

Paper Abstracts

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Long Distance Relationships Do Work

Conservation efforts in developing countries are very limited due in part to unstable political and economic conditions, resulting in low levels of education, particularly with regard to environmental themes. This situation, together with the lack of awareness of the local authorities responsible for law enforcement, is a significant impediment to conservation projects in developing countries. Conservation, in many cases, simply has not been a priority in communities with few economic resources and living under difficult conditions. In Peru, for example, marine endangered fauna are still used as a food source in many communities.

In this presentation we show how long distance relationships between zoos and in situ conservation projects, carried out in countries thousands of kilometers away, do work.

In 1995 Pro Delphinus started working on cetacean bycatch. At the time the team was composed of 8 biologists and veterinarians. By 1999 Pro Delphinus had expanded its work into sea turtles conservation in coastal communities. Currently we conduct projects concerning marine endangered fauna, such as sharks, marine otters, seabirds, sea turtles and cetaceans along the Peruvian coast.

Support received from zoos such as The Brevard Zoo, Cleveland MetroParks Zoo and Columbus Zoo have been crucial in our initial years. Personnel involved now include 38 biologists, veterinarians, educators, fishermen and students. Grants received from zoos have been for projects on environmental education in fishing communities, community based conservation, enforcement of legislation through awareness for maritime authorities, sea turtle assessments and marine otter conservation. We had almost 1500 participants from fishing communities learning about basic conservation issues. Finally, results obtained from the initial years have positioned us to be eligible to receive bigger grants from government agencies.

Our main goal now is to continue with the ongoing projects through the encouragement of local researchers and conservationists, by providing them the necessary resources for their participation, and by increasing the education level on environmental matters in fishing communities and local authorities.

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WildTrack; A New Direction in Wildlife Conservation Monitoring

WildTrack is a new initiative which applies non-invasive techniques for censusing and monitoring endangered species, to provide a fundamental resource for wildlife conservation. We believe the future of wildlife conservation depends to a large extent on the development of non-invasive, cost-effective and sustainable methods of censusing and monitoring. Our published research, and increasingly that of others, suggests that invasive monitoring techniques may negatively impact on the animals studied, by interfering with fertility, body condition, social organisation and behaviour.

We have developed a new award-winning footprint identification technique (FIT) which will be used to create the first ever footprint database for endangered species. The project will then aim to develop parallel technologies to give the broadest possible efficacy in monitoring different species in different environments.

The footprint identification technique is an adaptation of an ancient bushman tracking technique designed to take advantage of the scientific objectivity modern technology can provide. The technique allows us to identify endangered animals at the species or individual level, using digital images of their footprints, with high accuracy for both censusing and monitoring. The main advantages of FIT are:

- ✓ It is non-invasive to the animal
- ✓ It is objective and provides robust scientific data
- ✓ It can provide very high accuracy in identifying individuals
- ✓ It is cost-effective
- ✓ It provides truly comprehensive data about ranging behaviour
- ✓ It is adaptable and can work in parallel with other methods

WildTrack aims to be a wildlife community project, designed to encourage the widest possible participation from scientists in the biological and technology-related sciences, and from interested amateurs and naturalists around the world. Participants will need only a digital camera, GPS and internet contact to take images and send them to us for database-building and analysis. In each case, participants will initially send footprint images from a group of identifiable individuals. These are then used to build an initial library from which the algorithm for identification at species or individual level is developed. Once this is done the robustness of the algorithm is tested with images from unknown individuals. Finally the algorithm is used for full field implementation.

Currently WildTrack is working with projects involving white rhino in Namibia, black rhino in Cameroon, Sumatran rhino in Borneo, Bengal Tiger in Bangladesh and at the Carnivore Preservation Trust in North Carolina, the lowland Tapir in Argentina and the most endangered wild cat in the world, the Iberian Lynx in Spain and Portugal.

Zoo conservation communities, we hope, will find the WildTrack concept particularly interesting. They are in a unique position to contribute, because of their access to both captive zoo animals, and wild animals through the field projects they support.

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The Wildlife Conservation Society:

How a Cultural Institution/Zoological Park Evolved into an International Conservation NGO.

During the last fifteen years, the Wildlife Conservation Society has dramatically evolved in mission and scope. Still named the New York Zoological Society in 1989, the organization at that time functioned primarily as a major urban zoo with a small but growing portfolio of international conservation projects. Over these fifteen years, the now Wildlife Conservation Society has increased its field based conservation program budget from \$2.8 million in 1989 to more than \$40 million in 2004, while expanding its network of living collections in a unique partnership with the City of New York.

Concomitant with this growth has been the development of new structures and systems to support these efforts, reconcile perceived competing interests, and test new methods of integration. Discussed in this paper is a detailed description of program structure for WCS and specific examples of successes and continued challenges.

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Kinabatangan Orang-utan Conservation Project:

Results of a Seven-Year Collaboration with the Zoo Community

The Kinabatangan Orang-utan Conservation Project (KOCOP) was created by Hutana, a French NGO dedicated to wildlife conservation, in collaboration with the Sabah Wildlife Department (Malaysia, North Borneo).

Several large American zoos were solicited during the Great Ape AZA meeting (Oklahoma City, 1994). Some of them decided to support KOCOP and to allocate seed money necessary to initiate this project in the field. In 1998, KOCOP's presence was eventually established full-time in Sabah. We first hired five local research assistants in order to assess orang-utan survival in highly degraded forests.

Over the years, the long-term commitment of several American zoos for supporting KOCOP activities was instrumental for the success of this project, for the development of new conservation activities in Sabah, and for attracting new partners. Very quickly, KOCOP expanded the range of its activities beyond pure research observations. Today the project comprises a solid and motivated team of 35 intensively trained research assistants hailing from the local community. We know integrate multi-disciplinary efforts to ensure the long-term survival of orang-utan population in Sabah. Our current objectives are to increase the knowledge on the ecology and the conservation status of all orang-utan populations living in Sabah, to identify ways to mitigate conflicts between wildlife and people, to enhance policy framework for orang-utan conservation in the state, to support local socio-economic development compatible with habitat and wildlife conservation, to raise awareness at all society-levels, and to build local capabilities supporting long-term orang-utan conservation in Malaysia and in Indonesia.

This paper briefly presents our major activities in Sabah, and the main results secured to date, with a special attempt to show how the zoo community contributed to this development.

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Environmental Education Tools: Suitcases and Art Images

Both large and small zoos can enhance their commitment to *in situ* work by creating and providing environmental education materials to field projects. This talk will examine a model created at the Columbus Zoo and then adopted by the Brevard Zoo. Working closely with field contacts, artwork is developed for creation of conservation message posters, stickers, postcards, T-shirts and buttons. In addition an environmental teaching suitcase is created as a hands-on classroom tool. Each suitcase contains a variety of puppets, books, games, puzzles, maps, and other materials.

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Community-Based Conservation in the Bosawas Biosphere Reserve in Nicaragua: Biodiversity, Hunting Sustainability and Education

Bosawas, an area of almost 8000 km² in northeastern Nicaragua, is considered the largest tract of broadleaf tropical moist forest north of the Amazon. Home to 15,000 indigenous Miskito and Mayangna people, Bosawas was declared a Natural Reserve in 1991 and later in 1998 became an International Biosphere Reserve. In 1993, The Nature Conservancy (TNC) began its effort to help the indigenous communities of Bosawas gain legal title to their homeland, which is necessary for them to resist the recent invasion of mestizo colonists on the borders of the Reserve. Traditional land-use and rates of wildlife resource extraction resulted in low levels of habitat disturbance compared to the slash and burn practices of the colonists. However, obtaining legal title requires demonstration that hunting rates continue to be sustainable.

We are working with the indigenous communities of Bosawas to create a Wildlife Resource Management Plan to be part of their land title claim. We have completed data collection in two of the six territories and are starting in a third. The project has two major components, 1) a biodiversity inventory to document species presence and 2) evaluation of the sustainability of current hunting practices. Data collection is stratified across land-use zones that were mapped for the title claim by anthropologist Anthony Stocks. These include areas for agriculture, hunting, and for conservation, where hunting is not allowed. Currently, our biodiversity surveys focus primarily on mammals, birds and plants. Plant identification is used to describe vegetative structure of the various land-use zone, whereas mammals include the species most commonly hunted, and birds serve as general indicators of ecosystem health. Hunting sustainability is evaluated by comparing hunting rates and animal densities in each zone and by determining whether the conservation zones serve as sources to replenish numbers of animals being hunted elsewhere. To establish the foundation for community-based wildlife management, indigenous people have been trained to assist in sample collection and data analysis for every aspect of the study. They work as field assistants and conduct the hunting and meat consumption surveys, then all members of each village are invited to participate in regular workshops where results are discussed.

The results of hunting sustainability will serve as the basis for creation of the Wildlife Resource Management Plan, which will contain hunting guidelines. A separate plan with guidelines will be created for each territory. As with data collection, indigenous community leaders will be actively involved in establishing the hunting guidelines and will be solely responsible for enforcement. Strategies for regular monitoring will be developed, to be implemented by indigenous wildlife managers.

A conservation education program, including teacher training and the development of appropriate curriculum materials, is developed in parallel with the biodiversity and hunting studies. For example, a laminated bird guide has been created and distributed to the schools to describe the most important species identified in the biodiversity survey. The educational component supports the project by empowering indigenous teachers, instilling pride in students for their wildlife, and demonstrating the importance of conservation.

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Sustaining Long-Term Partnerships to Advance Habitat Restoration at National Wildlife Refuges: USFWS and the National Aquarium in Baltimore Restoring Chesapeake Bay Wetlands

The National Aquarium in Baltimore (Aquarium) has been partnering with the U.S. Fish and Wildlife Service (FWS) to advance habitat restoration projects on refuge land for more than five years. What began as a common goal to restore a

four-acre salt marsh at Eastern Neck National Wildlife Refuge (NWR) in Maryland, grew to include several similar projects; restoring a total of 32 acres of critical habitat, creating a long-term community-based monitoring program at these sites, and strengthening the bond between the FWS and the National Aquarium. Our mutually beneficial goal of habitat restoration, education, and community outreach is the focus of this strategic partnership. The FWS is able to provide resources in the form of public access to federal lands, long-term protection of restored lands, equipment, and expert knowledge. The Aquarium relies on its strong volunteer base, related exhibitry, outside funding opportunities, and place within the community to reach others to support these projects. Innovative methods were used to achieve restoration and outreach goals including getting local citizens and politicians involved; sponsoring media events at the sites; hosting informational meetings at the Aquarium; creating interpretive signs and printed materials; and combined outreach efforts. Our mutual designation as Chesapeake Bay Gateways Network sites also allows us to expand upon our common goal of connecting people to the Chesapeake Bay.

In the past five years, the Aquarium and FWS have partnered in restoration projects at Eastern Neck NWR, Blackwater NWR, and Barren Island, part of the Chesapeake Bay Marshland Complex, engaging over 1200 volunteers to plant over 420,000 individual native marsh plants. In addition, the Aquarium has been able to provide the opportunity for children in its various school programs to visit nearby refuges, thereby instilling in them a sense of stewardship for their natural environment that supplements classroom activities. This partnership has also provided resources to Refuge Support Groups, in the form of training, funding assistance, expertise, transportation and equipment, so that they can provide long-term monitoring at these sites; critical habitat information collection not funded by federal agencies.

The National Aquarium in Baltimore is in the process of revising its Program Master Plan. It is our hope to instill conservation ethics within all aspects of programming, culture, and activities. Sustaining long-standing partnerships with federal agencies such as the FWS will allow us to fulfill this goal and to be able to pass on to others the importance of our natural habitats.

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Partnering with Sanctuaries to Deliver Educational Messages in Africa

In 2003, Disney's Animal Kingdom entered into a partnership with the Pan African Sanctuary Alliance (PASA) to fund and evaluate selected education programs being delivered by PASA sanctuaries. The partnership involved assisting with capacity building of sanctuary education staff, education program development and evaluation techniques. Ten sanctuaries participated in the program. Each sanctuary developed an education program that best met the needs of their audience. During the 2004 PASA Educators Workshop, the educators were taught various evaluation techniques that they could use to measure the effectiveness of their programs. Several of the sanctuaries have completed their evaluations. Data from these evaluations have provided important information for both, the sanctuary staff and the Disney/PASA partners, that will be used to modify content, delivery method and future program development. The data show that students and other visitors to sanctuaries often lack knowledge on basic wildlife and environmental issues. We found that after participating in sanctuary education programs the students: 1) showed a significant increase in knowledge about the environment, 2) displayed a more positive attitude toward wildlife, and 3) had a better understanding of what they can do to help the animals and the habitats surrounding their communities. The partnership between Disney and PASA has benefited both parties. The sanctuaries benefited by learning new techniques for developing and evaluating programs as well as by receiving funding. Disney staff benefited by being able to aid in the delivering of conservation messages to hundreds of people across Africa – a task we could never do without the educators that work at each sanctuary. We have also increased our understanding of what makes conservation messages effective in different regions of the world and in different cultures. The partnership between Disney and PASA has enabled both us to expand our conservation messages to reach far beyond what either of us could do alone.

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Wild Bactrian Camel Conservation

The wild Bactrian camel (*Camelus bactrianus ferus*) is critically endangered throughout its range in China and Mongolia. Yet, wild camels remain poorly understood, with knowledge derived primarily from a few short studies and anecdotal information. We initiated a wild camel conservation project to determine the reasons for camel decline and to develop a program to address those problems. We are employing satellite telemetry to gather data on wild camel movement patterns, home ranges, habitat use, and sources of mortality. We are also collecting feces from camels and wolves to determine important forage plants and to begin to assess predation levels, respectively. In addition, steroid fecal analyses may help us evaluate wild camel reproductive physiology. Finally, we are directly observing wild camels to study their behavior. Thus far, we successfully collared 2 wild camels (1 M, 1 F). We received 1 year's data on the cow before her Doppler satellite collar failed and are receiving only sporadic data from the GPS satellite collar on the bull. Over one year, the cow covered a minimum distance of 4,527.34 km and her 100% minimum convex polygon (MCP) home range was 17,232 km². Her kernel home range sizes covered 8,696 km² for 95%, 4,031 km² for 75%, 2,284 km² for 55%, and 612 km² for 25% kernels. We received only 17 GPS locations on our bull from October 10, 2003 – February 1, 2004. During that time, he traveled a minimum of 463 km and his 100% MCP home range extended over 6,923 km². His kernel home ranges covered 6,298 km² for the 95%, 2,162 km² for the 75%, 682 km² for the 50%, and 464 km² for the 25% kernel. Over the past few autumns, mean group size was 10.07 ±1.82 wild camels/group. We are currently analyzing the behavioral data and plan to evaluate the fecal samples once we have sufficient samples. We hope to use the knowledge gleaned from our work to develop a proactive conservation program working in close cooperation with the Mongolian government and other scientists and conservationists.

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Collaboration for Conservation in Madagascar

The MFG (Madagascar Fauna Group) was formed after a 1987 international meeting that included personnel from key Malagasy ministries, CBSG, European and AZA zoos and field scientists. The meeting resulted in a Convention of Collaboration between the Malagasy Government and meeting participants to protect natural habitats, conserve endangered species and build local capacity.

The MFG was founded on the basic principle that uniting zoos and aquariums under one umbrella would significantly increase the contribution any one institution could make on its own. Zoos are a powerful vehicle for initiating and sustaining a conservation action loop: enabling in-country conservation which, when communicated to visitors, tells them their support is important. Unlike any other conservation organization, zoos and aquariums can hook visitors by showing them wonderful creatures in stunning natural settings and then give them very real opportunities to contribute to the animals' survival in the wild. More and more zoos are striving to link their collections to in-country conservation efforts but have stumbled when faced with identifying and administering effective programmes in countries physically, culturally and politically distant from their own home ground. The MFG has been successful in large part because member zoos can allocate a larger percent of their conservation dollars to specific in-situ conservation action by pooling resources to fund the in-country staff that evaluates, recommends and monitors the individual programs. But in a fast-paced world of sound bites and intensive competition for the recreational dollar, the MFG's membership strategy has been reformulated so a member can easily highlight and market its individual contribution while, in reality, remaining a collaborative member.

