

Outdoor Classroom

Eighth-grade students get hands-on experience in environmental awareness and appreciation at South Llano River State Park.

Article and photos by Sheryl Smith-Rodgers

Beads of perspiration slid down her face as 14-year-old Shannon Adams vigorously stabbed the rocky riverbank with a hoe. Behind her, a fellow classmate dumped a wheelbarrow of small stones onto the ground. Ignoring the afternoon heat, the girls and several other students continued site preparation for a new walking trail along the South Llano River near Junction.

"You ready to quit?" asked computer science teacher Scott Richardson.

"Noooo! We're just getting started," Shannon replied enthusiastically.

Building trails, molding seed balls, identifying plant life and measuring river flow are just a few of the activities that make the Field Trip Series at South Llano River State Park more than just another "picnic in the park." For the past four years, eighth-graders at Junction Middle School have participated in the day-long outings that incorporate hands-on learning with environmental awareness and appreciation.

"I think it's fun because you get to do all this neat stuff, but you also help the environment, too," said Shannon, taking a break from her hoeing. "We learn all kinds of things, like we're making this trail. And we made seed balls. They're cool! Seed balls work better than planting seeds because bugs can't eat them. And we've seined in the river, birded, and orienteered with compasses.

"See? I love this program! I do!" she concluded with a big grin.

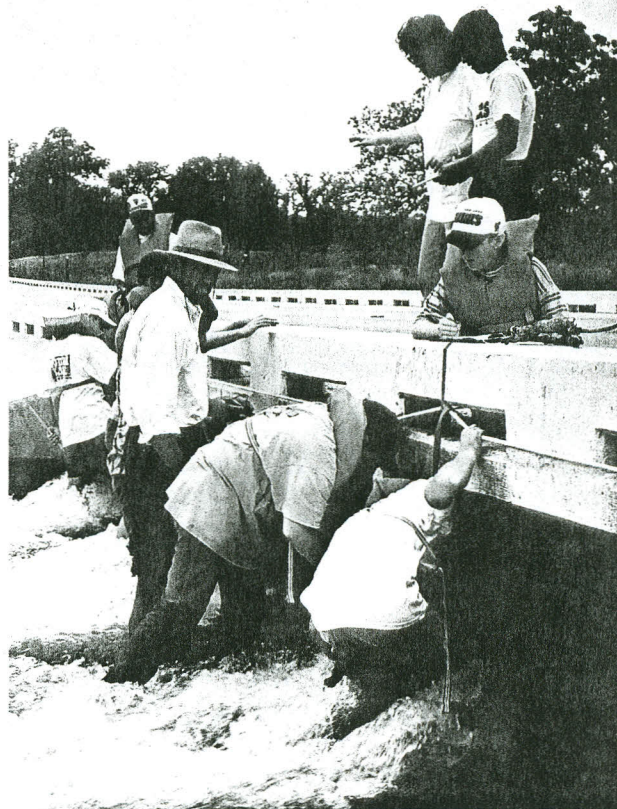
The popular field trips are the brain-

child of Richardson, English teacher Opal Roberts, and park superintendent Wayne Haley. "I used to take eighth-graders to Enchanted Rock (State Natural Area)," Richardson recalled. "While we were there, the kids were different to me and with each other. We all got along great. So I thought, 'Why don't we try to do more with kids in parks?'" Sharing his idea with Haley, the two talked,

planned, and drew up an outline for a series of field trips to the nearby park. Finally, on a fall day in September 1994, 70 Junction eighth-graders climbed aboard a yellow school bus, headed for South Llano River State Park and embarked on the first of four outings in their new Field Trip Series.

Typically, an outing for Junction students begins in the classroom. Students prepare by watching videos, listening to guest lecturers and reading. Once at the park, students break up into small groups, and teach-

ers report to assigned stations. Following a written schedule, the children rotate from one area to another, participating in a variety of different activities throughout the day. On a May 1997 trip, for instance, the eighth-graders made seed balls with native seed expert Bill Neiman, cut down intrusive Russian thistle, collected purple verbena seeds, worked on a walking trail, planted eastern gama grass



PHOTOS © SHERYL SMITH-RODGERS

Teacher Scott Richardson watches as students calculate the flow of the South Llano using a stick and a stopwatch.



Bill Neiman, who owns a native seed company in Junction, shows youngsters how to make seed balls, which disperse native grass and wildflower seeds when thrown on the ground.

in an eroding riverbank, measured river flow, and played "Plant Lotto."

