TREE Foundation
Annual Report
November 2007

Compiled by Dr. Meg Lowman, Executive Director
Annual Meeting, November 12, 2007
New College Foundation Board Room, 5 -7 PM
Sarasota, Florida

(cover photo: TREE interns Fabiana Silva and Charissa Jones enjoy the National Science Foundation traveling canopy exhibit which educates the public about the importance of forest canopies)

TREE FOUNDATION

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Sarasota FL 34235

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DC Randle, Research Associate (non-voting)
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Isanti MN 55040

Fabiana Silva, Research Associate (non-voting)
Environmental Education Specialist
Long-term Ecological Research Sites
Coweeta Research Station
Coweeta NC

H. Bruce Rinker, Ph.D., Research Associate (non-voting)
Env. Lands Division Administrator
Brooker Creek Preserve
Tarpon Springs FL 34688

Margaret Lowman, Ph.D. and Executive Director
Director of Environmental Initiatives
Professor of Biology and Environmental Studies
New College of Florida
5800 Bay Shore Road
Sarasota FL 34243

Robert Richardson, Board Chair Emeritus
President, Sarasota Downtown Association
2055 Wood St.
Sarasota FL 34237

Michael Brown, Legal Counsel
888 Second Street
Sarasota FL 24236

Student Interns (Center for Canopy Ecology)
Charissa Jones
Rachel Renne
Bryson Voirin
Ravi Bannerjee
Jessica Wheeler
Pamela Montero Alverez
Guillermo Sanchez
David Mitre
Marcos Oversluijs Vasquez

TREE Foundation Highlights for 2007:

1. Over 50,000 families and citizens viewed our Rain Forest Canopy Exhibit called "Out on a Limb" which traveled to Arts Day, Reading Festival and now resides in GWIZ Science Museum. Materials were translated into Spanish on the web site and for presentations.
2. Six canopy research interns were partially funded to present their findings at Ecological Society of America and Association for Tropical Biology annual meetings
3. Two of our past TREE interns got Fulbright fellowships to continue their research in canopy ecology! And a third intern from Panama received a graduate scholarship to Cambridge University, UK! TREE's influence on these students is truly making a difference!
4. The canopy walkway project is currently being touted as a model by Department of Interior and the National Park system to attract visitorship to the outdoors. The state of Maryland is constructing a similar walkway as a means of increasing visitorship to the outdoors.
5. Our proclamation "No Child Left Indoors" went from local (city and county commissioners endorsed an official No-Child-Left-Indoors Week in Sarasota County) to national dissemination, wherein Ecological Society of America and ultimately Capital Hill embraced the mantra. Current legislation for environmental education funding at a national scale is pending.
6. Our 2007 interns from Peru both experienced life-changing opportunities to learn about canopy ecology and conservation in America.
7. TREE Foundation funded the creation of a curriculum for SOS (science outreach to schools), a local environmental education program that is extending to national outreach through sister campuses.
8. New brochures were printed for the Myakka canopy walkway, and new bookmarks and stickers were created for TREE Foundation.
9. Our new TREE treehouse project was launched, with Laura Peter chairing a committee. Initial in-kind donations (landscaping, construction of a proto-type, fund-raising, and graphics/logo) all in process with a dedication planned for spring 2009.
10. Canopy ecology research and conservation was initiated with new research partnerships in India and Africa, with exchange of visiting scholars between USA and India/Africa next year as well as sharing of best practices in conservation.
11. Canopy ecology books were distributed to developing countries, and our web site has expanded significantly to include canopy education outreach activities, articles, photo galleries, and videos.
12. TREE Foundation partnered with New College and Sarasota County to develop a business plan for Base Camp Sarasota, a field station and environmental education center aimed at studying environmental change in Florida.
13. **Nature's Secrets** continues a successful distribution in the Sarasota Herald Tribune to educate the Florida public and science and environmental issues.
14. TREE's executive director received the Mendel Medal for achievements in science.

2007-8 Goals and Measures

GOAL	MEASURE	FUNDING
1. Local Canopy Ecology Activities		
Lead educational walks for the public on forest ecology, and train students as guides	Schedule and lead 3 hikes; train 10 student guides; produce 1 brochure	$ 2000
Host website for Biological Field station in Southwest Florida, research green architecture.	Use Florida House Institute to create designs, Brighter Tech for web	$20,000
Tree house for kids – initial design	Create logo, brochure, select site, fund-raisers	$10,000
2. International Canopy Ecology Activities		
Host 2 interns from tropical country to train in canopy ecology	Select and schedule; sponsor public lectures for students	$5000
Attend Ecological Society of America professional meetings (Lowman, plus 5 student interns)	Write papers and submit abstracts; attend and present research findings	$5000
Field work in Peru, India	Work plan for canopy research site	$5000
3. Public Science Outreach about Forest Canopies		
Host one community lecture on Conservation/ ecology	Attract 300 attendees and schedule speaker reception for students	$3000
International Center for Canopy Ecology – maintenance and growth of research and education outreach programs	Add 50 publications to files; collaborate with 10 scientists or students on research; run office at New College campus; present 3 outreach lectures on canopy ecology; distribute copies of TREE canopy publications to 10 field stations or scientists in developing countries; update website.	$25,000
	TOTAL	$75,000

Cycles of the Rain Forest

WATER

Rainfall & Snow melt 100%

Evaporation from Soil, Lakes and Rivers 25%

Runoff 25%

Transpiration and Respiration 50%

ENERGY

Sun

CO_2

H_2O

Light

Photosynthesis

Oxygen (O_2)

Sugars: stored energy for plants and animals

Producers

Consumers and Decomposers

Carbon dioxide (CO_2)

Water (H_2O)

Heat

Energy for life
Biosynthesis, Movement, Bioluminescence

Oxygen + Sugars

Respiration

NITROGEN

Atmospheric gas (N_2 with traces of NH_3, NO, N_2O, NO_2)

Denitrifying bacteria

Consumers

Plants

Assimilation

Nitrogen-fixing bacteria in root nodules of legumes

Nitrates (NO_3^-)

Decomposers (aerobic & anaerobic bacteria and fungi)

Nitrifying bacteria

Nitrogen-fixing soil bacteria

Ammonification

Nitrification

Ammonium (NH_4^+)

Nitrites (NO_2^-)

Nitrifying bacteria

CARBON

Atmospheric gas (as CO_2)

Released by respiration

Carbon is the building block of life

Absorbed by leaves

Leaves, branches and epiphytes fall

Some CO_2 dissolved in rainwater

Carbon dissolved in water is taken up by roots

Decomposition begins, releasing carbon

New College

National Science Foundation

Los Bosques Lluviosos Tropicales

lo que hacen por nosotros

From Pole to Pole - A Tardigrade Transect through the Americas

- James Burgess, Colleen Mitchell, Randy Miller, Meg Lowman & Hal Heatwole

Princeton University, TREE Foundation, Baker University, New College of Florida, North Carolina State University

www.treefoundation.org; www.canopymeg.com

A sampling attempt of this magnitude has never been taken on by tardigrade specialists. The ability to compare the tardigrade fauna in similar ecosystems in the northern and southern hemisphere has never been accomplished before. Acquiring this kind of information will be the baseline data for all ecological tardigrade studies in the western hemisphere.

Echiniscus mauccii

A tardigrade is a microscopic invertebrate that lives in aquatic ecosystems.

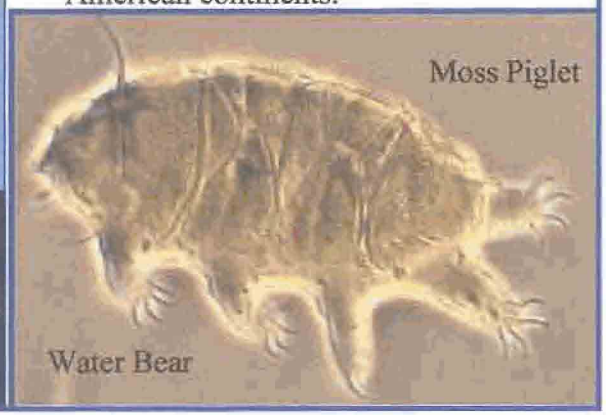
Semi-terrestrial tardigrades are considered to be the #1 Most Extreme Survivor because of their ability to die and come back to life.

James

Sampling a semi-terrestrial tardigrade is relatively easy. This is done by looking at a sample of moss or lichen soaked in water.

Samples for this study have already been collected and processed from Antarctica, Peru, British Columbia, Alaska, Alabama, Florida, Pennsylvania, and Kansas.

New collections will be from LTER sites and field stations on both American continents.



