



EFN NEWS

**BUILDING CAPACITY
FOR CONSERVATION
LEADERSHIP**

Impact of Gillnet Fisheries on Small Cetaceans in the Gulf of California

By Oscar Ricardo Guzón Zatarain, Baja California, Mexico



Most marine mammal species interact on a regular basis with fishing activities, and occasionally these interactions result in the capture and death of these animals. Currently, the incidental capture (bycatch) of small cetaceans during fishing operations is considered a serious threat to the different species and, thus, a worldwide conservation problem. Recent studies suggest that approximately 300,000 individuals of a large number of cetacean species die each year in fishing operations.

In spite of this problem, the effect incidental capture might represent for cetacean populations has only been considered and studied during the past 30 or 40 years. During this same time, technological advances have resulted in the development of new and improved fishing techniques and more effective fishing gear. These advances have contributed greatly to a rapid expansion of the fishing industry, particularly in fisheries using synthetic gillnets. Gillnets represent a threat for a great number of species of marine mammals, sea turtles, marine birds, fish, and other nontarget species. Recent studies indicate that gillnet fisheries worldwide are responsible for nearly 98 percent of the incidental catches of cetaceans and pinnipeds.

Despite the impact that incidental capture might have on cetacean populations, the lack of adequate information on fishing activities and proper abundance estimates makes it difficult to assess the magnitude of the problem. This is particularly true for developing countries, where a great percentage of incidental catches happen in artisanal fisheries, where fishing effort is intense and difficult to evaluate.

Many methods have been applied to estimate cetacean bycatch rates. Some of these methods include observer programs, voluntary and obligatory reports, logbook analysis, stranding reports, and fishermen interviews. The most effective methods for estimating bycatch rates are the observer programs, in which a group of trained observers register the number of marine mammals captured per unit of fishing effort. However, in developed countries, observer programs can cost up to \$1,000 per day per boat. Because of these costs, few countries, particularly developing countries, can maintain observer programs on a regular basis.

In developing countries, there is generally a lack of systematic monitoring of cetacean incidental catches or even minimum estimates of bycatch levels. For example, the Gulf of California in Mexico is considered one of the areas of the Eastern Tropical Pacific with the highest density of marine dolphins. It also has an outstanding diversity of cetacean species, with 31 species (21 genera) of whales and dolphins recorded and 39 percent of the world's 83 cetacean species.

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EDUCATION FOR NATURE (EFN) ALUMNI GRANTS

EFN Alumni Grants are a great resource for former Russell E. Train Scholars and Fellows who have completed their 2-year work commitment in their home country or world region. Eligible alumni can receive a maximum of US \$3,000 for short-term training, research, conference attendance, or other professional development opportunities. Alumni Grants can not be used toward a second degree unless the funds are restricted to use for research for a thesis or dissertation.

EFN awards a limited number of grants each year. Grants are available on a first-come, first-served basis starting in July of each year. To learn how to apply for an EFN Alumni Grant please visit the EFN website at www.wwf-efn.org.

Recipients include the following:

- **Karla Amador** (Costa Rica) participated in an intensive program on international and comparative law at Universidad Austral, Argentina. Karla is the director of the Honduran and Nicaraguan offices of Bufete Nassar, a venture capital company that conducts legal reviews for International Standards Organization (ISO) certification and environmental compliance.
- **Carla Carcamo** (Honduras) attended a course on wildlife and protected areas at Colorado State University, United States. Carla coordinates management and conservation programs and activities for 11 protected areas in the Francisco Morazan Protected Area.
- **Prem Chandra Gurung** (Nepal) is a master's student at the Agricultural University of Norway. He produced two articles based on his thesis research titled, "Himalayan Mountain Rangelands of Chhuksang: Integrating Indigenous Knowledge" and "Ecological Methods for Vegetation Assessment in Upper Mustang, Nepal."
- **Rajendra Poudel** (Nepal) will participate in the Evaluation 2004 Conference hosted by the American Evaluation Association in Atlanta, Georgia. Rajendra is a village tourism associate for the Tourism for Rural Poverty Alleviation Program.
- **Peter Sumbi** (Tanzania) is completing his research to earn a master's degree in protected landscape management at the University of Wales, United Kingdom. Peter is a forest program officer for WWF-Tanzania.

EFN Alumna Discovers New Bird Species in the Philippines

In May 2004, Carmela Española, Russell E. Train Fellow (2002), discovered a new species of flightless bird on the remote island of Calayan, Cagayan. The thus-named Calayan rail appears to be quite close to the Okinawa rail, distinguishable by only a few colored marks and its loud, raspy calls.

