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## *Why Children Should Study Nature*

by Maria Minno

One must never underestimate the importance of the Florida Native Plant Society to conservation. FNPS can play a unique role in public education that cannot be matched by any other organization, public or private. *The Palmetto* and the chapter newsletters are vital conduits of information. FNPS contributes to public education through fascinating and highly accessible field trips, where anybody who is interested can get firsthand experience with Florida's native species.

This type of exposure needs to be provided to our children through the public school system, where all would have equal access to interesting, hands-on, ecological lessons about Florida's native plants and their interactions. Florida's public school system should – and easily could – incorporate nature study into the required curriculum.

Here are four basic reasons why I feel strongly that this can and should be done:

### **1. First of all, we need more and better presentation of general science in our schools.**

Children educated in the United States lag behind children of other developed countries in both math and science. The math scores of the top one percent of our high school seniors would place them in on the 50<sup>th</sup> percentile in Japan. This doesn't mean American children aren't as smart as Japanese children; it shows that our schools are far behind in this area.

Four years ago Congress established a special task force whose job it was to find out whether or not the United States would have enough scientists and engineers in the future, and if not, why not. The task force found a great discrepancy between projected need and supply, and blamed the discrepancy on "chronic shortages of good mathematics and science teachers, little or no hands-on laboratory science, and lower teacher expectations" at many schools. They recognized a "need for improvements in the science and mathematics preparation of all of our students, especially in the K-8 educational pipeline."

Nature study *is* science. In fact, there is not much in science – physics, mathematics, chemistry, and especially biology – that is not included in nature study. Dr. Paul R. Ehrlich, a well-known

ecologist and president of the American Institute of Biological Sciences, says:

"Biology, of all the sciences, now has the greatest potential for making major advances in aid of humanity.

Today, most problems facing society either are biological or have large biological components."

### **2. This brings me to the second reason children should study nature: we need to know how science operates and how research is done.**

The Scientific Method is a sturdy foundation from which to build critical thinking skills. Nature study lends itself well to investigative study.

I recently read an article in *Bioscience*, the journal of the American Institute of Biological Sciences (Sundberg, et al, 1992). The authors point out that biological science educators realized long ago that the one reason laboratory

study is indispensable in biology is that it is the only way students can investigate on their own. Although there is good consensus on this point, lab classes almost never include real investigation. Why? Possibly because so many "cookbook" programs are available and readily accepted.

In contrast to canned lab programs, nature study is *entirely* investigative. The scientific method can be used informally in this way: Students first ask a question. Next they design an experiment to answer it. Finally, they conduct the experiment, analyze the results, and draw a conclusion. In this way students are able to actually use the Scientific Method even if they have never heard the term.



Students Angela Minno and Joshua Beebe inspect a caterpillar at the Medicinal Plant Garden on the University of Florida campus.

Thus children need to study nature so they can understand scientific investigation.

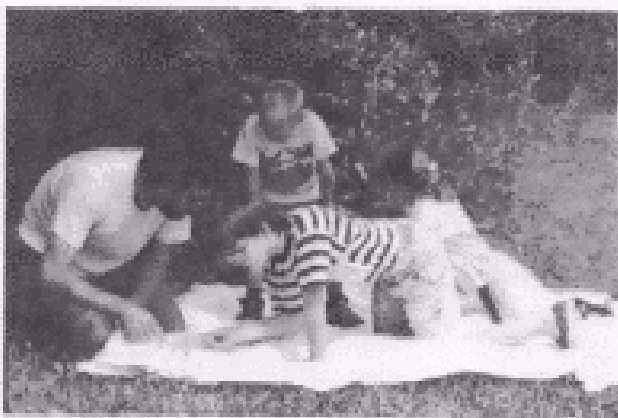
### 3. Reason number three: Ecological literacy.

Ecological literacy is a necessity in today's world. The American Institute of Biological Science, generally a very conservative organization, has put ecology and evolutionary biology on the top of its education priority list for the upcoming decade. Next in line are systematics, conservation biology, and behavior – all what you could call “nature study” subjects. And all of these priority subjects are notoriously neglected in our colleges and universities, not to mention in elementary and secondary schools (Anonymous, 1988).

Furthermore, this situation seems to be getting worse. Dr. Peter Raven (1990), a well-known botanist and educator, explains that, although ecologists are losing ground as educators and professionals,

“society (albeit unknowingly) is in ever-deepening need of [ecologists'] expertise...Most people know nothing about the importance of insects, nematodes, and soil microorganisms in their lives. I doubt that one in fifty U.S. Citizens could give a coherent description of the key role that photosynthesis plays in maintaining civilization, or give a coherent description of what an ecosystem is and the services it provides humanity.

U.S. students are less well informed about science and mathematics than those of almost any other industrialized nation. Ecology is often treated as a backwater area of biology, and the fact that global environmental changes will increasingly affect the life of every single person on earth is simply ignored in the construction of most university curricula.” (Ehrlich, 1990).



Entomologist Marc Minno identifies fallen arthropods for natural history students in Gainesville, after they shook the bushes over a white sheet.

In other words, most of us haven't been given the basic science knowledge necessary to make everyday decisions involving our own health and livelihoods, or the health of the environment we live in. Choosing dolphin-safe tunafish or eating Rainforest Crunch candy isn't going to be enough. We need to be choosing jobs, homes, elected officials, and modes of

transportation that are in line with a sustainable-use philosophy. A science-ignorant public cannot and will not do this.