Moss Piglet

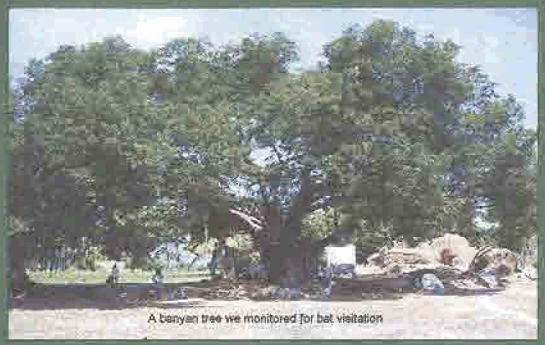
Water Bear

TREE FOUNDATION

www.treefoundation.org

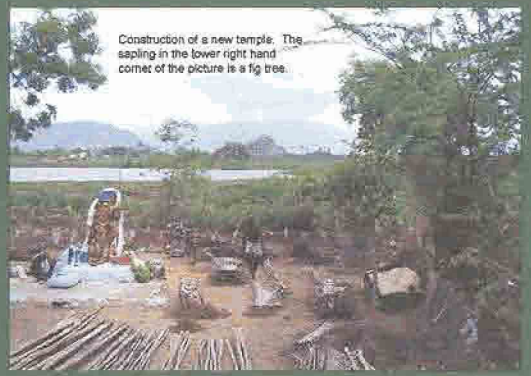
Sacred fig trees and fruit bats in South India

T. Caughlin[1], T. Ganesh[2], M. Lowman[1].
1. New College of Florida, Sarasota, FL 34234, 2. Ashoka Trust for Research in Ecology and the Environment, Bangalore, India


A banyan tree we monitored for bat visitation

Across a wide variety of tropical human cultures, fig trees (genus *Ficus)* are considered sacred. In India, several species of fig trees are protected from fuelwood collection and actively planted at Hindu temples. We hypothesize that preservation of fig trees for religious reasons can also contribute to the conservation of fruit-eating animals, such as the Indian flying fox.

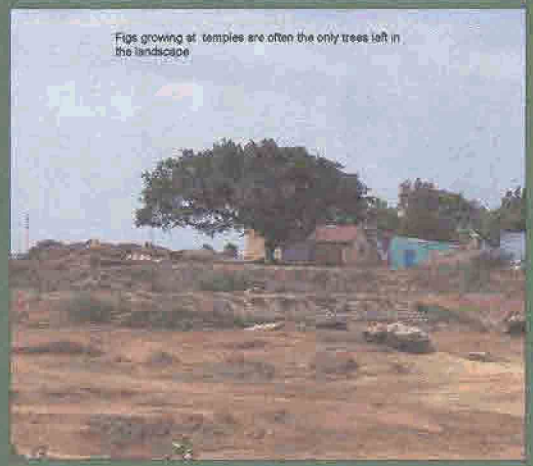

The indian flying fox, at a roosting site. Photo by T. Ganesh.


Construction of a new temple. The sapling in the lower right hand corner of the picture is a fig tree.

Materials and Methods

We surveyed all fig trees within a 4 km radius of our field station and recorded associations with temples.

We also recorded Indian flying Foxes, *Pteropus giganteus*, important pollinators and seed dispersers, feeding on 20 fruiting banyan trees.


Figs growing at temples are often the only trees left in the landscape

The majority of fig trees (74%) were associated with temples or shrines, implying that religion greatly contributes to the presence of these trees in South India.

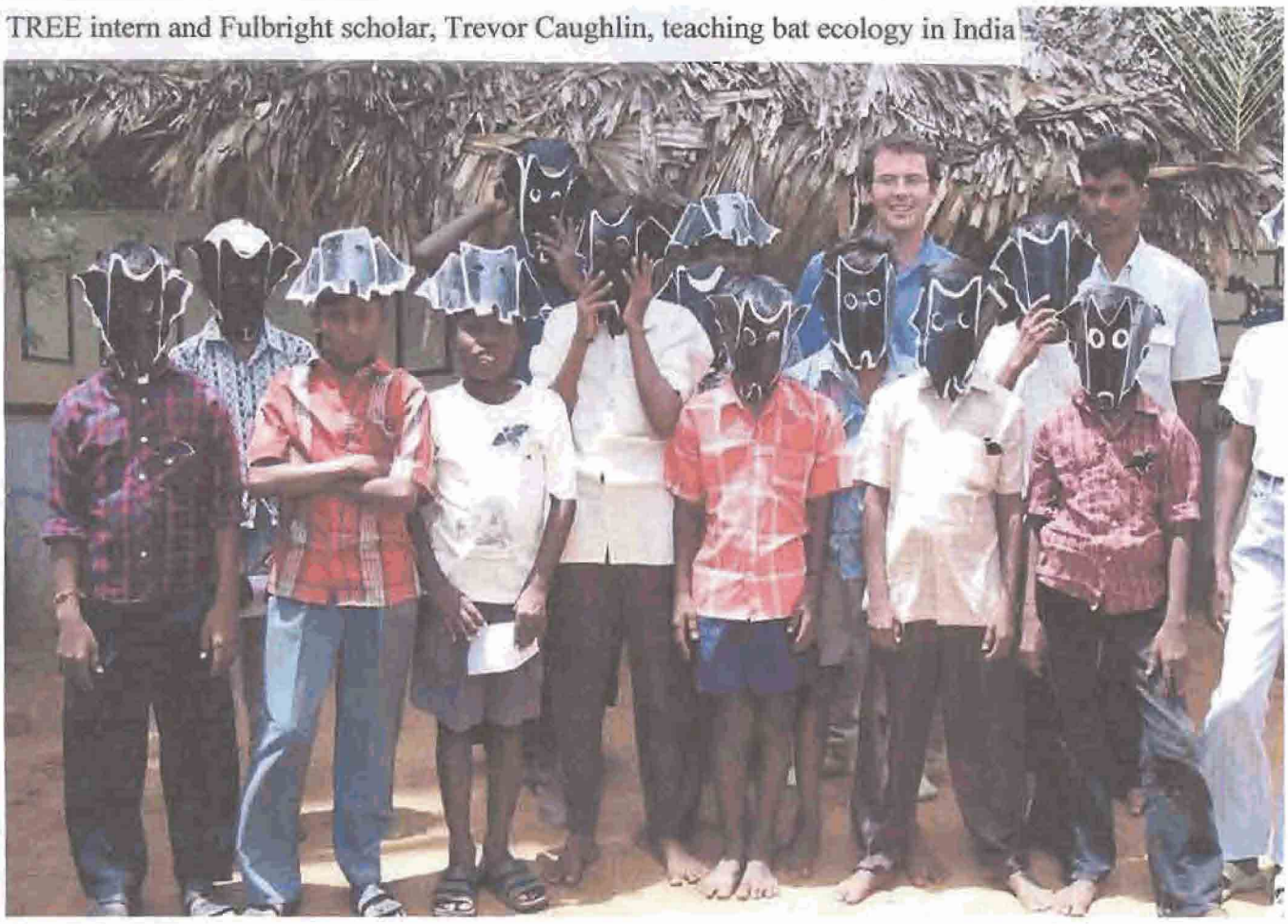
While fruit bats are not considered sacred at our study site, sacred fig trees are an important food resource for the bats, demonstrating a positive indirect effect of religious conservation.

This research would not have been possible without an Explorer's Club Youth Grant.

For more information, contact timothy.caughlin@ncf.edu

TREE interns at the Ecological Society of America scientific meetings

TREE intern and Fulbright scholar, Trevor Caughlin, teaching bat ecology in India

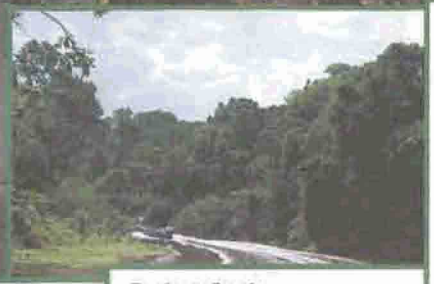


NSF Exhibit

Over 15,000 students and families enjoyed the TREE/ NSF rainforest exhibit at the Arts Festival in downtown Sarasota, Florida January 2007

Out on a Limb

Forest Canopies and Informal Science Education Exhibit



Abstract

"Out on a Limb – Forest Canopies" is an informal science education exhibit developed to educate people about forest canopies and illustrate the challenges of canopy access by scientists. A traveling rain forest diorama – with scaled models of scientists exploring the canopy and accompanying graphic panels and interactive activities – will circulate to community venues in southwest Florida, increasing public awareness of how forest canopies are important to life on earth. Canopy research provides a highly visual, exploratory approach to scientific inquiry that can be effectively communicated to school groups and the general public. The intellectual merit of our exhibit is to provide public education about forest biodiversity, how the treetops provide energy for all life, links between treetops and tree floor, and why citizens should conserve forests. In this poster, we map out the action plan for creating a community exhibit and planning out diverse venues for its display to maximize public science education.

Project Goals

Take home messages for viewers:

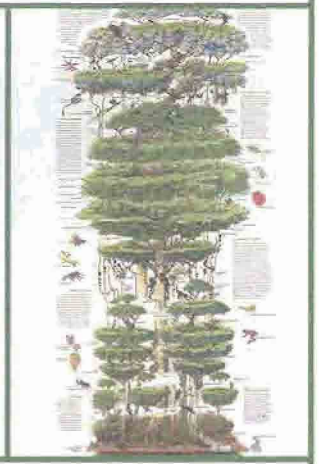
- Biodiversity in forest canopies
- Knowledge about linkages from the treetops to the forest floor
- The challenges scientists face while conducting research in the canopy
- The role that the public can play in conservation
- The importance of forests to all life on earth

Focus of National Science Foundation-funded research:

- Scientific Inquiry to ask questions about ecosystems
- How scientists use technology to answer important questions that relate to our daily lives
- Classification of biodiversity in the canopy and on the forest floor
- How the canopy is linked to the forest floor via herbivore-related activities

Other goals:

- To dispel the notion of scientists as stereotypical men in white lab coats and research as narrow and dry
- To inspire under-served and minority students to become interested in science, possibly seeking it as a career
- Show the exciting field work Margaret Lowman has done as a role-model for young women