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The Indian River Lagoon Bottlenose Dolphin Health Assessment Program: "Flipper" Gets an Overdue Physical Examination

Concern for the overall health of the Indian River Lagoon (IRL) ecosystem, an Estuary of National Significance, was first prompted by the rapid increase in development of the IRL area, and the associated alterations of physical and ecological features. Destruction of sea grass habitat, alteration of water flow and declining water quality are upsetting the balance and altering the function of the IRL ecosystem. There is a present concern about the health of the Atlantic bottlenose dolphin population living in the IRL. Dolphins in the IRL consume fish associated with seagrass beds and recent studies of IRL seagrass distribution and abundance suggest that overall seagrass abundance has declined throughout the IRL. Water clarity and quality are major factors controlling seagrass distribution and these factors have changed in the IRL over the past five decades due to significant watershed alteration and land drainage patterns. The major cause of water quality decline is fresh and storm water discharges that alter salinity, water clarity and introduce nutrients and pollutants into the system. For the years 1993-2000, dolphin strandings in the IRL represented approximately 40% of reported strandings along the entire east coast of Florida. In addition, with the exception of 1999, dolphin strandings in the IRL have increased and remained high since 1996. Perhaps even more alarming was

the occurrence of an unusual mortality event in the northern portion of the IRL over the summer of 2001, in which at least 30 dolphins died over a 2-month period. Photo-identification data and recently published pathologic research from HARBOR BRANCH Oceanographic Institution document a varied assortment of diseases in IRL dolphins that may have anthropogenic etiologies. Some of the pathologic findings in stranded dolphins also suggest immunologic dysfunction as a component in disease pathogenesis. To date, we have no explanation for these patterns because no recent comprehensive studies have been done to determine the health status of IRL dolphins. To address this issue, in the summer of 2003, we launched the first comprehensive study focused on defining the health status of IRL dolphins in collaboration with our partners at NOS/NOAA in Charleston, SC and under a permit issued by the National Marine Fisheries Service. Forty-three IRL dolphins were safely captured, examined, sampled and released during the study. This presentation will describe the first year of this 5-year program including the extraordinary logistic planning performed by the HARBOR BRANCH marine mammal staff and the cutting-edge technological examinations and diagnostic testing that were done. Defining the health status of bottlenose dolphins is important for the future management of this species and provides an insight into the health of the IRL ecosystem as a whole.

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The Mbeli Bai Study: The Importance of Baseline Research, Capacity Building and Conservation Education in the Conservation of Western Gorillas and Other Large Mammals

Mbeli Bai is a large swampy forest clearing situated in the south west of the Nouabalé-Ndoki National Park, People's Republic of Congo. Continuous monitoring of western gorillas began in 1995 and provides important baseline information on the social organization, demography and behavior of an intact population of gorillas, which is vital in predicting the effects of disturbances – such as logging and illegal hunting - to these and other gorilla populations. An important step forward of the Mbeli Bai Study is to analyze the long-term demographic data set, provide comparisons between the Mbeli population and neighboring populations, and collect ecological data in order to determine factors influencing abundance and distribution, life history and bai use by gorillas. Detailed studies are also undertaken on the activity of other large mammal species using the bai, including forest elephants, sitatungas, buffaloes and two otter species.

Knowledge is gained through training and employment of graduated Congolese research assistants. The Mbeli Bai Study is involved in increasing public awareness of the importance of protecting gorillas and other large mammals, both locally (conservation education program) and on an international scale (through facilitation of media visits and tourism). The Mbeli Bai Study, together with the Nouabalé-Ndoki Project, is running a conservation education program, Club Ebobo since 1998. Club Ebobo was expanded in 2003 to include other schools in the town of Ouesso, the regional capital of the Sangha province and in 2004 to Makao in the north-east of the Nouabalé-Ndoki National Park. The major aims of Club Ebobo are to teach local children about gorillas and their behaviour, and explain the importance of the research being conducted at Mbeli Bai. This approach has been expanded to take in all rainforest animals and emphasises the importance of conserving them and their habitat.

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Reducing the Wildlife Pet Trade in Belize

Caged parrots and monkeys are an all-too-common sight on the porches and backyards of Belize even though national law prohibits the practice. As is the case in many developing countries, a lack of options and resources have been the primary reasons for lack of enforcement. Animals could occasionally be placed with the Belize Zoo if space were available. But generally, animals were simply left with the offenders. Even more disturbing, confiscated animals were sometimes immediately released – without any sort of preparation, health screening or follow-up. It was learning of this practice that led to the development of a wildlife holding facility and a feasibility study to determine if confiscated howler monkeys could be rehabilitated to survive in the wild.

Established guidelines and methodology are followed wherever possible. Rehabilitation consists of health screenings, assimilation onto a natural diet, formation of social groups, and a period of time within a fenced natural habitat. Pre-release surveys identified Monkey Bay National Park as a suitable site, with adequate food sources and a low to non-existent resident howler population. Although just 1080 square acres, the Park forms part of a chain of protected areas stretching thirty miles from the Western Highway almost to the sea.

During the release, data is collected twelve hours daily for three weeks, and animals are provisioned until they wean themselves. Follow-ups will continue indefinitely. Fifteen howlers have been released between 1999 and 2004 and with few exceptions, animals have stayed together within the release sites. Wild howlers have moved into the area and now joined four of the released troops. Long-term monitoring will indicate the success of the program through survival

and reproduction of released howlers. Results of the study will provide recommendations for the management of the species in both captivity and the wild

With a need for additional release sites, discussions with private landowners are underway to assess properties for their suitability. While many landowners seem interested in the economic incentives through tourism, there is also a great potential for habitat protection and restoration, protection of the species and educational opportunities.

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Comprehensive Conservation Planning for Protected Areas

CBSG's Comprehensive Conservation Planning (CCP) process is a tool for *strategic conservation management planning* in parks and protected areas. The CCP process adheres to the CBSG principles of stakeholder inclusion, participatory process and rapid production of a product. Participants in the first phase of the CCP process develop a vision for the future of the protected area, explore key issues affecting its future within the larger landscape and begin to craft management goals. During the second phase, these goals are refined and detailed objectives for reaching the goals are created. Each CCP workshop results in the production of a strategic planning document containing a set of specific objectives to guide the future management of the park or protected area. CBSG's interactive and participatory approach produces positive effects on management decision-making and generation of political and social support for conservation actions by local people. Because all participants have the opportunity to provide input during the workshop, there is a high degree of buy-in to the product, which in turn helps ensure implementation. This paper will describe the CCP process in detail and present case studies illustrating the potential of this process to enable zoos to assist protected areas in the US.

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World Zoo and Aquarium Conservation Strategy

For the past 2 years, CBSG has been assisting the WAZA with the creation of the 2004 *World Zoo and Aquarium Conservation Strategy*. The document was authored by a large and diverse group and a draft circulated to all WAZA members and to regional zoo associations in hopes of ensuring production of a product containing broad input and varied perspectives on the key strategic directions for zoos and aquariums. The *World Zoo and Aquarium Conservation Strategy* was officially presented to the community at the CBSG and WAZA Annual Conferences in October 2004. This paper will synthesize the document and its value for the zoo and aquarium community. In addition, we will outline a process for taking the next - and most essential - step, the development of action plans on the regional and individual institution level to achieve the visions outlined in the document.

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Peninsular Pronghorn Recovery Program

The peninsular pronghorn (*Antilocapra americana peninsularis*. Mamm.) is an antilocaprid subspecies, internationally (IUCN) and nationally (NOM 059ECOL) considered to be in danger of extinction. A wild population of 200 individuals is estimated to survive in the El Vizcaíno Biosphere Reserve in Baja California Sur, Mexico. In 1997, a 5-year Peninsular Pronghorn Recovery Program was initiated considering three main components: (1) to obtain the reproduction of a semicaptive herd in the core zone of the Reserve; (2) protection and monitoring of the wild population, and (3) environmental education of the surrounding communities. Current results are: (1) a successfully reproducing semicaptive population of 128 individuals (2005) with high genetic variability (pure line); (2) protection and monitoring of the wild population and (3) the start of an extensive diffusion and technology transference program.

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Research Centre for Conservation at Cali Zoo "CREA"

The Cali Zoological Foundation (FZC) initiated an extramural conservation program—CREA— with the objective of contributing to the knowledge, management and conservation of the threatened species of fauna in Colombia through research and education.

This program, which has been working with 17 endangered and promising species of Colombia, is the only one of its kind managed by a zoological foundation in Colombia and constitutes an example for the zoological community of Latin America, especially in regions with high biological diversity.

The FZC has wanted to strengthen its conservation programs through CREA, a program established in 1996, which has centered its actions on the breeding in captivity of endangered species, programs for reintroducing fauna and in situ research. At present CREA has projects with 17 species of endangered animals. Many of the projects are developed in the region. This program is the only one of its kind managed by a zoological foundation in Colombia and constitutes an example for the zoological community of Latin America, especially in regions with high biological diversity. Approximately 50% of the resources used in CREA's projects come directly from admission fees to the zoo; the rest is obtained through donations, agreements and specific projects.

CREA, in association with other institutions, is involved in in-situ conservation projects. It is currently participating in the program for repopulating the Andean condor (*Vultur gryphus*) in Colombia in collaboration with US zoos, the Ministry of the Environment and its regional corporations. Together with the regional administrative entity of natural resources (Autonomous Regional Corporation of the Cauca Valley, CVC), CREA maintains a repopulation program of the snapping turtle (*Chelidra serpentina*) in the wetlands of the Cauca Valley and also conduct studies both in-situ and ex-situ in four species of birds from the Cauca Valley: the toucan barbet (*Semnornis ramphastinus*), Andean cock of the rock (*Rupicola peruviana*), Cauca guan (*Penelope perspicax*) and chestnut-fronted macaw (*Ara severa*).

In junction with the Los Angeles zoo, CVC and CRC the Cali Zoo carries out a conservation project of the mountain tapir (*Tapirus pinchaque*); and with the support of the Des Sables D'olonne zoo, Whitley Laing Foundation, Conservation International and Umacha Foundation , studies are being conducted on the giant river otter (*Pteronura brasiliensis*) in captivity and in the field.

In conjunction with the WCS Colombia program, a preliminary study was conducted in 1999-2000 to determine the status of the natural populations of the Cauca guan (*Penelope perspicax*) in the Cauca Valley and develop in-captivity management techniques. At present the FZC and WCS are collaborating on a study of its nutrition and the potential of disseminating seeds that form part of its diet, and have designed a research project to evaluate the status of the natural populations of the snapping turtle (*Chelidra serpentina*) in the Cauca Valley.

This shows the importance of the strategic alliances for developing conservation projects. The reproduction, research, repopulation and conservation programs that the FZC has been conducting through CREA are of great importance for fulfilling its institutional mission.

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Zoos Supporting Chimpanzee Conservation Projects in Uganda from 1996-2004

A brief history of Jane Goodall Institutes partnerships with various zoos around the world and the support they have contributed to Chimpanzee Conservation projects in Uganda will be explored. Over the past eight years, the Jane Goodall Institute has been supported by a number of zoos in various capacities. The types of support have ranged from small grants for programmes such as snare removal and education; staff development and training both in-situ and ex-situ; veterinary supplies and support; Emergency funds for conflict resolution workshops and scholarships for local nationals. A discussion on the types of support zoos could consider providing to conservation initiatives and how to implement and manage such support. This discussion will cover issues such as reporting; accountabilities; types of support generally needed and often overlooked by smaller zoos who wish to assist but feel they are financially unable. It will also provide some practical tips to effective cost saving methods to transfer funds and supplies to the field projects in Africa.

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AZA's Field Conservation Committee in 2005: How AZA Institutions Can Work Together Regionally with USFWS and Other Organizations on Field Conservation Efforts

The American Zoo and Aquarium Association (AZA) first created the *In Situ* Conservation Committee in 1993 (later called the Field Conservation Committee [FCC]) with the goal of better organizing members' work in *in situ* conservation. During the first ten years the FCC published a Field Conservation Resource Guide, educated AZA members about field conservation, and coordinated field conservation efforts. During 2004 the FCC reviewed its vision, mission and strategies.

The new vision of the AZA's Board-level Field Conservation Committee (FCC) is that AZA zoos and aquaria have a significant collective impact on conservation of wildlife in nature. The mission of the FCC is to assist all AZA institutions to engage in effective and sustained wildlife and habitat conservation. The FCC's global strategy is to:

- Continually evaluate current collective conservation impact
- Assist in the development of individual institutional conservation strategy/plans
- Annually offer an AZA Professional Training Course called "Developing an Institutional *In Situ* Conservation Strategy"
- Provide opportunities and available resources
- Increase funding for *in situ* conservation
- Guide development of collective conservation participation

The first collective conservation effort will be the North America Regional Conservation Consortium. The U.S. Fish and Wildlife Service (USFWS) and AZA signed a Memorandum of Understanding (MOU) to assist in the development and implementation of cooperative conservation programs. To facilitate increased cooperation between zoos and aquaria and USFWS, the FCC is focusing on a Regional Conservation Consortium (RCC) concept. AZA members of the RCC are comprised of zoos and aquaria found within the USFWS regions. USFWS regions are also divided into areas with a state-wide focus. Zoos/aquaria will take the lead in bringing together USFWS, local conservation organizations, schools, and state agencies.

The RCC will:

1. Determine conservation priorities for the region/area.
2. Define projects/programs that would benefit from AZA institution support (financial, technical expertise, operating supplies, etc.).
3. Propose new initiatives that would be driven by RCC members.
4. Provide smaller zoos with opportunities to participate in local field conservation efforts.

Some initial RCC areas include Pacific Northwest, Florida, New England, Ohio, and Texas.

This talk will use the proposed RCC in New England to illustrate the RCC concept. Some of the participants will include USFWS Region 5, the Wildlands Project, Roger Williams Park Zoo, and other institutions and organizations.

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Tree Kangaroo Conservation Program in Papua New Guinea: Update on Successes of a Community-based Conservation Program

The Tree Kangaroo Conservation Program (TKCP) has been working in Papua New Guinea since 1996 to help protect the habitat of the endangered Matschie's tree kangaroo. TKCP uses a community-based approach to help indigenous landowners conserve their forests for tree kangaroos and other unique wildlife.

Papua New Guinea (PNG), particularly the Huon Peninsula, has been designated a high-priority area for conservation efforts due to the significant amount of intact rainforest, high species endemism and relative lack of protected areas for wildlife. Conservation in PNG is challenging because land-use decisions are made by village-based landowners who face extreme economic and social hardships.

The TKCP's conservation work has three integrated components: research, education, and conservation outreach and habitat protection. All components are conducted to maximize the involvement and training of local landowners, villagers, and PNG university students. This investment in the people who live within the targeted ecosystems is mutually beneficial, and accounts for much of the TKCP's success.

The ultimate goal of the TKCP is to help establish a locally-managed Conservation Area to protect 150,000 acres of land on the Huon Peninsula. This Conservation Area will extend from sea level to 4,000-meter mountain ranges, thus preserving a complete altitudinal spectrum of Huon Peninsula habitats. Local residents are the primary decision-makers concerning which lands are to be preserved, and a local community-based non-governmental organization will be formed for the continued management of the Conservation Area. To date, PNG landowners have pledged a total of approximately 100,000 acres of rainforest habitat for conservation.

This talk will focus on the recent accomplishments of the TKCP and discuss how these community-based methods could be a model for other conservation programs.

