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On January 25, Fundación Natura was named as Trustee, and since then has administered the grants program that comes from FIDECO (The Trust).

Fundación Natura's Board of Trustees is its highest authority. Presently, it's made up of 2 members of the Public Sector and 5 members of the Private sector. Panama's president designated Monsignor Lauriano Crestán Durán as his representative on the Board of Trustees. The Political Economics Ministry designated the General Director of the National Institute of Renewable Resources (INRENARE) as its representative. Also, we have the participation of the National Association for the Conservation of Nature, the Smithsonian, and the National Association of Reforesters of Panama.

The Board of Trustees nominates a technical committee which is made up of 25 professionals highly qualified in diverse academic disciplines. These professionals are volunteers that advise Fundación Natura in the selection of the best proposals for funding. The Board also nominates the executive director, who is responsible for administering the Foundation. Some of the principal programs are General Administration, Project Administration, Funds Management, Personnel and Board of Trustees Development, and Information, Publication, and Public Relations. Presently, the Foundation has a staff of 10 people.

The Trust was founded on January 25, 1995, with contribu-

tions from the government of the Republic of Panama in the amount of \$15 million, from USAID with \$8 million, and from The Nature Conservancy with \$2 million.

The goal of this Trust is to finance, in a permanent way, investments that support conservation of natural resources and that protect the overall environment with priority in the Canal watershed. Up to 50 % of these funds annually support management plans for the wooded areas under the protection of INRENARE. The other 50 % is destined to financially support ecological projects developed by non-governmental organizations (NGOs), community groups, and academic entities.

This Trust puts Panama in an enviable position among the Latin American countries regarding national mechanisms for the conservation of the environment. It's because of this that I wish to highlight in this presentation the fact that Panama has at its disposal this national ecological fund that can be directed toward conserving our ecology.

The components of this Trust are the government of the Republic of Panama, which is the founder of the Trust, who then named The Nature Conservancy as fiduciary, who in turn named Fundación Natura as trustee. Within the Trust, USAID of Panama is recognized for its special role as the main donor.

Regarding the organizational structure of the Trust, we have on the first level the donors. At the

fiduciary level is The Nature Conservancy. Fundación Natura administers the funds that come from the Trust, and the beneficiaries are INRENARE and other similar organizations. The donors annually review the guidelines under which the grant program must operate. The trustee is responsible for the administration of the Trust and, to this end, The Nature Conservancy named the investment firm G.P. Morgan of New York to administer the investments.

This trust has been working in a very satisfactory way and the funds are being reinvested in order to maintain their present value. Besides the administration of investments and the flow of financing for the projects, other functions of the trustee are to guide Fundación Natura about the methods and guidelines of the donors, and the organizational and operative conditions donors require to perform the works. The trustee also approves Fundación Natura's yearly plan of work, approves the decisions of the Board of Trustees about project financing, and informs the donors about the performance and impact of the grants program. It's also responsible for ensuring that the professional administrator makes reasonable and prudent investments, avoiding those that are highly speculative. Presently, 6.6 % of the funds in the Trust are invested in the Republic of Panama. The rest has been invested in the U.S. Market and also in other countries of the world.

Now let me talk a little about the principal achievements of the dif-

ferent programs we have carried out up to now. The first is the program of small grants. The total administered fund was \$316,000 that came from USAID and The Nature Conservancy. From those funds, \$210,000 was used to finance 33 small projects in the region of the Canal, and \$106,000 was used for a training program and institutional strengthening of the organizations in charge of the projects. Here are some of the theme areas we see that stand out: Ecological education received 38 % of the funds; conservation research received 17 %; and the installation of tree nurseries received 14.7 %. There were other diverse theme areas as well including agroforestry, conservation of soil, sustainable agriculture, and reforestation. With the training programs it was possible to train over 4,000 technicians and professionals coming from over 25 different NGOs, community organizations, universities, and governmental institutions. This program also trained Fundación Natura staff to identify projects and to channel and administer them.

In the theme area of ecological education, there was a total of 11 projects that accounted for 38 % of the total investment and that were performed by 7 NGOs. Direct education and awareness was accomplished through presentations, environmental courses, and educational brochures for more than 10 communities and 50 schools located in the area of the Canal.

Regarding FIDECO's grants fund, we have performed a total of 33 projects. Twenty-eight are still

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being executed and 5 have been finished. Besides this, we have 2 financing schemes: one with the Farming Development Bank for a forestry component in cattle farms in the hydrographic basin of the Canal; and one with INRENARE and the Biodarien Project.

At the national level, our projects are mainly in the Panama Canal watershed, but we also have projects in Chiriquí, Veraguas, Coclé and Darién. Projects have been financed and have been performed by 17 NGOs, 2 community groups, and 4 academic institutions. The main portion of the funds have been directed to agroforestry projects with a total of 3,523 direct beneficiaries.

I'll speak now specifically about the achievements we have had in each one of the program areas. In the reforestation area, 450 acres have been replanted with native species on buffer zones of the national parks: Portobelo, Campana, Soberanía, and Chagres. We have also reforested 125 acres with fruit and forestry species in Chiriquí and Coclé. Another achievement is the preparation of a reforestation project folder with the goal of protecting the Canal basin.

