

**HARRISON FORD AND
 CONSERVATION INTERNATIONAL
 RECEIVE WORLD ECOLOGY
 AWARD**

Harrison Ford and **Conservation International** received World Ecology Awards from the International Center for Tropical Ecology at a gala dinner held at the **Missouri Botanical Garden** on May 9, 2002.

With more than 30 feature films to his credit, including the blockbusters *Star Wars* and *Indiana Jones* trilogies and *The Fugitive*, *Air Force One* and *Patriot Games*, Harrison Ford is a cinematic hero, a box office superstar. Off screen, he uses his considerable talents as a tireless campaigner for the environment and global conservation.

Ford has served on the board of Conservation International for 10 years actively participating in its design and growth. During this time, CI has emerged as a leading force in global conservation. Ford helped establish the Center for Applied Biodiversity Science at CI, the first early warning system for global conservation efforts.

He also played a key role in the development of CI's Center for Environmental Leadership in Business, a coalition of conservation and business interests searching for ways to reduce the impact of development on the earth's biodiversity.

In addition, Ford serves on the board of CI's Global Conservation Fund, which has secured the protection of over 40 million acres on three continents in the past 18 months. He lives in Jackson, Wyoming, where he donated nearly 400 acres of his property for a conservation easement to the Jackson Hole Land Trust.

Founded in 1987, Conservation International's mission is to conserve the earth's living natural heritage, our global biodiversity, and to demonstrate that human societies are able to live harmoniously with nature. CI is working in more than 30 countries on four continents to preserve threatened ecosystems and has identified 25 of the world's richest and most threatened reservoirs of plant and animal life and focused its efforts on the

conservation of these biodiverse "hotspots" which include the tropical Andes, Madagascar, southwest Australia and the Atlantic Forests of Brazil.

In his acceptance address Ford said: "conservation of biodiversity is *the* issue of our times. We have the ability to safeguard the hotspots and tropical wilderness areas—those epicenters of life that remain. What we do today will set the course and the example for generations to come."

The World Ecology Award is presented by the International Center for Tropical Ecology to eminent individuals who have raised public awareness of our global ecological crisis and made significant contributions to environmental protection and biodiversity conservation. Previous recipients of the award are **John Denver**, **Captain Jacques Cousteau**, **Prince Sadruddin Aga Khan**, **Dr. Paul Ehrlich**, **President José Figueres**, **Dr. Richard Leakey**, **Dr. Jane Goodall**, **Ted Turner** and **Dr. Gro Harlem Brundtland**.



Harrison Ford



Harrison Ford with the World Ecology Award, presented by the International Center for Tropical Ecology at a gala dinner held at the Missouri Botanical Garden (Photo: Nancy Birge-Osborne).



Dr. Russell Mittermeier, President, Conservation International, accepting the World Ecology Award on behalf of Conservation International at the gala dinner held at the Missouri Botanical Garden (Photo: Nancy Birge-Osborne).

The gala dinner was sponsored by **Bank of America, Mr. and Mrs. Leo A. Drey, The Dula Foundation, Fox Family Foundation, Hermann Foundation, Kroeger Charitable Trust, Mr. and Mrs. E. Desmond Lee, Sanford N. McDonnell Foundation, Constance and John McPheeters and Mr. and Mrs. Douglas Morriss.** (More pictures on pages 12 and 13).

This Newsletter describes recent activities of the **International Center for Tropical Ecology.** Established in cooperation with the **Missouri Botanical Garden,** the Center promotes research and education in biodiversity conservation, and the sustainable use of tropical ecosystems. The Center provides an academic, international environment for graduate education in tropical ecology, evolution, systematics, and conservation. Furthermore, the Center supports undergraduate education in conservation biology and promotes awareness within the St. Louis community of the importance of conservation and environmentally sustainable policies and practices.

THE CHRISTENSEN FUND FELLOWSHIP PROGRAM

The Christensen Fund Fellowship Program in Plant Conservation established last year through a \$2 million endowment has been brought to the attention of universities, herbaria, research organizations and non-governmental organizations throughout the tropics. We received excellent applications from highly qualified students from Bolivia, Brazil, Cameroon, Colombia, Costa Rica, Honduras, Indonesia, Kenya, Mauritius, Mexico, Nepal, Nigeria, Papua New Guinea, Paraguay, Peru, Puerto-Rico, Tanzania, Thailand and Zimbabwe. **Deby Arifiani** from Indonesia and **David Kenfack** from Cameroon have been awarded the first two Christensen Fund Fellowships. Deby completed her M.S. at UM-St. Louis in 2000 with a taxonomic revision of *Endiandra* (Lauraceae) in Borneo and is currently a curator with the Bogor Herbarium. Indonesia is one of the world's biologically diverse 'hot-spots'. Deby will continue to study members of the Lauraceae and is also working on a publication describing the rare plants of Indonesia.

David Kenfack is Field Director of the Korup Forest Dynamics Plot, funded through the Center for Tropical Forest Science of the Smithsonian



Tropical Research Institute. David is also working on a World Wildlife Fund project collecting baseline botanical information in the coastal forests of Sanaga-Bioko. He is Senior Botanist and Herbarium Curator of the Mount Cameroon Project with the Limbe Botanic Garden.