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**Forty Years of Scientific Research:
SeaWorld and the Hubbs-SeaWorld Research Institute A Model for Success**

Forty years ago the Mission Bay Research Institute was founded in San Diego, California, by several UCLA graduates. Shortly thereafter the same individuals founded SeaWorld and with it, the beginning of a unique partnership between a not-for-profit scientific research organization and a for-profit marine zoological park. Today the Hubbs-SeaWorld Research Institute (HSWRI, www.hswri.org), has its primary base in San Diego adjacent to SeaWorld California and a relatively new branch in Orlando, Florida, adjacent to SeaWorld Florida.

The founders of the Institute and of SeaWorld recognized the value of marine research and ‘solutions through science’ that are embodied in the Institute’s mission statement: “To Return to the Sea Some Measure of the Benefits Derived From It”. While Institute staff is conducting marine research projects around the world, a key to the Institute’s success is the close, working relationship with SeaWorld and the resources it provides. Could you imagine the National Science Foundation funding a grant to build and maintain facilities to hold killer whales for acoustics studies to study how manatees respond to crab pot lines or to rehabilitate an orphan gray whale calf! Projects include marine animal health, marine mammal strandings, leatherback sea turtle tracking, manatee physiology and reproductive biology, killer whales and the black cod fishery in Alaska and whale shark tracking to name just a few. The combination of scientific expertise and a unique set of facilities (including the staff) have resulted in numerous scientific publications and, in many cases, science-based solutions to conservation problems.

The unique partnership between HSWRI and SeaWorld serves as a model that other institutions can use to develop their own partnerships, enhance their scientific and conservation biology capabilities and create their own ‘solutions through science’.

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Can an Ugly, Exotic, and Invasive Species be of Conservation Interest?

The Brazilian Pantanal is the world’s largest wetland and is famous for its pristine wildlife. Many charismatic and endangered animals of high conservation interest such as the hyacinth macaw, jaguar, giant otter and marsh deer can be found there in healthy numbers. However, about 200 years ago a much less charismatic and potential menace was introduced to the Pantanal: the feral pig (*Sus scrofa*). The scientific literature fully documents the negative ecological and socio-economic consequences of their presence in different areas of the world. For these reasons, most of the literature on feral pigs discusses and suggests control methods. In the Brazilian Pantanal, no studies have addressed the issue of the presence of feral pigs, but their potential negative impacts have been suggested. At first glance, it certainly appears that this exotic and invasive species cannot be of any conservation interest.

Since July 2002, we have been conducting a study to understand and compare the ecological and socio-economic impact of the feral pig on the native wildlife communities, in particular on the collared and white-lipped peccary in the Nhecolândia Region of the Brazilian Pantanal. Objectives of the study are to estimate population densities and characterize habitat use of feral pigs and other mammals. Detailed assessments of resource use and fruit predation of feral pigs, white-lipped and collared peccaries are being conducted, as well as data collection on behavior, group size, age structure, sex ratio and fecundity. To understand the socio-economic impact of feral pigs we are characterizing hunting practices, evaluating their sustainability and conducting interviews to measure impact. Results are showing that feral pigs and peccaries use different habitats and their densities vary among different landscapes. The resource

use study will be key to understanding niche overlap between the different species and to define the niche occupied by feral pigs. Interestingly we have found that feral pigs might be important seed dispersers. We have confirmed that feral pigs are the preferred hunting targets of the *pantaneiros* (local cowboys). Most interestingly, local management practices of feral pig populations are traditionally carried out, involving capture/castration and release of young wild males to fatten up before being hunted again. Furthermore, hunters avoid killing pregnant females. These traditional practices are of great benefit to the local native animals as they are consequently rarely hunted. Feral pigs may, therefore, be contributing to the conservation of native wildlife by acting as a replacement species for hunting. Consequently, traditional hunting of feral pigs plays a key role, providing an ideal hunting target, which replaces native species and controls feral pig populations. This is an interesting and quite unique example in conservation biology where an exotic introduced species may be participating in the conservation of native wildlife. This study provides an interesting example, which can be used to illustrate to zoo visitors how important research can be in understanding the relationship between local communities and wildlife for conservation purposes. It also illustrates that even an ugly, exotic invasive species can be of conservation interest.

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Creating Effective Conservation Curricula for Village Schools in Papua New Guinea

Ensuring long-term preservation of the rainforests and wildlife of Papua New Guinea (PNG) requires education of local children about the inherent value of conservation and natural resource management. In this way, conservation education is an integral component to the success of the Tree Kangaroo Conservation Program (TKCP) in PNG. The TKCP, based at the Roger Williams Park Zoo, has been leading a community-based conservation effort on the Huon Peninsula of PNG since 1996. To date local village landowners have pledged over 80,000 acres for conservation. The Conservation Education Project has been designed in recognition of two facts: 1) Education, especially experiential learning, is one of the most powerful ways to effect change in a community; and 2) Investing in local communities is essential for long-term conservation success, and an education project can be a clear means of investment. Since its inception in 1999 the Conservation Education Project has collaborated closely with school headmasters, teachers, local leaders and villagers to provide conservation education in the schools. This talk will discuss methods of developing, adapting, and implementing curriculum materials to fit the needs of rural PNG teachers and students, as well as meeting the National Reform Curriculum Standards. It will also address the successes and difficulties in curriculum development regarding cultural issues, transportation and durability of materials, content, and physical presentation.

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The Taku River Conservation Project

Over 95% of the 10 million-acre territory of the Taku River Tlingit First Nation in northwestern British Columbia is wilderness. The 4.5 million-acre transboundary Taku River watershed dominates this territory as it flows from the interior mountain ranges of British Columbia to the coastal ranges of Alaska. The Taku River is the prevailing salmon producer of Southeast Alaska and the largest intact wilderness river system on the Pacific Coast of North America. The remoteness of the region has been fundamental to the maintenance of healthy, viable ecosystems supporting northern biodiversity, including large mammal predator-prey systems, wild-run salmon/grizzly bear systems, and natural disturbance (e.g., fire and flood) regimes.

The Taku River Tlingit are working to re-establish themselves as the primary land manager of their traditional territory. They are pursuing this assertion of stewardship through treaty negotiations with the BC and Canadian governments, the development of a territorial land plan, enhanced leadership in resource management, and legal challenges to unwanted resource development. The Tlingit have used and managed this landscape for thousands of years. Today, the Tlingit continue to rely on this watershed and its surrounding lands for a variety of resources and cultural needs.

To better understand the ecological requirements and limitations of their traditional territory as it faces development pressures and proposed uses, the Tlingit partnered with Round River Conservation Studies to complete a Conservation Area Design (CAD). The CAD combines western scientific approaches with the traditional ecological knowledge of the Tlingit. Adopted by the Tlingit in 2003, the CAD provides large-scale guidelines on the ecological limits and resiliencies inherent within the territory, thereby providing a basis for a community-based land plan for their territory.

To date, this remote region has experienced little industrial development, and has only one small human settlement. Increasing development pressures and a lack of ecological information, however, have led to escalating land-use conflicts. In a continuing partnership, Round River is providing support for the Tlingit in implementing their land

vision. The emphasis of Round River's work with the Tlingit is to equip them with the resources, tools and skills to secure land designations, negotiate management agreements, commence a local sustainable economy, develop capacity for resource management and challenge ecologically destructive development in their traditional territory.

The best prospect for success in this endeavor lies in increasing the wildlife, fish and land management capabilities and authority of the Tlingit. Our initial focus has been to prepare the necessary legal, institutional, and scientific foundations, whereby the Tlingit may begin to assume management authority. These efforts have included supporting the Tlingit's legal challenge of mining and road building in the Taku River watershed, developing a CAD and land plan, conducting wildlife and fisheries research, training, and supporting economic development.

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Designing and Implementing a Reserve Network in the Andes of Ecuador

Round River Conservation Studies plans to assist the Fundación Cordillera Tropical in the development and implementation of a Conservation Area Design (CAD) for the Mazar Wildlife Reserve and surrounding region in southeastern Ecuador. The region, situated on the eastern slope of the Andes, has high biological value and is threatened by ongoing road construction, land clearing, and resource extraction. This project represents an opportunity to bring leading edge conservation planning tools to assist in the conservation of a region of high ecological value and global significance. Round River, employing the principles of conservation biology, is an innovator in large-scale regional conservation planning and will be breaking new ground in South America with the initiation of this project.

Conservation Area Design for the MWR Region

Fundación Cordillera Tropical (FCT) was founded in 2000 with the goal of conserving biodiversity in the tropical Andes of Ecuador. FCT is currently creating a private protected area in the southeastern Ecuador, the Mazar Wildlife Reserve (MWR). The MWR, which will serve as an anchor protected area for the larger proposed reserve network, is host to various endangered species including the Andean bear, mountain tapir, puma, red-faced parrot, Andean condor and crescent-faced antpitta, as well as numerous other threatened species of birds, mammals and plants. The area also has a 2000-year history of human presence, and contains many pre-Columbian roads, terraces, and ceremonial sites.

The proposed conservation area design will serve to delineate and describe a network of core conservation areas, resource use zones, and ecological linkage areas within and surrounding the MWR region. The CAD planning boundary includes the MWR, and the adjacent *Bosque Protector #15* and Cardenillo watershed, or approximately 103,300 ha (255,000 acres). Intra-regional linkage areas will provide connectivity to intact areas in northern Peru and the Amazonian regions of southern and eastern Ecuador.

The following elements will form the foundation of the Mazar CAD:

- 1) A comprehensive biophysical and socioeconomic inventories of the planning area;
- 2) Prioritization of areas based on their biological, economic, and cultural significance;
- 3) Attention to the needs of important focal species in the region;
- 4) Protection of ecological and evolutionary processes;
- 5) Support of local sustainable resource uses;
- 6) Protection of linkages to intact areas in neighboring regions;
- 7) Full participation of local landowners and institutions in the CAD process; and
- 8) Building local capacity within FCT and other local organizations to conduct, implement, and monitor the CAD.

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Northern Rangelands Endangered Species Program for Grevy's Zebra

According to population surveys recently conducted in Kenya and Ethiopia, the global population of Grevy's zebra now numbers fewer than 2,200 individuals. In Ethiopia, there are fewer than 150 Grevy's zebra remaining, representing a 90% decline since 1980. In Kenya, the trend is similar with 1,600-2,000 individuals left, which reflects an 86-89% decline over the last 20 years. The threats facing this species include loss of range, poaching, competition with domestic livestock for critical resources, and predation. Only 0.5% of the Grevy's zebras' range falls within protected areas and the majority of the wild population occurs on community-owned land.

The long-term conservation of Grevy's zebra and other wildlife in Northern Kenya will require a cooperative effort between communities, government and non-government organizations to improve security for wildlife and to enhance livelihoods for rural people. In early 2004, the Lewa Wildlife Conservancy and six communities in Northern Kenya formed an umbrella body called the Northern Rangelands Trust (NRT). The overall goals of the NRT are to improve the livelihoods of communities and to conserve wildlife and habitat within communities through the management and sustainable use of natural resources.

The Northern Rangelands Endangered Species Program (NRESP) is an extension of the NRT whose objective is to support the *in situ* conservation of endangered species. The vision of the NRESP is to halt the decline of endangered species in Northern Kenya; its mission is to mobilize local communities and local and international wildlife organizations to conserve endangered species in a joint partnership. Its flagship species is the Grevy's zebra with 70% of the global population remaining within the NRT's community-owned lands.

The Saint Louis Zoo is a primary partner of the NRESP, providing community and programmatic support to this effort. Other Zoos have joined as NRESP partners in the last year, including the Zoological Society of San Diego. The Saint Louis Zoo is coordinating the effort to encourage other Zoos to partner in the NRESP and to contribute to the conservation of Grevy's zebra.

This presentation will describe the NRESP and its programs in detail. Ongoing support of current partners will be highlighted. The benefits of partnering in this program and partnership opportunities at all funding levels will be described within this presentation.

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Saving Tarangire National Park: A Community Approach

The Tarangire Elephant Project has been studying the elephant population in the Tarangire National Park ecosystem, Tanzania, since 1993. During that time the elephant population has increased by 7.7%, making it one of the fastest growing elephant populations on record. This increase is a testament to the success of the trade ban on ivory and to the strong conservation measures implemented by the Tanzanian government. By contrast other populations of large ungulates in Tarangire have declined dramatically over the past decade due to uncontrolled hunting and land conversion in dispersal areas outside the Park. If this situation is not reversed we expect to see a collapse of the mammal fauna in the ecosystem in the next two years. We discuss ways in which this trend can be reversed and how migratory species can be protected on village land.

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From Ex situ to In situ Conservation: Experience of a French Private Zoo

As institutions benefiting from wildlife and by considering how fast biodiversity is disappearing, zoos should be more and more active in nature conservation.

We define our own vision in this sense: being involved in the conservation of endangered animal species and their habitat by managing all our activities, leisure, education, conservation and research in a natural and coherent way.

This means that we have to reinforce our links with *in situ* projects, initiate networks, become forum spaces where visitors meet nature and are aware of its problems, and raise money for conservation. The second idea is that the success of conservation projects depends on the participation of local populations directly concerned by their environmental problems.

One of our main projects is a good example to illustrate our experience and interest. Since 2001, we support the "Association pour la Sauvegarde des Girafes du Niger" (Association for the protection of the Nigerian's giraffes) initiated for the protection of the last giraffes' herd in western Africa, with the purpose to protect the giraffes and their habitat through the help to local communities in a sustainable management of natural resources. The activities of this association are diverse :

- Research : census and monitoring of giraffes
- Species protection : support to forest rangers patrolling, restoration of drinking ponds
- Habitat protection : reforestation and restoration of degraded soils
- Education : increasing awareness among local populations and tourists

- Local development: implementing economic alternatives (money loans, purchase of seeds)
- Welfare : grain mills, wells, ambulance, motorbike

We provide a financial support to this association and we communicate about it towards our colleagues, the media and our visitors by traditional education means and by organising special events. For example, those last 3 years, we organised an event "From Sculpture to Nature". On this occasion, we invite traditional carvers from country where we support conservation projects, in that case Tuaregs blacksmiths from Niger. By melting bronze giraffes at the zoo during the summer, they help us to inform our public about our giraffe project. By selling their sculptures, we raise money for human welfare in the giraffe area and make a link between our captive giraffes and our *in situ* activities.

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**WCS Andean Bear Research and Conservation Program in the Northern Andes:
 A Multinational and Multi-institutional Effort.**

The Wildlife Conservation Society (WCS) has been doing and financing Andean bear research and conservation work for the past 20 years, starting in the mid 1980's with Bernie Peyton's pioneering work in Peru. In order to coordinate and direct WCS Andean bear research and conservation efforts in the Northern Andes region, the regional office has developed the WCS Andean Bear Conservation Strategy. The strategy is based on WCS traditional field research strength, and its goal is to achieve an adequate level of genetic, population, and ecological information on the Andean bear throughout its distribution in order to develop conservation and population monitoring programs and effective *in situ* conservation policies in Venezuela, Colombia, and Ecuador. The Conservation Strategy has 5 main lines of action: landscape analysis, ecology, conservation genetics, population monitoring, and bear human conflicts. To achieve the expected goal, WCS has developed, finance and/or cooperate with Andean bear research throughout the region by consolidating different lines of work with local, national or international NGO's, where WCS's main contribution has been field research design and implementation expertise. The cooperation and partnership with local NGO's has created a very powerful synergy that has permitted the development of 26 projects in 3 years. One project per line of action will be presented as an example.

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**Divvying Dollars and Prioritizing Projects:
 Conservation Strategies for the World's Endangered Iguanas**

The IUCN Iguana Specialist Group (ISG) is charged with the task of designing and implementing effective conservation measures for some of the world's most endangered animals. Many iguanas are island endemics; located in the West Indies, Galapagos, Fiji and Tonga. The multiplicity of island countries in which these taxa are located presents a variety of governmental and cultural challenges. It also necessitates a large list of project funding needs. The International Iguana Foundation (IIF) is a zoo-based nonprofit organization formed to manage fundraising and fund distribution for ISG projects. The interactive and collaborative nature of the ISG/IIF association will be discussed and example projects will be highlighted.