Regarding the agroforestry theme, we have a project that has studied 36 tree species in relation to germination, growth, feasibility, percentage of humidity, and effect of drought. That project is in process and studies many additional native species. Also, we built a specialized training center in agroforestry and silviculture management in the

Pintada de Coclé.

In the area of sustainable agriculture we have financed projects for the development, installation, and operation of 2 sustainable agriculture farms located in Cañaza de Veragua and Metetí de Darién—areas characterized by extreme poverty. These projects have had a positive multiplying effect since they have facilitated the establishment of 8 additional extension farms in Darién and 4 in Cañazas.

Concerning applied investigation for conservation purposes, we can mention the amphibian and reptile list of the Campana National Park that included the description of a new reptile species. There also is the study of the waters of the San Juan Díaz River in terms of its degree of contamination and the potential to decrease it; the development of scientific data about our avifauna with 39,449 records of species corresponding to 150 sites in Panama; and the installation of a sustainable energy production plant.

Regarding the management of uncultivated protected areas, a project was financed by the Smithsonian Tropical Research Institute for the remodeling of the Barro Colorado Island Visitors' Center and for the installation of the educational exhibit "El Bosque Habra," with which we hope to achieve an excellent impact in regards to ecological education. The School of Agricultural Engineers of Panama was contracted to prepare a map identifying critical areas in the Panama Canal watershed. The

priority will be to create new forestry areas in the Canal basin and prepare project profiles for the management of the uncultivated areas already protected and those proposed for protection.

As I mentioned earlier, the other beneficiary of the FIDECO grant program is INRENARE. We have had a positive impact through the conservation of 29 uncultivated and protected areas in the country. FIDECO's funds have been used for the protection, operation, maintenance and improvements through INRENARE. We have contributed to the improvement of INRENARE's administration through a refinancing of 5 national organizations and the Marenas Project.

Since its inception, Fundación Natura has distributed 4,449,153 investment dollars among 33 projects through NGOs and the National System of Protected Areas. As you can see in this graph, 52 % of the grants have gone to protected areas management, and 27 % have gone to agroforestry and reforestation projects. We can also mention that we have contributed to projects such as contamination, investigation, biodiversity, ecological education, and sustainable agriculture. This contribution toward the conservation of nature is very important if you keep in mind that we only began accepting proposals for financing in mid-1995.

Finally, let me speak about our strategic vision for the next 5 years. Just last year, in a strategic planning workshop, our Board of Trustees and executive personnel

defined our strategic vision for the next 5 years. Here are the main objectives that have been identified. First, we propose to optimize the grant program of FIDECO that we are presently managing. We want to assure Fundación Natura's strength and enhance institutional continuity by adding financing and the structuring of new programs. We want to contribute to the development of a new and ample base of cooperation with non-governmental and community agencies that may have affinity with our mission. And we want to develop leadership and catalyze the processes agreed upon by the NGOs to facilitate the formulation and implementation of a national ecological strategy.

Based on these objectives, our projections for the next 5 years include the strengthening of Fundación Natura's capabilities and the capabilities of other ecological organizations to coordinate, plan, finance, and carry out projects within FIDECO's grants programs. In addition to this, we will work to capture national and international financial resources to finance plans and programs to be developed by ecological organizations in other geographical and thematic areas that complement those of FIDECO.

Our Board of Directors recognizes that FIDECO's grants program is excellent, and it presently has a concentration in the Panama Canal watershed.

However, we realize the necessity for financing projects in other geographical and programmatic areas. Therefore, another objective is to serve as an intermedi-

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ary to capture additional financial resources to facilitate financing complementary areas. Also, we propose to streamline processes to give quick responses to our national ecological priorities, and to contribute to the institutional strengthening of the NGOs and community-based organizations so they may help implement sustainable development.

Since this symposium is about ecotourism, you may wonder why we don't have it programmed as a thematic area subject to receive financing. Well, I can tell you in advance that both the donors and the trustee are considering it as a new programmatic area to which we could offer financial support. This type of project will be supported when it is proven that it will benefit the communities adjacent to the uncultivated and protected areas and promote the ecological education and conservation of the ecosystem where the tourist activity will take place. Such projects would have the following characteristics: 1) they must be responsible and must have low impact for the environment; 2) they must educate the local communities and the ecotourists about the value of nature conservation; 3) they must provide sustainable benefits to the local communities; 4) they must promote natural resources conservation efforts at the local level; and 5) they must encourage the government to help with the protection of parks and to respect the local cultures.

Within this context, we foresee financing projects that would be carried out by NGOs, educational

entities, or community groups. The projects would be for training in ecological education, for the interpretation of national and cultural heritage, and for the practice and philosophy of ecotourism. They could also be for the financing of ecotourism plans in the uncultivated protected areas, studies of determination of load capacities in public use sites, inventories of tourist attractions, analysis of the correspondence of these activities in the protected areas, and the building of structures or facilities needed to develop ecotourism in protected areas. We trust that we will be involved in this important area in the very near future. Fundación Natura will recognize the ecological organizations and the community groups that currently have such programs available as soon as they have been formally approved, but we want to let you know in advance that this is being done.