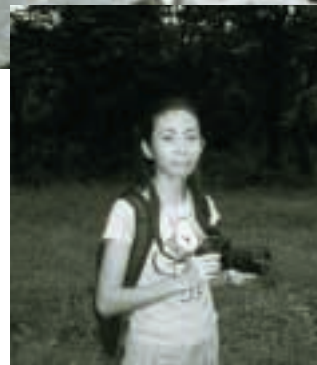
Carmela stumbled on the Calayan rail while taking notes and photographs intended for revising century-old distribution statistics for the island's rich biodiversity. She was part of a nine-person expedition organized by the Wild Bird Club of the Philippines to Calayan, the largest of the Babuyan islands.

Her reports of this distinctive new bird came with little surprise to the locals, to whom the bird is known as "piding." But to her colleagues in the Babuyan Islands Expedition 2004 team, the new species was an unforeseen but welcomed discovery. Already, analyses of the Calayan rail's status, distribution, potential threats, and habits are under way. From the preliminary observations, it appears that the Calayan rail's small population and geographic limitation to the island qualify it for "vulnerable" status in the IUCN Red List of threatened species. This discovery may provide the driving force in an ongoing battle to declare the Babuyan island group a protected area. Needless to say, it is much more than the Babuyan Islands Expedition 2004 ever expected.

Carmela Española



Calayan Rail.



Carmela Española

Carmela Española received an MS in Wildlife Studies at the University of the Philippines at Los Baños. Her thesis project was titled "An Avifaunal Survey of Capual Island, Sulu Province, Philippines."

2004 Russell E. Train Fellows

EFN is excited to announce the winners of this year's Russell E. Train Fellowships. These 31 outstanding conservationists representing nine countries were selected on the basis of leadership potential, professional qualifications, academic achievement, and commitment to conservation in their home countries and regions. This year's cohort of Train Fellows includes specialists in coral reef ecology, lemurs, and manatees.

Brazil

Josiane do Socorro Aguiar de Souza, PhD in sustainable development, Universidade de Brasília, Brazil

Fabiano Luiz de Oliveira Godoy, MS in sustainable development and conservation, University of Maryland, United States

Tatiana Lemos Bisi, MS in ecology, terrestrial and aquatic ecosystems, Universidade de São Paulo, Brazil



Tatiana Lemos Bisi

Luiz Firmino Martins Pereira, PhD in geography, Universidade Federal Fluminense, Brazil

Lúcia Tereza Ribeiro do Rosário, MS in natural resource management, Universidade de Brasília, Brazil

Adelaine Michela Silva Figueira, MS in ecology and agroecosystems, Universidade de São Paulo, Brazil

Cambodia

Bunneth Beng, MS in rural management, Norton University, Cambodia

Kay Leak, MS in development management, Norton University, Cambodia

Sivouthan Norng, MS in natural resources management, Asian Institute of Technology, Thailand

Honduras

David Jaen, MS in marine biology, Centro de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional, Mexico

Nereida Montes de Oca, MS in aquatic ecology, University of Bremen, Germany

Indonesia

Ulfa Hidayati, MS in rural sociology, Bogor Agricultural University, Indonesia

Jufri Muhammad, MS in social development, University of Indonesia, Indonesia

Laksmi Adriani Savitri, PhD in rural sociology, Universität Kassel, Germany

Mia Siscawati, PhD in anthropology, University of Washington, United States



Mia Siscawati

Laos

Soulisak Vannalath, diploma in conservation education and public awareness, University of Kent, United Kingdom

Madagascar

Paul Marie Andrianaivomahefa Raoelison, PhD in geography and development, L'Université Jean Moulin, Lyon, France

Jean Roger Rakotoarijaona, PhD in environmental economics, L'Université d'Antananarivo, Madagascar



Jean Roger Rakotoarijaona

Nivohary Sylviane Maria Volampeno, MS in conservation of primates, Oxford Brookes University, United Kingdom

Mexico

Leticia del Socorro Alpuche Gual, PhD in marine science, Centro de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional, Mexico

Ernesto Gray Vallejo, MS in offshore and ocean technology, Cranfield University, United Kingdom

Angel Alfonso Loreto Viruel, MS in geography, Universidad Nacional Autónoma de México, Mexico

Fabián Alejandro Rodríguez Zaragoza, PhD in marine science, Centro de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional, Mexico

Mauro Sanvicente, MS in natural resources and rural development, Colegio de la Frontera Sur, Mexico

Mozambique

Francisco António Geje, MS in conservation ecology, University of Stellenbosch, South Africa

Luis Jeremias Nhamucho, MS in conservation biology, University of Natal, South Africa

Arlete Lili Nomboro, MS in natural resources, Curtin University, Australia

Papucides Bosco Tiago Ntela, MS in conservation ecology and forest sciences, University of Stellenbosch, South Africa