Impact

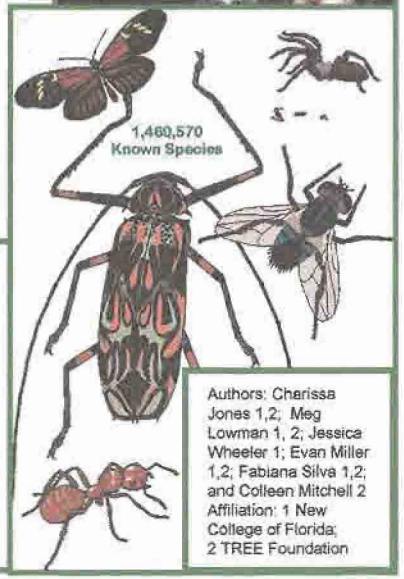
Audience

- Residents and visitors to southwest Florida
- School children
- Senior citizens
- University students
- Families and adult groups
- Amateur and professional naturalists

The diorama will be housed at many public venues, where a diverse range of people will have the opportunity to view it, including:

- Banks
- Libraries
- Malls
- Events, (eg. art and reading festivals, Duke Talent Identification Programs)
- Myakka River State Park
- Public Schools

Touring time: 12- 18 months
Impact: >250,000 people



Project Design

Overall, the 100-square foot mobile exhibit will include :

- 5x3x5 to-scale mini-diorama of an Amazonian tropical rainforest which will include scientists engaged in canopy research using a hot air balloon and raft, canopy platform and bridges, and climbing ropes. The featured forest will be a Peruvian lowland rainforest at a scale of 1:100. It will have a key of the diorama and viewers will partake in a "Where's Waldo" exercise to increase their powers of observation.
- An entrance walkway designed to imitate the canopy suspension walkways, though this one will be only 14 inches off the ground.
- Four colorful graphic panels (3.5'x2') will educate visitors about forest biodiversity, nutrient cycling and other links from treetops to forest floor, the importance of forest canopies to life on earth, and a panel on citizens' roles in conservation.
- A touch screen kiosk will show video images of scientists using technology to study the treetops and will interpret the diorama in greater detail
- Take-home activities for schools and teachers

Authors: Charissa Jones 1,2; Meg Lowman 1, 2; Jessica Wheeler 1; Evan Miller 1,2; Fabiana Silva 1,2; and Colleen Mitchell 2
Affiliation: 1 New College of Florida; 2 TREE Foundation

Meg Lowman Treetops Camp in upstate NY. (TREE donations funded one disadvantaged girl to attend camp.

TREE Scholars – interns, campers

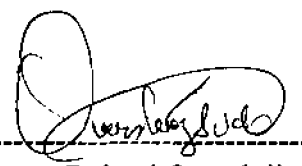
FROM: MARCOS ROLAND OVERSLUIJS VASQUEZ

TO: TREE FOUNDATION

I am working in 69 villages at 2006 helping over 4000 children's, 200 teacher and his family parents with adopt a school program, environmental education and sustainable development project to. What it's my responsibility in CONAPAC

My visit in USA (Philadelphia, Washington, Florida and Chicago), was great, I visited people than work in sustainability activities, botanicals gardens, natural history museum. I know lots persons with big heart. It was wonderful dream.

Thank you Tree Foundation



Marcos Roland Oversluijs Vasquez
Biology and conservative
CONAPAC

Final drafts of logos for the TREE treehouse project, to educate children about environmental education and inspire the joy of trees

THE CITY OF SARASOTA

Proclamation

WHEREAS, the TREE Foundation, Inc., a Sarasota, Florida based nonprofit organization, is promoting "No Child Left Indoors" week as part of Earth Week, 2007, to encourage adults to connect a child with nature; and

WHEREAS, national statistics show that visits to national and state parks have fallen off by as much as 25% in the last decade, because kids remain indoors playing computer games and watching TV; and

WHEREAS, biological, health, and economic data indicate that children who connect with nature perform better in school, have higher SAT scores, and exhibit fewer behavioral challenges; and

WHEREAS, teaching children about their "home", Planet Earth, fosters better stewardship and science literacy; and

WHEREAS, the City of Sarasota offers a wide array of parks and recreation areas wherein our children can connect with their amazingly diverse natural environment, from the gulf shore waters to coastal dunes to wetlands to oak hammocks to our abundant green-spaces throughout the city; and

WHEREAS, the TREE Foundation endorses activities locally and nationally to foster experiences for youth to appreciate and learn about nature and local ecology; and

WHEREAS, the locally begun "No Child Left Indoors" concept has grown into a national movement that encourages students, families, and adults to experience nature.

NOW, THEREFORE, the City Commission of the City of Sarasota, Florida, and on behalf of the citizens of our community, takes great pride in recognizing the week of April 15-22, 2007 as

"No Child Left Indoors"

and challenge all citizens young and old to take a child into the natural world for a shared educational experience.

Fredd "Glossie" Atkins, Mayor

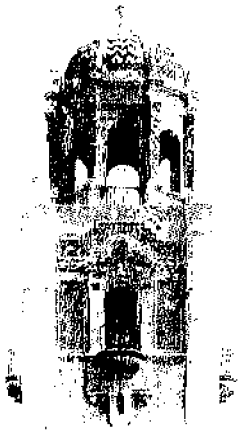
Danny Bilyeu, Vice Mayor

Mary Anne Servian, Commissioner

Lou Ann Palmer, Commissioner

Ken Shelin, Commissioner

ATTEST: Billy E. Robinson, City Auditor and Clerk



SARASOTA COUNTY GOVERNMENT

SARASOTA, FLORIDA

Proclamation:

***WHEREAS**, the TREE Foundation, a Sarasota, Florida based nonprofit organization, is promoting "No Child Left Indoors" week as part of Earth Week, 2007, to encourage adults to connect a child with nature; and*

***WHEREAS**, national statistics show that visits to national and state parks have fallen off by as much as 25% in the last decade, because kids remain indoor watching television and playing computer games and Sarasota County offers a wide array of parks and natural areas wherein our children can connect with their amazingly diverse natural environment, from the gulf shore waters to coastal dunes to wetlands to oak hammocks to dry prairies to treetop canopies; and*

***WHEREAS,** science education in America is falling behind that of other countries, especially knowledge of ecology and earth-based sciences, but data indicate that children who connect with nature perform better in school, have higher SAT scores, exhibit fewer behavioral challenges, and experience fewer attention deficit disorders and the locally "No Child Left Indoors concept has grown into a national movement that encourages students, families and adults to experience nature.*

***NOW, THEREFORE, WE THE BOARD OF COUNTY COMMISSIONERS OF SARASOTA COUNTY, FLORIDA** hereby recognize the week of April 15-22, 2007, also known as Earth Week, to celebrate "No Child Left Indoors" and challenge all citizens young and old to take a child (or a child at heart) into the natural world for a shared educational experience.*

***PRESENTED**, this tenth day of April 2007.*

CHAIRMAN

COMMISSIONER

VICE-CHAIRMAN

COMMISSIONER

CLERK OF CIRCUIT COURT

COMMISSIONER

No child left indoors

Meg Lowman
Professor of Biology and Environmental Studies,
New College of Florida,
Vice President for Education, ESA

Coming home late one Halloween eve after a long laboratory class, I stopped at the mailbox and found a hand-written note in my then 6-year-old son James's nearly illegible script. It read "Caution – black widow inside". At first, I thought it was a prank, but squinting hard, I was flabbergasted to see the characteristic tiny red hourglass of this venomous spider in the beam of my flashlight. James was delighted. I never knew that black widow spiders habitually seek out mailboxes in Florida until we looked it up in the encyclopedia that night. My son proudly told me that he had learned to identify spiders from our family walks in the woods, peering at insects and studying their colorful markings. This bit of nature knowledge proved to be a potentially life-saving skill.

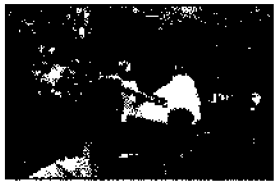
Kids need to know about nature. It nurtures and educates them, as well as instilling a sense of stewardship for the environment. A survey (Balmford *et al.* 2002; *Science* **295**: 2367) found that more children knew the characters in the electronic game Pokémon than could identify an otter, a beetle, or an oak tree. Nationwide, the science literacy of citizens – both young and old – has been eroded. Federal funding for science education has not kept pace with other science-dependent portfolios such as homeland security or petroleum exploration. The implications of this oversight represent a critical global challenge which our country cannot afford to overlook.

Richard Louv's recent book, *Last child in the woods – saving our children from nature-deficit disorder* (Algonquin Books 2005) analyzes the societal problems that have arisen in the latest generations of children, who have essentially lost contact with nature. Louv quotes a fifth grader, who stated, "I like to play indoors better 'cause that's where all the electrical outlets are". The author cites recent studies where environmental education programs provided important therapeutic value to troubled youth, substantial reduction in symptoms of attention-deficit disorder, and statistical gains in academic grades, problem solving, and SAT scores. Nature-deficit disorder not only damages children, but also affects adults, families, even whole communities, and inevitably shapes the future of nature itself. In the ESA report, *Profiles of ecologists – results of a survey of the membership of the* ESA (http://esa.org/education/diversity/), 58% of the respondents developed a passion for ecology before college, and 38% were hooked by the sixth grade. Almost 70% cited experiences not connected with a classroom or teacher that led to their love for science. In summary, early experiences outside of school influenced many ecologists to seek a nature-based career. In my recent book, *It's a jungle up there* (Yale University Press [2006], co-authored with my two sons) we expand Louv's platform by advocating nature-based immersion for entire families, not just children, to encourage a family conservation ethic.