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**The Butterfly Conservation Initiative:
 Building Local Capacity for North American Conservation Action**

Members and partner organizations of the Butterfly Conservation Initiative (BFCI) are spearheading various creative and effective butterfly conservation activities across North America, at zoos and aquariums and in the field. The Initiative promotes engagement in butterfly conservation by facilitating local and regional collaborative efforts, making information about butterfly conservation needs, efforts, and resources readily available, offering opportunities for staff to improve their own butterfly conservation skills, and connecting like-minded individuals dedicated to the goal of conserving threatened, endangered, and vulnerable North American butterflies and their habitats.

BFCI has hosted stakeholder meetings to help focus efforts supporting one region or a specific species. These meetings, such as the Karner Blue Butterfly Recovery Implementation Planning Meeting and the Northwest Butterfly Conservation and Recovery Workshop, bring together stakeholders to identify concrete ways individual organizations can support the larger effort. These meetings are important networking opportunities, allowing people to build relationships with local and regional government agency staff and local conservation organizations, as well as with nearby zoos and aquariums.

Networking is an important component of the BFCI, as it provides members with access to important resources, including fundraising ideas, festival how-to manuals, and the advice of other experts in the field. Besides networking at meetings and workshops, BFCI connects colleagues in a variety of ways. Questions ranging from exhibit design and construction materials to educational curricula and activities are posted to the BFCI listservs, as are communications about the latest news in butterfly conservation and the accomplishments of fellow BFCI members. Updates on these efforts are also provided in publications, presentations, and posters and are posted to the BFCI Web site. An additional benefit of the BFCI network and infrastructure is the leverage it provides staff at zoos and aquariums that are trying to convince their institutions to make local invertebrate conservation a priority.

Many zoos and aquariums' biggest contribution to butterfly conservation is education and outreach. Education programs at zoos and aquariums reach 11 million people annually and public awareness campaigns are frequently part of federal recovery plans. The BFCI has developed tools to support zoos' and aquariums' educational goals, including a Butterfly Activity Guide, profiles of all of the threatened and endangered species in the US, and a manual for hosting educational butterfly festivals. Education is not limited to reaching zoo and aquarium visitors; the BFCI seeks to ensure that skilled professionals and volunteers are available to support butterfly recovery. In conjunction with the AZA Board of Regents, BFCI has developed a *Techniques for Butterfly Conservation and Management* course appropriate for zoo, aquarium, government agency and conservation organization personnel interested in improving their butterfly conservation skills.

BFCI is comprised of 50 AZA-accredited participants and six partner organizations. 41% of the members are "small" institutions, with annual budgets under \$4 million, demonstrating the conservation capacity of all zoos and aquariums. With a strategic plan in place to propel the Initiative forward and the development of ever more butterfly conservation tools, BFCI is making a difference for butterfly populations in North America.

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Risk Assessment and Ethics in International Conservation Projects

The authors suggest that risk assessment and a decision-making policy for ethical considerations should be a component of planning for international conservation projects. The Internet has numerous resources to assist you in this process.

The authors recently returned from 3 years of working with elephants on their own international project. Among the risk assessments they faced were:

- the outbreak of Severe Acute Respiratory Syndrome (SARS) and the possibility that travel restrictions might prevent a return to the U.S.
- residing in a Muslim country during 9/11 and the invasions of Afghanistan and Iraq
- harassment by Immigration officials and threats of jail or extortion

Ethical dilemmas included:

- a major shipment detained by customs
- local viewpoints towards euthanasia of elephants
- donations offered with difficult pre-conditions
- an invitation to head a major conservation project tainted by corruption

The authors' experiences and those of others are discussed in relation to difficult issues that you may face. It is useful to have a strategy and policy thought out ahead of time. The central discussion focuses on:

1. What role do ethics play in project decisions?
2. How can conservation goals be accomplished in an environment of corruption?
3. How can risks be anticipated and minimized?

An in-depth study of the political affairs of your destination country is essential. Assess risks before you begin the project and stay informed while abroad. Most projects involve dealing with bureaucracy; adapting to a new language and customs; and struggling to get funding. Other problems may include finding a local NGO sponsor and identifying reliable individuals to assume the project leadership when you leave. In rare cases, you may find your personal safety threatened. You may be willing to take risks for the potential good of your project, but, it is prudent have an escape plan, travel cash, documents, and key information ready for a quick exit. Internet resources include:

- U.S. Department of State
- CIA World Fact Book
- Ex-pat forums

In some international field projects, you may be confronted with difficult ethical decisions. It is best to establish ethical policies in advance. Internet resources include:

- Center for Ethics and Business at Loyola Maramount University
- Transparency International
- Institute for Global Ethics
- The World Bank

One resource outlined ethical considerations as follows:

- The best argument for doing the right thing!
- A strategy for resolving ethical dilemmas
- Links to lots of other ethics sites
- The Ethics Audit for Non-Profit Organizations
- Contrasting the Vision and Reality

A review of policies by conservation NGOs regarding the above issues is included in the full report.

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Achieving Marine Conservation Outcomes: Research and Conservation at the Monterey Bay Aquarium

The mission of the Monterey Bay Aquarium is to inspire conservation of the oceans. We create exhibits and programs that introduce people from all walks of life to the wonders of the marine world. Effective conservation efforts have their roots in science, and we work to advance conservation through education, research and advocacy. Our primary conservation research initiatives focus on the southern sea otter along the west coast of North America, and pelagic fishes, especially bluefin tunas in the Atlantic Ocean and tunas and sharks in the Pacific. In 2004 we launched our primary marine conservation advocacy initiative, the Center for the Future of the Oceans. The goal of the Sea Otter Research and Conservation Program is to contribute to the recovery of the southern sea otter by directly supporting the federal plan for this threatened population. We pursue this goal through research, education and outreach collaborations with the University of California and state and federal agencies responsible for sea otter conservation. We currently focus our efforts on developing successful strategies for rehabilitation of stranded sea otters for return to the wild, improving our understanding of the role of disease in population growth, and studying the interactions between food availability, behavior and social organization in wild sea otters throughout their range. We pursue our pelagic fishes conservation research objectives through the Tuna Research and Conservation Center (TRCC), a joint venture with Hopkins Marine Station of Stanford University and the aquarium. The primary goal of the TRCC is to advance scientific knowledge, public education and conservation of pelagic fishes. The field work has focused on developing and deploying electronic archival and satellite pop-up tags to track the movements and environmental preferences of Atlantic and Pacific bluefin tunas. The Atlantic data are helping to improve international bluefin tuna fisheries management strategies; the Pacific data are showing trans-Pacific migration and coastal habitat use patterns for the first time. Laboratory studies at the TRCC focus on understanding the physiological basis for thermal adaptation in several scombrid species. The Center for the Future of the Oceans addresses a growing need to move beyond gathering and sharing information to directly influencing marine conservation policy at local, state and federal levels. Launched in the summer of 2004, the mission of the center is to advance policies that promote conservation of the oceans. We're currently developing the strategic plan for the center but its key objectives will include: informing conservation policy related to sea otters and pelagic fishes based on the scientific results from our conservation research programs; creating new marine reserves in California and adjacent offshore waters; and transforming the seafood market to favor sustainable commercial fisheries. Funding strategies for the aquarium's research and conservation programs have evolved over the years as attendance has stabilized while our programs have grown.

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**The Ultimate Conservation “Hotspot”:
Opportunities and Challenges in the Sahelo-Saharan Zone**

Conventional conservation marketing takes a triage approach by focusing on regions of high biodiversity and endemism. The logic behind this strategy is that such focus maximizes the cost-effectiveness of conservation dollars spent by targeting regions where the greatest number and diversity of species will be positively impacted. While these zones are richly deserving of the media attention and financial support that is generated by this strategy, the fact remains that other regions not deemed “hotspots” by this approach languish in obscurity.

Consider this: where did the largest mammal to go extinct in the past 20 years originally call home? When I put this question to the average zoo visitor, the vast majority have been beautifully sensitized and conditioned to automatically think of some tropical rainforest in equatorial Africa/Asia/South America. Most are quite surprised by the correct answer: the scimitar-horned oryx, a 350 pound desert antelope that once ranged across the Sahel and the Sahara of North and West Africa in the tens of thousands, has slipped into extinction in alarmingly quiet fashion. Right behind these magnificent antelope is a silent parade of other Sahelo-Saharan species marching towards a similar fate, all seemingly below the radar of our collective conservation consciousness. There are probably less than 500 addax left in the wild; fewer than 1000 dama gazelles, scattered in small relic populations across the Sahelo-Saharan zone; the red-necked ostrich has been extirpated across much of its range; and the desert cheetah, rare in pristine times, now faces the very real possibility of extinction in our lifetime.

If ever there was a cause overlooked and underfunded, conservation in the Sahelo-Saharan zone is that cause. In recent years, a committed group of zoos, wildlife biologists, NGOs and range state participants have been working hard to raise the profile of these issues and bring much-needed support and attention to the Sahelo-Saharan region. There have been some tremendous developments along this front in the past few years: the creation of protected areas; technical training for range state officials; the development of reintroduction/reinforcement programs for key species; increased publicity about the indiscriminate slaughter of wildlife by foreign hunting parties; and the launch of an effort to systematically survey and evaluate all remaining habitat. Even so, until very recently, conservation programs in the Sahelo-Saharan region have been some of the best-kept “secrets” in the conservation community at large.

This paper hopes to help change that. If ever there was an opportunity for a zoo to get in on the ground floor of a conservation movement, this is it. From the big to the small, the cause welcomes all. Concrete examples of both the challenges and the opportunities for zoos to become involved will be provided in an attempt to stimulate interest and generate commitment by more zoo partners. **There is no conservation hotspot on earth hotter than the Sahara....**

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Expanding the Turtle Survival Alliance’s Global Network: the Range Country Connection

Organized in response to the Asian Turtle Crisis, the Turtle Survival Alliance (TSA) is an IUCN Partnership Network for Sustainable Captive Management of Tortoises and Freshwater Turtles. The TSA’s mission is to develop and maintain an inclusive, broad-based global network of collections of living tortoises and freshwater turtles with the primary goal of maintaining chelonian species over the long term to provide maximum future options for the recovery of wild populations. Formed in 2001 the TSA has rapidly become recognized as a global force for turtle conservation and is now expanding its network to include range country programs that include a captive component. Recognizing that the battle to save turtle species will be won or lost in the country where they naturally occur, the TSA is now working with a range of rescue centers, captive breeding facilities, and headstart operations in Malaysia, Myanmar, India, Thailand and Vietnam. Building the capacity for turtle conservation within range countries, whether it be through husbandry and veterinary training workshops or by providing technical, financial and logistical support, is increasingly seen as one of most important actions that the TSA can take to prevent turtle extinctions.

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Building Conservation Partnerships: The Art of Listening

In 2005, Partners In Conservation (PIC) will begin its fourteenth year of operation under the auspices of the Columbus Zoo and Aquarium. PIC supports conservation projects, education initiatives and humanitarian programs in East Africa and conservation outreach programs in the United States. PIC offers people on both continents an opportunity to

become involved, work together and then assist conservation efforts and local people in Rwanda and the Democratic Republic of Congo (DRC).

This grass-roots program continues to achieve its objectives by forming sustainable partnerships in East Africa and the United States. The foundation for these partnerships is based on actively listening to Rwandan and Congolese colleagues as they define both conservation/humanitarian problems and viable solutions. In the United States, PIC collaborates and listens to the ideas of educators, students, and colleagues from other zoos.

By using this approach, people of all ages in Africa and the United States have ownership in PIC and actively participate in identifying and implementing programs. Initially, PIC partnered with one conservation organization working in Rwanda. In 2005, PIC will partner with projects in the DRC and Rwanda; these projects include four conservation organizations, eleven artisan co-operatives and one humanitarian program.

To fund programs in East Africa, PIC sells hand-crafted items, accepts donations, organizes an annual fund-raiser and partners with small businesses, service organizations and other U.S. zoos. Creative ideas offered by zoo staff and docents, educators, students and artists continue to increase fund-raising efforts and the sale of artisan merchandise.

PIC respects their partners and lets them know that their ideas and opinions are heard, valued and implemented. Actively listening to people is creating sustainable partnerships between PIC and their colleagues in East Africa and the United States.

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Conservation Funding Reassessed: Projects Supported by Zoos and Aquariums

As zoos and aquariums position themselves as institutions of conservation and environmental science, there is a growing emphasis on the funding of *in-situ* conservation projects. At the 1999 American Zoo and Aquarium Association (AZA) Annual Meeting, we presented results of a survey that indicated over 83% of AZA institutions were contributing to conservation projects out of their operating budgets, and the majority of those projects were endorsed by an AZA committee. Additionally, institutional contribution was not related to operating budget size, indicating that small institutions can be highly involved in supporting conservation. In this presentation we follow up on that report five years later by examining the trends in funding practices of AZA institutions as reported in the AZA Annual Reports on Conservation and Science. Over the past ten years there has been an increase in the number of institutions that report funding and/or participating in *in situ* conservation research. We examine the relationship between institution size and the type of *in situ* support provided (funding, active participation, both). We also examine trends in the location of projects supported (local, national, international) and factors that may influence these decisions. Understanding the funding trends of AZA institutions will improve the ability of non-AZA conservation groups to form more effective relationships with these zoos and aquariums and acquire funding from institutions that possess both technical skills and financial resources that may benefit conservation projects.

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Evaluating *In-Situ* Conservation Education: Kalinzu Forest Reserve School Program

In 2004, staff from Disney's Animal Kingdom partnered with staff from Jane Goodall Institute (JGI), Uganda and the Kalinzu Forest Reserve in the Bushenyi district of Uganda to develop, implement and evaluate a conservation education program. The aim of the program was to provide pupils from nine primary schools neighboring the Kalinzu Forest Reserve, the opportunity to visit the Forest Reserve Education Center and participate in a forest walk. The program was delivered by the JGI-Uganda field education officer and the Kalinzu Forest Reserve staff. The program included four activity modules conducted in the education center that focused on animal adaptations, wildlife diversity, threats to wildlife and "how you can make a difference for wildlife", as well as a guided forest walk. The program was evaluated using a written pre/post evaluation method. The evaluation survey contained five questions: four open ended and one multiple choice. A total of 364 students participated in the program. The data show that the students' awareness of environmental issues increased and their attitude toward the forest was more positive after participating in the program. The evaluation process provided information that enhanced our understanding of some of the cultural factors that affect how the children interpret the information provided in the program. These findings will aid us in the development of future programs and curricula for this region.

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Red Ape Encounters: Orang-utan Community-based Ecotourism

Traditionally, the people living in the Kinabatangan floodplain (Sabah, Malaysia) relied on natural forest and river resources for subsistence. Today forest reduction and fragmentation have resulted in a shortage of basic supplies, and in the emergence of conflicts with wildlife. Because of the amazing wildlife diversity and abundance still found in the area, the remaining forests of the Kinabatangan floodplain are now in the process of being gazetted as a Wildlife Sanctuary. However, with the loss of traditional access to the few remaining natural resources, the Sanctuary is often seen by local communities as a threat to lock up the last available resources.

In 2001, the Sabah Wildlife Department, the Kinabatangan Orang-utan Conservation Project (KOCP) and the villagers of Sukau started a 2-year pilot project funded by the Danish cooperation (Danida). The model is seeking to create an alternative sustainable source of income for the local community by achieving a broad involvement of villagers in ecotourism activities.