"Remember when you were a kid and used to eat dirt? Well, this is the best," Neiman told a group of students as he sifted one hand through a bucketful of red powder clay. "And you have to use this when making seed balls." Neiman, who owns the Native American Seed Company in Junction, talked about restoring Texas' diminishing tallgrass prairies as he showed the youngsters what goes into a seed ball recipe. Six parts clay, one part humus, two parts seeds (native grasses and wildflowers), and one part water are mixed into a mushy dough and rolled into one-inch balls. The balls are then allowed to dry and harden. After that, they simply may be tossed on the ground; Mother Nature does the rest.

"I'm going to throw some of these seed balls on the ground at my house," Shannon said.

Meanwhile, another group, supervised by Opal Roberts, chopped Russian thistles and harvested verbena seeds in a nearby field. "The meaning of this may not hit them until they're adults," Roberts says. "But you have to put something of yourself into your community. Nature is not here for the taking. So that's why we do work for the state park—because we use it."

At the "Plant Lotto" site behind the park's headquarters, an eager group of boys sprinted along a walking trail in search of different plant characteristics pictured on bingo-like cards. Once their cards were filled, the students returned to sci-

ence teacher Pam Bednarz, who checked their findings of stems and leaves. "The object is to take what we've learned in the classroom and apply it in the field," she says. "They also learn about the environment and making a minimal impact on it."

On a low bridge across the South Llano River, Richardson prepared a small troop of boys for a wet assignment — to calculate the river's flow. First, the students measured the bridge's width. Then some of them, outfitted in orange life jackets, waded into the current. Back on the bridge, someone yelled, "Get ready! Get set! Go!" and a stick was dropped upriver into the water. As soon as it reached the bridge's other side another boy yelled "stop!" and a stopwatch clicked. Noting the time, the boys scribbled more figures on their papers and began their mathematical work.

Now in its fourth year, Junction's Field Trip Series draws rave reviews from students, teachers, parents and local experts who participate in the outings. "We have kids who, no matter how hard they try, don't do as well in the book work," Bednarz said. "But out here, they can touch it and see it, and they just thrive. This series has been really positive."

Hoping to spread the program's successes to other school districts, Richardson and Haley have presented teacher workshops on how to implement the field trips. The pair also made a presentation to the Parent-Teacher Organization during its 1997 state convention. "This program would work in any school district using a ranch or park," Haley says. "Kids enjoy the field trips, and they put something back into the system through it." ★

For More Information

For information about the Field Trip Series call Wayne Hailey at 915-446-3996 or write to him at South Llano River State Park, HC-15, Box 224, Junction, TX 76849.

The Texas Parks and Wildlife Department web page, <<http://www.tpwd.state.tx.us>>, provides information on a variety of outdoor topics including native grasses and wildflowers. Additional information on native grasses and wildflowers can be found at the Native Plant Society of Texas web page, <<http://lonestar.texas.net/~jleblanc/npsot.html>>

SEED BALLS

What They Are

Seed balls are one-half inch diameter models of the living world containing all the seeds for a complete habitat, wild or domestic garden, or both in one. Hundreds of kinds of seeds, soil humus, dry powdered red clay, and sand, form the solid components of seed balls. When mixed with water and rolled into balls, they become little Adobe Gardens. They are cost effective, hundreds of times faster to apply, and can be made by anyone anywhere in the world where there is clay, soil and seed.

How To Make Them

1 Part: Dry Humus, from compost with live mycorrhizal fungi soil inoculates.

2 to 3 Parts: Dry Mixed Seeds, assortment (hundreds of kinds) of all desired plants.

5 Parts: Dry Red Clay, finely powdered and sifted, not gray or white clay.

1 to 2 Parts: Dry Fine Sand, cleaned and sifted (if clay does not have a little sand).

- Mix ingredients DRY, turning and sifting to coat seeds with soil, then clay, then add:

1 to 2 Part : Water added a little at a time until the clay mix is easily workable.

After thoroughly stirring the seeds in a large flat container, cover with dry soil humus from compost, then add dry clay and mix well. If local clay does not have a little sand in it, you may want to add some for aggregate strength. Water is then gradually added until a firm suitable consistency is reached for rolling the clay into half inch diameter balls. Wet clay is pinched off the main mass and rolled between the palms of the hands until smooth and round. After a few seconds the clay can be felt to set up or organize, as the tiny clay platelets align themselves to each other, and the seeds they enclose. It is important to roll the clay until this polymerization is felt, for then the ball will dry with structural integrity. Finished seed balls must dry undisturbed for approximately 24 hours.