The Christensen Fund Steering Committee met in October 2001 and developed guiding principles for the administration of this endowment and the mechanisms for awarding fellowships. The members of this committee are: **Dr. Bette Loiselle** (Chair), Director, ICTE, **Dr. Patrick Osborne**, Executive Director, ICTE, **Dr. Elizabeth Kellogg**, E. Desmond Lee and Family Fund Endowed Professor in Plant Systematics, UM-St. Louis, **Dr. Patricia Parker**, Director, Graduate Program in Biology and E. Desmond Lee and Family Fund Endowed Professor in Zoological Studies, UM-St. Louis, **Dr. P. Mick Richardson**, Manager, Graduate Studies, Missouri Botanical Garden, **Dr. Peter Stevens**, Professor, Department of Biology, UM-St. Louis, **Dr. Jan Salick**, Applied Research Department, Missouri Botanical Garden, **Dr. James Miller**, Applied Research Department, Missouri Botanical Garden, **Dr. Mary Yurlina**, Conservation Programs Manager, Center for Plant Conservation, **Mr. Douglas Ladd**, Director of Conservation Science, The Nature Conservancy, Missouri Chapter, **Dr. Stuart Davies**, Center for International Development and Arnold Arboretum, Harvard University. Senior Advisors to the Steering Committee are **Dr. Peter Raven**, Director, Missouri Botanical Garden and **Dr. Kathryn Kennedy**, President and Executive Director, Center for Plant Conservation.

COMPTON FOUNDATION FELLOWSHIPS

The Compton Foundation generously renewed support to the ICTE through their Program in Environment and Sustainable Development. This program contributes to the capacity of developing countries to make informed policy and resource management decisions based on principles of sustainable development and sound science and to promote integration of environment, peace and population issues in graduate level study and research. Compton Foundation Fellowships for 2002 have been awarded to **Lucia Lohmann** (Brazil) and **Lucio Malizia** (Argentina). Lucia Lohmann is in the final year of her Ph.D. program

and is studying the systematics of lianas in the Bignoniaceae using molecular and morphological techniques. On completion of her Ph.D. Lucia plans to teach at a university in Brazil and play an active role in documenting Brazil's rich biological diversity with a view to strengthening programs that provide legal protection of species-rich habitats.

Lucio Malizia is a Ph.D. candidate who, on completion of his studies, will return to the Laboratorio de Investigaciones Ecológicas de las Yungas at the Universidad Nacional de Tucumán where he has been a Research Associate since 1994. Lucio is studying bird and tree populations in the endangered Yungas forests in the Andes of northern Argentina. Lucio is keen to assist in conservation needs assessments that will balance economic development by oil and logging companies with biodiversity conservation through establishment of a network of reserves and protected areas. He has been an advocate of sound environmental planning and has assisted with writing several environmental impact statements.

Further Compton Fellowships will be awarded for the Fall 2002 semester.

GOLDIE MILLSTONE SCHOLARSHIP

We are delighted to announce that the ICTE has been selected to award the **Goldie Millstone Scholarship** for the next four years. This scholarship will provide research support to a graduate student studying tropical biology. **Andrea Loayza** received the first award for her study of the diet and movement of frugivorous bats between continuous forest and natural forest fragments in Beni, Bolivia. **Adrian Azpiroz** will receive the 2002 Goldie Millstone Scholarship.

FAUCETT FAMILY FOUNDATION RESEARCH SCHOLARSHIP

The Faucett Family Foundation has established a named research scholarship in Neotropical ornithology. The first recipient of this award is **Wendy Tori** who will undertake a study of the effect of human-induced fragmentation on the richness, abundance and genetic diversity of birds in an Andean forest in Kosnipata, Peru. We gratefully acknowledge the kind support of the Faucett Family Foundation.



TREES PROJECT RECEIVES LONG-TERM NSF FUNDING

A research proposal submitted by **Drs. David and Deborah Clark** has received funding from the National Science Foundation (NSF) through the Long-Term Research in Environmental Biology (LTREB) program. This will enable the Clark's to continue the TREES Project, already in its eighteenth year, for another five years. This study has been designed to examine the ecological bases of life history diversity and population ecology in tropical rain forest trees. The core activity is an annual census of 2,300 individuals of ten canopy and emergent tree species in 250 ha of old-growth tropical wet forest at La Selva Biological Station in Costa Rica. Growth, mortality, physical damage, and microsite conditions of all trees have been measured annually since 1983. All trees are mapped and incorporated into the La Selva Geographic Information System, and their distribution and performance have been studied in relation to both soil nutrients and topography over a mesoscale landscape. The core TREES dataset is the largest and longest record available of concurrent annually-measured growth and microsite conditions for tropical rain forest trees.

Two compelling scientific issues have been raised by the data to date which can only be resolved by continued research. One question with major environmental, political, and economic implications is whether tropical rain forests, as exemplified by La Selva, are experiencing a decline in forest productivity with global warming. The TREES data show a strong negative correlation between annual tree growth and annual minimum temperature over the period 1984-2000. This relationship supports recent findings from global process models predicting large productivity declines in the world's tropical forests due to global warming. Furthermore, a close correlation between atmospheric carbon dynamics and year-to-year tree growth patterns at La Selva supports a recent inference that the terrestrial tropics are strongly influencing the rate of atmospheric carbon accumulation. Both records have indicated large impacts of *el Niño* events, with markedly lower tree growth rates mirrored by substantial anomalous CO₂ efflux from the terrestrial tropics in such years. Extending the TREES measurements for a further five years will probably cover the next *el Niño*

event as well as continued global warming and will provide a critical test of these relationships. At the same time, the core initial research goal to elucidate the diverse life history modes represented among tropical rain forest canopy trees requires continuing the long-term measurements for at least a further 10-20 years. Analyses of the TREES data from the last 18 years have shown that, for non-pioneer canopy species—which are the vast majority of tree species in any tropical rain forest—growth from established seedling to the canopy requires 50-100 years. Many of the most interesting questions raised by the study remain unanswered. Why do the smallest saplings fail to show the expected tradeoff between growth capacity and survivorship? Is there any life history type that does not involve gap dependence at some juvenile stage? How many gap events, on average, are required for a juvenile tree to grow to the canopy? How many years of continuous suppression can juvenile trees survive with the capacity to then respond to a new high-light event? Do these processes differ among canopy species that differ strongly in mortality rates and growth potential through ontogeny? Without observations that are longer-term than those in hand, it will not be possible to answer these fundamental questions about how canopy trees actually achieve adult size in tropical rain forest.