The project uses the combined opportunities of accessible wild orang-utans and the presence of a long-term research program in Sukau with highly trained local research assistants. A core team of eight villagers was formed and further trained by KOCP to develop and implement the pilot project. A village institutional structure and community benefit-sharing processes were established by the villagers, and the Sabah Wildlife Department allocated an area in the proposed Kinabatangan Wildlife Sanctuary to conduct this project.

In 2003, the pilot project created a tourism company (“Red Ape Encounter”, RAE), fully owned and managed by the local community. RAE developed a business strategy and packages combining orang-utan research, forest interpretation and cultural experience. All incomes generated by RAE are distributed to community-based services, such as the Homestay Program, the village transportation service (boats and buses), and the cultural troupe. Part of the income is also assigned to a “Community Tourism Fund” and a “Community Conservation Fund” managed by two independent village committees.

The expected outcomes of RAE is to contribute directly to the conservation of the Kinabatangan orang-utan population and of its habitat through (1) provision of a more sustainable form of livelihood to the local community compatible with biodiversity conservation; (2) encouraging the local community to be more directly involved in the preservation of the Kinabatangan natural resources; (3) generating more goodwill towards, and local benefit from, the conservation of the Lower Kinabatangan Wildlife Sanctuary.

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The Growth of a Field Conservation Program: From Small Grants to Large Partnerships

The Lincoln Park Zoo Neotropic Fund was initiated in 1986 to offer small grants in support of *in situ* conservation efforts throughout Latin America and the Caribbean. Since its establishment, the Neotropic Fund has awarded more than 160 grants in 20 Latin American and Caribbean nations. In 1997, the Zoo expanded its field conservation efforts to new areas of the world with the initiation of the Lincoln Park Zoo Africa/Asia Fund which supports *in situ* conservation efforts throughout Africa, Asia, and the Pacific. Over 40 projects in 11 countries have been supported since its inception. The funds were established with the overriding goals of encouragement, empowerment and training of young conservationists working in their own country, thereby strengthening the core of conservation leadership while supporting conservation efforts in the region. In 2002-2003, the Lincoln Park Zoo went through a strategic planning process for *in situ* conservation with the aim of increasing the zoo’s involvement and commitment to field conservation beyond the small granting programs. The Zoo’s holistic conservation and science mission is to use rigorous, scientific approaches to improve wildlife conservation and animal management by identifying threats to zoo and wild populations, developing widely applicable strategies for minimizing those threats, and assisting managers and wildlife biologists with actions that ensure the continued existence of wild and zoo populations. Within this mission, our strategic plan for *in situ* conservation was developed to integrate these goals by focusing on conceptual and geographic areas in which our staff have expertise as well as working on projects involving species represented in our animal collection. I will provide a brief overview of the history of the small granting funds and describe how our strategic planning process led to our current program.

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Integrated Management Program for the Black Lion Tamarin (*Leontopithecus Chrysopygus*)

The Black Lion Tamarin (*Leontopithecus chrysopygus*), endemic primate species of the Brazilian Atlantic Forest in the inland of São Paulo State, has a status of “critically endangered” by IUCN, mainly due to its habitat destruction. This situation leads to the fragmentation of the known subpopulations, which became small, isolated, and exposed to genetic depauperation. Previous studies carried out by the authors gave subsidies to the establishment of a conservation program for the species and its habitat, including the creation of captive colonies and demographic and genetic management of all subpopulations. This program, called “Integrated Program for the Conservation of Black Lion Tamarin”, has planned actions in the wild and in captivity to solve the problems posed by the species, using the concept of metapopulation. Between 1995 and 2000 we have carried out translocations, reintroductions and managed dispersals. In this scenario, our results showed the translocation as the most successful technique to manage wild animals, and reintroductions and managed dispersals been possible, but requiring further research.

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Zoos and Their Extended Families

Modern zoos traditionally develop *in-situ* conservation programs in other countries. This development helps support field work for research, education and developing programs for the protection of the natural habitats where animals that zoos display in their exhibits live.

The Houston Zoo is also involved in international conservation projects. This international focus is on direct support of in-country conservation, research, education and training initiatives. Houston Zoo accomplishes this by providing staff that have the technical expertise and can assist in the development of international conservation programs, working closely with other zoo staff, governmental agencies and conservation organizations within that country.

In the last ten years, the Houston Zoo has embarked on developing its training programs, becoming increasingly involved in international conservation efforts with a particular focus on Latin America.

The Houston Zoo’s Conservation Program provides support for staff members from upper management to maintenance department to participate in many ways throughout Latin American Zoos. It allows our staff to organize training courses and workshops for zookeepers and educators, establish programs on animal training, building new exhibits, donate materials, write manuals in Spanish, as well as hosting staff from zoos in Latin America.

To date, professional training programs and workshops organized by the Houston Zoo have focused on animals that can be dangerous if proper management is not applied, providing resources and to build exhibits.

Why support zoos in Latin America? The city of Houston has a strong Latin American cultural influence therefore the Houston Zoo has recognized this as a priority to work in conservation programs. We are the only zoo in USA that has all bilingual graphics and most of the staff that participated in training initiatives are Spanish speakers. Providing direct technical support and financing projects, the Houston Zoo helps enhance the quality of animal husbandry, building new facilities, developing educational programs and curriculum. Helping zoos in this region promote the conservation of endemic animals and ecosystems throughout the region.

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The Evolution of Pan African Primate Sanctuaries and PASA: From Welfare to Conservation

The Pan African Sanctuaries Alliance (PASA) works to unite the chimpanzee, gorilla, bonobo and other primate sanctuaries that span the African continent. PASA members, despite limited funds and often harsh conditions, strive to rescue primates orphaned by illegal hunting and habitat destruction, provide employment and educational opportunities, promote conservation, maintain the highest veterinary healthcare, and serve as a focus for sustainable rural development activities. The bushmeat crisis, deforestation, and increasing commercial development has resulted in ever increasing numbers of orphan primates. As a result, PASA member sanctuaries have evolved from welfare organizations into centers of conservation. Examples of conservation projects that they are involved with include local education, snare removal, and species re-introduction.

PASA, formed in Entebbe, Uganda, in 2000, offers sanctuary managers an opportunity to pool resources and collaborate on long-term projects and initiatives. PASA provides support to its member sanctuaries through annual workshops for sanctuary managers, education officers, and veterinary healthcare workers. PASA also serves as a resource for its members by working to facilitate confiscations and transfers, locate funding, raise standards of health, and promote educational outreach and scientific research. The results of recent research illustrates that data from sanctuaries can indicate trends in extinction rates and provide information that may be critical for conservation planning. PASA's focus on research and conservation continues to increase.

PASA member sanctuaries serve as the last line of defense in the battle to save some of our closest relatives from extinction in the wild. PASA and its member sanctuaries will continue to evolve to meet the extensive conservation challenges existing throughout Africa.

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The Saharan Conservation Fund: The Power of Zoo Partnership

The extinction crisis that has for so long been silently running its course in the Sahelo-Saharan region of North and West Africa has already cost the world one magnificent species (the scimitar-horned oryx) and threatens to count other desert species, including the addax antelope, dama and Cuvier's gazelles, red-necked ostrich and desert cheetah, among its next casualties. At the Convention on Migratory Species (CMS) meeting held in Djerba, Tunisia in 1998, a group of zoos, wildlife biologists, range state representatives and NGOs first conceived the idea of creating an organization of conservation-minded individuals and institutions to pool their knowledge and resources in an effort to address this crisis in some way. Over the ensuing years, this organization has come to be known as the Sahelo-Saharan Interest Group (SSIG). The SSIG meets annually, preferably in one of the 14 range states of the Sahelo-Saharan region, to present papers, exchange ideas, and develop strategies. Its collective membership represents a broad cross-section of the on-going conservation activities in the region.

An outgrowth of the SSIG forum has been the recognition by those involved that there is a growing need to formalize and expand the SSIG's role in implementing conservation programs in the region. In order to do so, SSIG must take the next evolutionary step in organizational development, to become a stand-alone entity with the resources and staffing necessary to develop projects, raise funds, and implement programs in situ. The Saharan Conservation Fund (SCF) is the vehicle under development to provide the organizational structure and legal identity necessary for this next step.

This paper will walk us through the development of the SCF, highlighting the pivotal role that zoos can and are playing in the launch of this important initiative. Opportunities abound through the SCF for zoos both large and small to make a real difference in the Sahelo-Saharan region through the power of partnership. On-going efforts to use zoo support of the SCF to leverage significant project funding from such sources as the World Bank, Global Environment Facility (GEF) and the Fonds Français pour l'Environnement Mondial (**FFEM**) will be discussed. An open invitation will be extended to all zoos, regardless of size, that feel as we do that cooperative action now can halt the decline of this fragile desert ecosystem and nurture the recovery of the wildlife unique to the Sahelo-Saharan region.

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Saving Ndoki's Chimpanzees: Insights from the Goualougo Triangle Chimpanzee Research and Conservation Project

It is becoming increasingly apparent that chimpanzee (*Pan troglodytes troglodytes*) and gorilla (*Gorilla gorilla gorilla*) populations in central Africa are rapidly declining due to disease epidemics, commercial bushmeat hunting, habitat destruction and human expansion. These threats pose significant risks to all remaining ape populations, but little is known about the specific social and ecological requirements of central African apes. In 1999, the Goualougo Triangle Chimpanzee Project was initiated in the Nouabale-Ndoki National Park, Republic of Congo. This remote region comprises a large track of intact ape habitat known to harbor relatively high densities of both central chimpanzees and western lowland gorillas. The long-term goals of the Goualougo Triangle Chimpanzee Project are to further our knowledge of the central chimpanzee and use this information to improve the overall conservation status of the apes in the region.

Standardized methodologies such as line-transect nest surveys, behavioural monitoring, and ecological surveys are used in our investigation of the chimpanzee behavioural ecology. In addition, a novel remote video monitoring system has been developed to document the tool using and ranging behaviours of several communities.

Findings from this research have already significantly increased our knowledge of the ecology and social behaviour of these sympatric apes. In addition to these scientific pursuits, we work with the Wildlife Conservation Society to target a broader audience including conservation managers, timber industry executives and political leaders. This approach has been successful in gaining local, national and international attention for regional conservation efforts. Through the extended reach of our research findings, the Goulougo Triangle Chimpanzee Project is addressing important issues effecting the conservation of chimpanzees and gorillas.

As pressures continue to increase on chimpanzees and gorillas inhabiting the Nouabale-Ndoki National Park and surrounding forests, immediate action is needed to ensure the survival of these apes. The possibility of long-term ape research is dependant upon further development of the relationship between conservation and research efforts in habitat countries. The Goulougo Triangle Chimpanzee Project indicates the rapidly changing context of ape research and positive contributions that can be made toward conservation efforts in central Africa.

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**Addressing the Commercial Bushmeat Trade and Human/Wildlife Conflict
Through Anti-poaching Work and Environmental Education: A Report from the Field**

Amara Conservation's (Amara) mission is based on a two-pronged approach for conservation and species protection. We provide support to prevent illegal taking and injury of animal species while at the same time educating local people about the importance of wildlife. Currently we are focusing on the Greater Tsavo National Park Ecosystem (GTE) in Kenya. This area contains the largest free roaming elephant populations in the world and is increasingly under heavy poaching pressure (scientific estimates are now at over ½ million animals of all species removed each year from the park ecosystem) by local people, the commercial bushmeat trade and ivory poachers from neighboring countries.

Amara provides substantial support to antipoaching efforts in the GTE, including the Tsavo Park rangers, Chyulu Hills antipoaching teams, de-snaring teams in the region and around Amboseli Park. Literally thousands of wire snares have been removed by these teams and numerous wildlife rescues have been conducted. We are currently working on a program to rehabilitate and reintroduce three orphaned lions. The Warden of Tsavo National Park has asked us to be a supporting member to help them build infrastructure, ranger bases and address their serious poaching problem.

Amara believes environmental education is integral to helping communities develop ways to coexist with wildlife. To address this, a plan was developed for a mobile environmental film unit through discussions with the African Environmental Film Foundation (AEFF) and Kenya Wildlife Service. There is currently no environmental education in the Kenya Schools syllabus, so even the educated are uneducated on environmental issues.

In 2004 we ran two pilot projects for the mobile film unit with educational films in local languages. The second program consisted of "hotspot" barazaas (community forums) in six communities known to harbor or at least tolerate extensive commercial bushmeat poaching. Amara coordinated and sponsored these meetings to specifically address and discuss bushmeat poaching issues and wildlife/human conflicts. The program was led by the Kenya Wildlife Service (KWS) Education Warden, KWS Community Wildlife Officer, KWS Researcher, Public Health Officer, a de-snaring team leader, Taita/Taveta Wildlife Forum Coordinator and Amara representatives. The community input was amazing with the first item listed by every community as a priority being further environmental education programs for their members.

We have seen great results with our environmental education films and follow up community forums. Children have become motivated to protect their environment, even collecting wire snares that they find in the bush, and communities have begun to speak out and oppose poachers. Our goal is to run this mobile film unit all of next year and visit all the communities in the GTE at least two times with different films. In sixteen additional "hotspots" we will be holding additional community forums after the films. At the same time we will continue supporting antipoaching work in the region to try to curb the unsustainable wildlife losses in the GTE.

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Operation Black Ghosts:

Saving the Last Black Rhino (*Diceros bicornis longipes*) in Cameroon.

The black rhino is one of the most endangered megaherbivores on earth. Of the four subspecies, the Cameroon black rhino (*Diceros bicornis longipes*) rhino is undoubtedly the most endangered, with a minimum number of 15 known

individuals left in Cameroon and identified by me early in 1999. The Cameroon government and international conservation community are well aware of this situation, but to date improved wildlife management strategies have not been able to benefit this population. However, poaching pressure appears to have declined since the 1990's which is encouraging. Several attempts to enumerate the population have failed.

It is of critical importance to determine exactly how many animals remain and ascertain their distribution and viability as a breeding population. Operation Black Ghosts plans to do this, and will be partly supervised by the IUCN's African Rhino Specialist Group. If numbers and distribution can be determined then international help is more likely to be forthcoming.

Project Black Ghosts therefore aims:

- To gather indisputable, updated info about rhino population
- To make this information available to decision makers and scientific community
- To help design less disturbing long term management option
- To allow and further support the successful implementation

In order to do this, we will employ a new footprint identification technique (FIT) from WildTrack, alongside the traditional skills and bush knowledge of local people who are experts in locating and identifying these animals. If tissue samples become available these can be used to better understand the genetic composition of the subspecies. Staff employed by Operation Black Ghosts will be comprehensively trained in the use of all necessary techniques. It is our hope that once numbers and distribution have been determined then home range maps can be produced and regularly updated, either by continuation of the monitoring techniques described above, or by radio-telemetry if this is considered beneficial.

If the remaining population is considered viable the population will be ranked as an African Continental priority for conservation by the African Rhino Specialist Group. Clearly this would have longstanding benefits not only for the black rhino and the other species in the ecosystem, but also human rural populations who live with them.

We hope to launch Operation Black Ghost in 2005 depending on the availability of funding, and we estimate the time required to achieve these objectives will be 12 months. Operation Black Ghosts has formal approval from MINEF (Cameroon Ministry of Environment and Forests), IUCN's SSC AfRSG (African Rhino Specialist Group), IRF (International Rhino Foundation), SCI (Safari Club International), Conservation Force and IUCN's French Committee.

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Marrying Research to Develop Lasting Solutions to Anthropogenic Conflict in the Painted Dog *Lycaon pictus*.

The Painted dog also known as the African wild dog *Lycaon pictus* is one of the most endangered African carnivores, with hypotheses to explain the decline including human interaction, pack size dynamics and competing predators. Historically however, for the last 2500 years, humans have tenaciously persecuted canids and canid-like carnivores and painted dogs are no exception. Consequently, species have been extirpated from great areas of their former ranges, which have taken them closer to the extinction vortex or into it. Carnivores are peripatetic, particularly the cursorial hypercarnivores whose energy budgets are high, thus bringing them into frequent contact with man. As a result, canid mortalities are significantly dominated by anthropogenic factors. Although telemetry has been a powerful research tool for gleaned information pertinent to their conservation, *sensu stricto* it does not conserve animals. However this paper presents survivorship, mortality and pup guarding data that highlighted the importance of individuals to conservation and enabled a conservation strategy to be designed and focused for the painted dog, *Lycaon pictus*.

