum and TAKS • Use SYH to teach science • Provide consultants who visit and offer support and resources to teachers 	<ul style="list-style-type: none"> • Physical design plans for actual SYH’s on each campus • Complete SYH at each designated campus. • Obtain NWF Certification for each completed SYH • Observation and Activity Logs from teachers who use the Habitat • Logs of consultant visits • Schoolyard Habitat Professional Development materials created 	<ul style="list-style-type: none"> • Based on teacher observation, students increase motivation in science • Teachers use the SYH in a variety of ways to promote outdoor learning experiences to students • Teachers’ knowledge and skill in intertwining AISD curriculum with SYH as a key teaching tool increases 	<ul style="list-style-type: none"> • Students increase state test scores in science by 10% • Students close achievement gap by 10% as measured by SES or race • Maintenance of habitat • Increase in multidisciplinary teaming • Increase of math integration

Which campuses participated in the Schoolyard Habitat project? While year 1 (2010-2011) saw participation by multiple elementary and middle schools, year 2 (2011-2012) focused on only middle school campuses in the District. In both years, campuses began participating through the principal, who volunteered. At each campus, a team of approximately 5-7 teachers led the project by attending training, planning the site, coordinating efforts to build the Habitat, and instructing students in the SYH upon its completion. Table 1 lists participating campuses by year. Forty-five teachers participated in the project during year 1 and 36 participated during year 2.

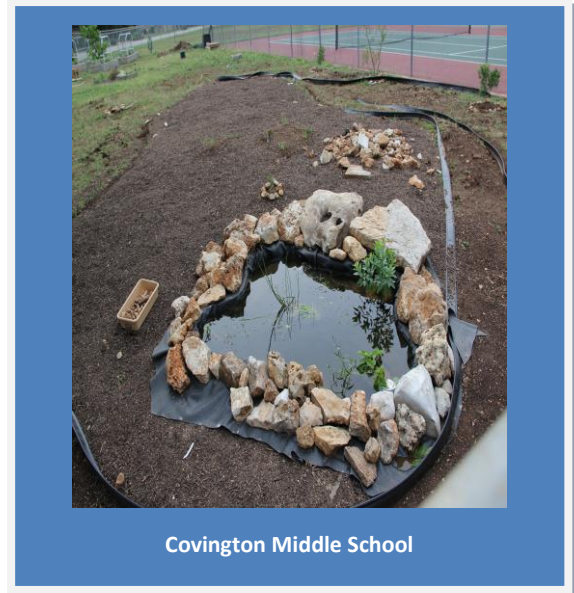
Table 1. SYH Participating Campuses 2010-2012

SYH participating schools year 1.		SYH participating schools year 2.
Elementary	Middle	Middle
Casis Clayton Dawson Ridgetop Rodriguez	Bailey Burnet O'Henry Small	Bedichek Covington Garcia Fulmore Gorzycki Murchison Martin Paredes Webb

What activities did this project undertake? SYH program activities included the actual planning, building and maintaining of the habitat on each campus, as well as a demonstration habitat at the AISD Science and Health Resource Center (SHRC) building. Teachers integrated lessons and activities into the planning and building processes and used the habitat for student lessons and activities after it was completed. The SYH teams consisted of approximately seven staff per campus, and involved a range of 10-600 students, with 215 students on average per campus. After receiving training campus teams designed their habitat with support and assistance available from project staff as needed. After submitting habitat plans to the NWF SYH staff for review and feedback, campuses were provided \$2000 to purchase plants, soil, and other materials needed to construct their outdoor learning habitat. The typical campus spent about 11 hours planning their habitat, five hours building it, and two hours per week maintaining it.

Teachers received 3.5 days of SYH training. In addition to formal training sessions, program staff were available for other direct support services as well. Teachers were able to take advantage of staff expertise in the following ways

- Logistical and/or technical problem solving,
- Curriculum planning assistance,
- Access to additional printed resources or materials,
- Borrow equipment for student experiments or investigations,
- Co-facilitate activities or lessons with the NWF or the AISD Outdoor Learning Specialist.



Source. National Wildlife Federation.