With that I conclude my presentation about Fundación Natura and its strategic financing for the conservation of Panama's environment. I thank you very much for your attention and I wish you a very good day.

Oscar McKay is Executive Director of Fundación Natura. He has a B.S. degree in Forestry from Iowa State University, and has an MBA from the Central American Institute of Business Administration. He began working for Fundación Natura in 1997. Prior to that he worked in the private sector at the national and international levels, including President and General Manager of Moore Agrícola in Panama; Manager of International Marketing of the Machinery Division of the FMC Corporation of Arkansas and San José, Costa Rica; and General Manager of "Sarasqueta Y Compañía," a Melo Group Firm.



INRENARE's Vision, Mission on Ecotourism, and National Parks System

Dimas I. Arcia,

Assistant Director, National Institute of Renewable Resources (INRENARE)

Good afternoon. First, on behalf of the National Institute of Renewable Resources, INRENARE, we wish to thank you for the opportunity to present the vision, the opportunities, and the experiences we're involved with concerning conservation of the environment and natural resources. The topic that I will present at this symposium refers to the vision and mission of INRENARE concerning ecotourism and protected areas. It is with great satisfaction that I present this topic to you, because we have heard this morning about present opportunities that provide our country with options for investment.

In INRENARE's opinion, when talking about ecotourism in protected areas, we have to present the general framework of the institution and the guidelines provided by the national government concerning the preservation of the environment and natural resources. We have identified some general guidelines that I will comment on today.

The first guideline refers to reducing the deterioration of Panama's national heritage which is constantly being threatened.

The second is associated with the first, and refers to the tourism benefits being derived from wildlife viewing. It assures that this activity is sustainable, is a benefit, and will always be available. Likewise, we identify the need to review and adapt legislation concerning conservation of biodiversity and natural resources which will allow us to reach established objectives of modernized institutions, in this case INRENARE. Lastly, within the process of globalization and economic global marketing and investment, we define aspects that minimize the impact on the rural environment.

Within these general guidelines INRENARE has decided to work towards specific objectives. The first of these is the consolidation of protected areas, because this is considered the basis of the resources that define the country. Secondly, we want to define aspects of the natural resources that are outside the protected areas which offer opportunities for multiple use within local communities. In this sense we promote and advance a program to try and develop multiple uses of the forests in a sustainable fashion. The third guideline is to pro-

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mote reforestation. Agricultural activities in sensitive areas cannot be sustained and should be stopped and the land reforested. The fourth guideline is to promote ecotourism. Ecotourism is promoted in the protected areas and in the local communities so that benefits from nature and biodiversity within the local economic system accrue back to the community. Likewise, the management of watersheds provides support for national economic life within the context of systemic ecosystems. It is important to integrate local people, preservation of nature, and the surrounding communities to determine which activities can be supported within the watershed. Lastly, the institution of partnering is very important and must be strengthened relative to technical, political, and administrative issues.

We must provide the support necessary to achieve the vision that we have established. We would like to present this now from within the context of the country. What we're talking about really is from this very well-known map, already published, on the forest coverage in Panama and the satellite images from 1992. This map offers a look at the environmental issues of Panama, put in the simplest fashion. The presence of forests is a main indicator of the health of the country, as far as the function of natural resources is concerned. It is not the only indicator, but it is the most descriptive.

In this sense, we can say that forests are an important part of Panama's biodiversity. More than 30 % of the country is covered in

forests with the highest concentration on the Atlantic side. Forests are also concentrated in the western region of the country, but we can see several spots where there is obvious encroachment from agricultural activity. The Panamanian Academy is also in this region. We are faced with a country in which there are opportunities to manage the natural resources but also there are lands which somehow have to be reconverted in their use. In summary, the best use of more than 75 % of Panama's territory is to keep the lands in forests, due to soils and topography. Forests are a commodity because we would want to use them for ecotourism and as protected areas, not to be timbered. The Pacific slope is the one that shows mainly deforestation and degradation. Approximately 4.9 million acres have been degraded and should be reconverted to park or forest. According to official technical studies, 7,400 acres of these 4.9 million acres would be suitable for commercial reforestation for an international market.

The protected areas in Panama represent about 25 % of our total land mass. This is one of the greatest percentages of all the Central American countries, including Costa Rica. There are 48 protected areas that are managed in different ways. We have 2 border national parks and 5 coastal parks—all part of our national heritage.

I would now like to show what exists in each of these areas. In the case of National Park Darien, we have the diversity of endemic bird watching. The Darien is

accessible by plane, horseback, walking, or boat. The National Park Chagres, which is just a half hour away from the city of Panama, protects the main watershed that provides water to the Panama Canal. It also protects very important biological resources. The National Park Soberania is more than just a summer garden, which is how it has been known. Within this national park there are 54,000 acres of protected area in which there are historical, cultural, scientific, educational, and recreational values within 20 minutes of Panama City. In another sector we have the Ila de Nacimiento Park. It is located in one of the most interesting Provinces and one that has excellent potential for the development of tourism. These areas represent values that are protected, accessible, and constitute an opportunity for national ecotourism.