Vietnam

Thang Long Ha, PhD in ecology, University of Cambridge, United Kingdom

Nguyen Thi Ha Nguyen, MS in environmental policy, Roskilde University, Denmark

Manh Cuong Nguyen, MS in biology and conservation, University of Missouri, United States

Thang Long Ha: Saving Vietnam's Douc Langurs

By Niko Klein

Nature has always interested Thang Long Ha, and it was this interest which guided his decision to study zoology at Hanoi National University in his native country of Vietnam. In the 10 years since his graduation, he has worked for the Endangered Primate Rescue Center (EPRC) in Cuc Phuong, Vietnam, as well as the Frankfurt Zoological Society for the Conservation of Species and Populations (ZSCSP) in Hai Phong, Vietnam. He has obtained a master's degree studying primate conservation at Oxford Brookes University in the United Kingdom, won a BP Conservation Programme Award for his project on bats in Cuc Phuong National Park, and published multiple papers on the langurs of Vietnam.

When, in April of 1999, Long began work on a primate conservation project funded by the Frankfurt Zoological Society at the EPRC, he was only partially aware of the gravity of the Vietnamese langurs' situation. Threatened by human population growth, logging, and hunting and trafficking, the Cat Ba langur's population was shown through surveys to have decreased from 110 to fewer than 70 in a single year. This and the increasing warning signs from other langur species confirmed that some of Vietnam's most unique native primates were at risk of extinction.

Having realized firsthand the seriousness of the langur's situation, Long decided to dedicate himself to the study and preservation of the langurs of the Indochina region. Now, with the help of the Russell E. Train Education for Nature Program, Long is pursuing a PhD at Cambridge University in the United Kingdom. He will be studying ecology and ecological behaviors of endangered primate species, with a specific focus on douc langurs.

Even heading toward his doctorate studies, however, Long is aware that education alone will not save Vietnam's langurs. He plans to continue his grassroots efforts alongside his PhD studies: from training students and rangers in primate conservation and care to setting up a sanctuary in cooperation with Da



Thang Long Ha

Lat University in Vietnam for the study of the grey-shanked douc langur. He is also in the process of developing a conservation awareness campaign using the native Vietnamese langur species to attract public attention toward the preservation of Vietnam's rich, natural ecosystem. By providing a better understanding of the douc langur species, and a higher public awareness of the importance of nature conservation, Long hopes the disturbing decline in Vietnam's endangered primates can be reversed.

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Other than the tuna-dolphin observer programs implemented in Mexico after the United States banned tuna trade and a short-term program for vaquita in the higher Gulf of California during 1993–1994, no other systematic programs have been developed for monitoring the incidental capture of cetaceans in the Gulf of California. The relatively high densities of cetacean species in the Gulf of California, together with the lack of information regarding their incidental capture, make it difficult to assess or even detect the magnitude of the problem.

My research, supported in part by a Professional Development Grant from EFN, will help address this issue. There were several objectives of the study, first of which was to obtain the first estimate of mortality for small cetaceans in the Gulf of California gillnet fisheries. These estimates were based on simple models simulating different bycatch scenarios using existing bycatch rates from observer programs in other countries and limited fishing effort data from gillnet fisheries operating in the Gulf of California. Secondly, to determine the impact of estimated mortality over small cetacean populations in the Gulf of California, and finally to propose guidelines for the development of a pilot observer

program to monitor gillnet fisheries in the Gulf of California according to their potential impact on small cetacean populations in the region.

At the conclusion of the study, the following recommendations were made for next steps and follow-up:

- To continue with data acquisition and analysis to extract the information on fishing effort required as input by the proposed model
- To apply the model to obtain mortality estimates for small cetaceans—by species (when possible) and for an overall category of “small cetaceans”—for the industrial and artisanal fishing fleet operating with gillnets in the Gulf of California by fishery
- To obtain a total annual mortality estimate for overall fisheries operating with gillnets in the Gulf of California
- To obtain an annual mortality rate (fraction of the population affected by the fishery) by species and establish target limits for species with evidence of unsustainable bycatch
- To present the results of this study to the Small Cetaceans Committee of the International Whaling

Commission for discussion, as well as pertaining national bodies to ensure actions to regulate bycatch in Mexican fisheries

- To propose a pilot observer program to monitor marine mammal bycatch in fisheries operating with gillnets in the Gulf of California, according to their potential impact on small cetacean species in the region
- To promote the importance of a fisheries observer program in the region with academic institutions throughout the Gulf of California to ensure their participation and commitment

Bycatch estimation studies like the one proposed in my research are fundamental in achieving a better understanding of the nature of cetacean–fisheries interactions and for determining the scope of the problem on the other countries’ experience. The study I participated in can give us a starting point to address this issue in Mexican waters. In addition, the future implementation of systematic observer programs to monitor incidental mortality in the Gulf of California as well as proper management and conservation programs can help reduce levels of incidental mortality.