DEBORAH CLARK ELECTED FELLOW OF AAAS

Dr. Deborah Clark, a Research Professor in the Department of Biology and Faculty Associate of the ICTE, has been elected a Fellow of the **American Association for the Advancement of Science**. Deborah has worked in the tropics for over 30 years, first in the Galapagos Islands for her doctoral studies, and for the last two decades as a full-time researcher at the La Selva Biological Station in Costa Rica. She studies the ecology of tropical trees, long-term processes affecting tree growth and survival in lowland forests, effects of climate change on forest productivity, and implications of this on global climate and the atmosphere. For fourteen years she was Co-Director of the La Selva Biological Station, and she currently chairs the Graduate Education Review Committee for the Organization of Tropical Studies. She is a past President of the Association for Tropical Biology and has published over 50 papers in prestigious scientific journals.



RICKLEFS RECEIVES ST. LOUIS ACADEMY OF SCIENCE AWARD

Dr. Robert Ricklefs, Curators' Professor in the Department of Biology has won the Academy of Science of St. Louis' Fellows Award. He received the award at a dinner held on April 4, 2002. The annual award recognizes an "active scientist



who.....excels in communicating to and teaching colleagues, future scientists and the general public." In naming Ricklefs for this prestigious award, the academy noted his leading role in the areas of evolutionary biology and biogeography. It also cited the role two of his textbooks have played in educating the public about ecological issues. *Ecology* first published in 1973, is now in its fourth edition; and *Economy of Nature*, first published in 1976, is now in its fifth edition. **Dr. Peter Raven**, Director of the **Missouri Botanical Garden** and trustee and fellow of the academy, said of Ricklefs, "...his findings and research are of major benefit to all who are concerned with conservation, biodiversity and evolutionary biology."

SCIENTIFIC BOARD MEMBERS

Dr. Rodolfo Dirzo, Director, Center for Ecology, Universidad Nacional Autonoma de Mexico, **Dr. Kathryn Kennedy**, President and Executive Director, Center for Plant Conservation, **Dr. Elizabeth Losos**, Director, Center for Tropical Forest Science, Smithsonian Tropical Research Institution and **Dr. John Terborgh**, James B. Duke Professor of Environmental Science and Biology, Duke University have joined the ICTE's Scientific Board.

Rodolfo Dirzo's main field of expertise is tropical ecology and conservation and his primary area of research is ecological interactions. He focuses on the conservation of processes in tropical forests. Rodolfo's work includes the study of defaunation (the contemporary loss of vertebrates) and its consequences on forest diversity and function; deforestation and its consequences on atmospheric properties; and trophic relationships between plants and animals (who eats who, who is

eaten by whom, and with what consequences for the functioning of ecosystems).

Kathryn Kennedy leads the Center for Plant Conservation which is headquartered at the Missouri Botanical Garden. The Center for Plant Conservation is a national coalition of conservation-minded institutions dedicated to conserving and restoring the rare native plants of the United States.

Elizabeth Losos oversees the Center for Tropical Forest Science (CTFS), a pan-tropical network of standardized, large-scale demographic tree plots. The CTFS network currently maintains the most comprehensive database of tropical tree demographic information in the world, monitoring over 3 million trees of 6500 species throughout the tropics. The mission of CTFS is to coordinate and promote standardized long-term research in the natural and social sciences and use the results to address issues in tropical forest management, conservation, and natural resource policy. CTFS is a voluntary consortium of universities, research organizations, forestry departments, and non-governmental organizations from Africa, Asia, and Latin America.

John Terborgh's interests lie in the fields of tropical ecology and conservation. He has studied birds, primates, herbs and forest trees and has directed student projects involving butterflies, lizards, amphibians and crocodillians. The common denominator in all this work has been the goal of solving problems of general ecological interest using a comparative approach. Typical comparisons have involved seasonal patterns in resource utilization by forest primates, habitat use by Amazonian birds, and latitudinal variation in the structure of mature forests. He regards as particularly important the need to understand the many consequences of habitat fragmentation, especially those related to the disruption of trophic-level processes. Dr. Terborgh and his students conduct much of their research at the Cocha Cashu field station that is maintained in Peru's Manu National Park.

NATIONAL PARKS SERVICE DIRECTOR VISITS ST. LOUIS

The Director of the National Parks Service, **Fran Mainella** visited St. Louis in September 2001 and met with representatives from the **International Center for Tropical Ecology, Missouri Botanical Garden, Missouri Department of Conservation**



(Confluence Greenway), Missouri Department of Natural Resources and The Nature Conservancy (Missouri Chapter). The Director described opportunities to develop partnerships between the National Parks Service and public and private organizations to enhance biodiversity conservation, promote long-term sustainability of ecosystems, and raise scientific literacy of the public. The Director was accompanied by **Dr. Gillian Bowser**, Special Assistant to the Director and ICTE alumna (Ph.D. 1999).