Concerning the marine coastal resources, we have the National Park Coiba, which is well known because it was used as a jail for many decades. The Coiba Park has a combination of resources, including the largest coastal reefs or submarine islands found in the Central American Pacific. It is a value that is worthwhile to promote. And the highlands of Chiriqui, the National Park Volcan Baru', offer the opportunity for people in a small country such as ours to be able to enjoy highland ecosystems. It has the climate, vegetation, and bird watching opportunities similar to many other countries that have highland altitudes. The Portobelo National Park was mentioned this morning. It was said to be on the

list of priority pilot projects being carried by the Panamanian Tourism Institute (IPAT). It definitely has numerous values based on historical and cultural aspects.

In summary, we are talking about a series of areas that have been identified for their attractions and their values and for the possibilities of carrying out tourist activities. There is a direction, a course of action, that we should take in order to promote the many outstanding natural areas of Panama to the world tourism community. All of us who are here can take advantage of it. But the system of protected areas, as a long-term vision, is not only related to the management of these areas. A new vision is necessary to consolidate and to create larger corridors for the preservation of biodiversity. It should encompass local points of view and opportunities for conserving social and cultural benefits as well.

We are working on biological corridors, the largest of which is the Biological Corridor of the Atlantic which is a Central American/Meso-America corridor from Mexico to Colombia. Panama is the country that has a natural corridor that is the most intact in all of Central America. This slide does not suggest that everything shown in green would be declared a protected area. The system of protected areas is in the darker green and the proposed management areas appear in the lighter color green. But what we are seeking is to establish this strip of protected areas as a means for conserving biodiversity. This does not mean that we are eliminating all

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activities; only those which would cause serious hazards to protecting fragile biological resources. It is a long-term process to reconvert activities that have slowly deteriorated the environment to ones that will allow the ecosystems to function naturally. We would allow mining programs, but with strict environmental regulation. This would also apply to new roads and highways that would impact the environment. But the Biological Corridor of the Atlantic is a very specific project. It has funds from the World Bank and it is governed by other coastal corridors. In the case of Chiriqui, it is an altitudinal corridor at sea level at the Gulf of Chiriqui to the Barú volcano offering the opportunity to experience many different ecological changes. The Biological Corridor offers the opportunity to provide the world and the American continent a protected biological corridor from north to south, and west to east through the Caribbean Sea.

As we have said, we are convinced that Panama offers many opportunities for ecotourism. Its natural resources, its people, its business capacity, its vision for development, and perhaps most importantly, its geographical location give it a privileged position. One does not only visit Panama, one comes here and passes through it. In terms of biological diversity, Panama is extraordinary. It is an exceptional attraction which makes it a biological bridge. The narrowest part of the American continent, a coastline of almost 22,000 miles on both sides, not only beaches but also mangroves, reefs, etc.

But in terms of ecotourism and protected areas it also has its hazards and its risks—the main one being deforestation. We are not talking about the protected areas, although even in protected areas there are places where it occurs. We have protected areas that have been controlled almost 100 %, and others that are less controlled and are subject to these threats or hazards. Another important point is pollution. As the country advances in urban development, opening roads, etc., the waters of the rivers and the lakes may become contaminated by ecotourism activity. These are things that have to be controlled. We have specific information that suggests that we have pollution because the volume of solid waste and garbage generated by the number of visitors is more than we can handle. It is a threat which needs to be addressed and taken care of.

The dynamics of investment is a subjective topic. This is a perception of ours, but we feel that we should present it. What does dynamism of investment mean? It means that we are interested in investing in ecotourism to meet the needs of the country. How many investors are there that are interested, that will come with investments and promises? It can become a risk, a threat. This investment does not necessarily mean we are prepared to accept them or to carry them out in a satisfactory manner. This type of investment is related to what we have called, in a subjective manner, an institutional delay to take care of this dynamism in investment. What we are talking about is that we should allow an

investment process that is consistent, coherent, and of course, dynamic that could be administered by the institutions themselves. We are talking about laws to promote adequate investment, to allow the application of rules and environmental standards subject to the expectations of sustainable management. In our opinion, these are elements that could interfere in any vision of ecotourism and management of protected areas. These risks could be overcome and could maximize opportunities. The most important is that we should have a border between ecotourism and the environment. We will continue to work with IPAT as a sister institution, very closely, in the master plans or policies as well as in the field of ecotourism development. We have bilateral agreements which create certain difficulties, but we are aware that any promotion of ecotourism should be based upon respect and conservation of the resource. This is an important point.