When baby boomers think back to their childhood, they can probably recall a tree house, a scout camping trip, or neighborhood picnics. In today's world, many parents are rightfully reluctant to give their children unsupervised time outdoors, due to dangers ranging from global threats to distrust of strangers. But knowledge of nature is their best weapon if young people are to ultimately make good decisions about personal health, climate change, and land-use management. They need to touch flowers and know why some plants cannot survive without insect pollinators, walk in a forest and understand how many millions of years were required to create petroleum from dead plants – and it doesn't hurt to know how to identify a venomous spider!

As ecologists, we must lead by example in order to prioritize linking young people with their environment. This can be achieved by dedicating a portion of our research time to ecology education and outreach to youth. Science outreach activities can be planned in conjunction with ongoing research, and range from leading hikes for families, creating a nature trail at a local park, championing ecotourism, or bringing an insect collection to your child's science class. Over the next 2 years, the ESA annual meetings will feature informal science education sessions, where innovative case studies will illustrate how ecologists can promote K–12 and citizen science education as part of their work ethic. Our goal is to have "no child left indoors" by 2015. Please join the ESA Education and Human Resource Committee in working together as responsible ecologists to meet this target. Not only will the next generation benefit, but the future of the planet depends on it.

Fostering partnerships between regional government and ecology



Margaret Lowman

We boarded a Lear jet, and the co-pilot offered us champagne from a full bar as we settled into plush leather seats with expansive leg room. For a tropical biologist who expects to find no flush toilets at her field sites, I was overwhelmed. I was the token scientist for a special meeting with Florida's Governor, Jeb Bush, flying to Tallahassee with a state senator, a college president, a county commissioner, and two lobbyists. After we landed, a waiting limousine whisked us to the capitol building, where we found ourselves in a boardroom exchanging jokes with the Governor. He claimed to remember me from a prior meeting to discuss ways to enhance Florida middle school science education with distance learning. Whereas biologists are great at bandying about Latin names of ants or plants, politicians become expert at matching human faces with names and party loyalties. I listened in awe as our state senator skillfully navigated the conversation. Like a captain steering a ship through a maze of reefs, he incorporated stories and "hooks" into the conversation, elegantly leading up to our funding request. I knew that I was learning from a pro about how to effectively communicate with regional government. At the end of the meeting, our message was delivered and the response was enthusiastic. We emerged after an hour with a pledge from the conservative Republican Governor to support our vision for a center of excellence to research best practices in land use and ecological management in subtropical Florida and beyond.

In just one short meeting with a state policymaker, we made great strides forward, turning the dream of an integrative research center focusing on land use ecology, the Florida Land Institute (FLI), into a reality. During the meeting, we communicated one important message to the Governor: that our project would enhance the quality of life for his constituents. This was strengthened by linking effective land use to Florida's economy. If Florida saves 1% of GSP (gross state product) from our FLI initiatives, over $5 billion would be accrued annually (S Mulkey pers comm). The stakes are high – an estimated 900 people move to the Sunshine State every day. Ironically, they move to Florida because of its natural environment; so implementing effective ecological management translates into revenue from real estate, health care, and tourism. FLI will engage professionals in transportation ecology, sustainable construction, hurricane-resistant building, renewable energy, and ecosystem management.

In mid-career, I find my role as an ecologist shifting away from the comfort zone of conventional research, writing technical reports, and communicating almost exclusively to colleagues at annual meetings. Ecologists are increasingly being drawn into "a new social contract of active engagement" (Bradshaw and Bekoff 2001), where issues of sustainability, land use, ecosystem services, and restoration ecology demand an interface between scientists and other community stakeholders. Ecologists are inevitably called upon to include humans in ecosystem analyses and to expand our formerly reductionist views to a whole-systems approach. In Florida, the development of best practices in land use represents a good example where professional ecologists need to be at the table with developers, businessmen, and policy makers. Recently, ecologists and developers joined together to formulate a plan for the development of a sustainable community on Babcock Ranch, the largest state-owned land parcel in south Florida. With encouragement and scientific expertise, the Babcock development will include a large conservation tract (Lowman 2006). Governor Bush signed the Babcock parcel over to state ownership in May 2006 (Figure 1).

How do concerned ecologists juggle an emerging new duality as objective scientists and engaged citizens at a regional level? Over the past decade, ecologists have successfully entered the policy arena on global issues such as climate change, biodiversity conservation, and pollution through groups such as the International Panel for Climate Change, National Academy of Science, and national ecosystem assessments (eg Heinz 2002). But at a local level, the distinction between scientist and citizen can easily blur (Hammond and Bradshaw 2001). The politicization of science, termed "scientizing" (Sarewitz 2004), can also undermine positive environmental outcomes. Alpert and Keller (2003) define a two-hat strategy, whereby ecologists increasingly provide objectivity and neutrality wearing a science hat, but advocate policy as private citizens. Scientists have been defined as the early warning system in regional communities (Pouyat 1999), the equivalent of the canary in the coal mine, whereby their views strike a balance between objectivity and concern (Rykiel 2001).

The Aldo Leopold Leadership Program (ALLP) trains scientists to become effective communicators to policy makers and to the public (Lubchenco *et al.* 1998). Three simple communication tips from my ALLP training facilitate my ability to translate science to regional policy makers in Florida: (1) keep it simple and without jargon; (2) tell a story; and (3) link science to economics and/or human health. Economic- and health-related platforms were essential to the success of our conversation with Governor Bush. The ALLP also recommends that communication of science to regional government (or other non-scientific audiences) should be delivered in short, simple

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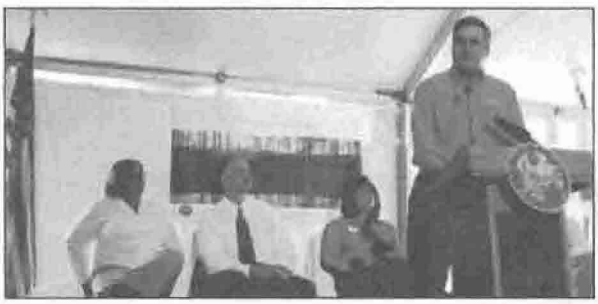

Governor Jeb Bush announces the creation of a regional conservation tract on Babcock Ranch in South Florida.

stories or soundbytes. (For example, my technical research on nutrient cycling between canopy and forest floor processes via herbivory was translated by local journalists into "the scoop on poop".)

States are beginning to assume a larger role in science policy, probably as a consequence of the growing costs of regional environmental issues (eg invasive species, infectious disease, and land use). Nonetheless, state funding for science has declined from 8.1% to 6.6% of total spending for university research and development between 1990 and 2004 (Andres 2006). A few states, such as Oregon, have appointed science advisors to link environmentally sound stewardship with policy. With growing populations and development, regional governments face increasing pressure to use ecologically based decision making. In Florida, a leadership group (www.leadershipflorida.org) provides statewide networking to facilitate policy decisions. Ecologists remain a minority (albeit growing) voice in this group of predominantly bank presidents, mayors, attorneys, and business leaders. Other states have similar leadership groups.

Scientists historically solved issues like disease, and explained actions such as gravity or earthquakes. Now, ecologists are called upon to respond to complex environmental problems and create multi-scale and multi-cultural predictions of outcomes. Ecologists of the next generation will therefore require new training in public outreach, new job descriptions, the ability to communicate science to policy makers, and the skill needed to play effective roles in regional decision making. A 21st century mission statement for ecologists was defined by Alpert and Keller (2003): "to provide the most useful scientific information possible for making the legislative and administration decisions that affect society and nature, by meshing their interests with those of policy makers."

A growing number of ecologists recognize the need for a stronger link between science and policy (Schlesinger 2005). At the 2006 ESA annual meeting in Memphis, TN, plenary speaker Ron Sims quoted former Speaker of the House Tip O'Neill by saying, "All politics is local". Sims, the County Administrator for King's County, WA, recently received the prestigious 2006 Edgar Wayburn award from the Sierra Club for outstanding service to the environment by someone in government. In speaking about his initiatives, Sims called King's County a "living laboratory of innovation" where he "listens first to scientists and then to policy makers". With staff scientists fully engaged in research and think-tank activities, Sims' team has restored the habitat of endangered salmon, built the largest hybrid articulated bus fleet in the country, and implemented some of the most progressive land use policies in the US.

More and more ecologists are serving their local communities by bringing science into regional decision making. Some write newspaper columns to educate their public sector (W Schlesinger and S Pickett pers comm). Others serve as leaders in science education, raising the science literacy of youth and contributing to future decision making (Brewer 2002a,b). Programs such as neighborhood nest watch lead to tangible political action and awareness "one backyard at a time" (Evans *et al.* 2005). Others have forged partnerships in multi-state geographical areas, leading to the establishment of marine reserves (Lubchenco *et al.* 2006). Even when conservation policies are initiated at a national level, the practice and execution often remain local (eg Chatre and Saberwal 2005).

What will your community look like in the year 2050? Getting involved in regional government as an ecologist is one important way to shape that outcome.

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NATURE'S SECRETS / by Meg Lowman

For the love of bromeliads, young scientists study forest canopy

"The moment one gives close attention to anything, even a blade of grass, it becomes a mysterious, awesome, indescribably magnificent world in itself."
— Henry Miller, American writer and painter (1891-1980)

"To be poor and be without trees, is to be the most starved human being in the world. To be poor and to have trees, is to be completely rich in ways that money can never buy."
— Clarissa Pinkola Estés, "The Faithful Gardener: A Wise Tale About That Which Can Never Die"

MEG LOWMAN
NATURE'S SECRETS

What do you get when you combine 205 third-graders, 52 parents, 620 bromeliads and a single canopy walkway?