CONSERVATION ACTION PRIZE

In October 2000, the International Center for Tropical Ecology established the Conservation Action Prize to recognize individuals who are particularly active in the frontline of biological conservation. The award honors individuals intimately involved and successful in seeking solutions to conservation problems, developing conservation strategies, implementing programs that conserve natural resources, habitats and biodiversity, educating the public on issues pertaining to biological conservation, or providing leadership through example. These individuals are rarely recognized publicly for their dedication, yet, their work underpins the day-to-day successes in the conservation of biodiversity and habitats. The prize recognizes conservationists active in Missouri as well as those active nationally or internationally. The first recipient of the Conservation Action Prize was **Sharon Matola**, Director of the Belize Zoo, an activist in environmental education and ardent campaigner against ill-advised development projects in Belize.

The **2001 Conservation Action Prize** was presented at the Conservation Forum to **Douglas Ladd**, Director, Conservation Science, The Nature Conservancy (Missouri Chapter). The prize was accepted, on his behalf, by his daughter, **Melica Ladd**. Douglas Ladd has been involved with conservation planning, natural area assessment, management, restoration, and research for more than twenty-five years, with particular emphasis on vegetation, and fire ecology. Recent work has concentrated on vegetation and fire ecology of mid-western prairies and woodlands, developing assessment and ecological monitoring protocols for terrestrial vegetation, and eco-regional conservation planning. He has also worked on lichen floristics and ecology in the Midwest for over a decade, and is

currently collaborating with **Richard Harris** of the New York Botanical Garden on a treatment of the lichens of the Ozarks. He has undergraduate degrees in botany and chemistry, and a master's degree in botany from Southern Illinois University, where his thesis research was conducted under **Dr. Robert Mohlenbrock** on the flora and vegetation of north-central Vermont. In addition to numerous articles and reports, he is the author of two plant field guides, *North Woods Wildflowers* and *Tallgrass Prairie Wildflowers*, and co-author of *Discover Natural Missouri* and *Distribution of Illinois Vascular Plants*. A research associate at the Missouri Botanical Garden in St. Louis and the Morton Arboretum in Chicago, Ladd also serves on the Science Advisory Board for Bernheim Arboretum and Research Forest in Louisville.

NEWS OF FACULTY, STUDENTS, AND ALUMNI

Dr. Patricia McDaniel, UM-St. Louis Adjunct Assistant Professor of Biology and ICTE Faculty Associate received a grant from the U.S. Fish and Wildlife Service's Division of International Conservation—Western Hemisphere Program, to develop and coordinate the *Field Methods in Tropical Ecology and Conservation Training Program*. This three-week field course is designed for Latin American professionals and upper-level university students and will provide its participants with training in basic and advanced field methodologies as well as the application of various techniques to local environmental concerns and conservation priorities. The course will be held this summer at the Bocas del Toro Biological Station, Isla Colon, Panama. The program is a collaboration between the **Saint Louis Zoo** and the ICTE, with initial program development funds provided by **Dr. Patricia Parker**, through the E. Desmond Lee and Family Fund Endowment.

Dr. Susanne Renner, with three of her students, has published an illustrated treatment of the Melastomataceae for Thailand (Renner, S.S., G. Clausing, N. Cellinese, and K. Meyer. 2001. Melastomataceae. The Forest Herbarium, Royal Forest Department, Bangkok) and is now working on treatments for the Flora of China and the Flora of Laos, Cambodia and Vietnam. Together with colleagues, she is also working on the phylogenetics and biogeography of Monimiaceae (Takeuchi, W., and S.S. Renner. 2002. A generic record for *Faika*



(Monimiaceae) in Papua New Guinea. *Flora Malesiana Bull.* 13: 54-55). For each family, molecular sequences, morphological data, and fossils are used to understand how these plants have attained their current wide distribution in tropical and subtropical areas. A newly started project deals with the Himalayan cobra lily genus or jack-in-the-pulpit (*Arisaema*), which is centered in the Himalayas but also has three species in North America.

Dr. Godfrey R. Bourne represented CEIBA Biological Center and Guyana at the Guiana Shield Conservation Priority Setting Workshop at the Torarica Hotel and Resort, Paramaribo, Suriname (5-9 April 2002). The workshop was co-sponsored by **Conservation International, Netherlands Committee for IUCN, Guiana Shield Initiative, and UNDP Guyana**. A consensus map of conservation priority areas of the shield, and two documents were produced: *The Guiana Region: A Global Priority* and the *Paramaribo Declaration*. Dr. Bourne has also been appointed to a 5-year term as an External Examiner by the **University of Guyana** to help evaluate and improve the curriculum in the Department of Biology.

Rodney Dyer, Juan Fernandez, Shing-Fan Huang, Zacharia Magombo and Michelle Price all completed the requirements of the Ph.D. degree and graduated in Winter 2002. **Kelly Jo Bailey, Monica Carlsen, Micah Dunthorn, Linda Hurst, Lucio Malizia and Lupita Sanchez-Acebo** graduated with the Masters of Science in Winter 2002. **Craig Litteken** received the Graduate Certificate in Tropical Biology and Conservation.