Certainly, it is a very clear objective. This objective has to be clear for those of us who are directing the government part of the sector, as well as for the investors. Tourist activity based on the ecology and the resource is true support, a promise of respect for the natural value or asset. This is what will guarantee the permanence of the activity, not capital or other resources. The raw material is the natural asset. Therefore, it is important when we talk about investment, that we invest to appreciate the resources instead of investing to diminish the resource. There must be a clear objective where truly the natural asset is the main

focus. This is associated with carrying capacity of the site; sustainability of the site in the long term. Additionally, investments and activities carried out should be harmonious with the natural environment. We are speaking of coastal protected areas, insular protected areas, protected areas in the highlands, and areas where there are indigenous peoples. For example, in Darien, we're not going to have investments contrasting with the type of construction or facilities that might exist in these areas or in the protected park. We think the protected area offers a high potential of resources for long-term sustainable ecotourism investment. Another special consideration that we should point out is the participation of local communities as actors, in our opinion. If the local communities living in the environment are invited to participate actively in the activity they will become the defenders of the environment.

To conclude, much of our presentation has been very general, but we would like to close with something much more specific concerning strategies for the protected areas and ecotourism in the Panama Canal basin. This metropolitan area at the present time has 7 protected areas officially declared. We have the national monument of Barro Colorado Island which is managed by the Smithsonian with a well-defined research objective. There are areas of National Park Chagres, National Park Portobelo, which are the green and purple that you see here. On the other side is National Park Campano. In our vision this is a

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subsystem of protected areas within the national system that is seen from 2 perspectives. Parks within the basin or watershed contribute to the protection of the water resources within the Canal watershed, but they also contain 50 % of the Panamanian population. The National Metropolitan Park is just 30 minutes away from the city of Panama. It offers a corridor which is very interesting and accessible, and from the perspective of internal tourism, very little would be needed to manage it in an important way.

Because it is associated with the Canal, this biological corridor offers an opportunity of great value. We see it as a subsystem that should be integrated in harmonious ways with other national objectives. We already have a legal frame work for the general plan for land use. We have a structure. What we are missing in this vision of development is protection of the country within a much broader context. Thank you very much.

Dimas Arcia is an Assistant Director of INRENARE. He is an engineer, and also has a master's degree in forest resource economics. Presently, he's a candidate to another master's degree in conservation of natural resources. He's also a University Professor in natural resources in San Miguelitos, the regional center, and professor in the Master of Environmental Sciences at the University of Panama. Engineer Arcia has also carried out several advisory services in international organizations, and has represented Panama in several organizations, including the United Nations for agriculture and food farming for the Central American Center, and the Commission of the United Nations for Sustainable Development.

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Harpy Eagle Project

Karla Aparicio,

Graduate Student, National University of Costa Rica

Good afternoon. Thank you for being here at this time. I am going to share with you part of my experience with the majestic harpy eagle. The harpy eagle is an impressive species which is the national symbol of Panama. It is an endangered species and is therefore protected by Panamanian law. Its range extends from southern Mexico to Argentina and southern Brazil. The females are large—almost one meter tall and can weigh 16.5 pounds. The males are smaller—less than one meter and can weigh 10 pounds. Because of its large size, our native Indians say the eagles can carry off their chickens and pigs and even their children. This is what they think, but of course this is not true.

The harpy eagle is a species where the young live with the parents for 2 years. Harpy eagles learn to hunt from their parents, and they eat whatever the parents bring them during this period. Their diet is mostly arboreal mammals like sloths and monkeys. This slide shows the remains of prey collected from beneath harpy eagle nests. These bones belong to sloths and monkeys and some smaller birds. We don't see any chickens or children.

The harpy eagle is a species that needs virgin lowland forests in order to survive. This species generally has to wait 3 years after fledging before it can breed. Of the 2 eggs usually laid, only one generally survives. Harpy eagles have a very slow reproductive rate and this is one reason they are endangered. They need a very moist or humid environment, and because of deforestation, the loss of habitat could also mean the loss of the harpy eagle.

At this time I would like to talk about the institutions that have been making an effort to try to prevent the extinction of the harpy eagle. In 1991 the Peregrine Fund, a nonprofit organization studying birds of prey in the United States, was interested in the preservation of the harpy eagle. It expressed its interest to the Panamanian government and the Panamanian government signed a cooperative agreement with the Peregrine Fund for protection of the harpy eagle.

Since the signing of the cooperative agreement, there has been a field program which began in the Province of Darien. After several years, other organizations have

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"I worked very closely with people from the local community and we could not have done this project without their cooperation."

joined this effort. Sony Corporation, together with the mayor's office in Panama, the Panama Audubon Society, and other non-governmental organizations (NGOs), formed a committee to manage the funds donated by Sony Corporation to work with the eagles that are in captivity in Summit Gardens. There is a large flight pen and observation towers that allow the biologist to observe the eagles. There also is an observation platform where visitors may observe the eagles. This project has an educational center which is an air conditioned facility with television screens and educational materials. This is the best way for the Panamanian people and visitors to see their national symbol. Since it is at Summit Gardens, it is accessible to anyone by bus or by car.

