

A NANFA EDUCATION GRANT REPORT

The Wildlife Pond Renovation at Clinton Community Nature Center: Get to Know Native Fishes

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Ponds are definitely a plus when they offer soothing sounds to muffle the noise of the world, a great focal point or destination in the landscape design, a home for water lilies, and the creation of bountiful wildlife habitat, particularly native fish species. But what happens when the pond just doesn't work? A garden pond renovation will take some serious digging, but its results can be dramatic and rewarding. A variety of elements must work together for a water garden to keep its balance, and every change you make impacts each of the others. If the pump is a problem, as it was in a pond built and maintained by volunteers in Clinton, Mississippi, then replacing it affects the entire environment for the better.

The McMullen Wildlife Pond at Clinton Community Nature Center is located in a very sunny butterfly garden in an otherwise shaded 30+ acre urban forest. Native plants are abundant, but with no consistent water source except rainfall, habitat conditions were difficult. The pond was designed to be an oasis in the dry season, to nurture local species of fish, frogs, and dragonflies, and provide water for small mammals and deer who traverse the Center. With the help of an experienced landscaper, volunteers built the pond in 2001. Despite adequate depth, a high quality liner, and a good selection and number of plants, the water would not stay clear for more than a week. Slightly less often, the pump would stop altogether and conditions deteriorated rapidly until it looked more like an algae farm on a mudhole than a pond. Within three years, these problems needed to be addressed.

Muddy water can be a problem in any water feature when the approach to it is too steep, or if the edge of a rigid

NANFA's
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plastic pond is buried too deep. If the surrounding garden beds or lawn are fertilized, those products wash into the pond, enriching its nitrogen content and the algae that love it. The obvious problem in our wildlife pond appeared after each rainstorm when dirt washed into the pond and silt clogged the filter, causing poor water flow and leading to stagnant water problems. The pump impeller eventually shattered, and replacements had to be fashioned since replacement parts were no longer available. "Maintenance" meant frequently draining the pond, pulling out the submerged pump, cleaning and repairing it, clearing the algae, and waiting for it to rain again. The pond looked and smelled bad, could not sustain fish, and had to be fixed as thirsty critters were waiting, not to mention frustrating Center members and volunteers.

This renovation plan began with work outside the pond to divert the rainfall away from the edge and into the native plant garden surrounding it. By reducing the slope and increasing the height of the berm beside the pond, much less rainfall reaches the pond and most is channeled away from it. The resulting increased space alongside the water made room for a larger diversity of native habitat plants near the water feature, which further aids in rain control. Plusses in the new layout also include a better view of the pond from a nearby bench and room for an exhibit about pond life and native fishes. The work on the pump, plus natural shifting of the clay soil under the pond, led to the liner sliding out from

*Right:
Lesson plans showing
how McMullen
Wildlife Pond is being
used to teach
youngsters about
aquatic science.*

AQUATIC STUDIES Buddy Kit

Benchmark: The student will understand characteristics of life cycles and environments of organisms.

Lesson 1: Understanding Aquatic Biomes

Objectives: Distinguish between biotic and abiotic factors in an aquatic biome.

Methodology: Have students inspect notebook in Buddy Kit. Working with a partner, students complete each assignment before proceeding to the next lesson.

Materials: Notebooks found in Buddy Kit.

Evaluation: Check student work when each assignment is complete.

Lesson 2: Aquatic Life in a Pond

Objective: Compare and contrast the different levels of biological organization found in a fresh water pond.

Methodology: Collect water from a pond. With a magnifying glass, observe plants or animals that may be present. On plain paper, students try to draw what they see.

Materials: Petri dishes, pond water, magnifying glasses, typing paper.

Evaluation: Be sure the students are observing and recording (drawing what they see) results on paper.

Lesson 3: The Aquatic Environment

Objective: Examine the environmental properties of pond water.

Methodology: Have students stir up a small area of pond and obtain a sample of water. Use the collection jar found in their Buddy Kit. Let the sample sit and have students observe what happens after 5 min, 10 min, 20 min, 30 min, 1 hr and overnight. Have students record what occurs during each increment of time on their worksheet.

Materials: Stirred pond water, collection jar, Aquatic Environment worksheet.

Evaluation: Students will record observations by using drawings of their samples and a brief explanation of what happened after each increment of time.

Lesson 4: Uniqueness of Water

(this activity may require 2-3 class periods)

Objective: Students will become familiar with some of the

unique properties of water and the biological implications that result from these properties.

Methodology: *Part 1:* Surface tension of water is a force exerted by the surface of water on the particles below.

Using a pipette, place one drop on a piece of wax paper. Look carefully at the water drop from the side and draw its shape. Next, dip a toothpick into liquid soap. Touch the toothpick to the water drop while viewing from the side. Answer questions on the Uniqueness of Water observation sheet. *Part 2:* pH is the measure of acidity in a sample.