Christina Casado Acorn (M.S. 2000) is working with HDR Engineering Inc. and involved in the planning phases of individual restoration projects for the Everglades in South Florida. HDR Engineering has been hired by the Army Corps of Engineers as Program Management Consultants for the Comprehensive Everglades Restoration Program (CERP). This program was established through the Water Resources and Development Act (WRDA) 2000 bill signed by Congress that allocated \$8 billion to be spent over the next 40 years on the restoration of the Everglades. Christina married Jay Acorn on April 21, 2001.

Dr. Michelle Price (Ph.D. 2002) has been appointed Curator of Cryptogamic Herbarium at the Botanical Garden in Geneva, Switzerland.

Dr. Armand Randrianasolo (Ph.D. 2001) has been appointed Secretary for the IUCN species survival commission in Madagascar.

José (Pepe) Tello (M.S. 1996) is now studying for his Ph.D. at the University of Illinois-Chicago and the Field Museum. He has recently been awarded a National Science Foundation grant for his field research.

Len Meier (M.S. 2000) is working with the Office of Surface Mining (U.S. Department of the Interior) and served on the Steering Committee that organized the conference: *Bat conservation and mining: A technical interactive forum*. He also contributed a paper entitled: *Importance of mines for bat conservation* that was published in the conference proceedings.

Andrea Loayza received a Wildlife Conservation Society Research Fellowship for her study of the diet and movement of frugivorous bats between continuous forest and natural forest fragments in Beni, Bolivia. Andrea was also awarded the 2001 **Goldie Millstone Scholarship** by the ICTE to support her bat research.

Kimberly Holbrook has received grants for her research on the seed dispersal of nutmeg species by toucans through a Fulbright Fellowship, Philanthropic Educational Organization (PEO) Scholar Award, Conservation & Research Small Grants Program—Cleveland Zoological Society, Lincoln Park Zoo Field Conservation Funds, Frank M. Chapman Memorial Fund and a Pilot Award from the Organization for Tropical Studies. She also has a paper in press with *Ecography* that describes her work in Cameroon on the long-distance movements of hornbills.

Sandra Arango was awarded the Virginia Thomas Scholarship for a foreign student from the Federated Garden Clubs of Missouri Inc.

Patricia Feria has co-authored a paper with **A. Townsend Peterson** (*Diversity and Distributions* (2002) 8: 49-56) on predicting bird community composition using point-occurrence data and inferential algorithms.

Mark Beilstein received the Ernest and Lillian Swanson Scholarship from the Federated Garden Clubs of Missouri Inc.

Dr. Simon Malcomber had a successful trip to Tanzania and collected 10 of the 11 recorded Rottboelliinae grass genera in addition to several other interesting species. DNA will be extracted from the Rottboelliinae collections and analyzed to



infer: (1) the nearest relatives of the group and (2) whether the group is monophyletic.

Patrick Sweeney spent two months in southeast Asia collecting *Garcinia* (Clusiaceae). He visited lowland and hill dipterocarp rain forest and upper and lower montane rain forest in areas throughout Malaysia. He also visited Bogor Botanic Garden and Taman Buah Mekarsari, both in Indonesia; Singapore Botanic Garden; and the Forest Research Institute of Malaysia in Kepong. A total of 161 *Garcinia* collections were made representing approximately 50 species. These materials will be used in Patrick's investigation of phylogenetic relationships and floral evolution in *Garcinia*.

Kevin Matson received the Saint Louis Audubon Society Research Scholarship and the Mickey Scudder Scholarship in Field Biology from the Webster Groves Nature Study Society.

Dr. Jaqueline M. Goerck (Director, BirdLife International—Brasil Programme; Ph.D. 1999) wrote to announce that the Ecological Station of Murici was created in June 2001 through a federal decree signed by the President of Brazil. Murici is an important area for biodiversity conservation, and especially for the conservation of many threatened bird species. BirdLife International, together with *Sociedade Nordestina de Ecologia*, has collaborated with IBAMA (*Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais*) and the Ministry of the Environment in creating this ecological station.

2002 ICTE SCHOLARSHIP AWARDS

A record sixteen research scholarships were awarded by the International Center for Tropical Ecology in March 2002. **Goldie Millstone Scholarship:** Adrian Azpiroz (*Black-and-white monjita and saffron-cowled blackbird in Eastern Uruguay: ecological association and conservation*); **Jane Harris Scholarship for Tropical Botany:** Mark Beilstein (*Phylogenetic analysis of the mustard family (Brassicaceae)*); **Mallinckrodt Graduate Fellowship in Tropical Ecology:** Karina Boege (*Ontogenetic variation in plant resistance: consequences for herbivores and plants*); **John Denver Memorial Scholarship in Tropical Ecology:** Adriana Ferraro (*Spatial and genetic lek structure in Andean cock-of-the-rock (Rupicola peruviana)*); **Stephen Mitchell Doyle Scholarship in Tropical Ecology:** Marcos Maldonado Coelho (*The relative role of habitat and landscape factors*