I now want to talk about the conservation program for the harpy eagle. It began in the province of Darien. The Darien National Park basically was the promoter of this action. This Park is 1.2 million acres in size. It is a beautiful landscape with an abundant canopy. In addition, its lowlands are basically covered by alluvial valleys of the rivers and are occupied by indigenous communities. Research near El Real in Darien led to the discovery of 3 nests of harpy eagles. We conducted an extensive plan on environmental education for the communities in that area. The results were that we captured 2 juveniles which were outfitted with radio transmitters. People from the local community helped. In this slide we see the location of the Canal watershed and the Chagres

National Park. A little below we can find the Soberania National Park. This is the famous Pipeline Road in Soberania National Park. In the 1970s, Dr. Engleman observed the species at this site. After that time, this species could no longer be observed in the area. Recently, because of efforts by the Peregrine Fund in the United States and the National Institute of Renewable Resources (INRENARE) in Panama, 2 young eagles bred in captivity in the Peregrine Fund's laboratories were brought here as a plan to re-introduce harpy eagles to Soberania National Park. The Chagres National Park is where I concentrated my efforts because this is where the eagles are that I found. Unfortunately, the field work in Darien had to be suspended because of the political situation in Darien. It just turned out that the nests were located in areas of conflict in Darien. Therefore, we have not been able to continue our work there. Fortunately, we have found new records of the harpy eagle in the Chagres National Park in the highlands.

As I mentioned before, the Chagres Park is important for the Canal watershed because it supplies water. In the higher land of the Chagres we have trees like this Ceiba that are more than 120 feet high. These huge trees are the trees needed by the harpy eagle for nesting. Trees must have a very strong trunk and branches to hold the nest which can measure almost 6 x 6 feet around. It is made of little branches, which is what we see here. Last year, I participated as an ornithologist in a project of the

Smithsonian and INRENARE which is a project for monitoring the watershed. This project allowed me to discover a female harpy eagle which was incubating an egg. In March, this young female harpy had already been hatched. Once we made the discovery of the nest, we called the Peregrine Fund and they sent expert climbers to help capture these animals. The climbers have had a lot of experience working in Venezuela and we did not have to wait a long time. Rafael Alvarez, who worked with the Peregrine Fund as an assistant in Venezuela, and I climbed the tree. In the nest we recorded all kinds of data. We also made observations while we were climbing up. The female was a little nervous, but we only watched her. Our mission was to capture one of the adults. Since the young was recently born the parents were close to the nest. We used this type of trap with this cord, and the trap was operated from below. You put a piece of bait here and hope the eagle will come to the bait. The trap is placed high in the tree near the nest and secured tightly with rope. If it is loose, these animals would simply remove the trap.

These are the radio transmitters that we place on the back of the eagle. They will carry these devices for about 5 years until the cloth harness that you see here eventually rots and falls off. The transmitters cost \$3,000 each. It sends a satellite signal once a month and if the satellites are well placed and if there is no cloudiness, we will receive the signal. This way we have the position of the animal at least

once a month. You can receive data like this for 5 years. Besides these transmitters, we put on metal leg bands. We write the name that this animal is going to have in the computer of NASA. The leg band is made extra wide so it will not bother the eagle when the talon grows a little bit. As I mentioned, after some 5 years the radio transmitter falls off, but the leg band stays forever with the animal. Here is a photo showing the male harpy when it went into the trap. This was in April. The adult that I had always seen attending the juvenile had been the female, but when we checked the trap to see who we caught, it was the male. After capture the eagle was lowered down very, very carefully. For safety we covered up his talons. He behaved beautifully and was quite gentle when handled. Here we are fitting him with the radio transmitter. After we finished the whole operation, we let him go and he took flight. He didn't go very far, and at first, just sat on one of the branches very close by. But things didn't end that day, because the juvenile still had to be fitted with a radio transmitter. After a month and a half, we came back to the area to put the radio transmitter on the juvenile. Then looking down he said, "Once again you're here. What a surprise!" Although these juveniles can jump and fight, they stayed in the nest when Rafael Alvarez climbed to the nest and brought the juvenile down. We took all the measurements that we needed. Again, for safety, we put bandages on the talons when we banded the young eagle. This animal weighed 7 pounds. Here you see him after we put on the

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radio transmitter. He also has his leg band on.

I worked very closely with people from the local community and we could not have done this project without their cooperation. I got them to participate in the work. As you can see right here, when we make this type of operation, we try to hire local people so the community takes ownership in the special thing they have. It takes great effort to keep alive one of these animals. We also had help from people such as the park rangers of INRENARE who always participate in eagle captures. We see here people from the Chagres National Park. After this capture one of the helpers made a video and I assume some of you may have already seen it. There was also an article in the Miami Herald concerning the harpy eagle.

Large species such as the harpy eagle are very important because they are indicators of a healthy ecosystem. We are safeguarding the habitat for these species but also for the many other species that live here as well. For example, many species of birds are abundant in this habitat, species we enjoy looking at because they are so pretty. And not just birds, but many groups of mammals as well. We have got to save the harpy eagle and its habitat. I have to thank you for your interest, and I thank the Audubon Society for supporting me in this field work that I have been doing in the National Park Chagres in cooperation with the INRENARE. I want to thank the Peregrine Fund for their assistance and guidance. I would also like to thank Sony

Corporation who made it possible for me to give you this talk today. Thank you very, very much. If you have any questions, I will be delighted to answer them.

Question:

What are all the things that are being done to save the harpy eagle in Panama?