Additional activities undertaken within this grant-funded project were (a) obtaining approval from AISD Facilities for all SYH locations on campuses, (b) providing all professional development to teachers to build and use the habitats, and (c) aligning the NWF curriculum materials (e.g., *Access Nature* and *The How-To Guide*) with AISD science and math curriculum and the appropriate grade-level TEKS. Copies of all materials produced for this grant-funded project are available from the National Wildlife Federation, South Central Region office or from the AISD Science Department.

What were the outcomes for the project?

The outcomes for this project were positive. All but one campus completed their habitat and received NWF official certification as a SYH by spring, 2012. NWF curriculum materials were aligned not once, but twice. Due to curriculum changes at the state and district levels, NWF materials were aligned to state and local standards in year 1, and then realigned during year 2. Documents were aligned by grade level, and made available to teachers through email distribution, the Science Department curriculum website, and in paper copies as requested.

Campuses completed their habitats at different paces. Some campuses finished construction and used their habitat for instruction for several months, while other campuses were only just beginning formal science lessons by the end of the school year. Nearly all teachers who completed the end-of-year survey indicated plans to use the habitat for science lessons and/or afterschool activities (e.g., the after school environmental club called “Green Team”) during the 2012-2013 school year. One middle school also developed an elective science class that pertained to native plants and focused on SYH instruction.

Proposed Short Term Outcomes


The SYH project posed several short-term outcomes (a) Based on teacher observation, student motivation to learn science will increase; (b) Teachers will use the habitat in a variety of ways to promote outdoor learning experiences for students; and, (c) Teachers’ knowledge and skill in integrating the AISD curriculum with the SYH as a learning resource will increase. Data collected from teacher and student surveys support that all short term goals were met through the course of the SYH project.

(1) Student motivation to learn science will increase. According to teacher survey and instructional logs, student motivation increased. The following items appeared on the end-of-year survey.

- “Students prefer SYH activities to more traditional-style school activities.” 14 out of 16 teachers agreed with this statement. On a five-point scale (where 5=highest agreement), the average rating was 4.4.
- “Overall, how would you summarize the impact of your outdoor learning habitat on student knowledge and understanding? Using this program to improve student knowledge and understanding of our outdoor environment was...” 87.5% of teachers responded using the descriptors *effective* or *somewhat effective*.

Students reported increased motivation when using the SYH to learn science as well. A survey item read “I am more motivated to learn when I am in the habitat on my campus than inside my classroom.” A total of 71.7% of students who participated in the project reported feeling more motivated by SYH activities than science instruction in the typical classroom. Table 2 shows the specific responses yielded by this survey item.

Table 2. Year 2 Student Responses to “I am more motivated to learn when I am in the habitat on my campus than inside my classroom.”

#	Answer	Bar	Responses	%
1	I disagree a lot.		24	5.6%
2	I disagree some.		26	6.1%
3	I am neutral.		71	16.6%
4	I agree some.		128	30.0%
5	I agree a lot.		178	41.7%
Total			427	100.0%

Source. 2012 AISD National Wildlife Federation Student Survey

(2) Teachers will use the habitat in a variety of ways to promote outdoor learning experiences for students.

Multiple methods of collecting information about SYHs uses were employed. Teachers completed observation logs for lessons they taught in the SYH. They attended an Appreciative Inquiry (AI) Summit (which was a half-day summit that explored the program through in-depth interviews and discussion). Additionally, they completed an end-of-year survey that asked for examples of the lessons and curriculum used with the SYH. Teachers used the SYH to teach science, do academic activities, and for after school activities related to the environment.