The answer — one of the few long-term databases on plant population ecology in Sarasota County. Denise Fugere's third-grade class at Pine View School in Osprey is studying the growth of two bromeliad species in the Florida forest canopy. In particular, the students are measuring the impact of a herbivore (definition: animals that feed on plants) on the health of these air plants or epiphytes, as bromeliads are called.

For eight years, Fugere's students have used a very simple tool kit — paper, pencils, rulers and field notebooks. With these tools, they make field observations to assess the damage by the invasive Mexican weevil (Metamasius callizona), which kills Florida bromeliads. The students have developed a scale of bromeliad health, ranging from 1 = sick, to 3 = healthy, with written and photographic keys for all of the moderately damaged levels in between.

During an April field expedition, the third-graders arrived at Myakka River State Park in a yellow school bus and hit the trail with great enthusiasm. They scoured the forest, locating their permanent canopy sites, and began scribbling furiously in field notebooks.

Using digital images, they can accurately measure the growth of bromeliads that are out of reach. One student actually "inherited" the bromeliad of her older sister, who studied the same plant several years ago. Students conveyed a strong sense of kinship to their study specimens, expressing joy at finding them healthy and growing.

The cardinal and giant air plants (Tillandsia fasiculata and T. utriculata) are the two species of bromeliads under study by these junior biologists. When the canopy walkway was built at Myakka in 2000, ecologists first observed the deterioration of bromeliad rosettes. Leaf material was heavily eaten and fell to the ground, sometimes killing the entire plant.

The invasive weevil came from Mexico to Miami in a shipment of tropical bromeliads destined for a plant shop or botanical garden. The weevil is now well established in Florida, and continues to devour native bromeliad species. Beginning their fieldwork in the year 2000, the third-graders documented a serious bromeliad dieback in 2001 when the weevil outbreak peaked. Consequently, fewer bromeliads now exist in their study plot for measurements and observations.

ABOVE AND BOTTOM RIGHT: MEG LOWMAN; BOTTOM LEFT: HERALD-TRIBUNE ARCHIVE

Potential future ecologists from Pine View School in Osprey visit the canopy walkway at Myakka River State Park in Sarasota County. Below left: the adult Mexican weevil is about half an inch long. Below right: this bromeliad has been studied by two sisters over four years.

Invasive species are estimated to cost Americans $137 billion annually, in attempts to control their distribution and damage. Other infamous invasives are air potato vines, Brazilian pepper, kudzu, gypsy moths and zebra mussels. All spread rapidly, leaving a swath of both ecological and economic carnage.

The canopies of subtropical forests in Myakka park and throughout Southwest Florida contain a unique layer of biodiversity in the epiphytes, or air plants. Dispersing their tiny seeds via wind, epiphytes land in bark crevices and germinate. They are not parasites, but instead gain nourishment from rainfall and the tiny particles of dust in our atmosphere.

Many epiphytes are structured as a rosette, whereby the center forms a nutrient soup for the plant as material collects in rainwater. Epiphytes in the Myakka canopy include resurrection fern, butterfly orchid, Spanish moss, and other bromeliads and ferns. (Don't confuse poison ivy with an epiphyte; the trifoliate leaves and reddish stems of this toxic plant are also common in the Florida canopy!)

Fugere is an old hand at elementary science teaching, having served our community for 28 years as an educator. She has received funding from an Edge of Excellence grant from the Education Foundation of Sarasota County and from the Pine View Foundation to buy her students digital cameras and microscopes to study local bromeliads. Despite years of experience, her enthusiasm for science has not waned, and her students are noticeably inspired.

Other benefits of this youthful scientific corps: A graduate student at the University of Florida is using the third-grade data for her graduate thesis; Myakka park is gaining valuable data on its tree canopies; and Sarasota County is amassing a long-term data set on bromeliads and their weevil herbivores. But best of all, future scientists are being nurtured for possible careers in field biology at this formative young age.

(Note: Watch for Part 2 of a blueprint for Florida's clean-energy future on May 20.)

6 MAY 2007

Activity

Go online and study the third-grade bromeliad survey at http://savebromeliads.ifas.ufl.edu/field/pvww/pineview.html. Take a trip to Myakka River State Park, and see if you can observe weevil damage in the bromeliads. Walking across the canopy walkway, you may get a closer view of these air plants. Can you observe any other herbivores eating foliage? (For directions to the park, call (941) 361-6511 or visit www.myakkariver.org.)

Dr. Margaret Lowman (aka Canopymeg) is a science writer and director of Environmental Initiatives at New College of Florida. On the Web: www.canopymeg.com

6 MAY 2007

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NATURE'S SECRETS / By Meg Lowman

'Adults – No Entry!' — A eulogy to treehouse sanctuaries

"It is told that she had a house built in the branches of a tree that grew near the falls, for that is the custom of the Elves of Lorien, to dwell in the trees, and maybe it is so still — even in these latter days dwelling in the trees might be thought safer than sitting on the ground."

— **J.R.R. Tolkien**, "The Lord of the Rings"

MEG LOWMAN

NATURE'S SECRETS

Kids and treehouses — those two words go together, and invoke a reminiscent smile on almost anyone. Treehouses were as important to 20th-century American childhood as apple pie. What is it about treehouses that makes us all smile and immediately savor our memories of childhood with those classic treehouse signs, "Adults — No Entry"? But how many children in the 21st century have ever experienced the thrill of escaping to a treehouse in the neighborhoods? Like many of the forests in which treehouses were built, is this important childhood ritual becoming extinct?

Our ancestors were tree dwellers. Throughout human history, people have taken to the trees as safe havens, sites of special spiritual connection, and as a cornucopia of food, medicines, materials and productivity. With their millions of green leaves that produce sugars from sunlight, the treetops are the epicenters of life and food chains throughout the planet.

In Papua New Guinea, a tribe called the Korowai still live in trees, erecting amazing aerial houses accessible by twig ladders. It is speculated that their unusual habit of community treehouses evolved as a mechanism to escape enemies on the forest floor and provide a healthy environment above the dank, dark understory.

Many famous people have escaped to childhood treehouses — John Lennon (of the Beatles), Winston Churchill, the Roman emperor Caligula and Queen Victoria when she was a young princess.

I recently had the privilege of hosting Richard Louv, author of the acclaimed book "Last Child in the Woods," during his visit to the Sarasota Reading Festival. Richard was thrilled to visit Southwest Florida's Myakka River State Park treetop walk. In childlike fashion, he beamed with joy at the elation of climbing into the forest canopy and experiencing life as did our ancestors. We mused on how the transformation of an abstract collection of nails and boards could create a virtual sanctuary for kids, safe from the rules of adults and from the chaos of ground level.

Treehouses serve several important biological functions for the children who are fortunate enough to experience them. Treehouses exemplify biophilia, an important term coined by E.O. Wilson that reflects our innate human desire to connect with the natural world. In an evolutionary sense, humans descended from ancestors in the treetops. Anyone who pauses at the zoo to watch a monkey cavorting in the branches is amused, inspired and subtly reminded of something inside that tugs on our evolutionary memory banks.

Treehouses also bring kids into contact with the hotspots of the forest — flowers, new leaves, pollinators, birds, arboreal mammals and millions of beetles. The essence of energy from sunlight all converges in this region high above the forest floor.

Third, canopies undoubtedly produce the purest air on the planet, emanating fresh from greenery that transforms carbon dioxide into useful energy. Oxygen is just one of the byproducts of this important process of photosynthesis. Just as patients appreciate plants in hospitals, perhaps kids benefit from the clean, fresh atmosphere enveloping a treehouse.

Fourth, treehouses are safe sanctuaries in a world of chaos and technology, and elicit the creative energy of youth. (And don't overlook the fact that they make cozy spots for sleepovers with best friends!)

Do kids need treehouses? And how does a treehouse give our children a sense of biophilia, ultimately making them better global stewards?

Scientific studies have shown that children need contact with the natural world. In most urban areas, stands of trees are cleared, vacant lots for tree-forts are nonexistent, and deed restrictions often preclude hauling tidbits of timber into the tree branches. Will treehouses become extinct?

At a local level, Myakka River State Park houses a unique treetop experience for families and visitors, both young and old. Only 100 feet in length, the canopy walkway nonetheless provides a special biophilia link for all who seek inspiration and discovery in our ancestral treetop environs. The treetop walk has more than doubled visitorship to Myakka River State Park, staff say.

On Sunday afternoons, people line up patiently to traipse across the tops of live oaks and cabbage palms, the dominant canopy of a Florida subtropical hammock. To date, it is the only public treetop walk in North America; but others are in development. In an era in which visitorship to both national and state parks is declining, treetop walks represent a solution to reverse this alarming trend.

Treetop experiences may represent a win-win for American parks. First, treehouses or walkways represent an important hook to inspire youth to enjoy the natural world, rekindling their sense of biophilia as they transition into adulthood. Second, aerial adventures may provide a competitive edge over computer games, skateboard parks and television that will inspire families to visit local parks and spend time in nature.

So if you are a parent or a community leader, please consider bringing back treehouses as an important legacy for connecting local kids to nature.

Dr. Margaret Lowman (aka Canopymeg) is a science writer and director of Environmental Initiatives at New College of Florida. Her column appears semimonthly. On the Web: www.canopymeg.com

Activity

Can you recommend an ideal community site with a shady stand of trees for a treehouse? The TREE Foundation (which oversaw the Myakka walkway project) is seeking sites, designs and business partners for its community treehouse project. Please send your suggestions to Laura Peters, lpeters@comcast.net. Students and teachers, watch for a treehouse design competition in 2007 (www.treefoundation.org).

COURTESY OF JESSICA WHEELER

This treetop walk extends above the vast green expanses of tropical forests in the Amazon basin.