USEFUL DEFINITIONS

Bycatch Incidental capture of a nontarget animal during fishing operations.

Cetacean Any of an order (Cetacea) of aquatic mostly marine mammals that includes the whales, dolphins, porpoises, and related forms and that have a torpedo-shaped nearly hairless body, paddle-shaped forelimbs but no hind limbs, and a horizontally flattened tail.

Pinniped A suborder of aquatic carnivorous mammals such as seals and walruses, with all four limbs modified into flippers.

Gillnet A flat fishnet suspended vertically in the water to entangle fish by their gills.



Notes from the Field

AFRICA

Asha Abeid, Tanzania (1998)

Russell E. Train Scholarship, College of African Wildlife Management, Tanzania

Asha received a scholarship from the government of Tanzania to complete a bachelor's degree in forestry at Sokoine University of Agriculture, Tanzania. Her senior research project will focus on "Assessment of Factors Hindering Women's Participation in Conservation." The research will be done in two villages, Pongwe and Kiwenga, in the central and northern districts of Zanzibar Island. Asha hopes that her research will act as a stepping-stone toward advocating effective strategies for solving obstacles to women in the field of conservation.

Edward Kimakwa, Kenya (2001)

Russell E. Train Fellowship, University of Nairobi, Kenya

Recently, Edward participated in an international course on tropical freshwater lakes and wetlands management, sponsored by the MacArthur Foundation and organized by PASS-START. Since earning his degree, Edward has been promoted twice at the Fisheries Department of Kenya and now heads the Research and Resource Monitoring Section. His projects include sustainable shrimp fishery research, the Global Environment Facility National Capacity Self-Assessment project, and the African Coelacanth Ecosystem Conservation Programme.

Rose Sallema, Tanzania (2002)

Professional Development Grant, Makerere University, Uganda

Rose works with the Geographical Information System Unit of the National Environment Management Council, where she has been an integral part of the successful promotion of the Tanzania Coastal Management Partnership, a joint initiative of the government of Tanzania, U.S. Agency for International Development, and the University of Rhode Island's Coastal Resource Center. She oversees the development and quality control of district-level maps for local government partners and was also involved in the production of the 2003 *State of the Coast Report*.

ASIA

Kalpana Kumal, Nepal (2000)

Russell E. Train Scholarship, School of Environment Management and Sustainable Development, Nepal

Kalpana has been working for the past few years at the Nepal Federation of Indigenous Nationalities, a nonprofit organization that fights for indigenous rights, including language and cultural rights, land rights, and natural resources rights of Nepalese people. This is the third year she has been elected to the post of secretary of women, children and health. This fall, she will begin studying toward an MSc in natural resources management at Pokhara University in Nepal with support from the Interchurch Organization for Development Cooperation, Netherlands.

Ramon Menor Docto, Philippines (2001)

Russell E. Train Fellowship, University of the Philippines at Los Baños

Since completing his PhD in Environmental Science, Ramon has begun teaching environmental management at Palawan State University. He engages in community outreach as the university extension director and conducts training programs in environmental awareness and education in remote communities. He has also conducted livelihood training programs to ensure that people in the community, especially indigenous people, can subsist without having to turn to potentially endangered forest products.

Manoj Kumar Shah, Nepal (2001)

Russell E. Train Scholarship, Institute of Forestry, Tribhuvan University, Nepal

A few years after completing his degree in forestry and after several years of service as a park ranger, Manoj was selected as a conservation officer for the Department of National Parks and Wildlife Conservation in his home country of Nepal.



Thi Dao Nguyen received the 2003 International ReSource Award.

Thi Dao Nguyen, Vietnam (2001)

Russell E. Train Fellowship, University of Kent, United Kingdom

In April 2004, Thi Dao was awarded the International ReSource Award from Swiss Re. The award was given in recognition of her continuing work on the A'Vuong Watershed Project, a project in the mountainous and largely impoverished Quang Nam region of central Vietnam. The project, a partnership between the WWF Indochina Programme and the Quang Nam Forest Protection Department, focuses on the sustainable management of the region's forest and rivers by indigenous peoples. It does so by allocating land rights to the local communities and by delegating responsibility for conserving the natural resources to those directly affected.

Ken Serey Rotha, Cambodia (2000)

Russell E. Train Fellowship, Australian National University, Australia

Rotha recently attended the Southeast Asia Regional Workshop on Indigenous Peoples and Collaborative Management in Protected Areas in Chiang Mai,



Ken Serey Rotha (right) poses with other participants during the Southeast Asia Regional Workshop on Indigenous Peoples and Collaborative Management.