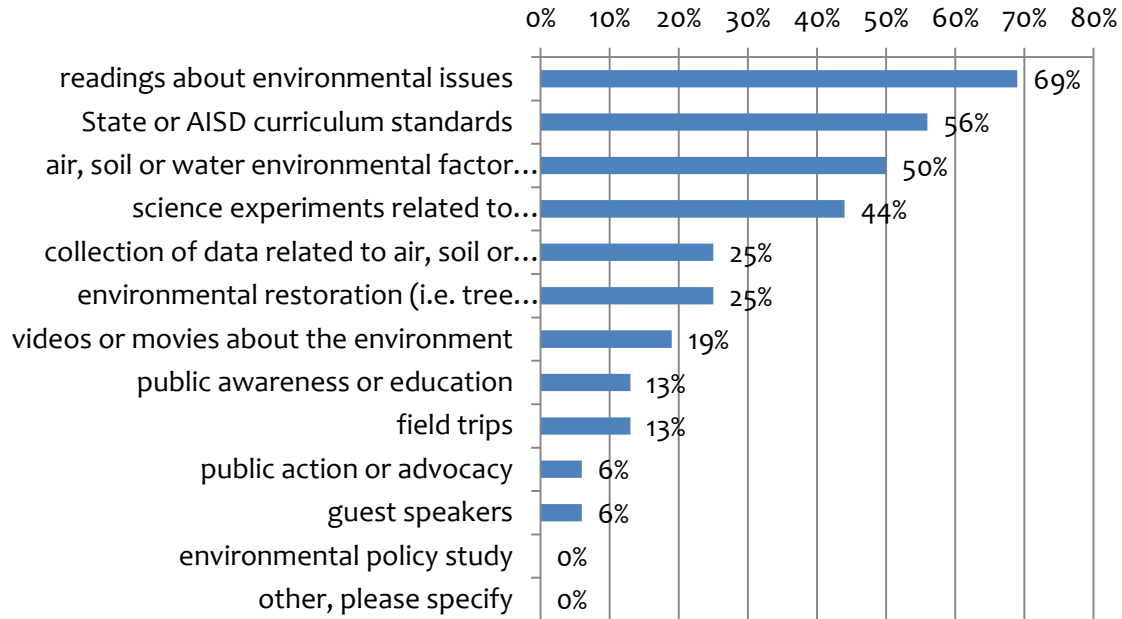
Observation logs. Each year a separate group of schools participated in training and in building a habitat. Teachers involved in year one completed observation logs that indicated types of activities completed in their habitat throughout the year (n=124 observations). The most popular lessons and activities were from the NWF curriculum (i.e., general nature observations, “Nature Scavenger Hunt” and “Habitat Hunt”). Teachers who explored their habitats with their students did things like collected soil and rock samples, sketched the habitat, and recorded observations — including observations of habitat inhabitants and weather patterns. The average time for these lessons was about 40 minutes. Year two observation logs (n=226) indicated that teachers involved students fairly equally in activities of planning/building (34.0%), experimenting/collecting data (36.0%) and demonstrating/observing science concepts (35.0%). Figure 2 illustrates the types of curricular resources used by teachers to plan habitat lessons.

Appreciative Inquiry (AI) Interviews. Teachers in year two attended a half-day AI Summit that provided opportunity for in-depth interviews and collaborative planning time for the future growth and development of the SYH partnership in AISD. Teachers discussed the many ways they have used the habitat with students, community groups, and parents to create new and authentic partnerships. The process of designing and building the habitats provided an inspiring opportunity for multiple stakeholders to contribute to a shared resource on the campus. Teachers reported the primary use for the SYH would be academic instruction; however, it also provided a place for teens to volunteer for service learning hours, for athletes to plant and move heavy rocks, and for community members and after school groups to have space to gather and be in nature. To say that the SYHs were used for a variety of purposes is an understatement. Still, nearly all teachers reported on the teacher survey that the primary purpose would be to teach academic lessons; in fact, 1 teacher in 4 indicated that their vision for the SYH was exclusively as an academic learning space.

Teacher survey results. Teachers reported the types of lessons and activities they had completed with students. Figure illustrates a variety of types of uses for the SYH. There was variety in the types of activities

and uses that the SYH fulfills even early in its development on the campuses. Figure 2 focuses on the diversity of academic lessons and activities occurring within the SYH. Teachers experimented with many ways the science curriculum can be taught by taking instruction outdoors.

Figure 2. Learning Activities Conducted in Connection with the Schoolyard Habitat