How To Apply Them

Once they are dry, seed balls may be stored in a cool dry place, where they may breathe until they are spread abroad. Or they may be broadcast immediately after drying and allowed to lay dormant in place until released by rains. **THEY DO NOT NEED TO BE BURIED OR WATERED.** Seed balls are perfectly content to simply lay about "sleeping" until the right amount of rain falls. When rains come, no matter where a seed ball has landed, something from the mix inside will be at home on the spot, so all possible habitat bases are covered in one broadcast application. A minimum application seeks a scatter density of at least 10 seed balls per square meter. Adequate coverage requires at least .20 grams of seeds per seed ball, or 2 grams of seeds per square meter-minimum! Restoration requires at least 3 grams of seeds per square meter. Between 8 and 12 kilograms, or 20 to 30 pounds of mixed seeds are required per acre. Protected from predatory insects, rodents, birds and other animals, seed balls lie dormant until sufficient rains fall to start their germination. Then hundreds of sprouts explode from each ball as they eagerly reach for the sun. There is absolutely no one way to make seed balls. Be like a child and just try them. It's fun! The more you put out the faster Nature regrows.

Collecting your own components

Clay Gather local red or brown clay, like you might use for terra-cotta pots. Not white or bentonitic gray clay. Red clay contains a broad diversity of minerals, especially the iron and manganese minerals. Some gray clays were deposited in anaerobic environments, and may contain sulfides and salts. Local clay is desirable if available, as it may have the local complement of mineral nutrients to which the native plants have already adapted. Do not quarry clay in a way that will cause damage or lead to erosion. The finest clay sources are found by streams that flood and leave pools of still water to evaporate. The mud at the bottom often shrinks as it dries, and cracks into large pieces. Gather them when they are dry. Brush off coarse sand and powder the pieces by grinding between concrete blocks, bricks or stones. The clay needs to be dry and loose. Sift it through a screen to remove large chunks. If there is no local source of clay nearby, you may order terra-cotta clay from ceramic supply companies.

Seeds Collect native seeds (grasses, wildflowers, shrubs, trees, etc., everything available from your local ecosystem, and whatever you want to re-introduce into your watershed.) It is best to **USE SEEDS FROM YOUR AREA** as they are at home with things as they are and you will not set loose invasive plants that could damage native ecosystems. The best

source is from the vicinity of the site itself.

Humus or compost Begin growing a guild of micro-organisms in a compost pile. Gather a little leaf litter from the bottom of the leaf floor, under all of the native trees and shrubs within your entire watershed. Look for the white mycelium filaments, often found at the interface between the decaying matter and the upper, organically rich soil layer. Also gather a little duff from beneath the oldest grasses and shrubs found by stream banks. **DO NOT TAKE ALL** of the material from any one place. That would tear a large hole in the local biosystem. Add your own clippings and kitchen scraps. A few weeks to several months later, depending upon location and climate, you will be able to harvest a little of the essence as needed for inclusion in seed balls. Living soil humus is critical to success, especially in arid regions.

A Word Of Caution!

You roll all the forces of Nature into Seed Balls when you make them. They have tremendous regenerative powers and they can be of great benefit. But used carelessly or wantonly, Seed Balls can cause irreparable biological disruption by effectively introducing alien species into a habitat with no means of coping with rampant invaders. The world is already host to numerous incidents of introduced exotic species that have radically altered Native Landscapes everywhere. Be careful of which seeds you choose and where you scatter them. The Native Plant Society strongly requests that you only use native species. Making seed balls is easy, but choosing the right seeds is the real problem. What must be intuitively understood and deeply respected before meddling in the forces and processes of Nature is the spiritual essence of a place. This requires reverence and humility and a willingness to be taught by Nature.

Sources Of Materials

If you cannot find something locally, try these sources:

Clay Source

Cedar Heights Clay Co., - P. O. Box 295 - Oak Hill, Ohio 45656 , 614/682-7794

Native Seed Sources

Native American Seed - 610 Main Street, Junction, TX 76849, 800/728-4043, <http://www.seedsource.com>

Writings

Plants On The Loose

"Is there such a thing as a good plant or a bad plant?" — The Threat Of Exotic Grasses —

By Dan James - In The Arid Lands Newsletter

"Of all the components of a garden, water is the one that limits or enhances garden life."

— Alien Plants & Water —

By Lesley Henderson - In Plant Invaders Of South Africa - Garden South

"Although the term exotic somehow brings up the image of a plant holding a drink with a little umbrella, the reality is that exotic means 'out-of-place' in the California ecosystem."

— Biological Pollution And Exotic Plants —

By David Chipping - The California Native Plant Society

Seed Ball Gardens And Starter Kits!

Adobe Seed Ball Co. — P. O. Box 1355 — Alpine, Texas 79831

Thanks to this source for seed ball education: Text Copyright (C) 1996 Jim Bones (Unless Otherwise Indicated) Box 22 -Tesuque, NM 87574 - 505/988-1762 visit the web site for more details on Seed Balls: "Light Writings" - <http://www.rt66.com/~jimbones>

This information has been edited and distributed by the Austin Chapter of the Native Plant Society of Texas, 512/836-4751, http://lonestar.texas.net/~jleblanc/npsot_austin.html