Thailand. The workshop was jointly organized by the Asia Indigenous Peoples Pact Foundation, the International Work Group for Indigenous Affairs, and the IUCN's Commission on Environmental, Economic and Social Policy.

Karma Yangzom, Bhutan (1999)

Russell E. Train Fellowship, Yale University, United States

Karma is a freelance consultant in the areas of environmental assessment and rural development. She has participated in such projects as the formulation of the rural enterprise development project in Bhutan, and an environmental assessment of the construction of feeder roads and highway improvement activities. She is the project manager for a pilot organic label project, supported by Helvetas Headquarters, which is currently introducing organic labels in Bhutan.

LATIN AMERICA

Gustavo Sebastián Cabanne, Argentina (2002)

Russell E. Train Fellowship, Universidade de São Paulo, Brazil



Gustavo Sebastián Cabanne

Sebastián recently completed his master's degree at the Universidade de São Paulo where he studied the genetic effects of deforestation on birds in the Atlantic Forest. He has now started another project, which he plans to turn into his PhD research. He will study past genetic differentiation in birds in the Atlantic Forest with the aim of mapping important areas for conservation and addressing the history of the biome.

Congratulations to Our Recent Graduates!

Gustavo Sebastián Cabanne, MS in biology-genetics from the Universidade de São Paulo, Brazil

Hugo Enrique Cañiza, MS in politics and environmental the management from the Universidad Paulo Freire, Nicaragua

María Cristina Casavecchia, BS in biology from the Universidad Nacional de Córdoba, Argentina

Milene Castellen, PhD in conservation biology from Universidade de São Paulo, Brazil

Luis Gustavo Martins da Silva, MS in vertebrate zoology from Pontificia Universidade Católica de Minas Gerais, Brazil

Hiyas Dechitan, MS in environmental science from the University of the Philippines at Los Baños

Carmela Española, MS in wildlife studies from the University of Philippines at Los Baños

Gopal Bahadur Ghimire, BS in forestry from the Institute of Forestry, Tribhuvan University, Nepal

Verónica Guerrero Borges, MS in earth sciences from the Universidad Nacional de la Plata, Argentina

Babita Gurung, MS in tropical forestry and management from Technische Universität Dresden, Germany

Chipego Hamiwe, diploma in wildlife management from the College of African Wildlife Management, Tanzania

Ram Bahadur Mijar, MS in environmental management from the Institute of Forestry, Tribhuvan University, Nepal

Henderite Loisa Ohee, MS in conservation biology from Indonesia University, Indonesia

Jeanneney Rabearivony, PhD in ecology from University of Kent at Canterbury, United Kingdom

Ken Serey Rotha, MS in environmental management from Australian National University, Australia

Sukmawati Saleh, MS in Anthropology from Husanuddin University, Indonesia

Ana Liza Subade, PhD in environmental science from the University of the Philippines at Los Baños

Sheila G. Vergara, PhD in Environmental Science from University of the Philippines at Los Baños



Now Open! 2005–2006 Russell E. Train Fellowship Competition

It's that time of year again. Please tell your friends and colleagues that applications for Russell E. Train Fellowships are now available. This year, Train Fellowships will be offered to conservationists from Argentina, Belize, Cambodia, Guatemala, Honduras, Indonesia, Laos, Mexico, Mozambique, Tanzania, Vietnam, and Zambia. Each country has identified conservation priorities, such as specific fields of study, ecoregions, or endangered species, and will recruit and select applicants working to advance conservation on the basis of those priorities.

All Train Fellows must have significant conservation experience, leadership potential in their fields, and a commitment to advance conservation in their home countries and regions. Fellows receive financial support for education-related costs for up to 2 years. Study must be at the master's or doctoral level and may take place anywhere in the world. Train fellowships are highly competitive; in 2004 Education for Nature (EFN) awarded 31 fellowships.

Who Can Apply?

To be eligible for a Train Fellowship, an applicant must be a citizen or legal resident of a participating country and must have a minimum of 2 years' work experience in conservation. Applicants must be enrolled in, have been admitted to, or have applied to a graduate degree program (master's or PhD) at an institution of higher education by the application deadline and must begin their studies within 1 year of the application deadline. Individuals who have received a fellowship from EFN and are still enrolled in the same degree program are eligible to reapply if their countries are participating in the program. Individuals who have received a fellowship from EFN in the past and are requesting funds to pursue a second degree are not eligible. WWF staff members, including long-term consultants to WWF and employees seconded from governments or other organizations, are not eligible. Eligibility criteria may vary slightly among participating countries.

How Are Train Fellows Selected?