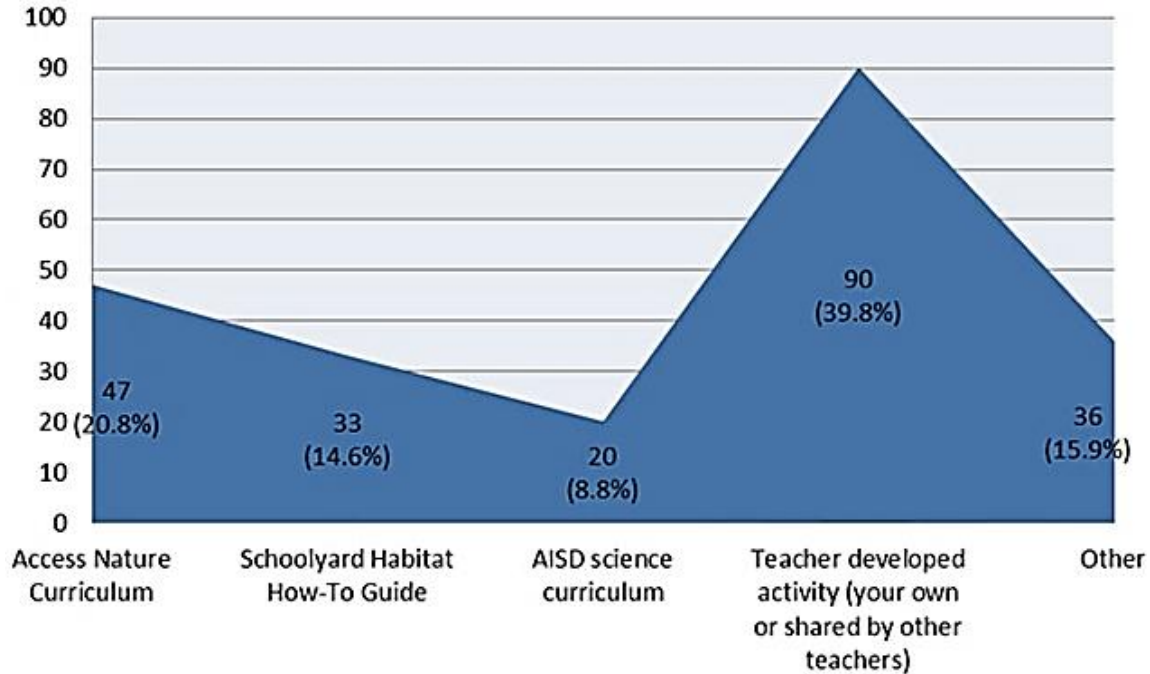


Source. 2012 AISD National Wildlife Federation Teacher Survey

(3) Teachers' knowledge and skill in integrating the AISD curriculum with the SYH as a learning resource will increase. Teachers seem to be achieving this program goal. According to teacher surveys and AI Summit interviews, curriculum integration was challenging. Teachers expressed a need for additional training (75.0% indicated plans to attend additional environmental education training). They also felt the lesson structure of NWF curriculum materials needed to be formatted as formal lesson plans. With that said, figure 2 indicates teachers learned to use the habitats for a variety of academic purposes. At the initial stage of the outdoor learning habitats, an ongoing process of professional development seems necessary. Figure 3 illustrates that teacher developed activities were the most frequent curriculum resource for SYH lesson plans. Teachers also used the NWF materials, *Access Nature* and the *Schoolyard Habitat How-to-Guide*. Most likely, they used the NWF materials to get the main idea for a lesson, and then modified it to make sure the final lesson plan addressed the TEKS and the AISD Science Curriculum Road Maps. By the time changes were complete, it was considered a "new" teacher developed lesson due to the substantive changes made.

A recommendation for AISD and NWF staff is to provide a means by which teachers can share these lessons with each other as they develop and test them with students in the SYH. By assisting teachers to share their lesson plans, the SYH can be used more fully, more frequently, and more effectively than if a teacher tries to develop an effective curriculum on his or her own.

Figure 3. Curriculum resources for SYH lessons reported by teachers in year 2 lesson observation logs.