on bird communities in a fragmented landscape of the Atlantic Forest, southeastern Brazil); **Stokes Family Scholarship in Tropical Conservation:** Renata Ribeiro (*Effect of fragmentation on availability, stability and utilization by birds of suspended dead leaves in the Atlantic forest, Brazil*); **Jane and Stanley Birge Scholarship:** Kimberly Schultz (*The interactive effects of mycorrhizal fungi and soil nutrients on tropical tree seedlings: A potential mechanism in tropical forest regeneration*); **Parker-Gentry Tropical Research Fellowship:** Alberto Vicentini (*The evolutionary history of the plant genus Pagamea Aubl. (Rubiaceae): Evolutionary patterns at its center of diversity on the Guyana Shield*); **Faucett Family Foundation Research Scholarship in Neotropical Ornithology:** Wendy Tori (*Effect of human-induced fragmentation on the richness, abundance and genetic diversity of birds in an Andean forest in Kosnipata-Peru*); **Development Board and ICTE Scholarships:** Yeshey Dorji (*A revision of the genus Leucesteria*); Diego Santiago-Alarcon (*Population genetic structure, diseases, and ectoparasites loads in populations of the Galapagos dove (Zenaida galapagoensis)*); Jamie Talley (*Geographic variation in the primary song of the rusty-margined flycatcher: Patterns of taxonomic affinities in Guyana*); Teresa Patricia Feria (*Influence of species characteristics and environment on predicting species distributions*); Lucio Malizia (*Species turnover across tree assemblages in Andean forests*); Thomas Ryder (*Causal factors for male spatial aggregation and the ecological relationships of syntopic manakins in lowland Ecuador*) and Noah Whiteman (*Effects of host mating system on ectoparasite loads in the Galapagos hawk (Buteo galapagoensis), a threatened island-endemic*).

MOU SIGNED WITH UNIVERSITIES IN ARGENTINA

A memorandum of understanding has been signed between the **International Center for Tropical Ecology** and the **Laboratorio de Investigaciones Ecológicas de las Yungas** at the **Universidad Nacional de Tucumán** and the **Laboratorio ECOTONO** at the **Centro Regional Universitario Bariloche, Universidad Nacional del Comahue** in Argentina. This MOU will foster collaborative research and education among the partners.



MOU SIGNED WITH UNIVERSITY OF ANTANANARIVO

In December 2001, the ICTE hosted a visit by members of the Faculté des Sciences, **University of Antananarivo**, Madagascar: **Dr. Bakolimalala Rakouth Ramamonjiso**, Head of Plant Biology and Ecology Department, **Prof. Charlotte Rajeriarison**, in Charge of Graduate Studies, Plant Biology and Ecology Department and **Dr. Noromalala Raminosoa Rasoamampionona**, Animal Biology Department. As a result of this visit, **Chancellor Touhill** has signed a memorandum of understanding with the University of Antananarivo to develop collaborative programs. The collaboration will include faculty exchange visits, graduate training through short courses and cooperative research programs.

2002 JANE AND WHITNEY HARRIS LECTURE

The annual Jane and Whitney Harris Lecture was held on April 4, 2002 at the **Missouri Botanical Garden**. This year's lecture was delivered by **Dr. Martha L. Crump**, Adjunct Professor of Biology at **Northern Arizona University** and Conservation Fellow of the **Wildlife Conservation Society**. The title of her talk was: *In search of the golden frog: A tropical saga*. Marty Crump has worked in, Ecuador, Argentina, Costa Rica, and Brazil studying harlequin frogs, golden toads, and predaceous tadpoles. Her recent book, *In Search of the Golden Frog* (University of Chicago Press), describes her experiences as a field biologist. She is also a co-author of the student text *Herpetology* (Prentice Hall), now in its second edition. Dr. Crump has been appointed as an ICTE Research Associate.

VISITORS TO THE ICTE

Dr. Stuart Davies, Research Fellow with the Kennedy Center for International Development and the Arnold Arboretum, Harvard University visited the Center in October as a member of the Christensen Fund Fellowship Program Steering Committee. Stuart is a tropical ecologist and taxonomist specializing in the plants and ecosystems of Southeast Asia.

Dr. Marcelo Aizen from the Laboratorio Ecotono-CRUB, **Universidad Nacional del Comahue**, Argentina visited the Center at the end

of October and presented a seminar entitled: *A story from the Southern Andes: a hummingbird pollinator, a marsupial disperser and the winter flowering of a mistletoe*. Marcelo also met with Center Associates and discussed mechanisms leading to establishing closer links between the Center and universities in Argentina.

Dr. Emilio A. Herrera visited the Center in February. He is one of Venezuela's leading behavioral ecologists. After finishing his undergraduate degree at Universidad Simon Bolivar in Caracas (1980), he obtained his Ph.D. in behavioral ecology from Oxford University, United Kingdom, in 1986. He then returned to Venezuela and is, at present, an Associate Professor of Environmental Studies at **Universidad Simon Bolivar**. Dr. Herrera has published extensively on the social behavior, behavioral ecology, and management of capybaras (*Hydrochaeris hydrochaeris*) in the Venezuelan llanos, as well as on the biology of the tegu lizard, *Tupinambis teguixin*. Currently, Dr. Herrera is on sabbatical leave in the Department of Integrative Biology at the University of California at Berkeley, where he is conducting DNA-fingerprinting studies of capybaras. Dr. Herrera presented a seminar to the Department of Biology entitled: *Behavioral ecology of capybaras in Venezuela* and also delivered the annual lecture hosted jointly by the **International Center for Tropical Ecology** and the **Center for International Studies** which was entitled: *Wildlife management and conservation in the tropics: The case of the capybaras in Venezuela*.

Joaquim do Marco Neto, Director, Jureia Ecological Reservation and **Anajulia Elizabete Salles**, Director, Brasilia Botanical Garden visited the ICTE under the auspices of the U.S. State Department's International Visitor Program. The visit was coordinated by the **World Affairs Council of St. Louis**.

TROPICAL ECOLOGY IN THE TEMPERATE ZONE

Robert Marquis, Professor of Biology, is interested in the ecology and evolution of plant resistance to herbivores in tropical and temperate ecosystems.