Train Fellows are selected through a competitive, merit-based process. Eligible candidates must submit a completed application form along with two letters of recommendation and other supporting documents to the appropriate location. An independent, interdisciplinary panel of experts is convened in each participating country to review applications and to identify top candidates on the basis of the following criteria:

- Professional qualifications, as evidenced by previous and current conservation-related positions, references from colleagues in the field, publications, and other sources
- Leadership, through involvement in community and volunteer activities, the workplace, local and national government, and other areas
- Prior academic achievement as shown by grades, academic awards, references from teachers and professors, and so on
- Motivation and commitment to contribute to conservation in an EFN country and to share what is learned with others in their field and in their home communities

Application guidelines and deadlines vary by country. Applications are available from EFN partner organizations in participating countries. For more details, including where to request an application form, please visit our website at www.wwf-efn.org/fellowships.html.

Train Fellows are selected through a competitive, merit-based process.



Javier Sanguinetti

Ecological Studies on Araucaria Ecosystems in Argentina

By Javier Sanguinetti, Biologist,
Lanin National Park, Argentina

Monkey puzzle trees (*Araucaria araucana*) are ancient plants. Called *pehuen* by Mapuches, the native inhabitants of Chile and Argentina, they dominate the Andean forests of north-western Patagonia. Giant, parasol-shaped Araucarias grow up to 50 meters tall; can reach an age of more than 1300 years; and as a species predate flowering plants, dinosaurs, and even the separation of the South American continent. Yet despite their long history, the Araucaria's restricted distribution (less than 4,000 square kilometers), slow

growth, and low regenerative capacity make the Araucaria particularly susceptible to human impacts. With the economic development and expansion of the human population in the past century, the exploitation of Araucaria forests has sharply accelerated and their health and distribution has, in turn, declined.

With a Russell E. Train Fellowship granted by the World Wildlife Fund (WWF), I am conducting field studies in the Araucaria forests within the Lanin National Park in Argentina. We are attempting to assess the seed production of the *pehuen*, its use by Mapuches, its consumption by livestock and wild boar, and the impact of those variables on native rodents and birds intimately dependent on the *pehuen* seeds.

The number and location of seeds gathered by Mapuches are being recorded through surveys of the native people. With their assistance, comparative research is being done with other forests where there are significant differences in livestock presence, number of exotic species, and seed and firewood gathering. Gross seed production is calculated through the estimation of the density of seeding trees, the number of cones per tree, and, number of seeds per cone, which are harvested from the trees by the native assistants with a traditional lassoing technique.

With the help of the native Mapuches, consumption by exotic and native species is being measured with the use of marked seeds, which are captured in the seed-falling with giant seed traps. In autumn, when the most concentrated of the periodical, varied seed-fallings occurs, the winds shatter the Araucarias' massive cones and carpet the forest floor with large, nutritious seeds. Undisturbed, they create a season of abundance for native birds and mammals. With close monitoring, we are studying the predispersal consumption of the Araucaria's seeds by such native species as the Austral parakeet (*Enicognathus ferruginea*) and the pine rat (*Aconaemys porteri*), as well as regional beetles, which date from the Cretaceous and Jurassic period, all of whom depend on the seeds and, in turn, hold an important role in the sexual reproduction of the Araucaria.

To the Mapuches, the seed not only is of important religious significance, but also is central to their survival: they collect the seeds for personal consumption

as well as selling them to traveling merchants for cash. In contrast to today's geographic confinement, the Mapuche were once a fundamentally migratory people, who traveled between forest ecosystems and the Patagonian steppe searching for seasonal food sources. They were hunters of native species like guanaco, rhea, or huemul deer and were gatherers of edible plants, resins, fungi, and fruit. Now, however, they are restricted to specific areas. Cattle-, goat- and sheep-ranching are their main economic activity, but as a source of income this activity is only marginally, if at all, profitable.

The Araucaria ecosystem is particularly affected by this change toward ranching. Huge numbers of nonnative livestock animals are attracted to Araucaria seeds in addition to their traditional diet of ground vegetation. Not only do grazing livestock affect the number of seeds, but also their consumption of vegetation greatly reduces the species diversity of plants and affects the habitat of native species such as rodents, marsupials, and birds, which need vegetation cover for feeding, breeding, and protection against predators.

Nonnative and undomesticated species such as wild boar are also disturbing the balance of consumption and production of the Araucaria. Together with the increase of livestock grazing, these nonnative animals seem to be greatly affecting the sexual regeneration of the Araucaria forest and diminishing the biological diversity of species that depend on its seeds for survival. In our study, we found a direct relationship between less seed diversity and greater forest degradation and numbers of exotic species. At least four species of native rodents have been observed as being heavily affected by such human intervention as clearing forest understory and raising livestock. Their prominent role in the regeneration and survival of seedling Araucarias is threatened by these numerous interferences as well as by the added competition for sustenance.