This paper therefore presents these data and a new holistic model for conservation of this species that resulted from the research and community appraisals. This model brings in the community as partners, whilst at the same time providing for some of their identified and important needs to include education skills acquisition and recreation. From the dogs perspective, part of this work included using a bio-fence principle to keep packs inside the park, protection of individuals to maintain pack integrity and development of a new collar that was designed specifically for the species and functioned actively to reduce losses from snares, road traffic accidents and being shot by farmers whilst concomitantly fulfilling the research role. Finally implications for canid conservation in general are discussed.

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The Monofilament Recovery and Recycling Program

The Monofilament Recovery and Recycling Program (MRRP) is designed to prevent fishing line pollution and wildlife entanglement by educating and empowering citizens with the means to act responsibly while enjoying our waterways. MRRP's goal is to educate the public on the problems caused by monofilament line left in the environment, to encourage line recovery and recycling through a network of line recycling bins and drop-off locations, and to conduct volunteer monofilament line cleanup events.

Since MRRP first began in Brevard County in early 2001, the program has readily caught the interest of residents and visitors. Support and participation in the program remains high. Requests for additional fishing line recycling bins have been coming from residents throughout the county, as well as from people from other Florida counties, and even other states. Recognizing that this program could easily be emulated and benefit wildlife everywhere, the Brevard County Natural Resources Management Office (NRMO) partnered once again with the Florida Fish and Wildlife Conservation Commission Advisory Council on Environmental Education to conduct the MRRP Dissemination Project. A website with all the tools and information for starting MRRP can now be found online at: <http://www.fishinglinerecycling.org/index.asp>.

Acknowledging the need to continue and expand MRRP at the local level, the Brevard Zoo awarded NRMO a Conservation Fund grant to support MRRP in 2002. The Brevard Zoo Teen Volunteers (2002-2003) also selected MRRP as the local program they would support through their fundraising efforts. These funds have allowed NRMO to build additional recycling bins, purchase volunteer t-shirts, print educational materials, and more. NRMO has also given the Brevard Zoo a recycling bin and educational materials that the zoo can use for a display to educate its visitors. This successful partnership could be implemented similarly to instigate other projects, or be copied in other locations. The possibilities to maximize the benefits of MRRP are great.

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Rhinos, Tapirs and Bears, Oh My!:

Non-Animal Staff Involvement in International Conservation Efforts

When you think of zoo staff participating in field conservation efforts, the image usually is of zookeepers or veterinarians, people with loads of animal husbandry experience. Few would imagine a graphic artist tramping through tick infested forests in search of wild tapirs. But it can happen! Like many of my fellow wildlife and fisheries major graduates, I was unable to secure a job in my chosen field fresh out of college. My meager artistic talents did, however, land me a graphic artist's job at the Houston Zoo, where I was exposed to the world of captive animal management and allowed to dabble in various conservation activities.

Over the past few years, our institutional commitment to conservation has grown significantly. In 2003, the Houston Zoo launched its new Naturally Wild Conservation Program, earning a very positive response from staff and the public alike. This new program focuses on threatened species, the integrity of the habitats in which they live, and regions of high conservation priority that they represent.

At the heart of our new program is staff participation and support. From horticulture and maintenance to education and development, everyone wants to be a part of the conservation team and we continue to explore new ways in which individuals can contribute. Personally, I have been able to provide my graphic design talents to the International Rhino Foundation and the IUCN/SSC Tapir Specialist Group, and have more recently volunteered for field research projects studying tapirs in Brazil and brown bears in Alaska. But I'm only one example. Last year, the Houston Zoo maintenance staff helped construct a new Baird's tapir exhibit and breeding compound in Panama. The herpetology staff is presently recruiting volunteers from any zoo department to participate in Texas reptile and amphibian surveys. And members of our administrative staff are helping to organize regional wildlife surveys and censuses, as well as to enhance our collaboration with our state wildlife agency, Texas Parks and Wildlife.

At the zoo itself, all departments contribute to conservation through an annual staff campaign that is on course to one day reach 100% individual participation. In addition, our concessionaires have instituted a Conservation Hero incentive program to increase public support for field conservation, and the new zoo carousel, once it recoups construction costs, will generate additional revenues for the Naturally Wild program.

This presentation demonstrates how an institutional commitment to conservation can create opportunities for personal involvement and build pride among the entire staff.

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Acquisition, Conservation, and Doing the Right Thing..... that's what it's all about

Today, zoos and aquariums face difficulties incorporating our new conservation imperative into all aspects of our operations. Taxon Advisory Groups (TAGs) are charged with managing the animals in our collections and recommending which species should be held. In addition, TAGs develop action plans with priorities for conservation projects. Many times, the practices of acquiring animals from the wild and supporting in-situ conservation, conflict. The pressure of having active and interesting collections for the public can be intense. Despite Regional Collection Plans and our good intentions, animal availability through commercial dealers can take precedence over our planning and conservation "good sense". In an attempt to address this problem, the Raptor TAG has formed a formal partnership with the Vulture Study Group (VSG) of the Endangered Wildlife Trust. By collaborating with a South African NGO, the TAG will partner captive vulture management and in-situ conservation.

As part of their rescue operations, the VSG holds non-releasable rescued vultures. Vultures that have been identified in the TAG's Regional Collection Plan are brought from the VSG rehabilitation center into AZA managed programs - the funds that would normally be used to acquire these birds from other sources are placed into a trust fund to support in-situ vulture conservation in South Africa. This relationship will expand to include various conservation, education and research activities. Proliferation of these types of partnerships can create the environment where our animal acquisitions from the wild for our collections can leave the realm of commercial transactions and become conservation initiatives.

In addition to the session we would like to organize an evening discussion based on the topic and related issues. Some possible topics for discussion include:

- Real "enhancement", what to the USDA guidelines really mean?
- How could this work for other TAG's, taxonomic groups?
- What other similar examples/activities are out there?
- What are the major potential stumbling blocks?

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Project Payamino: A Community Project in the Ecuadorian Amazon

Project Payamino was initiated in 2002 as an agreement between San José de Payamino, an indigenous community in the Ecuadorian Amazon and Aalborg Zoo in Denmark. The community has 270 members and a territory of 600 km² of primary rainforest, situated in one of the most species diverse areas of the world. The area is under threat from oil, logging and gold companies but also from the community itself as it is dependent on money. Hunting and fishing for the bush meat markets, logging of trees or letting the oil companies in seems to be the obvious way. Working with an indigenous community is a different way of thinking and acting. How does Project Payamino work? Why does it work? What have the project achieved so far? What are the plans for the future?

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**Monitoring Jaguar Populations Using Camera Traps:
Abundance Surveys in the Cockscomb Basin, Belize**

The authors will present the results of three consecutive years of a jaguar abundance study in the Cockscomb Basin jaguar reserve in Belize, Central America. The survey results for at least 4 individual surveys will be presented. The abundance surveys were conducted using remote camera trapping to estimate a population based upon a closed population mark and recapture analysis. The results indicate a relatively high density of jaguars at this site when compared to other studies using similar techniques. Differences in density estimates between successive surveys will be presented, and we suggest that variation in the buffer area included in the analysis is chiefly responsible for this variation. The authors will suggest possible alternative methods for calculating the buffer area beside the mean maximum distance moved (MMDM) of animals recaptured. The presentation will emphasize the methodology of using mark and recapture analysis to estimate abundance in individually recognizable species, and will outline some of the promises and limitations of the method for investigating felid population status and ecology.

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Evaluating Successful Conservation Partnerships Between Zoos and Aquariums, State and Federal Agencies and Non-governmental Organizations

As we face an alarming rate of world-wide habitat fragmentation and species declination, conservation organizations are forming partnerships to improve the effectiveness of species and habitat recovery. By combining professional expertise and the resources, the goal is to improve the quality of current and future recovery efforts. Forming quality partnerships that work effectively and proficiently toward their common goal can be a daunting task for any institution. Therefore, this research identifies characteristics and trends in conservation partnerships between American Zoo and Aquarium Association (AZA) accredited institutions and related facilities, and their partners, such as non-governmental organizations (NGOs), federal and state agencies, academic institutions, and private industry.

Preliminary questionnaires were distributed either by e-mail, FAX, or U.S. mail to all 229 AZA accredited institutions and related facilities to determine if they were currently involved in conservation partnerships. Using an in-depth literature review plus focus groups with AZA institutions, we were able to create a closed-ended telephone interview questionnaire to contact Preliminary Questionnaire respondents currently involved in conservation partnerships. During the telephone interview, respondents were asked a series of questions about which characteristics most contributed to the success of their current conservation partnerships. In addition, through these interviews we were able to discover trends in the formation and maintenance of conservation partnerships, past, present and future. With this, we can provide guidelines to institutions for improvement of existing as well as creation of new conservation partnerships. Because our research is still being completed and has yet to be analyzed, we do not have conclusions at this time.

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A New Spin on Conservation: Saving the Endangered Snow Leopard

Zoo involvement in wildlife conservation continues to grow both in the number of zoos providing resources and their depth of involvement. Interest in projects that include sustainable conservation objectives is also a growing trend among zoos and other conservation organizations. The purpose of this talk is to discuss the Snow Leopard Trust's participatory approach to conservation and the many ways zoos can and are involved in saving the snow leopard from extinction.

The Snow Leopard Trust is practicing an approach to snow leopard conservation that centers on helping local communities become good stewards of their environment. The success of community-centered conservation projects rest on three key principles:

- **Solid science is needed to develop and monitor effective conservation projects.** Scientific research identifies the most crucial sites to focus on and what methods will be most effective. Monitoring sign density before and after a community conservation effort begins is a necessary check on the program's effectiveness.
- **Community Partnerships are the best way to address the root causes of wildlife – people conflicts.** Partnerships are integral to successful conservation because the people who live in the region are ultimately the ones who decide whether or not they are going to prevent illegal hunting or turn a blind eye to it (or even participate in it). Finding ways to interest and motivate them to protect local wildlife is crucial.
- **Developing Programs that will endure.** To succeed over the long-term conservation programs must have a plan that leads to a healthy environment and independent and prosperous communities. All Snow Leopard Trust programs build capacity in the communities we partner with and have a clear ending point for donor support.

The use of these principles will be explored using zoo-supported snow leopard conservation efforts in Mongolia and Pakistan as examples.

The presentation will also focus on how zoos can protect the snow leopard by encouraging their visitors to become active in conservation efforts. According to the American Zoological Association, there are more than seventy zoos in North America housing snow leopards. These beautiful cats are seen by tens of millions of people every year. If zoos could move just a fraction of one percent of their visitors to take action, they would raise millions of dollars for conservation. That level of long-term commitment could change the conservation question from “if” to “how soon” the snow leopard is no longer endangered.

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Naturally Wild Conservation Staff Campaign at the Houston Zoo

Staff campaigns have been used for many years in other not-for-profit industries as reliable sources for fundraising. In 2003, the Houston Zoo implemented The Naturally Wild Conservation Staff Campaign - a zoo-wide effort to raise money for Houston Zoo conservation programs by asking staff members to monetarily contribute to the cause.

Following the formula provided by higher education and hospital development departments, the Zoo staff was divided into sections, each with an appointed leader, that competed against each other for highest participation rates. An incentive period jumpstarts the giving and small appreciation gifts are provided to all who participate. Matching gift incentives were also utilized to motivate participants.

The Houston Zoo has now completed two campaigns, raising \$18,000 from 83% of the staff in year one and \$43,500 from 98% of the staff in year two. Because of these impressive results, The Naturally Wild Conservation Staff Campaign is slated to become a consistently utilized fundraising program at the Houston Zoo.

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Conserving Gorillas:

The Role of The Dian Fossey Gorilla Fund International and its Host Partner, Zoo Atlanta

Recent reports on African ape populations show drastic decline across the continent with estimates that the majority of populations/species will be functionally extinct in the next 25-50 years. Yet in the past 15 years the mountain gorilla population of the Virunga Massif has increased by 17%. Amazingly, this increase occurred during a time of intense political strife and the loss of approximately one million human lives. A large number of conservation organizations played and continue to play a role in ensuring the survival of the mountain gorillas, including The Dian Fossey Gorilla Fund International (DFGFI). This talk will outline DFGFI's multidisciplinary approach to conserving mountain and lowland gorillas in Central Africa. Specific programs to be discussed include: 1) protecting, monitoring and studying gorillas; 2) assisting local communities in developing conservation programs; 3) promoting public health and education; and 4) educating in-country scientists, students, and civil servants. Additionally, the talk will cover the Zoo Atlanta-DFGFI relationship as one model of how zoos can support *in situ* conservation.

Usongo, Leonard¹, MS, PhD and Mike Loomis², DVM, MA, Dipl ACZM

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Elephant Conservation in Cameroon: A Cooperative Program Between WWF Cameroon Program Office and the North Carolina Zoological Park

The North Carolina Zoological Park (NCZP) and WWF Cameroon Programs Office (WWF-CPO) have had a cooperative program for elephant conservation in Cameroon since 1998. A memorandum of understanding signed by the NCZP and WWF-CPO in 1999 solidified the program. The objectives are to develop a program of activities which is of mutual interest and benefit to both the NCZP and the WWF-CPO and which is based on: an equitable exchange of information, expertise and services; taking themes from live conservation management experiences from Cameroon to the NCZP and enhancing existing WWF-CPO projects' activities.

The program has concentrated on monitoring elephant movement patterns in and around several protected areas in northern and southeastern Cameroon using satellite-tracking collars on elephants. Initially, the program focused on human-elephant conflict around Waza, Kalamaloue, Benoue and Bouba Ndjida National Parks in northern Cameroon. Over the past four years, the program has centered on elephant movement patterns in and around several protected areas in the forest of southeastern Cameroon. These areas include Lobeke National Park, Nki and Boumba Bek Reserves and the Ngoilla-Mintom corridor between the Dja Reserve and Nki Reserve.

The NCZP has raised over \$350,000 over the life of the program. The NCZP has provided veterinary expertise in elephant anesthesia, purchased satellite collars and satellite time for data generation and data transfer, determined duty cycles for the collars based on satellite over-pass data, purchased and assisted in the purchase of equipment used in the program and provided training in veterinary procedures. WWF-CPO has provided all logistics in Cameroon and has made significant amounts of conservation-related information available to NCZP for educational purposes. The elephant location data is integrated into existing WWF-CPO projects and is used to identify movement corridors, and to concentrate anti-poaching, sensitization and education efforts. The data is also used in developing cooperative projects for elephant monitoring and conservation with logging concessions and sport-hunting concessions around protected areas. To date, 20 elephants and two bongo have been collared.

The NCZP and WWF-CPO jointly write grant proposals for funding and publish papers in scientific journals to report significant findings. Both also frequently provide content materials to *Field Trip Earth (FTE)*, a conservation education website operated by the North Carolina Zoological Society (<http://www.fieldtripearth.org>). *FTE* tracks the activities of conservation researchers working world-wide, and provides information about their work—stories, maps, photos, videoclips, datasets, etc., to K-12 classrooms in all fifty U.S. states and approximately 100 countries around the world. Teachers and students then use those materials to support instruction in the natural sciences, as well as in language arts, mathematics, social studies, and other curriculum areas.

Visitors to “The Elephants of Cameroon” section on *FTE* can interact with the research team by reviewing online field diaries, by asking conservation-related questions, and by responding to discussion questions posted by the team members. The site also provides information about the objectives and methods of the research program, about elephants and other wildlife in Cameroon and about the people, culture and geography of Cameroon itself.