PROVIDED BY MEG LOWMAN

The TREE Foundation is a Sarasota County nonprofit dedicated to linking kids with nature through tree research, education and exploration. The foundation's flagship project was the construction of the Myakka canopy walkway to educate visitors about forest canopies in Florida.

Keystone species sustain life in India's tiger reserve

"How many times have I wished that I could look out onto the world through the eyes, the mind, of a chimpanzee. One such minute would be worth a lifetime of research."

— **Jane Goodall**, "The Chimpanzees I Love," 2001

MEG LOWMAN

NATURE'S SECRETS

We scoured the forest floor, seeking fruits and flowers as clues to identify tree species towering above. Feathered flocks foraged overhead in an explosion of color and sound.

The birds of India were new to both my eyes and my vocabulary — scarlet minivet, brown-cheeked fulvetta, plain flowerpecker and little spiderhunter. They were insectivores, meaning insect-eaters (or spider-eaters, in the case of the "spiderhunter"). But despite a palate for bugs, these birds depended for their survival on one evergreen tree, called Vedipla by the locals (scientific name: Cullenia exarillata).

Insects are attracted to eat its fruits; birds in turn consume the insects; reptiles congregate to eat the insects; monkeys join the cacophony to eat insects, leaves and fruits. And tigers may lurk on the forest floor, hoping to eat the animals that ate the insects that ate the fruits!

Ecosystems are complex chains of who-eats-who. Indian tropical forests are no exception.

India's Cullenia tree is an example of what ecologists call a "keystone species," meaning that it has a strong impact on the health of its ecosystem. Other examples of keystone species include starfish, which are important predators in marine coastal waters. Because starfish prevent one species from outcompeting others, they serve to maintain the high diversity of intertidal pools along the Pacific coast.

A North American keystone species, the beaver, manipulates its environment to allow more species to co-exist. In creating its dam, beavers pro-

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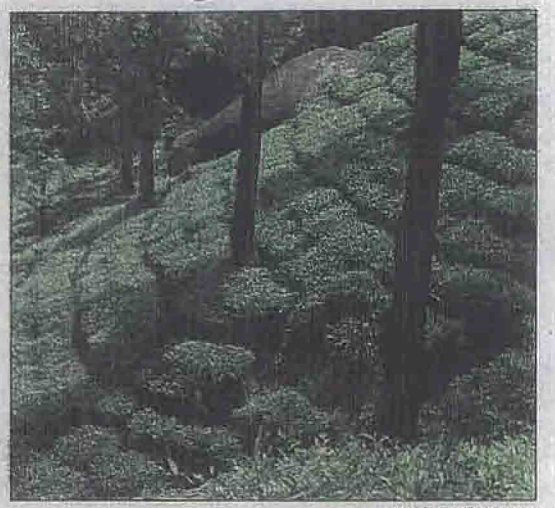


PROVIDED BY MEG LOWMAN

Tea plantations are a predominant vegetation up to the boundaries of the Kalakad Mundanthurai Tiger Reserve, which faces a threat from encroaching land-use pressures.

Keystone species are vital to chain of life in reserve

LOWMAN FROM 1F

vide new habitat for others. Similarly, alligators serve as keystone species in Florida, making deep holes that also form critical water conservation areas for other wildlife during droughts.

Keystone species are sometimes debatable, because scientists struggle to tease apart the complex relationships in ecosystems. But any species labeled "keystone" is usually the primary focus of conservation efforts, since the ecosystem may become altered or even collapse, if it declines.

Cullenia is endemic to India, meaning that it grows naturally nowhere else in the world. It is protected in an important biosphere reserve, Kalakad Mundanthurai Tiger Reserve, in the Agasthyamalai Hills in the Western Ghats of southern India.

This region is a refuge for highly endangered primates, civets, bats and many species of birds, butterflies, amphibians and reptiles. The 360-square-mile (900-square-kilometer) reserve is threatened by encroaching land-use pressures, including tea and coffee estates originally established by the British, rice paddies in the lowlands and rising instances of poaching.

At the tiger reserve, Indian scientists study the responses of biodiversity to global change. One project involves monitoring this keystone tree and the populations of animals that depend on it. Permanent plots have been established by biologists to monitor plant growth.

PROVIDED BY MEG LOWMAN

A young villager holds large, fleshy Cullenia seeds.

One of India's foremost ecologists, Soubadra Devy, risks life and limb to ascend her hand-hewn, rickety ladders to study pollination. A remote field station in the tiger reserve allows scientists to live in the jungle for long-term research.

Despite the primitive conditions, an intrepid group of Indian researchers greeted us upon arrival. They immediately hustled me along the trail for a very special sight — six lion-tailed macaques feeding in a Cullenia canopy. What a thrill!

Despite their accident-prone appearance, the twig ladders allowed us to literally sit amid a troop of our ancestors.

A hike through the Kalakad Mundanthurai Tiger Reserve forest proved equally extraordinary. At the edge of a small stream, my host, Dr. T. Ganesh, whooped and hollered with joy. He pointed to an enormous tiger footprint, freshly imprinted in the sand. Less than one hour ago, an endangered Indian tiger had stood in this spot.

I looked nervously around the jungle in awe. Nearby we found claw marks on a tree trunk, clues that this tiger was not only large but also that we were trespassing in his territory. We practically tiptoed home, fearful yet anxiously hoping to glimpse this forest giant.

In the reserve, tigers are at the top of the food chain, and humans humbly defer to this "king of the jungle." But recently, eight tigers disappeared from the Ranthambore National Park in western India. Despite their endangered status, tigers are still poached for their skins or for their bones, which constitute ingredients of traditional Chinese medicines.

Although technology can transmit information around the globe in seconds and photograph the farthest galaxies, many mysteries remain close to home. Scientists have not figured out the secrets of pollination of the Cullenia tree, nor do we understand the complex ecosystem of one of the last remaining tiger reserves.

A dwindling number of tigers and langur monkeys surely hope that we can do better. Their survival depends not only on the continued fruiting of their keystone tree, but also our knowledge about how their forest works.

Dr. Margaret Lowman is a science writer and director of Environmental Initiatives at New College of Florida. On the Web: www.canopymeg.com

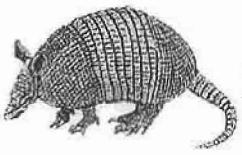
ASSOCIATED PRESS ARCHIVE

A one-year-old Bengal tiger looks for water last month at the Nehru Zoological Park in Hyderabad, India. Poaching and habitat loss have savaged India's tiger population.

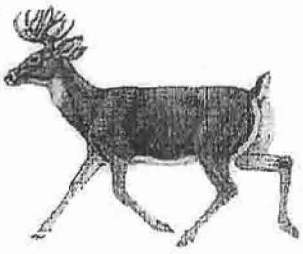
A Guide to Mammal Tracks at Carlton Mabry Reserve

The Florida panther (*Puma concolor coryi*) is rarely seen. It is a subspecies of the puma, found only in south-central Florida. Today the panther has a population of only about 80 cats . The panther continues to face habitat loss, degradation, and fragmentation from human urbanization, agricultural development and roads.

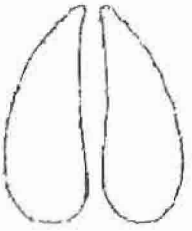
The Raccoon (*Procyon lotor*) is notable for its black mask and bushy ringed tail. Raccoons are very common in the U.S. They are omnivorous feeding on fruits, plant material, small animals, and garbage. Raccoons usually become active in the late afternoon and throughout the night. Problem raccoons are usually the result of feeding by humans.

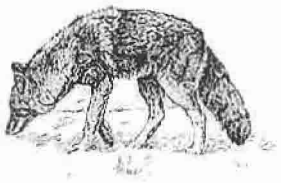


The Nine-banded Armadillo (*Dasypus novemcinctus*) is an odd looking mammal about the size of a cat covered with armored plates. Armadillos like forested habitats with loose textured soil that allows them to dig easily. They most often feed at night, and have very poor eyesight.

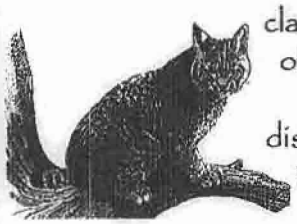


White Tailed Deer (*Odocoileus virginianus*) can be found throughout Florida. Males have antlers. This deer is an herbivore and eats mostly twigs and leaves. Most browsing is done at night or on over cast days. Predators include man, dogs, bobcats, coyotes, bears, and panthers.

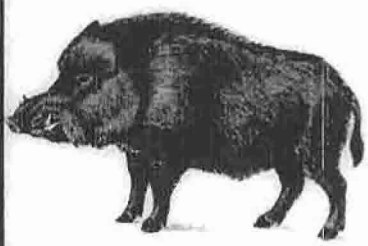




The Coyote (*Canis latrans*) occurs throughout the eastern United States. Coyotes are extremely adaptable; just about any type of forest or farmland is suitable habitat. The Coyote is a member of the dog family. In size and shape the Coyote is like a medium-sized dog, but its tail is round and bushy.

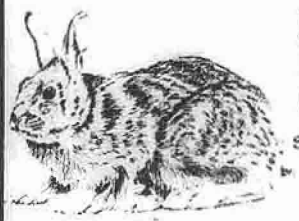


The Bobcat (*Lynx rufus*) is equipped with razor-sharp claws, needle-like teeth, and the strength to make good use of these weapons. The name comes from the short, stub-like tail, approximately five inches long, which has a distinctive black tip.. Bobcats can measure up to three feet in length, including the tail, and weigh 15 to 30 pounds. Bobcats are excellent climbers.