Source. 2012 AISD National Wildlife Federation Teacher Survey

Proposed Long Term Outcomes

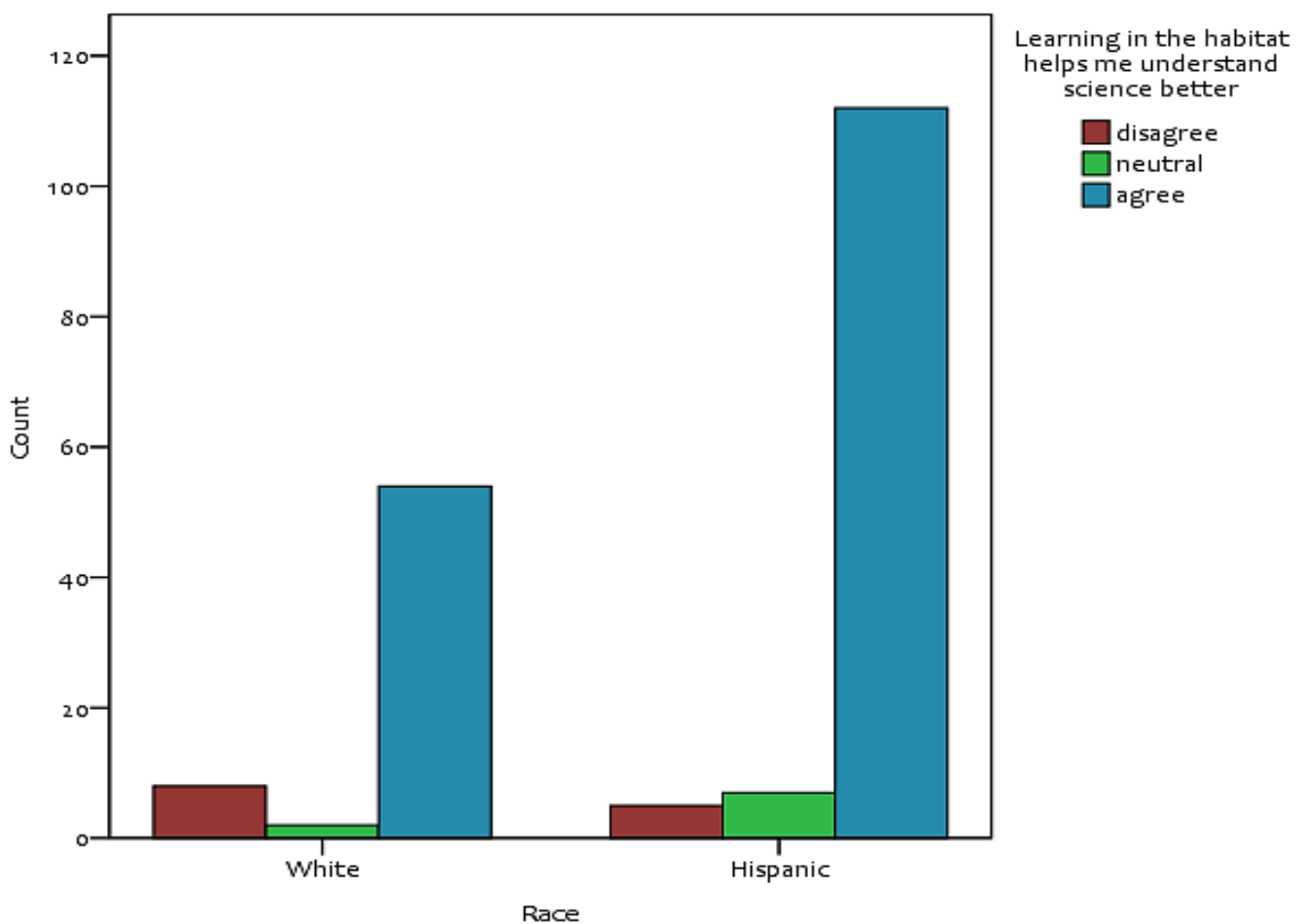
There were five proposed long-term outcomes for this project. The first was “Students will increase state test scores in science by 10%.” This goal has not been attained yet. The process of planning and building the habitats took most campuses the better part of a full school year to complete. By the end of the campus’ first year in the program, most had completed their initial habitat plans and some were continuing to expand and further develop the outdoor learning space. Teachers reported that 25% of the SYHs were completing the building phase, 6% had completed the building phase but were not yet implementing academic lessons, 50% were in a maintenance phase, and 19% had completed the initial plans and were planning expansions.

Due to the time invested in planning and building the habitats, teachers had begun to use them for formal instruction during the final months of the school year. Many habitats were completed just prior to the annual state assessment period in April. During the 4-6 weeks prior to testing, teachers were strongly discouraged from engaging students in any activities not directly related to test preparation. In order to measure accomplishment of this academic program goal, a formal experimental or quasi-experimental research design is needed. During Spring, 2012 the project was not at a point that this type of intensive experimentation would have produced fruitful data. Teachers were not using the SYH consistently across curriculum units or teaching common curriculum elements across campuses to measure academic gains that could be attributed to the use of the SHY. It was acknowledged in the Logic Model for this program that measuring student academic outcomes would be a long-term goal, rather than an immediate return on investment.