On top of this, whatever science most of us are exposed to is almost never ecology, because ecology is probably the most neglected aspect of science. Yet an understanding of ecology is necessary for making the connection between individual actions and global consequences.

Thus, children need to study nature because nature study can form the foundation of ecological literacy.

### 4. Finally, nature study is easy, it's inexpensive, and it's fun.

Nature study can be done in any schoolyard. A book I co-authored with Dr. Feinsinger (see box) was written specifically to make it easy for teachers to use their own schoolyards for nature study.

A vast amount of environmental education material is available to teachers, but almost every bit of it totally ignores a child's own natural environment. Instead, they study exotic animals and plants that live far away in other parts of the world. At least one Gainesville school has students saving money to preserve tropical rainforest in Brazil, undoubtedly a good thing. Yet rainforests in the United States, in Hawaii and the temperate Northwest, are rapidly being destroyed without notice. Even curricula covering native plants and animals usually discuss only the ones that require a field trip to see (Anonymous, 1976). Studying only environments that are distant and unfamiliar leaves children feeling estranged from the natural world surrounding them.

I have looked at dozens of schoolyards, and have never seen one that didn't have some interesting plants or animals that could be studied. Most have more than you could ever need. On backyard naturalist tells a story of the surprising diversity in his own backyard:

“The former Curator of insects at the American Museum of Natural History, Frank Lutz, once made a bargain with the museum's director in which they agreed that beginning with the 501<sup>st</sup> species of insect Lutz found in his suburban New York lot, he would receive a salary increase of ten dollars per additional species. the bet was never made official, but Lutz began counting...and recording. Eventually he tabulated 1,402 species.” (Tekulsky, 1985)

You don't need expensive or complicated equipment to study nature. The most interesting things can be seen with your own eyes. Many of the animals that you might want to investigate – such as a grasshopper, planthopper, or ant – can be held in your hand. You don't need to plant anything; in fact, if you do you'll be missing out on one of the most interesting things: how seeds plant themselves! The most you might want to do is to stop mowing a part of the grass.

Fun means better learning, and hands-on experiences have been shown to have the greatest educational impact on students in learning and retention. Many school activities are scheduled in 30-minute sessions, because “they say” that kids have such short attention spans they lose interest quickly. Children outdoors, however, do not lose interest so quickly, and often beg for a longer lesson.

Nature study is all hands-on. An eminent educator, Dr. John Richard Schrock (1990), points out that

“the educational value of words, pictures, and other abstractions [cannot be equated] with that of direct multisensory experiences. An analysis of the amount of information conveyed, sense by sense, by various media reveals how impoverished such abstractions are.”

Other educators agree that “there is no substitute for the understanding which comes from direct experience”. Because nature study is holding, touching, and investigating the curious living things around us, people who study nature often “bond” with nature.



Students Eric Marshall (rt) and Joseph Andrews share a discovery with the author.

Thus, children should study nature because it is the easiest and least expensive way to study science, as well as being fun.

#### What FNPS can do?

What can the Florida native Plant Society do to help bring hands-on nature study to children?

As an individual member of the society and your chapter, you are exceptional in your interest in and love of Florida's

native plants. You can share your special attitude and knowledge with children. I volunteered for a year to teach schoolyard nature study in the after-school program at some Alachua County schools. For each school, several of us spent just four hours a month to give children a chance to learn about ecology in their schoolyard.

A group of five or six volunteers can take a whole classroom of school children in groups of five. We found this 1:5 adult/student ratio ideal for people with no special training in teaching children. We used the *Handbook to Schoolyard Plants and Animals* as our guidebook, spending about two hours studying the chosen topic of the day. Another hour was spent previewing the schoolyard, looking for interesting organisms and interactions to bring to the attention of the children. One hour was spent directly with the five children.

Individual FNPS chapters could organize a pool of volunteers and make known through the school district office their availability for schoolyard trips. The experience is rewarding all around.

FNPS members, parents or not, can help improve science studies in schools by demanding outdoor, hands-on nature programs. There should be a science specialist in every elementary school. In Alachua County, home of the University of Florida, the school system has ecialists in art, computers, music, and physical education, but not science! Speak with school board members about bringing nature study into the schools of your county. Be sure to point out how import it is, and how inexpensive it is to implement.

FNPS, either chapters or the state organization, could help by making a resolution regarding nature study, and bringing this to the attention of the head of the State Department of Education, and even the governor. Members should question the school board and other representatives on their opinions, regarding nature study in schools, and could support candidates based upon this criterion.

*Maria Minno has a Master of Science in Botany from the University of Florida, and coauthored, with Dr. Peter Feinsinger, Handbook to Schoolyard plants and Animals of North Central Florida. She has worked with conservation groups to promote habitat protection for endangered plants and animals, including the gopher tortoise and its associates. Presently she is helping educate adults and children about school yard and backyard nature study. She is married to a butterfly taxonomist and mother of two children.*

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*The Handbook to Schoolyard Plants and Animals of North Central Florida*, by Dr. Peter Feinsinger and Maria Minno, is available, for a \$3.00 donation plus \$1.50 postage (made payable to Nongame Wildlife Trust Fund). Order from Nongame Wildlife Department, Florida Game & Fresh Water Fish Commission, 620 S. Meridian, Tallahassee, FL 32399-9969.

Teachers interested in a nature study program may write to Ms. Minno for ideas to use with their classes. She has a Schoolyard Nature Study Book (nature coloring book) available at [http://www.fnps.org/stored\\_web\\_pages/schoolyard\\_colorin](http://www.fnps.org/stored_web_pages/schoolyard_colorin)



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