Preliminary results show that in the study area the collection pressure by native people is high only in low-production years. By itself, Mapuche collection is far less significant compared to the rate of predation by livestock and wild boar, which varies geographically depending on the size of their populations and the availability

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Ecological Studies on Araucaria Ecosystems in Argentina

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of other food resources (such as pastures for livestock). Together, these species consumed up to 75 percent of our marked seeds during the whole season.

At the heart of this problem is the socioeconomic instability of the Mapuches. Unaided by the fact that less than 25 percent of the total Argentinean Araucaria forest area is protected from grazing, most of which is already inside protected areas, the Mapuches have turned in an ironically unprofitable retreat to raising livestock. The effect of this increase in nonnative mammals has been devastating on both the trees themselves and the native animals that depend on them. In spite of a recent moratorium on the Araucaria's use for wood, the establishment of reserves, the regulation of seed harvest, the

restriction of international trade (CITES, Appendix I), and its presence on the Global 200 designated by WWF, the future of the Araucaria remains uncertain.

With the information this project will provide and the prioritizing of impact areas it allows for, we can begin planning and implementing conservation strategies to reduce the environmental impacts of nonnative species on the sexual regeneration of Araucaria and on the native species that depend on the seeds. As follow-up, the seed production and the seed predation will continue to be measured in forthcoming years to discover the major environmental variables that cause the changes in production as well as the effects of predation by the different consumers.

Perhaps the project can also facilitate discussion with the Mapuche people about a seed-gathering quota. Up to now their poverty has prevented an emphasis on conservation of the environment, but provided with the opportunity to participate in the research and conservation management of their pehuen, they can reach an understanding of the importance of conservation. Recovering their ancestral culture and raising their socioeconomic standing will not only restore the Mapuche dignity, but also help to protect the Araucaria ecosystem.

Javier is pursuing a PhD in ecology and conservation biology at the Universidad Nacional del Comahue, Argentina.

Guidelines for writing an article for *EFN News*

In each issue, *EFN News* highlights the research and work of our grantees and alumni. This is your opportunity to share your work with fellow conservationists. *EFN* encourages all grantees and alumni to consider submitting an article. Articles should be of publishable quality and should not contain typographical or spelling errors, or incomplete information. All articles must be submitted in English. Please read through the guidelines below to learn more.

Formatting: Articles should be approximately one page, single spaced, size 12 font (Times New Roman). Your article should not exceed 1,000 words.

Audience: Because many of our grantees are studying in different fields, we ask that you write your article for a general audience and *not* your immediate scientific peers. We encourage you to describe the particulars of your project but be conscious of how well your reader will understand you and attempt to explain less familiar terms. Because grantees are from around the world, please keep in mind as you write that many readers may know little or nothing about your region. Therefore, background information is very important.

Content: Your article should be constructed in clearly distinguishable, logically progressing paragraphs:

Paragraph 1. Provide background information and **introduce** the topic or region of your project or research **AND** your **objectives**.

Paragraph 2. Establish the **relevance** of your project or research to the local environment as well as conservation as a whole.

Paragraph 3. Describe your project or research, your methodology, include any **unexpected** findings, and so forth.

Paragraph 4. Identify the **challenges** you have faced and the **successes** you have had.

Paragraph 5. In conclusion, remember to **relate** your project or research and its effects **to nature conservation**, both local and international.

Your article should leave the reader with a clear picture of your work, and its objectives, difficulties, successes, and effects. We will edit the article for consistency of grammar, spelling, and style.

Photographs: Photographs are an important part of any article. Please include photos of yourself and the object or region of your study. Below are specific guidelines for photographs:

1. Photos that are scanned from original prints must be scanned at **300 dpi**. Digital photos at lower resolutions must be sufficiently large (**1 MB or more**) to ensure that print quality is acceptable.
2. Photos should clearly show **your face** (in focus), preferably in a **natural setting** where you work or with a wild animal you are working to protect. Face shots used for passports or other official documents are not acceptable.
3. If you submit a photo of a group that includes you, be sure to identify which person is you.

Short-Term Training Opportunities

Centre for Environment

Education is a 3-month residential training program conducted every year in India. The course aims to provide an opportunity for persons who have entered the profession of environmental education to acquire, in a relatively short time, the multidisciplinary perspective that is necessary for environmental educators. www.saseancee.org

Economy and Environment

Program for Southeast Asia offers intensive, 5-week regional short courses and biannual workshops for its members and researchers. Focused on environmental and resource economics, the program is based in Singapore, but its network members include Cambodia, China, Indonesia, Laos, Malaysia, Papua New Guinea, the Philippines, Sri Lanka, Thailand, and Vietnam. www.eepsea.org

The International Ecotourism

Society holds education and training programs on sustainable tourism assessment and development, ecotourism management, ecolodge development, cultural heritage tourism, and community-based ecotourism, at its program center in Washington, DC. www.ecotourism.org