The second long term goal was “Scores on state tests of science knowledge will reflect a 10% reduction in differential performance between White and minority students.” This goal has not been achieved yet. As in the case of the first long-term goal, additional time will be needed to allow teachers to master the most

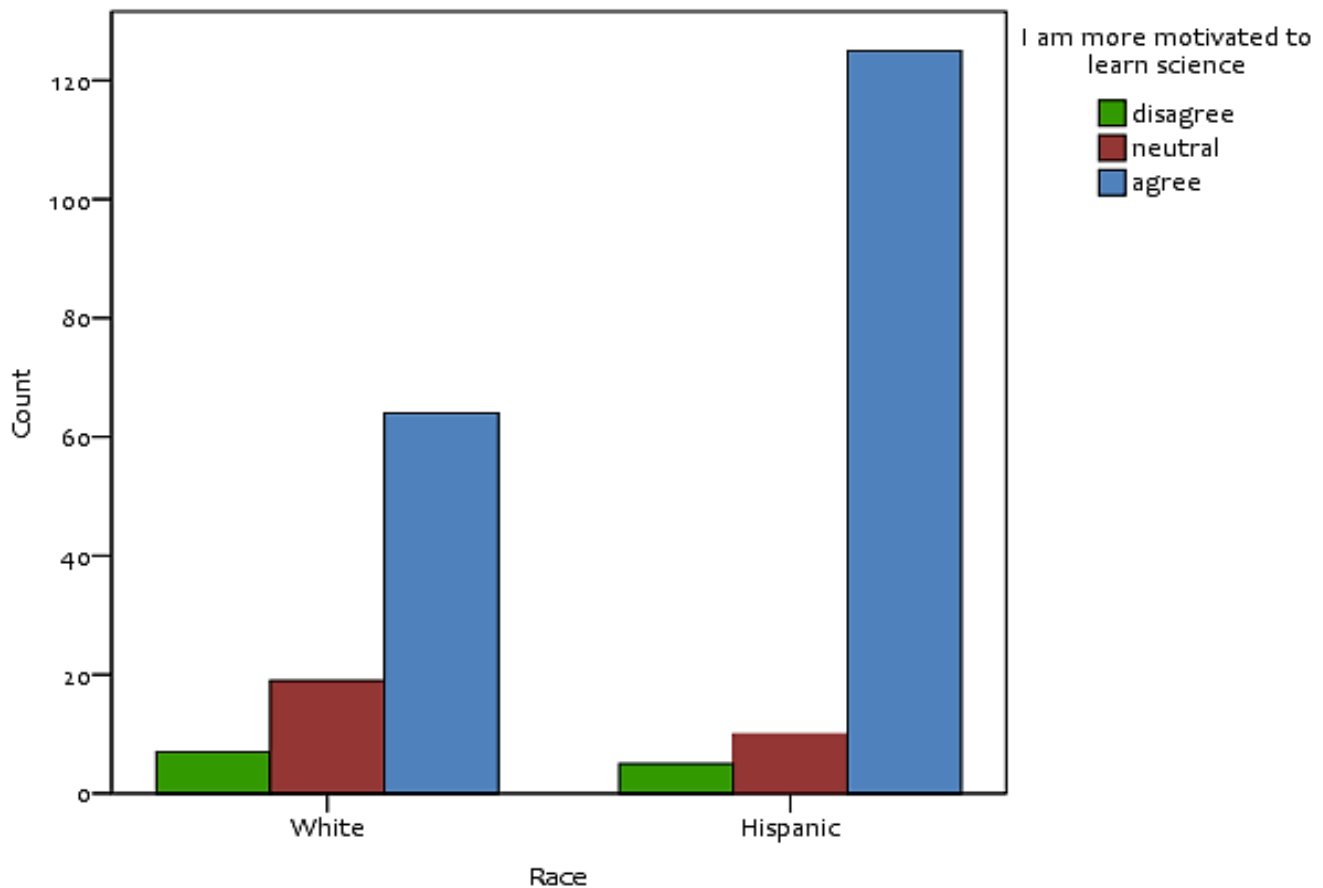
effective use of the SYH as a learning resource. Curriculum materials need further development, and teachers need time to figure out the practicalities and organizational practices that lend themselves best to teaching in the habitat. However, the student survey attempted to “peek” at present levels of student perceptions of the habitat by ethnicity. When examining student data disaggregated by ethnicity (White and Hispanic), Hispanic students reported being far more motivated by learning in the habitat than their White classmates. They also reported believing that the habitat helped them understand science concepts better, and they reported a stronger hope that the habitat will help them earn higher grades in science. Figures 4-5 illustrate differences in attitude between White and Hispanic students regarding the value of the habitat for academic learning.