Answer:

There are 3 that are occurring at the present time with the harpy eagle. One is the educational center that is being promoted by Sony and the mayor's office in Summit Park. The only thing we are going to do is transfer the harpy eagle pair that is now in the cage at the Summit. They are going to be transferred to a bigger cage. This project is oriented toward environmental education and for people to be able to know about the species and have a place to see this species. The re-introduction that is being done is in the Soberania National Park, where research has been going on for a couple of months. The Peregrine Fund has a breeding center in the United states that was able to obtain many eagle juveniles. They were able to mate eagles from the ones they have obtained from Panama and Ecuador, and were able to secure fertile eggs and hatch them. Now these young eagles are one year old. They were brought to Panama and kept in a cage. Then after a certain time, one of the juveniles is released to the wild and then after a couple of months they let the other one go. Hopefully in the future when the tours come to the resorts and to other ecotourism areas, they will

be able to see harpy eagles in the Soberania because they are part of the re-introduction effort. The third part is the field work I mentioned.

Question:

What is being done by the program to improve the factors which made the harpy eagle disappear? You said that in 1970 they disappeared. They had observed the eagle from the 1970s to the 1980s. What is going to insure that this re-introduction is going to be successful?

Answer:

Very good question. The experts from the Peregrine Fund do not yet know if this is going to be successful. This is a trial, a test, that is going to be carried out for the first time in Panama. I have worked with the harpy eagles in the wild and I hope that they are successful. We'll soon know the results.

Karla Aparicio is working on her master's degree in wildlife management at the National University of Costa Rica. She has a degree in biology from the University of Panama. She made the 2 most recent discoveries of harpy eagle nests in Panama. She has been the biologist coordinating the database of important areas for the birds of Panama, a program carried out by the Audubon Society of Panama. She also participated in the unique harpy eagle project under construction in Summit Park.



Panama's Vision for Future Conservation

Nicolas Ardito-Barletta,

General Administrator, Interoceanic Regional Authority (ARI)

Thank you very much for such a kind introduction. First of all, I want to congratulate you for this symposium, in which we are discussing the biodiversity of Panama and the Canal areas, where the Interoceanic Regional Authority (ARI) seeks to undertake sustainable tourism development. We have all been contributing and learning together, and it's important to listen to people who know more than we do concerning this matter so we avoid making mistakes as we look for sustainable uses for this national wealth.

In my presentation, I will supplement some of what has been said and focus on sustainable development of ecotourism projects and the use of Panama's rich biodiversity for scientific research. I would like to point out what many of you may already know: ARI's work is based on a regional plan that covers the entire Canal watershed. I will now say 2 or 3 things concerning this and general land use issues in the former Canal Zone, the area of ARI's immediate responsibility.

My remarks are based upon the knowledge and information that was gathered by the consulting

firm Mason & Associates in Washington, in coordination with Panamanian professionals. This information is available for Panamanians to make use of and serves as a guideline for the development of projects that are being carried out.

The regional plan covers the hydrographic basin of the Canal and seeks to incorporate urban, social, and regional development in the areas surrounding Panama City and Colon. These areas have a tremendous capacity for expansion and development of new economic activities. At the same time, ARI must protect the hydrographic basin of the Canal, an extensive area. This is essential for the operation of the Panama Canal and for the protection of the rich biodiversity surrounding it. In the plan's recommendations, ARI should maintain the wild areas and even expand them.

On the other hand, rural production areas, which are now limited, would be changed to just 89,000 acres—promoting the reduction of agricultural areas. ARI seeks to convert these areas to reforestation over the next 25 years. Most of these farms are private and

"Most of these farms are private and that is why we have to encourage the proprietors of these lands to participate. ARI must convince them that reforestation of these areas and agroforestry is more profitable than farming and cattle."

that is why we have to encourage the proprietors of these lands to participate. ARI must convince them that reforestation of these areas and agroforestry is more profitable than farming and cattle. We must also encourage them to take advantage of ecotourism opportunities and accommodate large economic development projects that generate exports and employment. Another important issue in the Canal area is that of contamination. ARI is currently negotiating with the United States to undertake a cleanup over the next few years.

This region bordering the Canal is the area of compatibility with the Panama Canal. This is an area ARI aims to use in a limited way, thus protecting the operation and future expansion of the Canal. Nothing will be done without consulting the Panama Canal Commission, as it is known today, or the "Panama Canal Authority," as it will be called after 1999. The general land use plan shows residential areas in green, to maintain the concept of a garden area, especially in existing urban areas on both sides of the Canal. With urban development, protecting parks and converting other areas to parks is very important. In preparing these plans, ARI used an integrated approach for the generation of exports and employment. The Canal areas link Panama to the world economy and can ben-

efit the international and national economy.

Although ARI is promoting several maritime, commercial, industrial, educational, and tourism activities in the Canal areas, today I will focus only on tourism. ARI aims to increase employment, grow the economy, improve social welfare, and create a link with the international community. Tourism presents many opportunities for the reverted areas. This morning, Dr. Hana Ayala spoke eloquently about how we can consolidate the concept of Panama to increase international tourism. ARI is aware of the importance of this and includes tourism in its development plans.