Biologists are drawn to conduct research in the tropics for many reasons: high diversity of animals and plants, potential for year-round activity of their favorite study organisms, and a chance to study



unique interactions among organisms. One type of interaction that is particularly common in tropical forests is that between ants and plants. Plants provide food, in the form of nectar and food bodies rich in glycogen, and sometimes shelter, in hollow stems and roots, and leaf pockets. In visiting and sometimes living on the plant, ants will attack insects that might eat the plant, provide nutrients in the form of insect body parts, and clip off vines that might climb on the plant. These actions are often beneficial to the plant and may have provided the impetus for the evolution of plant traits that attract ants in the first place.

The frequency of ant-plant interactions is the highest in tropical habitats. For example, some 90% of the trees in Peruvian forests are found to have such interactions with ants. However, ant-plant interactions are not limited to the tropics. My lab group has been studying an ant-plant system that is native here in Missouri (and the eastern United States). This past summer, I had the good fortune to work with a set of very bright and enthusiastic students. **Rodrigo Rios** is from Bolivia and is working to complete his M.S. in Biology from UM-St. Louis. He was supported in his first year by a fellowship through the **Missouri Botanical Garden**. In addition, two high school students served as field assistants. **Paul Renner**, now a junior at Priory H.S., completed his third year as a field assistant with professors in the Department of Biology. Finally, **Anya Vykopal**, now a senior at MICDS, also spent the summer working on this project with us. She was a former **STARS-Solutia-NSF Young Scholar** at UM-St. Louis as a sophomore, and will be attending Cornell University in the fall (in environmental studies). This research was supported by a University of Missouri Research Board grant.

The plant we have been studying is the Partridge Pea, or *Chamaecrista fasciculata* in the Fabaceae (legume family). This plant is an annual plant species, common to prairies, some glades, and other open areas. At the base of each of the compound leaves is a circular, raised gland called an extrafloral nectary. A nectary is a gland that produces nectar, which is some combination of sugar, water and amino acids. Nectaries are typically found inside flowers, producing nectar that attracts pollinators, such as bees and hummingbirds. When these nectaries are found outside flowers, they are called “extrafloral”

nectaries (EFNs). The plants with EFNs that gardeners in the St. Louis area are probably most familiar with are peonies. In this case, ants are attracted by EFNs on the sepals (green leaflike structures that cover the flower buds). Cut peonies brought into the house almost invariably bring with them ants visiting the nectaries on the sepals.



Anya Vykopal, Paul Renner and Rodrigo Rios preparing to study interactions among ants, herbivores and the Partridge Pea, an annual plant in the Fabaceae or legume family.



*Ants utilizing an extrafloral nectary on the Partridge Pea (*Chamaecrista fasciculata*).*



When first described, there was much discussion in the ecological literature about the role of the EFNs. It is now generally agreed that their function is to attract ants, whose presence provides some benefit to the plant. In the Partridge Pea system, it has been shown that some ant species provide protection against insect herbivores. The ants do this by attacking or molesting insect herbivores, making it difficult for them to eat the leaves.

Our goal last summer was to document variation in the interactions among ants, herbivores and plants at different locations in the Metro region. Our prediction was that where both ants and herbivores were present in high abundance, plants would produce large amounts of nectar to attract ants as protective agents. In contrast, in places where ant and/or herbivore abundance was low, we would find plants with small nectaries, and nectaries that produced little or no nectar. By comparing populations, we were testing the impact of herbivores and ants for the evolution of plant traits, in this case the EFNs. We found great variation in ant and herbivore abundance. Our initial results show that the two populations with the lowest ant and herbivore abundance produced the least amount of nectar. We are in the process of analyzing population differences in nectar content at this time.

EARTH LINKS: ECOLOGY IN TRANSIT

The ICTE worked with **Arts in Transit** of the **Bi-State Development Agency** in developing a design that was painted on a bus as part of Earth Day celebrations on Sunday, April 21, 2002. The designs reflected the theme of this year's Earth Day, *Connecting Communities* and were created by artists **Robert Ketchens**, **Janet Sanders** and **Nannette Vinson** who are the first EarthLinks artists-in-residence, a program initiated by Arts in Transit. This activity is part of the *EarthLinks: Ecology in Transit*, an educational outreach program that is designed to promote awareness of the importance of trees in the bi-state region of greater St. Louis. EarthLinks: Ecology in Transit is co-sponsored by the **Missouri Botanical Garden (Litzinger Road Ecology Center)**, **Bi-State Development Agency (Arts in Transit)**, **Missouri Department of Conservation (Confluence Greenway)** and the **International Center for Tropical Ecology**

ICTE DEVELOPMENT BOARD VISITS CUBA

Members of the ICTE Development Board spent eight days in Cuba in February 2002 and met with **Dra. Angela T. Leiva Sánchez, Director, Jardín Botánico Nacional** as well as visiting a number of sites of ecological interest. The ICTE will foster the developing relationship with the Jardín Botánico Nacional and the **Instituto de Ecología y Sistemática** based in Havana, Cuba. **Roger McManus** (Director, Center for Conservation and Sustainable Development, **Missouri Botanical Garden**) indicated the political importance of such relationships and the how timely it is to start developing them with Cuban institutions.