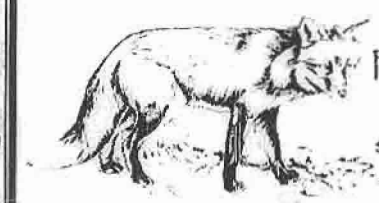
The Wild Boar (*Sus scrofa*) Boars are wild pigs that are not native to North America. They were brought here from Europe by the Spanish explorers in the 1500's. Wild boars are large and can weigh up to 300 pounds. They have stiff black fur and straight tails. Both males and females have tusks that curl out of their mouth.

The North American Gray Squirrel (*Sciurus carolinensis*) has adapted to urban and suburban areas where it is regarded as aesthetic or as a minor annoyancene .Squirrels are scatter hoarders , i.e. they will gather nuts and store them in any accessible hiding place, usually by burying them. Squirrels are generally clever and persistent animals.



The Eastern Cottontail (*Sylvilagus floridanus*) and the Marsh Rabbit (*Sylvilagus palustris*). The cottontail is gray-brown in color with a white "powder puff" tail, it measures 14-17 inches and weighs 2-4 pounds. The marsh rabbit is slightly smaller, darker brown, and has coarser hair than the cottontail. It has a small inconspicuous tail that is dingy white on the underside and will often walk rather than hopping as most rabbits do.

The Virginia Opossum (*Didelphis virginiana*)is a marsupial. Opossums are about the size of a house cat, have long naked tails and small ears. If threatened they may go limp and appear dead, hence "playing possum". Opossums are common in residential and suburban areas, and are most active at night.



The Gray Fox (*Urocyon cinereoargenteus*) has quite a lot of red hair and may be confused with the red fox. Foxes mainly eat small mammals such as rabbits, rats, and mice. The face, sides, back, and tail are gray and the sides of the neck and underside of the tail a rusty-yellow color. The gray fox is essentially a nocturnal animal.

Smithsonian Magazine

INTERVIEW

MARGARET LOWMAN

ECOLOGIST, SARASOTA, FLORIDA

Bugs in trees and kids in labs get their due in a new book by "Canopy Meg"

BY MARIAN SMITH HOLMES

Margaret Lowman, of the New College of Florida, pioneered forest ecology by building the first canopy walkway in North America, in 1991. She recalls her adventures as a scientist and single parent in *It's a Jungle Up There*.

WHY SPEND TIME IN TREES? Almost 50 percent of life on earth is estimated to live in tree canopies, yet this was an unexplored region until about 25 years ago. Much of my work has involved solving the challenge of just getting into the treetops: inventing gadgets, refining hot air balloon design, creating canopy walkways, working from cherry pickers and construction cranes. Once up there, I discovered that insects eat four times more leaf material than we imagined.

IS THAT IMPORTANT? Lots of things stress forests. And with forests becoming warmer, drier and more fragmented, insect outbreaks are predictably one of the first responses to climate change.

YOU'VE TAKEN YOUR TWO SONS, NOW STUDENTS AT PRINCETON, ON RESEARCH TRIPS. Often I had to. When they were 7 and 5, we flew on an old prop plane into the jungles of Belize, where I was building a canopy walkway. We've slept under tarantulas clinging to the thatched ceiling of our hut and done research projects in Australia and Peru. But scientists weren't always tolerant of my children. They were kicked out of Biosphere 2 in Arizona, where I was building a canopy access system. One colleague would not let them near the microscopes in a joint project, even though my children were very adept at identifying bugs. That attitude strengthened my conviction that women need to muscle into the science world.

IT HAS BEEN SAID THAT THE MOTHERS OF YOUNG CHILDREN ARE UNDERREPRESENTED IN THE SCIENCES BECAUSE THEY CAN'T PUT IN THE LONG HOURS. I have experienced chapters in my life when juggling parenting and career put me at a disadvantage. Science needs the brains of women. And since women are the only half of society that can bear children, our system needs to accommodate that. For example, listing child care in a grant budget would be a way to give women more opportunity.

YOUR CANOPY WALKWAYS ARE USED IN SOME PLACES TO PROMOTE TOURISM. WON'T THAT HARM THESE FRAGILE ECOSYSTEMS? Canopy walkways have become a great opportunity for local people to create an income from a forest without logging it, and this is a success for conservation.

YOU SAY YOU MAKE A LIVING CLIMBING TREES. HOW DID YOU GET INTERESTED IN THAT? As a little girl in Elmira, New York, I made tree forts with my best friend, Betsy Hilfiger. We used to rescue birds fallen from their nests. Meanwhile, Betsy's brother Tommy was in their basement stitching bell-bottom jeans. He went on to develop a clothing empire. Now the Hilfigers and I raise funds for the Meg Lowman Treetops Camp for disadvantaged girls, in Elmira, hoping to inspire them in science careers. ●

Visit Smithsonian.com for more interviews.

WHAT IT TAKES '07

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35 Earth-Changing People + Ideas

NATIONAL GEOGRAPHIC

ADVENTURE

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DREAM IT. PLAN IT. DO IT.

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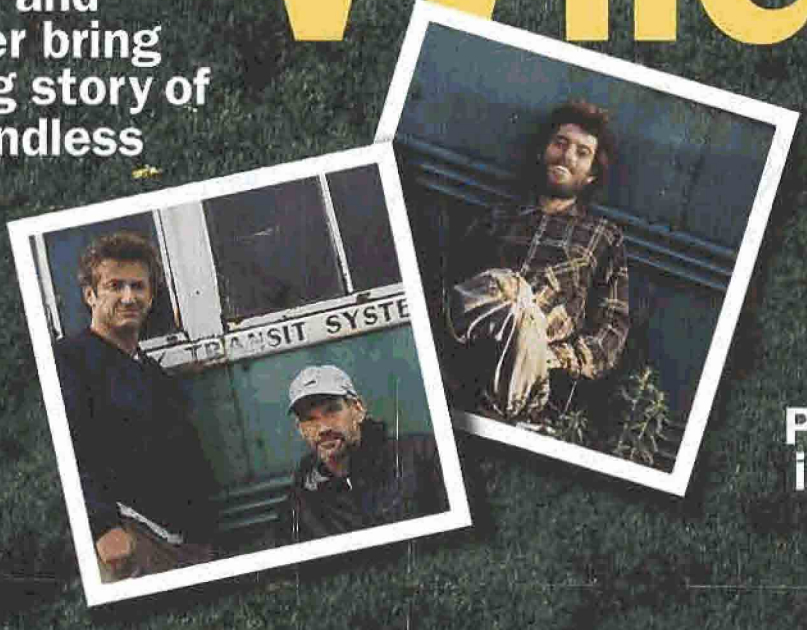
> Sean Penn and Jon Krakauer bring the haunting story of Chris McCandless to a new generation



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RESCUE A RAIN FOREST *from the top down*

Margaret Lowman /// *Arbornaut, 53*

DURING HER NEARLY 30-year career as a rain forest researcher, "Canopy Meg" has hung out in trees from Australia to Peru, Cameroon to Panama. She's mastered the intricacies of stringing steel-cable walkways hundreds of feet above the ground, contended with voyeuristic Pygmies, and stared down a particularly cranky Gabon viper. Her work has contributed to the preservation of the Washpool region, one of Australia's last remaining rain forest tracts. But with trees around the world falling fast to saw and bulldozer, Lowman is as likely to be escorting politicians and developers on canopy walks as swinging through the leaves on a steel vine.

Air your grievance. "Good things can happen when scientists communicate to the public and not just to other scientists. I worked on a television series that was shot in the rain forest of Belize. While we were there, it was announced the forest was going to go under the chain saw. But after the program aired, the government withdrew the logging rights."

ACTION PLAN // Buy Green Lumber
Only purchase wood products from Africa, Brazil, Indonesia, or Malaysia if they carry an "FSC-certified" label (*www.fscus.org*), which means they come from sustainably managed forests.

GROW TREES *with a propeller*

Alex Khajavi ///
Airline owner, 64

TINY NATUREAIR, based in San José, Costa Rica, has managed to go completely carbon neutral. Alex Khajavi purchased the carrier in 2000 and now has seven efficient De Haviland Twin Otter Turboprops flying to 17 ecotourism destinations in Costa Rica, Nicaragua, and Panama. By taxiing on one engine and minimizing idling, NatureAir has contained its carbon footprint even as passenger miles have soared. But there's still carbon output to offset—6,320 tons last year—which the airline does by investing in privately held rain forest on the Osa Peninsula, a hotbed of biological diversity. Farmers there have an incentive to keep trees standing, helping keep a crucial corridor between Piedras Blancas and Corcovado National Parks safe from loggers.

Fly out front. "If we can prove on a smaller scale that an airline can be sustainable, then maybe we can excite other airlines to follow. We want our clients asking, 'Why isn't my international carrier doing this?'"