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IDEA WILD: How Small Grants can Benefit Big Conservation Efforts

IDEA WILD was founded in 1991 to minimize the loss of biodiversity by empowering people on the front lines of conservation efforts in developing countries. IDEA WILD is unique in the conservation arena and provides basic equipment and supplies for biodiversity research and conservation education projects. We receive requests daily for small equipment grants from professors, students, and non-profit staff working to minimize the loss of biodiversity within their countries. In thirteen years IDEA WILD has provided binoculars, mist nets, climbing ropes, computers, global positioning systems, telemetry, projectors, cameras, and other equipment to over 3000 projects. These small equipment grants help collect much needed data, facilitate training, help fill professional positions, and build relationships. We will show examples of these field projects, evaluate their successes, present ideas on how zoos can participate in these efforts, and explain the application form to field biologists.

“Do not underestimate the power of the small- the ability of an individual to go out in the world and make a difference, we often equate largeness with power, rather than seeing largeness is in fact a limitation to change – think of smallness as a virtue not a limitation,” Walter Wink

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"Chester Zoo's Field Conservation Support: An Overview of Partnerships, Programmes and Their Development."

Chester Zoo was established in 1932 and became a charity in 1950 as the North of England Zoological Society. The zoo site covers 40 ha within a total landholding of 160 ha. We currently receive over a million visits each year and employ ca 270 full time staff reaching 500 in high season.

Chester Zoo joined the World Conservation Union- IUCN in 1989 and since then has committed support to *in-situ* conservation. This had small beginnings with funds for Zoo Outreach India, Buffy-headed Capuchins in Brazil, Spotted Deer in the Philippines and Zoology and Veterinary Studentships in the UK. At the same time our staff began to work with conservation projects overseas. At this time the projects supported were often opportunistic or followed individual staff interests.

The Zoo now supports eight major programmes. These are in the UK, Philippines, China, Assam, Nigeria, Kenya, Mascarenes and Brazil. Programmes may either focus on species as in Black Rhinos in Kenya, Asian Elephants in Assam, and Jaguars in Brazil, or on a range of species as in the Philippines, China, Mascarenes, Nigeria and UK. Where programmes focus on particular species then these are usually those we keep at the zoo. We link major new

exhibits with field conservation support. We also continue to offer grants to smaller projects to assist direct conservation and conservation research and have instituted a selective review process to assess these.

Funds are generated through zoo visitor income from admissions, catering and shops supplemented with funds from research and conservation grants, business and private donors, our Keeper for A Day Scheme and consultancies. We feel it important for our visitors to know that their zoo visit supports both *ex-situ* and *in-situ* conservation.

How financial support is directed varies according to the needs of the different programmes. This has been used for salaries, infrastructure, transport, maintenance, conservation research, core functions, training, conferences and workshops. We also support projects through the involvement of our staff – scientists, vets, curators, keepers and tradesmen.

Good long term partnerships have been most important in developing the conservation programmes. Our partners include Government Departments, Conservation ngos- large and small, international, national and local, Universities and researchers, other zoos and in-country breeding centres. For partnerships to work effectively then good interpersonal relationships and trust are essential and we must invest high levels of staff time and energy into maintaining and strengthening these.

To be one of several funding agencies has important advantages in pooling resources. It is also important that we can identify with, effectively contribute to and in some cases lead particular projects and programmes. Zoos have special skills and expertise in conservation breeding, veterinary care and small population management. Where we can we aim to link our *in-situ* field support with our *ex-situ* work. Chester Zoo aspires to become not just a zoo that supports other organisation's field projects but to become one that is pro-active in conserving biodiversity worldwide.

Poster Abstracts

Alberts, Allison, Ph.D., Jean-Pierre Montagne, and Jeffrey Lemm. Applied Conservation Division, Conservation & Research for Endangered Species (CRES), Zoological Society of San Diego.

Biodiversity Monitoring and Habitat Management in Southern California: A Local Conservation Initiative of the San Diego Zoo.

The San Diego region is a key component of the California Floristic Province, an internationally recognized biodiversity hotspot. More than 800 of the 1,800 acres of land at the San Diego Zoo's Wild Animal Park consist of undisturbed coastal sage scrub habitat. Since 2002, researchers in the CRES Applied Conservation Division have been using pitfall trap arrays and snake funnel traps to survey this area for small mammals, reptiles, and amphibians as part of a long-term biodiversity monitoring effort. Once captured, animals are marked, measured, and released. Ten of the pitfall trap arrays also serve as locations for bird surveys in early (April) and late spring (May), consisting of fixed-point, eight-minute sight and sound bird censuses. In addition, bird surveys are conducted around two of the exhibit ponds at the Wild Animal Park. To date, 16 mammal, 56 bird, 16 snake, 12 lizard, and five amphibian species have been documented in these habitats. Together with historical records for the site, these data are being entered into a GIS database and analyzed to assess the status and population trends of key species. It is clear from data obtained to date that a number of sensitive species inhabit the natural areas surrounding the Wild Animal Park. By investigating patterns of biodiversity at the Wild Animal Park, where intensive and comprehensive monitoring is feasible, methods and approaches to effective habitat conservation can continue to be developed and employed at other sites throughout Southern California. In 2004, a new study was initiated to test the effects of roads on local diversity of amphibians, reptiles, and small mammals. At several locations along both dirt and paved roads surrounding the Wild Animal Park, pitfall trap arrays were installed on either side of the road in order to assess how often different species cross roads. Control arrays installed several yards inland of each road array allowed researchers to gather baseline information on movement rates to compare with road crossing data. We found that arrays that are closer to roads have notably fewer recaptures, indicating that animals do not remain in the vicinity of roads as long as they remain in non-roaded areas. Whether this is due to increased mortality near roads or more frequent migration away from roads requires further study. In either case, it appears that roads can have a significant impact on population dynamics of native species.

Alberts, Allison, Ph.D., Jonathan Dunn, and Jeffrey Opdycke. Applied Conservation Division, Conservation & Research for Endangered Species (CRES), Zoological Society of San Diego.

Seed Banking to Conserve San Diego's Native Habitats.

San Diego County is home to more species of endemic plants than any other county in the continental United States. At the same time, the county contains the highest number of threatened and endangered species on the continent, the vast majority of which are plants. Much of San Diego's extraordinary plant diversity is found within a habitat known as

coastal sage scrub, upon which a variety of threatened and endangered animal species depend. Today, less than 15 percent of coastal sage scrub and its unique plants and animals remain. In 2001, the CRES Applied Conservation Division launched the first seed banking program in the region. The botanical conservation center, located at the San Diego Zoo's Wild Animal Park, is dedicated to conserving rare native plants through the collection and storage of seeds from key locations for propagation and revegetation efforts. We have recently become a partner in two major plant conservation initiatives: the Kew Royal Botanic Gardens Millennium Seed Bank Project, and the San Diego Museum of Natural History's Plant Atlas. The Millennium Seed Bank Project aims to collect and preserve seeds from arid habitats worldwide. We are serving as their local partner, working jointly to bank seeds from key species of San Diego's rich but highly threatened flora. The Plant Atlas Project uses GPS and GIS technologies to map the locations of key plant species throughout San Diego County, an effort essential to identifying at-risk populations and guiding conservation and restoration activities. An additional goal of the botanical conservation center is to demonstrate environmentally friendly forms of construction, energy, and water use on-site that can be applied to homes and gardens throughout our arid region. The main building made of straw bale construction, which as a result of its high insulation value requires no air conditioning and very little supplemental heat. Annual burning of straw in California produces more carbon monoxide and particulate matter than all of the electric power-generating plants in the state combined. Building with straw takes what would otherwise represent a problematic waste product and puts it to constructive use. In the future, we plan to enhance our straw bale facility with solar power, a rainwater collection system, and a living roof. The ultimate goal is that our botanical conservation center will serve as a model program for the local community, showcasing the value and feasibility of alternative energy and water conservation measures in San Diego County's arid environment.

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Creating a New Tool to Promote Conservation Strategies in the Brazilian Pantanal

Due to economic pressures, many large ranches in the Brazilian Pantanal have been divided into smaller, less viable properties. As a result, traditional extensive grazing practices, which included the seasonal movement of herds among patches of native savanna, have become less practical. To make smaller properties economically viable, ranchers have to clear-cut native forests and plant exotic grasses to increase grazing area and productivity. In addition, environmental damage due to over use by cattle, erosion and conflicts over uncontrolled burning of pasturelands are likely to increase in small, intensively used ranches. Little is known about the impacts associated with these changes in land use. A rapid method to evaluate resource use of domestic as well as wild animals is therefore necessary to evaluate and understand these changes. A precise understanding of resource use by plant-eating animals will enable researchers to recommend sound conservation land management strategies that will benefit both cattle ranchers and wildlife. The aim of this project is to create an illustrated interactive key to analyze resource use by plant-eating animals through micro-histological analysis of fecal samples to assist landowners in making sound land management decisions. To create the key, plants collected throughout the Pantanal will be referenced and used to prepare slides, which will enable us to identify, describe and characterize the anatomical characteristics of the epidermal cells of these plants. Each characteristic will then be photographed, categorized and entered into the DELTA *software* thus contributing to the creation of the interactive key. Therefore, when looking at a micro-histological slide of a fecal sample, the observer can compare the anatomical characteristics of epidermal cells of each plant part found in the feces to the series of illustrated characteristics displayed by the key. The interactive key automatically identifies plant species, therefore enabling the observer to rapidly and accurately identify plants consumed by the animal whose feces have been collected. The interactive key will be of great importance for future research and conservation management planning in the Pantanal. Our understanding of resource use by plant-eating animals will enable researchers to study plant/animal/land-use interactions and recommend sound conservation land management strategies. This interactive key will promote sustainable livestock management and conservation of biodiversity in the Pantanal ecosystem.

DiFiore, Sonia - Cleveland Metroparks Zoo
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Improving the Future for Wildlife...Locally

This poster will highlight of some of the local/regional conservation initiatives that the Cleveland Metroparks Zoo is involved with including:

- Head Starting/Reintroduction of Blanding's Turtles and E. Plains
- Garter Snakes
- Butterfly and Wildflower Monitoring and Conservation
- Big Creek Clean Up
- Recycling and Composting at the Zoo
- Zoo Exhibit Educating Visitors on Creating Backyard Wildlife Habitat for Birds and Butterflies

It will also discuss future plans for the development of our local conservation and research program and point out the challenges and opportunities associated with coordinating local conservation initiatives as a member of the regional park system.

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**Inspiration to Action: WPZ Keeper Builds a Network for Hornbills
Together Pinning Our Hopes On Success**

Woodland Park Zoo keeper Eric Kowalczyk stands as proof that one person's passion can create connections to link a network of conservation actions. Kowalczyk works hard to ensure the future for the birds he loves. He is the North American AZA species coordinator for six species of hornbills and works with the Hornbill Research Foundation (HRF) in Thailand, helping Woodland Park Zoo direct resources where they are most needed. One connection at a time, the network continues to expand support for the magnificent hornbills.

Dr. Pilai Poonswad, director of the HRF, believes the survival of Thailand's forests and wildlife will depend upon people's understanding of the importance of the forests to their lives. With this in mind, HRF reaches out to their community in a variety of activities. Kowalczyk reaches out to his community by providing information on the birds and providing tangible, fun actions for the zoo-going public to take. To generate interest in the birds, WPZ sells wooden hornbill pins, handmade by children in the Young Bird Conservation Club (YBCC) in Thailand. Dr. Poonswad buys the pins from YBCC and sends them to Kowalczyk and the zoo then sells them to visitors. One hundred percent of the profit is returned to YBCC via Dr. Poonswad. A connection is made that enhances both communities!

To date, Kowalczyk has facilitated the sale of over 1000 pins throughout the U.S. with more to be sold in 2005. Woodland Park Zoo profits go to the YBCC. Zoos that have participated in the sale of these pins to date include Atlanta Zoo, Houston Zoo, Lincoln Park Zoo, Miami Zoo, Minnesota Zoo with profits from these zoos going to either the YBCC, the Hornbill TAG or a combination thereof. With innovative programs as diverse as the birds themselves, this growing network provides genuine hope that these important birds will continue to grace their forests for years to come.

Mr. Wichai Napua, director of YBCC, recently wrote to Kowalczyk: "We teach [the children] to study natural things closely. I believe that the best thing for all human beings is learning to live with all nature peacefully. That's important values for all our children. They are ready to do good things to all beings."

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Growing In Situ Conservation with Your Volunteers

The Seneca Park Zoo like many zoos has moved out of the stereotypical perception of a menagerie of exotic animals to a center for conservation education and research. So how does fourteen-acre facility facing the ever-menacing budgetary crunch be able to actively participate in international as well as local insito projects.

Enter the Docents. With the word given they started off and with the zoos support and inspiration found at the first ZACC conference they were on their way. This presentation will follow the progression of projects, programming as well as the partnerships that the Seneca Park Zoo and Docents have been evolved with over the years since the first ZACC conference.

As this presentation will show there are other possibilities that zoos can emulate by utilizing their volunteer force to set up insito programming and fundraise to support the conservation mission of these facilities as well as AZA. The presentation in poster form will measure 4'x 6'. Be computer generated with only 15% text that will outline the successes as well as the downfalls the docent organization faced to support the zoo in becoming a moving conservation force in Upstate New York and the inspiration they have instilled in other Docent organizations.

Kinyaga, James & Jonathan Kipkorir

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The author is affiliated with Saint Louis Zoo and San Diego Zoo through their partnership with Lewa Wildlife Conservancy.

The Story of Il Ngwesi

Il Ngwesi Group Ranch is located in the Mukogodo Division of Laikipia District in northern Kenya. The area is owned by Laikipiak Maasai pastoralists with a population of approximately 6,000 people. The ranch is 16,500 hectares of which 8,765 are managed as a community conservation area and the rest is used for communal grazing. In 1996 the Group Ranch established a lodge from which other conservation-based enterprises such as the cultural village, camel safaris, and camp sites have been established. These initiatives all generate substantial income which goes to supporting projects that are prioritised by the community at the Annual General Meeting. Funds are allocated for the construction of cattle dips, water projects, schools, education scholarships and health services.

When Ian Craig of Lewa Wildlife Conservancy first approached our elders with the suggestion that we turn our ranch into a wildlife sanctuary, build a lodge and open it to tourism, community members were very suspicious of his motives. We feared that our land would be confiscated and turned into a national park and we questioned why a white man would be helping us. What was it in for him? But with increased community mobilization and education, members of the Il Ngwesi community were convinced. It is now the Il Ngwesi elders who offer valuable information to other up-coming community conservation initiatives across Africa.

Marketing was the other big challenge. The Maasai had never been involved kind of trade of hotel business apart from the sale of livestock, we did not know how to go about sourcing clients for our new tourism business, luckily through collaboration with friends and partners like Lewa Wildlife Conservancy. We are growing quickly and getting to learn about ecotourism.

All the management and governance of the lodge and conservation area is decided in annual general meetings at the end of every year where members reach a consensus. These issues include the equitable distribution of benefits, staff recruitment, pasture management and best land practices.

Getting qualified people to work at the lodge was not easy since the Group Ranch members have never had access to formal education. Through Lewa Wildlife Conservancy we got professionals to come and train our workers in-house. The lodge has won several awards including the British Airways *Tourism for Tomorrow* award 1997 in recognition of sustainable tourist development, Travel News Magazine's *Best Self-Catering Lodge* 1998, 2000 and 2002, the prestigious *David Sheldrick Conservation Award*, and the UNDP *Equator Initiative Award* 2002 with a cash prize of \$30,000.

The Group Ranch employs eight community scout guards who patrol the ranch paying particular attention to the northern boundary surveillance to prevent illegal grazing and poaching. Everyone has benefited from the extra security in the area. Instant communication by radio has ensured that cattle are no longer stolen and houses no longer raided. Human-wildlife conflict has reduced in the Group Ranch because every man, woman and child knows it is in their interest to protect the wildlife that the tourists come to see.