International Institute for Geo-Information Science and Earth

Observation offers over 30 short courses each year from its center in the Netherlands. Course topics range from GIS and remote sensing to advanced concepts in land administration. Courses last from 3 weeks to 3 months. www.itc.nl/education

International Ocean Institute

promotes education, training, and research to enhance the peaceful uses of ocean space and resources, their management and regulation, and the protection and conservation of the marine environment. Courses are held on such topics as oceanography, the law of the sea, ocean resources, and coastal zone management. The Institute is based out of Malta, but has centers in Canada, China, Costa Rica, Fiji, India, Japan, Kenya, Malta, Senegal, and South Africa. www.IOInst.org

International Institute of Rural Reconstruction

offers international courses at its center in the Philippines, while regional level training is conducted in Africa and Latin America. Courses are focused on natural resource management and are designed for managers and leaders of development organizations. www.iirr.org/etpgeneral.htm

LEAD International

identifies outstanding men and women at mid-career level who represent a range of backgrounds and provides them with training designed to enhance their leadership capabilities and knowledge of issues related to environment and development. Programs take place in Brazil, Canada, China, Europe, French-speaking Africa, India, Indonesia, Japan, Mexico, Nigeria, Pakistan, and southern Africa. www.lead.org

Pan African Institute for

Development offers short-term training in such subjects as integrated rural development, natural resource planning and management, risk and disaster management, and tourism from its regional centers in Burkina Faso, Cameroon, and Zambia. The West African branch is the only program with its own website. www.paid-wa.org

Smithsonian Institution, through its Wildlife Conservation and Management Training Program (WCMTTP), provides comprehensive training in scientific theory and hands-on experience in the techniques of collecting, analyzing, and interpreting field data for the conservation and management of wild fauna and flora. Topics covered include field methods, data analysis, wildlife conservation, biodiversity, animal ecology, animal behavior, protected-area management, and radiotelemetry. <http://natzoo.si.edu/ProfessionalTraining/WCMTTP/Courses/CBWM/default.cfm>

Society for Conservation

Biology Annual Meeting will take place from July 15–19, 2005 in Brasília, Brazil. The theme for the 2005 meeting is “Conservation Biology Capacity Building and Practice in a Globalized World.” www.conbio.org/2005

Southern African Wildlife College

provides training for natural heritage managers and protected-area managers from Africa. Its focus is on developing relevant skills to manage wildlife populations in a sustainable and culturally acceptable manner. The college offers certificates and diplomas in natural resource management, as well as a number of short-term skill development classes. www.wildlifecollege.org.za

Tropical Biology Association

offers 1-month long courses that highlight current concepts and techniques in tropical ecology and conservation. Field exercises form a large part of the curriculum and are intended to demonstrate how current concepts are being approached in the field and the kinds of techniques that are used. Participants undertake their own research project during the course, which lasts between 10 and 12 days. The project is written up and presented as a paper at the end of the course. www.tropical-biology.org

University of Cambridge, Department of Zoology

will hold its annual Student Conference on Conservation Science from March 22–25, 2005. This conference aims to bring together conservation scientists in the early stages of their research careers. Applications are now being accepted through the website at www.zoo.cam.ac.uk/scs/

The WILD Foundation was founded to protect wilderness and wildlife, promote wise use of wild lands worldwide, and provide environmental education and training. It focuses on international projects that link wilderness and people, and it holds a major World Wilderness Congress every 3 to 5 years. The WILD Foundation has a special focus on southern Africa. www.wild.org

Don't Forget to Keep Us Updated!

Have you moved, been promoted, changed jobs, or been published? If so, we want to hear about it. In every newsletter, we include exciting news about our grantees and alumni. We also are especially interested in hearing how EFN has helped you achieve your professional goals. Updates and photos will appear in the "Notes from the Field" section of the next issue of *EFN News*.

Name: _____

Name of employer: _____

Job title: _____

How long have you been working at this organization? _____

Is your present job related to conservation? _____

yes no

What conservation activities have you been involved in over the past 6 months?

Explain how the degree you earned through EFN has helped you contribute to conservation in your region:

Address Corrections

Make sure we have your most current contact information. If you have moved or returned home after completing school, it is important that you notify EFN. Please send the following information to EFN by mail, fax, or email at

1250 24th St, NW, Washington, DC 20037, USA

Fax: +1-202-887-5293

Email: efn@wwfus.org

Name: _____

Street: _____

City: _____ State/Province: _____

Country: _____ Phone: _____

Fax: _____ Email: _____



A Special Thanks!

EFN would like to thank Niko Klein, EFN summer intern 2004, for all of his help. Niko was integral in writing and editing many of the articles in this issue of *EFN News*. His hard work and dedication helped make this issue a great success!

Thanks Niko!



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