THE NEXT STEP
SCRATCH PAPER

If every U.S. home received and paid its bills online, annual greenhouse gas emissions would drop by 2.1 million tons. See> ***www.electronicpayments.org***

COST	TIME	EFFORT	IMPACT
$0	20+ minutes		

Short Grant History of TREE Foundation, Funding our Mission to Conduct Local and International Canopy Projects and Linking Youth to the Natural World – Midyear 2007

1. Myakka Canopy Walkway project – 1999-2001 with a total of $128,853.86 raised from private and grant sources, plus five foundations (see list):

Selby Foundation	$30,000
Community Foundation	$10,000
Nations Bank Foundation	$10,000
Gulf Coast Foundation	$25,000

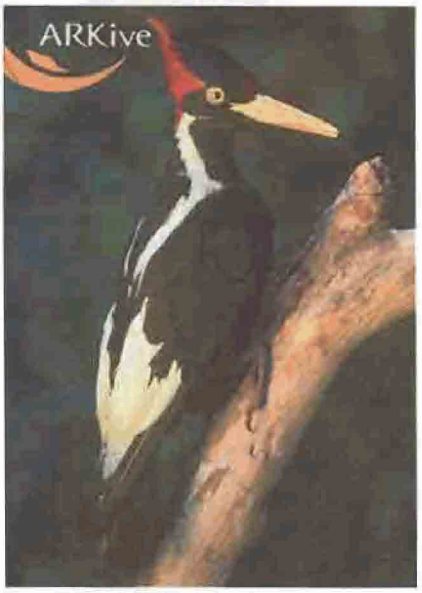
2. Canopy Ecology Research in the tropical rain forests of Puerto Rico – 1999-2004 with funding from National Science Foundation totaling $419,976 (grant attached) plus additional sums for students ($59,932) totaling $ 479,908.
3. Herbivory protocols using canopy cranes - 2003-4, Global Canopy Program, ($26,178)
4. Canopy Ecology for middle school students – 1999, 2004 - Jason Project for Education for direct support of $20,000 in 1999 for canopy studies of the Amazonian Peru and $25,000 in 2004 for canopy studies in tropical rain forests of Panama, plus in-kind contributions of over $1,000,000 for the distance learning hardware and support staff.
5. Out on a Limb – 2005, canopy ecology exhibit for the public – two years funding from National Science Foundation $74,950.
6. TREE website development and overhead – 2004, Aaron Foundation for $10,000
7. Canopy intern program for college students – 2004, Booth Family for $3000
8. **Forest Canopies**, textbook for professionals and college courses – 2004 published by Elsevier Publishers
9. **Life in the Treetops**, public outreach book on canopy ecology – 1999-2001 (hard cover and paperback editions) published by Yale University Press with special funding from the Mary Cady Tew Memorial Foundation (undisclosed sum).
10. Canopy Ecology programs in Southwest Florida and beyond – Triad Foundation 2004 for $30,000 to fund training of interns, community lecture series, publications (7 and 8 above), research and education programs in Florida canopies, interpretive signage and brochures at the Myakka River State Park canopy walkway, and science education outreach in local schools.
11. Canopy Ecology programs in Southwest Florida and beyond – 2005, with $35,000 pending from Triad Foundation.
12. Canopy Ecology programs in Myakka River State Park – 2005, grant in process for $20,000 from Gulf Coast Foundation to fund expanded signage and programs
13. Canopy outreach programs in local schools – 2005, $15,000 grant in process from Community Foundation to fund school outreach programs in ecology.
14. Canopy Ecology in the Amazon – 2005, $20,000 from New College Foundation for six students to study and initiate research programs in Amazonian Peru on ethnobotany, canopy access, soil ecology, herbivory and allelopathy.
15. Canopy Ecology at Myakka River State Park – 2005 continued contributions from public sector for walkway programs averaging $3000 annually.

16. Canopy Ecology conferences in Australia, India, Panama, Costa Rica, Miami – funds from Association for Tropical Biology and Selby Gardens from 1999-2004 totaling approximately $30,000.
17. Canopy ecology student internships for students from Panama and Peru to attend classes at New College, learn canopy ecology at the Center for Canopy Ecology and apply for graduate stipends during their stay in USA – 2005, $2500
18. Distribution of **Forest Canopies** textbook to field stations and tropical students in developing countries - 2005, $2000
19. Continued student outreach to promote science education in middle schools, with approximately 24 New College students participating in this program - $10,000
20. Creation of a national science advisory committee who convened in September in Sarasota County and selected a site and criteria for an international biological field station, partnering with Sarasota County, New College of Florida, Gulf Coast University, University of Florida, Manatee Community College, University of South Florida, and the Organization for Biological Field Stations - $10,000
21. Creation of web site with high visibility - $4,500
22. Participation in 4th International Canopy Conference by 3 TREE Research Associates and 3 student interns - $8000
23. Funding of two local interns for their subtropical canopy research - $1000
24. Publications of conference materials - $2000
25. Successful local canopy ecology hikes with publication of 2 field guides - $2000
26. Student science outreach volunteers receive Sarasota County Conservation award for environmental education, April 2006
27. Meg Lowman received Sarasota County Lifetime Achievement in Conservation award, April 2006
28. Over 6,000 students in southwest Florida were linked to nature through classroom or hiking ecology activities led by 26 New College biology students in 2006 – Community Foundation and Triad $15,000
29. Our National Science Foundation exhibit, Out on a Limb – Forest Canopies was launched in fall 2006 and was viewed by over 50,000 families, children and citizens in its first six months of circulation - NSF $75,000
30. Three interns received TREE Foundation scholarships to train in canopy ecology and botany during 2006 – from the Peruvian Amazon and from Panama - Booth Foundation $7500
31. Five women and minority undergraduate students received scholarships to present their ecological research at national meetings -Triad and Explorers Club $10,500
32. Another canopy book was published, **It's a Jungle Up There – More Tales from the Treetops** and distributed in developing countries and tropical field stations - Triad $2000
33. A new project aimed at linking kids to nature was launched in 2007 and is in the planning phases: a treehouse that will provide a "green hour" for children to experience the natural world - Rodriguez Foundation and Triad $10,000
34. The website (www.treefoundation.org) was improved with new information on the Center for Canopy Ecology - Triad and Aaron $8000
35. Field work in the Peruvian Amazon was continued in 2006-7 studying herbivory in forest canopies with undergraduate students - Triad $2500

36. Base Camp Sarasota planning phases were completed by mid-2007, with completion of a series of planning/visioning charettes, business plan and green-design sketches of proposed construction for the proposed biological field station of southwest Florida - Florida House Institute, Sarasota County, Economic Development Corporation & Triad $85,000
37. TREE's first fulltime research associate worked at headquarters to organize the files, assist with canopy ecology projects, design new "green hour" activities for youth, and undertake tardigrade studies in Florida forest canopies - Aaron Foundation $20,000
38. New brochures for the Myakka canopy walkway were printed in 2007 - Triad $2500
39. Student researchers worked in India, Panama and Florida on canopy ecology in 2007 with publications on sloth ecology, and on frugivory by bats and birds in trees of India - $10,000 Explorers Club, Triad and New College
40. Myakka canopy walkway continues to host thousands of families in 2006-7, and has doubled the visitorship to Myakka River State Park - $11,000 (miscellaneous) and $10,000 Spurlino Foundation for brochures, student nature hikes, and new signage
41. Successful application for TRIAD Foundation – received $25,000 for canopy ecology and education programs (both local and global) – September 2007
42. Base Camp Sarasota – received $5000 from Economic Development Corporation to create a web site for this long-term ecological project for Sarasota County
43. Preliminary application filed to The Conservation Fund for their 2008 grants to fund projects linking children and nature. TREE Foundation proposes to build a treehouse in Oscar Sherer State Park with environmental education enhancements.
44. Donations from Kluttz, Rodriguez, Booth, Lowitt Foundations to fund interns and exchange programs for 2008 ($6000)
45. Treehouse project launched with in-kind donations from local partners: Turner Landscaping (pledge for landscaping), Ringling School of Art and Design (logos and brochures), Rodriguez Foundation (prototype treehouse, and fund-raising functions on Casey Key), coordination with state park chaired by Laura Peters.
46. National Science Foundation grant on ecosystem services in the forest edges of Thailand submitted in September 2007 for $570,000 partnering with New College and University of California – Santa Barbara. If successful, new internships for student training in canopy ecology would be funded, as well as research on the ecosystem services of pollinators and herbivores in tropical forest edges.
47. Ecological Society of America (ESA) and Association for Tropical Biology (ATBC) – joint funding of TREE Executive Director to attend the Tropical Ecology Congress in India, December 2007 ($3000).
48. Media outreach in 2007 – Smithsonian Magazine, National Geographic Adventure Magazine, Explorers Club Journal, Leonard Lopate Show, NPR radio interviews, Society for Environmental Journalists, and others offered in-kind contributions for outreach of our canopy ecology programs and publications.

Save the Date!
Fedder Community Lecture Series
Thursday February 28th
Sainer Art & Music Pavilon @ 7:00pm (reception @ 8:00pm)
(5313 Bay Shore Rd. Just South of the Ringling Museum)

Ivory-billed Woodpeckers in the Pearl River Basin



Speaker Mike Collins
Annandale, Virginia

After growing up in the swamps along the Hillsborough River, the speaker was trained in mathematics at MIT, Stanford, and Northwestern and has been a scientist at the Naval Research Laboratory since 1985. His usual research is in ocean acoustics, atmospheric waves, and seismology. For the past few years, he has returned to the swamps in order to participate in efforts to find populations of Ivory-billed Woodpeckers, which he has seen in Louisiana, Mississippi, and Florida. He has been a bird watching fanatic for more than ten years.

In 1997, he took a 12,500 mile trip around North America on a trip that included stops at several sites in Florida, along the Gulf Coast states, the Lower Rio Grande Valley and Big Bend in Texas, southeastern Arizona, up through the Rockies, the plains of North Dakota, the spruce bogs of Manitoba, and finally through Michigan to see Kirtland's Warbler. He has also gone on birding adventures (usually solo) in Brazil, Peru, Argentina, Mexico, Australia, and Europe, but searching for the ivorybill has been the most exciting adventure of all.

Sponsored by Fedder Community Lecture Series, TREE Foundation & New College