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Green Enrichment: Incorporating Recycling into a Zoo's Enrichment Program

As more zoos concentrate on the importance of recycling throughout their facilities, it is easy to overlook reusing in-house items as a ready source of enrichment materials. Operating on a limited budget for enrichment, Louisville Zoological Garden [LZG] exploits various avenues for procuring needed objects. From camel hair to large trees, items are used and reused to provide activities and enhance the environments of the zoo's animals. Communication between departments, such as Guest Services [paper towel rolls], Special Events [Halloween pumpkins], Public Relations [donated clothing], Horticulture [browse], and the Animal Health Center [medical supplies boxes and containers] occurs regularly so that a browse or enrichment opportunity is not missed. Indeed the "Zoo Poopy Doo Circle of Life" – hoof stock refuse composted off-site by waste management and returned as "zoo poopy doo" to sell to the public as well as to fertilize plantings on zoo grounds, which are then fed as browse – is an excellent example of green enrichment. Even our adult male sea lion has been trained to "recycle" plastic bottles thrown into the pinniped pool. As a result of these efforts the LZG's animals benefit by having a stimulating enriched environment while enabling the staff to "reduce, reuse and recycle" in accordance with our mission statement "to better the bond between people and the planet."

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**Using Your AAZK Chapter as a Tool for Revitalizing Your Zoo's
Conservation Commitment**

When exploring options for establishing or revitalizing a zoo's conservation commitment, an institution should consider soliciting support for such an endeavor from its local AAZK chapter. Louisville Zoological Garden [LZG] established a Conservation Committee in 1997 to develop, coordinate, fund, and promote conservation projects undertaken by zoo employees. When the committee was dissolved in 2001, no staff position assumed the role of managing these efforts.

At the same time, LZG Chapter of the American Association of Zookeepers [AAZK], functioning independently from the Conservation Committee, provided resources for keepers' conservation initiatives, such as purchasing equipment for research projects, contributing funds to *in situ* conservation, and sponsoring keeper participation in TAGs, seminars, and workshops. Led by a small but diehard core membership, LZG AAZK continued to raise and distribute money, and slowly emerged as one agent for conservancy at the Zoo. The Chapter's recent endeavors, such as the reissuance of Cuban Crocodile[CC] ball caps, which benefits the CC SSP, have enlivened the zoo's conservation spirit, even spurring some individuals to make unsolicited donations to the Chapter.

While not a unique concept [many, if not all, AAZK chapters support conservation efforts], nevertheless LZG AAZK appears to be, at this time, one focal point for conservation at the zoo. Though still on tenuous ground, LZG AAZK intends to strive to help to revitalize the Zoo's conservation commitment.

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The IUCN/SSC Tapir Specialist Group (TSG) Fundraising Committee and the TSG Conservation Fund (TSGCF)

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The IUCN/SSC Tapir Specialist Group (TSG) Action Planning Committee

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Citizen-based Sound Monitoring in the Indian River Lagoon - A Pilot Project

Almost all human beings are aware of the airborne sounds (or noise, depending on one's point of view) generated by human activities (motor vehicles, air craft, construction projects, factories of all kinds, fireworks displays, radios, televisions, musical concerts, etc, etc) and there are many laws and regulations from the federal down to the local that regulate sound levels for human safety and to maintain an enjoyable environment overall. However, relatively few humans are aware of the sounds in the ocean. Until the Industrial Revolution, sounds in the ocean were almost exclusively due to natural biological and physical factors such as animal sounds, rain, wind and waves, earthquakes, volcanic eruptions, underwater land slides, etc. Within the past century humans have rapidly exploited the oceans and have introduced a wide variety of pollutants (chemicals, trash, sound) into the ocean both knowingly and unknowingly. The 2003 Pew Oceans Commission report referred to sound pollution of the oceans as a 'non-traditional' source of pollution: non-traditional because anthropogenic sound in the water has not been widely recognized as a pollutant until recently.

The National Research Council of the United States National Academy of Sciences has produced three reports relating to marine mammals and noise. The 2003 report concludes that, among other things, "Sound in the ocean is generated by a broad range of sources, both natural and human (anthropogenic), for intentional use or as the unintended consequence of activity in the ocean."; that "There are very limited data to determine long-term trends in ocean noise levels." and that "There are very limited observations concerning the effects of ocean noise on marine mammals." The NRC research recommendations include "Monitor[ing] ocean noise in geographically diverse areas with emphasis on marine mammal habitats." and "Educate[ing] the public."

The Indian River Lagoon on the east central coast of Florida is extremely important habitat for the bottlenose dolphin (*Tursiops truncatus*) and the endangered Florida manatee (*Trichechus manatus latirostris*) as well as for the endangered green sea turtle (*Chelonia mydas*), the threatened loggerhead sea turtle (*Caretta caretta*) and a variety of marine fishes, birds and invertebrates. The primary objective this is to conduct a pilot project to establish a long-term, citizen-based program to document sounds, both anthropogenic and natural, that are integral to the habitat of the bottlenose dolphin in the Indian River Lagoon. This project will not only collect valuable scientific data but also will educate the public by involving them in the scientific process.

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Anne K. Taylor Fund, Community Based Conservation Project in the Masai Mara, Kenya

The Anne K. Taylor Fund (AKTF) works in the greater Masai Mara region to reduce the level of commercial bushmeat poaching within and around the Masai Mara Reserve. The Masai Mara forms the northern extension of the vast Serengeti – Mara ecosystem and is home to one of the last great wildlife migrations on earth and incredible biodiversity with over 95 species of mammals and 480 species of birds recorded in the area.

AKTF works directly with the local County Council rangers, Mara Conservancy, the Kenya Wildlife Service and surrounding communities on antipoaching patrols and de-snaring activities in the Masai Mara region. The program utilizes young Maasai men hired from the local communities to patrol the region with armed rangers in an effort to curb poaching activities, remove wire snares that are encountered and educate the children and adults in the communities about the importance of wildlife. AKTF also coordinates and funds wildlife rescues of animals injured by poaching activities and spends considerable resources assisting local schools in the region with infrastructure and educational supplies.

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Amara Conservation Ltd.

Amara Conservation's (Amara) mission is based on a two-pronged approach for conservation and species protection in East Africa. We provide support to prevent illegal taking and injury of animal species while at the same time educating local people about the importance of wildlife. Currently we are focusing on the Greater Tsavo National Park Ecosystem (GTE) in Kenya. This area contains the largest free roaming elephant populations in the world and is increasingly under heavy poaching pressure (scientific estimates are now at over ½ million animals of all species removed each year from the park ecosystem) by local people, the commercial bushmeat trade and ivory poachers from neighboring countries.

Amara believes environmental education is integral to helping communities develop ways to coexist with wildlife. To address this, a plan was developed for a mobile environmental film unit through discussions with the African Environmental Film Foundation (AEFF) and Kenya Wildlife Service. There is currently no environmental education in the Kenya Schools syllabus, so even the educated are uneducated on environmental issues. We have seen great results with our environmental education films and follow up community forums. Our goal is to run this mobile film unit all of this year and visit all the communities in the GTE at least two times with different films. In sixteen additional "hotspots" we will be holding additional community forums after the films. At the same time we will continue supporting anti-poaching work in the region to try to curb the unsustainable wildlife losses in the GTE.

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**Seattle Aquarium Citizen Science:
Inspiring Marine Conservation in our Local Students**

Program Description

Citizen Science is a volunteer-based program designed to collect long-term and scientifically significant data on nearshore habitat and wildlife of seven Seattle area marine reserves. Trained high school students from traditionally underserved populations will form the core of the work force.

Purpose of Citizen Science

- Engage students in "real world" science while sparking their wonder with the marine environment

- Inspire historically under-represented students to advance with inquiry-based science
- Support Washington State Essential Academic Learning Requirements
- Bridge the gap between the need for habitat protection and public involvement in wildlife management
- Create an ongoing monitoring system of recently established Seattle marine protected areas

Components of Citizen Science

- Teacher training and support in implementing Citizen Science into existing curricula
- 20 hours of classroom, inquiry-based instruction followed by testing on animal and plant identification by each of the five participating teachers
- One three-hour classroom-based methodology training session conducted by Aquarium staff at each of the five schools
- One three-hour, inquiry-based field training session conducted by Aquarium staff
- One four-hour field trip to conduct a beach characterization survey
- One four-hour field trip to conduct a biological survey of the beach

Methodology

The study will monitor changes in the ecological condition of Puget Sound rocky beaches using epifauna and macroflora as indicators of change. Intertidal assessment will include yearly:

- Habitat characterization:
 - Backshore elevation
 - Beach slope along a profile line from the backshore to -2.0' tide
 - Substrate composition within 10' wide sections along profile line
 - Habitat type – substrate + overlying vegetation – along profile line
 - Water temperature and salinity
 - Mean sea level
- Relative abundance transects:
 - 24 key species or groups of species monitored
 - criteria for selection include:
 - ease and accuracy of sampling
 - not buried so as to reduce impact on environment and volunteers
 - taxa selected to include all trophic levels within the local intertidal community
 - species are grouped if there is no significant ecological difference between them, e.g., barnacles and limpets
 - 50 meter transect line running parallel to the shore at the 0' tide (MLLW)
 - Ten randomly selected 0.25 m² quadrats (50cm x 50cm) sampled along transect
 - Mobile species (or groups) counted
 - Sessile species (or groups) documented with “percent cover”, e.g. barnacles, anemones and vegetation
 - One beach with extensive sandy sections will be sampled for clams in addition to the above – one cubic foot sample will be dug and all selected bivalves greater than ½” in size will be weighed, measured on beach and returned
- Biodiversity survey:
 - All species of epifauna and macroflora along the profile line will be counted for presence or absence
 - Birds and mammals observed on/near the beach will be documented

Quality Control

- All students must pass a competency test to assure knowledge of species identification and methodology skills
- Data entry/certification will occur at the Seattle Aquarium by the Conservation Coordinator
- Data analysis/management to be supervised by the Seattle Aquarium Curator of Animal Health/Research.
- Program development overseen by 19- member Steering Committee representing scientific and educational experts from the West Coast
- Scientific protocol vetted by a 14-person team of local marine scientists who also provide on-going scientific oversight
- Data and reports to be shared with students, scientists and planners to encourage inquiry-based learning and conservation planning

Educational Evaluation

- Pre and post assessments of students will be conducted by a professional field science evaluator
- Detailed reports with statistical analysis will be provided to Seattle Aquarium, program partners and all participating teachers

Partners

Seattle Aquarium Society
Discuren Foundation

City of Seattle
City of Burien
King County
Washington Dept. of Natural Resources
Univ. of Washington
Environmental Science Center
Highline School District
Seattle School District
WSU/Island County Beachwatchers
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**Columbus Zoo & Aquarium
Freshwater Mussel Conservation and Research Facility**

The threats to and decline of North America's native freshwater mussel fauna have been well documented. North America has the world's most diverse freshwater mussel fauna and are among the most rapidly declining animal groups on the continent. The Nature Conservancy recognizes 55% of North America's mussel species as extinct or imperiled compared to only 7% of the continent's mammal and bird species. The US Fish and Wildlife Service lists 61 endangered species.

The Columbus Zoo & Aquarium has built upon previous successful partnerships to create a new collaborative initiative to help conserve the imperiled native mussel fauna of Ohio and the Ohio River Basin. The partnership includes the zoo, the U.S. Fish & Wildlife Service, The Division of Wildlife – Ohio Department of Natural Resources, The Ohio State University, the Ohio River Valley Ecosystem Research Team, the Nature Conservancy – Ohio Chapter, the City of Columbus, Columbus Recreation & Parks Department, and the Mussel Mitigation Trust. This unique partnership through pooling of resources and expertise opened The Columbus Zoo & Aquarium Freshwater Mussel Conservation and Research Facility in October 2002.

The research objectives of the facility concentrate on understanding the basic biology of imperiled mussels with the ultimate goal of restoration or bolstering of existing mussel populations. This research includes host identifications, captive husbandry requirements, reproductive biology, and nutrition. For instance, the recent identification of the hosts for the federally endangered Clubshell could enable us to culture these mussels and return them to their historic range. Furthermore, holding facilities associated with this project can be used as temporary refugia for large numbers of mussels. This application may be important to mitigating unforeseen disasters.

The Columbus Zoo and Aquarium Freshwater Mussel Research Facility is one of only six in North America and the only such facility in the Midwest. It is the only facility associated with an educational resource such as the Zoo. Thus the value of the facility far exceeds its original purpose as a conservation facility – it also acts as a source of education and outreach concerning these imperiled animals.

The project currently employs Dr. Tom Watters, Curator of Mollusks at the OSU Museum of Biological Diversity, as the Director of Science for the facility for which he supervises all related science activities. The expertise of Dr. Watters, an internationally recognized malacologist, is critical to the facility's success and operations. Dr. Watters oversees and conducts the research at the Facility including specimen holding, quarantine, host identification, etc. He supervises all technicians and students that work at the facility, as well as guiding their research and helping to secure funding to support them. He interacts with other researchers who wish to utilize the Facility, ensuring that their research lies within the scope and purpose of the Facility's design and mission. Dr. Watters acts as a liaison with state and federal wildlife agencies, ensuring that the research at the Facility operates with their knowledge and approval. The Columbus Zoo & Aquarium Shores department maintains the facility and is responsible for animal husbandry and systems.

One of the goals of the Facility is to acquire brood stock of as many mussel and aquatic snail species as possible. These animals will provide material for numerous studies ranging from basic biology to host identification, propagation, and genetics. Acquisition of these stocks has been the primary activity of the Facility in 2003. Within the past year we have acquired and are successfully maintaining 24 mussel species and eight snail species comprising over 700 specimens. These specimens have already been used for genetic studies by visiting researchers. Native fish hosts have also been collected and stocked in the tank room. We have had successful mussel reproduction at the facility and have begun

harvesting conglutinates to be used in host identification experiments. This fall we will begin propagation of mussels for reintroduction into the Sandusky River through a recent grant from Ohio Division of Natural Areas and Preserves.

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**Biological Sample Testing and Health Assessment for the
African Forest Elephant (*Loxodonta cyclotis*)**

For over a century, the Wildlife Conservation Society (WCS) has been successfully conserving endangered species and their habitats, with expert field research and local partnerships resulting in the creation of over 120 million acres of reserves and sanctuaries across three continents in the last decade alone. In globally significant landscapes, WCS is conducting research on species travel patterns, promoting sustainable natural resource management, strengthening local institutions, and combating wildlife diseases and health problems that complicate conservation.

While African elephants (*Loxodonta africana*) have been researched for decades, only limited hematological assessments have been conducted on this species and no comprehensive information exists on disease exposure of African forest elephants (*Loxodonta cyclotis*), an elusive species dwelling in the forests of central Africa. The aim of this project is to support conservation management by providing baseline data on the health status of the African forest elephant in some of the most important priority landscapes: Lope National Park, Loango National Park and Langoue Bai in Ivindo National Park in Gabon, and Odzala National Park in Congo. Results will be made available to other scientists, elephant conservation NGO's, and government officials to help influence conservation practices and policies for forest elephants through out Central Africa.

For the past several years, WCS ecologists and field veterinarians have been working on a project entitled, *Forest Elephant Inventory and Monitoring in Support of Priority Conservation Landscape Management in Central Africa*. The team immobilized elephants in the national parks of Gabon and Congo for telemetry collaring and health assessment. Biological samples were opportunistically collected from each elephant collared. These samples comprise the most complete set of biological materials ever amassed for infectious disease and health testing of African Forest elephants. The next critical step of this project, laboratory analysis of these biological samples, will provide critically needed baseline health information on diseases to which forest elephants have been exposed to and those to which they have not been exposed.