Figure 4. White and Hispanic Students’ Agreement with “Learning in the Outdoor Habitat helps me understand science better.”



Source. 2012 AISD National Wildlife Federation Student Survey

Figure 5. White and Hispanic Students' Agreement with "I am more motivated to learn when I am in the habitat than inside my classroom."



Source. 2012 AISD National Wildlife Federation Student Survey

The third long term goal for this partnership was to ensure that all SYHs were properly maintained after the project was completed. Teachers reported spending an average of two hours a week on maintenance activities. They also indicated plans for summer care of the habitat. Teachers felt this was a manageable time commitment. The fourth long term goal was increased interdisciplinary team teaching in the SYH. The fifth and final long term goal for the SYH partnership was increased integration of math content into the SYH curriculum. These two goals remained viable long-term goals for the habitat project as campuses continued development of the curriculum and generated new innovative uses. Because teachers were still learning to integrate the SYH into existing science curriculum standards, these long-term goals will be addressed as teacher fluency accrues.

What were the challenges and limitations of this project?

As with any project, the SchoolYard Habitat program faced several challenges during implementation. Interviews with the NWF South Central Region Senior Education Manager and the AISD Outdoor Learning Specialist identified the following challenges to implementation of the grant as delineated in the proposal.

- AISD's Science Department was hesitant to fully integrate the SYH curriculum into the AISD Curriculum Roadmaps (therefore, separate alignment documents were created as opposed to

revising the actual Roadmaps). The rationale for their reluctance was that not all schools had SYHs available to teachers.

- It was an ongoing challenge to AISD's Science Department to make the most current documents easily accessible to teachers via the AISD website, due to a vacant position in the technology department.
- AISD's Mathematics Department was originally to work with the SYH; however, they later chose not to participate. Their participation would have made achievement of long-term goals 4 and 5 (see above) attainable in the shorter-term. Mathematics integration with SYH is aimed at involving mathematics teachers to lead hands-on lessons in environmental education contexts, rather than having science teachers include mathematics concepts in SYH science lessons (which already occurs). There are integrated mathematics and science lesson plans within the NWF materials and available in environmental education resources that could have been implemented without excessive demands for teacher planning. But the NWF acknowledges that using the SYH to teach mathematics (and other subjects) may require more forethought and planning than science.

What recommendations are made for institutionalization and replication?

Recommendations for institutionalization include refining existing curricular materials and expanding integration of TEKS and AISD Curriculum Roadmaps into NWF lesson plans. Assist teachers to share SYH lesson plans in a way that is efficient in time and labor. The number one priority for making these habitats part of the teaching routine on campuses (that have now invested time to plan and build it) will be making certain that high quality, easily accessed lesson plans are available to help teachers meet their instructional requirements.

A second recommendation is that social networking around the habitat should be built as soon as possible. Campuses that reported involvement in collaborations with external community groups (e.g., Scouts, Keep Austin Beautiful, or even parent volunteers) had higher satisfaction with the amount of work required by the project and administrative support available to them than others did. Ongoing maintenance plans, including summer breaks, will be critical to keeping the outdoor learning resource an important learning location. Those campuses that have a larger support network to accomplish the care, maintenance and even expansion of the SYH will likely shoulder the responsibility well over time.

The original AISD SYH teams should continue to meet formally or informally to share progress, ideas, challenges, and lesson plans despite the grant's formal conclusion. Synergistic efforts will bolster sustainability for the project and affirm the environmental identity of the SYH program. When teachers were asked about the most personally important aspect of this project, they said:

- "Students learn lifelong skills that they may use later in their lives. They will also teach future generations as well."
- "Getting students curious about the outdoor world. Using common sense to solve real-world issues."