More than 250 cruise ships transit the Canal but do not stop in Panama because there are no appropriate facilities. The development of cruise ship ports in Amador and Cristobal would quickly mean that hundreds of thousands of visitors could disembark in Panama and find out what the country offers. The development of these ports is timely because the cruise industry is expanding in the Caribbean, seeking new sites and new activities for passengers. ARI has signed development contracts for a port and other projects in Amador in which companies will commit \$500 million during the next 5 years. Projects include a commercial center, golf course, tourist center,

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and ecological entertainment. These activities will attract not only cruise ships, but all types of tourism. Amador is set to become Panama's main tourism center.

ARI has made every effort to plan development in Amador well, to make it one of the most beautiful urban settings in Panama. ARI will insist on maintaining green areas and keeping the colonial-type architecture in the shopping center and hotels. A new road will link the golf course and cruise ship port in Amador to the city.

Some of the projects to be built in Amador include:

- 1) Hotel and commercial area by United Enterprises Trust Group.
- 2) Cruise ship port by Desarrollo Puerto Amador.
- 3) Golf course by Los Reyes.
- 4) Apartments, residences, and time-share units.

In the Atlantic sector, the former School of the Americas will be converted into a \$20 million, five-star hotel by Detur, a Spanish-Mexican group. New residential areas were created near this project by converting barracks into apartments for residents of Colon. ARI has several companies interested in developing hotels and time-share units at Kobbe, a beach area close to Panama City. This will be a \$20 to \$50 million investment.

In Gamboa, villas and a hotel will be created by Herman Bern, a major Panamanian real estate developer. The rivers near Gamboa will be maintained, allowing for more tourism, scientific, and educational projects in this area. This is the principal site

from which we hope to create many ecotourism opportunities.

The Panamanian railroad will be renovated by Kansas City Southern Railways for cargo and passenger purposes, making it a major transshipment point in Latin America. Panama will become one of the 15th largest transshipment centers in the world. The railroad will also transport passengers and tourists from one side of the country to the other.

ARI will work with the National Institute for Renewable Resources (INRENARE), the Smithsonian Tropical Research Institute, the Panamanian Tourism Institute, and other groups to develop ecotourism activities. Ecological training, small enterprises, environmental monitoring by INRENARE, and educational and research centers are all welcome possibilities. ARI will maintain control of load capacity to the area so that development will be sustainable.

Three projects have been approved at this time and we hope to have more. If they are as successful as we think they will be, then in a very selective manner, we will allow development of other activities along the railroad and on the lake. As you know, Pipeline Road, the Las Cruces Trail, and Plantation Road are all excellent areas for ecotourism.

The main idea for tourism development in the Canal areas is to utilize both the Caribbean and Pacific sectors. In Amador, on the Pacific, there are all the projects I mentioned earlier. In and around Colon, there's a golf course, Fort

Sherman, beautiful coastal areas, and more. Cruise lines could bring from 200,000 to 400,000 visitors each year, creating sustainability. The entire infrastructure and tourism businesses would allow us to attract another type of visitor—those who arrive by plane. Visitors could be trekking in the jungle in less than an hour's drive from their hotel. Panama offers the most modern amenities and the most primitive anywhere in the world. With this I conclude my presentation and will take any questions. Thank you very much.

Question:

In developing the railroad along the Canal, are you planning to clear new areas?

Answer:

No, the train will follow the route of the original railroad. Perhaps Kansas City Southern Railways will have to create a wider corridor for high-speed trains, but they plan to use the same route. At either end of the Canal, ARI has allowed them some larger areas to accommodate their trains, roads, and facilities.

Question:

I have a question concerning the islands near the former School of the Americas. Is it a possibility these are going to be incorporated into the recreational lake, or do you have other project plans?

Answer:

So far, we have no specific project for the use of these islands, but the idea is to maintain the environment and possibly allow cruise passengers to land in

Cristobal and take small boats to these islands. It's likely that cruise ship passengers will visit Gamboa, at the interior of the isthmus, and spend 2 or 3 hours at the hotel and then take the railroad back to their cruise ship. A variety of opportunities will be developed gradually.

Question:

What coordination and involvement has taken place between local entities? What is going to assure that your plans will be carried out?

Answer:

There has been a lot of coordination with regional plans. All state entities that have to do with it have participated, especially the Ministry of Housing. This has been a continuing consultation process. The general land use plan is a zoning strategy. The Minister of Housing by law has to make adequate zoning. It is very time consuming, but necessary to have a coordinated process among the different interests. Our mission is to incorporate all of this into the national development, and not to maintain another Canal Zone in the hands of the Panamanians.

Nicolas Ardito-Barletta is General Administrator of the Interoceanic Regional Authority (ARI). ARI is responsible for the properties Panama receives from the U.S. as military bases around the Panama Canal revert to Panamanian control. He has held some of Panama's most important government positions, including President in 1984-85 and Minister of Planning. He has also had an important role in international finance as the Vice-president of the World Bank for Latin America. Dr. Ardito-Barletta has a doctorate of economy from the University of Chicago and from Guadalajara University.