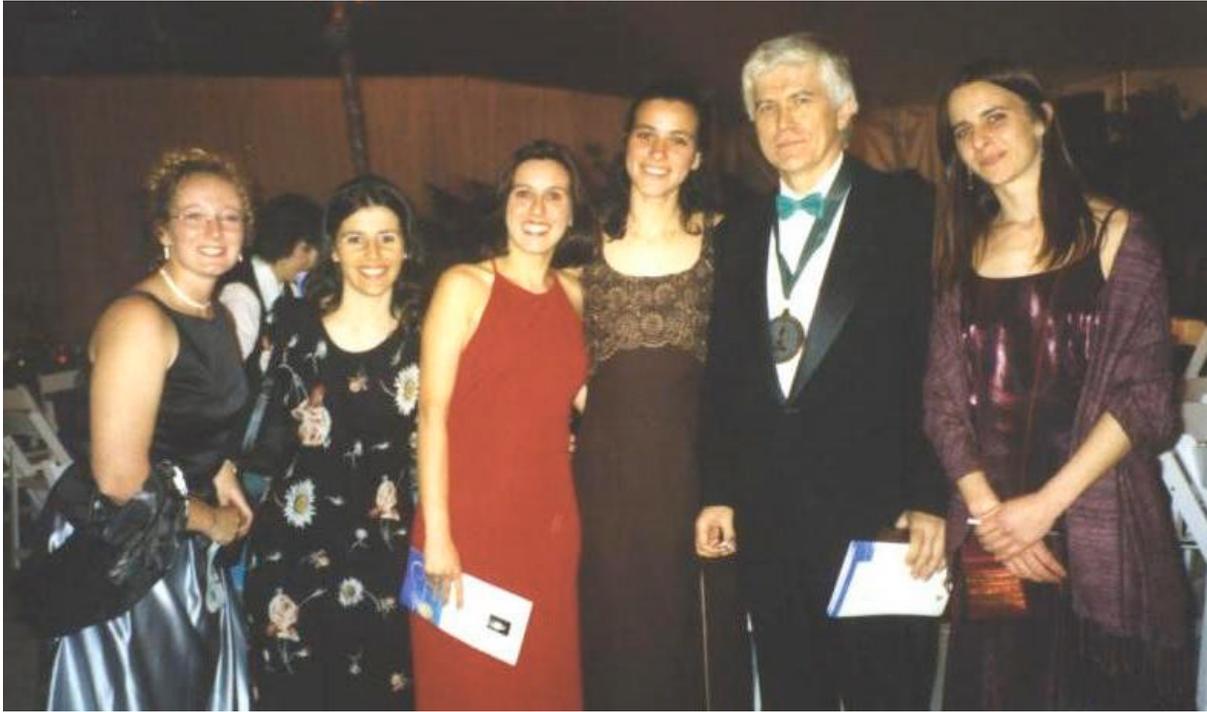
FAMILY FROLIC IN THE TROPICS

The first *Family Frolic in the Tropics*, a fund-raising, fun event was held at the **Missouri Botanical Garden** on Wednesday, January 30 2002. The event included a flashlight scavenger hunt in the Climatron, mask making, games and a theatre performed by the education staff at the **Saint Louis Zoo**. The organizing committee for this event was chaired by **Julie Cowhey** with support from **Pam Trapp**, **Doug Wolter**, **David Shores**, **Dr. John M. MacDougal** and **Olga Martha Montiel**. The sponsors of the event were **Just Like Magic Catering**, **Pine Valley Spring Water Company**, **Ronnoco Coffee Company**, **Mount Pleasant Winery**, **Spicer's 5 & 10 Inc.**, **Wild Oats Market**, **Really Big Coloring Books, Inc.**, **Saint Louis Zoo** and **St. Louis County Parks Department**. The **Missouri Botanical Garden** hosted the event and played a key role in its organization. Funds raised at the event will support graduate student research.

NEW OFFICES FOR ICTE

The ICTE has moved into a new offices and conference room in Benton Hall (Benton 216). The suite includes offices for the Executive Director, ICTE Secretary and a visiting scientist, conference room and storage space. The telephone number for **Patrick Osborne** remains unchanged (314-516-5219) but the ICTE Secretary, **Brenda West-Ammons** can now be reached on 314-516-4246.

Please send future contributions to Dr. Patrick Osborne, ICTE, University of Missouri-St. Louis, 8001 Natural Bridge Road, St. Louis, MO 63121 (Email: osbornepl@msx.umsl.edu; FAX: 314-516-6233).



Dr. Russell Mittermeier with ICTE graduate students Jaynie Doerr, Adriana Rodriguez, Andrea Loazya, Wendy Tori and Karina Boege at the World Ecology Award dinner (Photo: Margaret Rambo).



Robert R. Hermann, Chair, ICTE Advisory Board, Chancellor Blanche Touhill, Harrison Ford and Dr. Peter Raven, Director, Missouri Botanical Garden at the World Ecology Award dinner (Photo: Margaret Rambo).



Dr. Bette Loiselle, Director, International Center for Tropical Ecology, Chancellor Blanche Touhill, Harrison Ford and Dr. Patrick Osborne, Executive Director, International Center for Tropical Ecology at the World Ecology Award dinner held at the Missouri Botanical Garden (Photo: Margaret Rambo).



Dr. Russell Mittermeier, President, Conservation International, Carole Kroeger, Board Member, The Nature Conservancy-Missouri Chapter, Hal Kroeger, Vice-Chair, International Center for Tropical Ecology Advisory Board, Dr. Peter Raven, Director, Missouri Botanical Garden and Dr. Patricia Raven at the World Ecology Award dinner held at the Missouri Botanical Garden on May 9, 2002 (Photo: Margaret Rambo).

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