Neutral pH is 7.0 (range best suited for living organisms). Anything below 7.0 is considered acidic, anything above 7.0 is basic. Using the pH paper in the buddy kit, have the students tear off approximately 3-4 inches of paper tape. Place a small amount of pond water in a collection jar. Dip pH tape into the sample. Compare the color of the wet pH paper with the pH chart found on the side of the pH paper holder. Record results on the Uniqueness of Water observation sheet. Next, using the freshwater pH test kit (found in the Buddy Kit) perform a pH test on a sample of pond water from the collection jar. Follow the instructions found in the Kit. Record results on the Uniqueness of Water observation sheet. *Part 3:* Water temperature. Fish can exist at many different temperature levels. Using the thermometer in the Buddy Kit, measure the temperature of the pond where the sample was collected. Record the temperature on the Uniqueness of Water observation sheet.

Materials: all materials are included in the Buddy Kit.

Evaluation: Uniqueness of Water observation sheet.

Lesson 5: Results of Pollution in a Pond (optional lesson)

Objective: Students will be able to describe what happens when a freshwater pond becomes polluted.

Methodology: students will view "The Caney Creek Incident" video tape, then write their views on what happened and how to correct the problem of water pollution. These are personal observations, therefore there are no wrong answers.

Materials: Video can be checked out at the Clinton Community Nature Center for school use. Call 601-926-1104.

Evaluations: Allow students to share their ideas and views about water pollution with the class.



Fig. 1.

McMullen Wildlife Pond before renovation.

under the rocks at the edge of the pond. Like a puzzle, each piece must fit neatly into the next for the ledge to hold the liner in place. With the dirt work complete, the volunteer team reset the pond liner, making room for a small deck to accommodate curious day campers' water quality studies. That addition further flattened the pond edge, giving more room for the sometimes-rushing water to soak in before it reaches the pond.

At last, the physical changes at pondside were complete, and the team turned its attention to the original reason for the renovation. Selecting a new pump begins with consideration of its capacity and installation needs. The pond's design submerges the pump to keep it out of the way and present less of a distraction for wildlife, but it does make the task of replacement more difficult than an aboveground design. Eventually, we located a heavy duty pump with replacement parts available. As with any retrofit project, it is extremely important to select a new part that fits the old system; in this case, we chose the sturdiest pump with the largest capacity that would fit into the box made for it on the bottom of the pond.

Any time a water feature is drained to repair its liner or prepare for winter, it's time to look for holes in the liner, or places where it may have slipped beneath its rock edges. Round pots without sharp edges are recommended for submerged plants as the attractive slatted boxes may, over time, rub into the liner and damage it. If sections of the liner have slipped their mooring, resist the temptation to simply shove them back in. Instead, remove several rocks from the ledge where the gap occurs and reset the entire section to strengthen it.

After about 60 work hours provided by Center members, the renovation of McMullen Wildlife Pond was complete. Plants returned to their appropriate places as the water cleared. Using grants from NANFA (North American Native Fishes Association) and U.S. Soil Conservation Service (WHIP program), the community added new plants, fish, and information about pond life for human visitors to the habitat. The Center's Educator, Johnny Broussard, developed an Aquatic Studies Buddy Kit for students on field trips to the Center. Nature Center Life Member (and NANFA



Fig. 2.

McMullen Wildlife Pond after renovation.

Board Member) Dr. Jan Hoover will construct a viewing trap in addition to his donations of native fish species, Bantam Sunfish, *Lepomis symmetricus*, Golden Topminnow, *Fundulus chrysotus*, and Blackspotted Topminnow, *F. olivaceus*.

The pond was overwhelmed with water and mud when Hurricane Katrina pounded our county, but the damage was minimal beyond strenuous cleanup. The outdoor information exhibit was not damaged. Mammal, bird, and butterfly counts are up in Butterfly Garden, too. But best for us, 18,000 visitors including hundreds of students, are getting to know native fishes. 🐟

NANFA's Gerald C. Corcoran Education Grant Program

was founded in memory of past NANFA President Gerald C. Corcoran, a champion of environmental education, to help fund projects that educate the general public about North American fishes and their environments. To date, the Education Grant has awarded over \$7700, including this year's grant (described on page 31).

How to join NANFA's e-mail lists.

NANFA's e-mail list is a great place to discuss North American native fishes and receive the latest NANFA news. To join, send the phrase "subscribe nanfa-l" in the message (not subject) area of an e-mail to:

majordomo@nanfa.org

You will be sent a follow-up e-mail to confirm that you actually wish to be subscribed to the list. To join the digest version, in which a day's postings are combined into one e-mail, send the phrase "subscribe nanfa-l-digest" to the same address as above.

NANFA's Board of Directors has its own list to discuss NANFA's management and long-term goals. Every member is encouraged to join both the list and the discussion. Send the phrase "subscribe nanfa-bod" to the same address as above.