Those words are perfect to close this report. They are powerful endorsements of the rationale for schools to invest time and talent in pursuing the SYH project on their own campuses.

Additional Information about this Report

About the Department of Research and Evaluation. The Department of Research and Evaluation (DRE) was established in 1972 to support program decision and strategic planning in the district. The department is housed in the Office of Accountability and is charged with evaluating federal, state, and locally funded programs in AISD. DRE staff integrates best and innovative evaluation practices with educational and institutional knowledge. DRE staff work with program staff throughout the district to design and conduct formative and summative program evaluations. DRE's methods for evaluating programs vary depending on the research question, program design, and reporting requirements. The evaluations report objectively about program implementation and outcomes, and serve to inform program staff, decision makers, and planners in the district. DRE reports can be accessed online at <http://www.austinisd.org/dre>.

About the Author. Laura T. Sanchez Fowler completed a Ph.D. in education at the University of North Texas in 1996. Her academic interests include factors affecting differential school performance trajectories in high-risk students. She has published more than 20 peer-reviewed and professional papers and book chapters. Laura re-joined the Research and Evaluation team in December 2011.

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District Strategic 5-year Plan. This report speaks to goals 1, 2 and 4. **Goal 1:** All students will perform at or above grade level (on standardized tests). **Goal 2:** Achievement gaps among all groups of students will be eliminated. **Goal 4:** All schools will meet or exceed state accountability standards, and the district will meet federal standards and exceed the state standards.

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APPENDIX A Before and After Photos from Each Campus

Campus	Before	After
Bedichek		
Burnet		





Source. All photos contributed by National Wildlife Federation

Campus	Before	After
Covington		
Dawson		





Source. All photos contributed by National Wildlife Federation

Campus	Before	After
Fulmore		
García		

Source. All photos contributed by National Wildlife Federation

Campus	Before	After
Gorzycki		
Martin		

Source. All photos contributed by National Wildlife Federation

Campus	Before	After
Murchison		
O'Henry		

Source. All photos contributed by National Wildlife Federation

Campus	Before	After
	<div data-bbox="131 331 196 468" data-label="Section-Header"> <p>Paredes</p> </div> <div data-bbox="215 325 813 827" data-label="Image"> <p>A photograph of a dirt area at the Paredes campus. In the foreground, there are several green plastic buckets and some small plants. A chain-link fence is visible in the background, and a building is partially visible on the left.</p> </div>	<div data-bbox="816 325 1494 827" data-label="Image"> <p>A photograph of the same dirt area at the Paredes campus after the habitat project. The area is now more landscaped with some plants and a sign that reads "NWF Schoolyard Habitat". A building is visible in the background.</p> </div>
Webb	<div data-bbox="215 955 813 1541" data-label="Image"> <p>A photograph of a dirt area at the Webb campus. In the foreground, there are some small trees and a concrete sidewalk. A brick building is visible in the background.</p> </div>	<div data-bbox="911 924 1398 1575" data-label="Image"> <p>A photograph of the same dirt area at the Webb campus after the habitat project. The area is now more landscaped with some plants and a concrete sidewalk. A brick building is visible in the background.</p> </div>

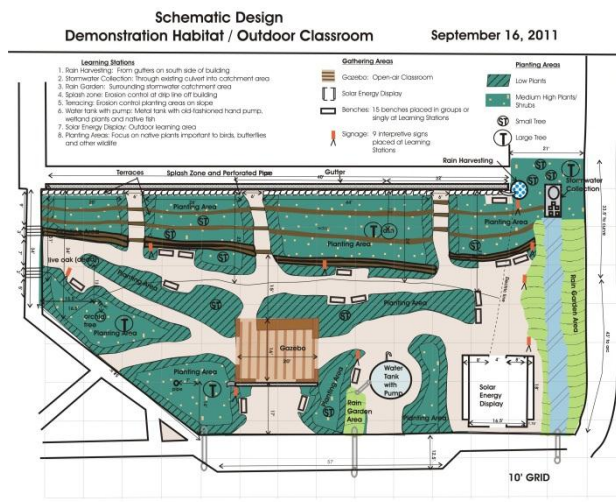
Source. All photos contributed by National Wildlife Federation

Campus

Before

After

Demonstration Habitat at SHRC



Source. All photos contributed by National Wildlife Federation