



Shorebirds in Panama-The Best Kept Secret of Birding in Central America

Dana Bradshaw,

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I would like to present to you some information on a research project I have been involved with here in Panama, and in doing so, hopefully bring to light an appreciation for some things that most Panamanians, and many conservationists, are relatively unfamiliar with, and that is shorebirds.

Shorebirds are a distinct and diverse group of birds that do not tend to captivate birdwatchers like forest dwelling birds, but nonetheless are starting to gain attention based on certain aspects of their ecology. Some are somewhat striking in appearance, from the elegant looking black-necked stilt to the boldly patterned ruddy turnstone.

However, the bulk of shorebird populations are comprised of relatively nondescript, small, brown and white birds that can often only be told apart by close comparison with neighboring birds.

The aspect of shorebirds' lives that makes them so interesting is the geography of their life cycle. The bulk of all shorebirds that exist in the Western Hemisphere spend their nesting season in the high Arctic of Canada. It is only the onset of the northern winter that drives them to the tropics, where some species winter as far

south as the tip of Argentina. Almost all of the species travel at least through Central America however, making this group of birds perhaps the best examples of true neotropical migrants. As their name dictates, shorebirds migrate south along both coasts, making use of several critical stops to rest and refuel along the way. As the coast of North America, then Central America, draws to a point, literally millions of birds come to occupy a relatively small land area that we now know is critical to the safe passage of these species. That area, of course, is the Isthmus of Panama.

During the 1980s, a group of biologists from the Canadian Wildlife Service conducted one of the grandest wildlife surveys ever conducted in the world. They surveyed the entire continental coasts of Central and South America for wintering shorebirds. It was this seminal work that first documented that Panama harbored a significant population of wintering shorebirds relative to the rest of the tropics. It was not until recently, however, that a dedicated interest was devoted to the role of Panama in the transit of these northern nesters to

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their southern wintering quarters. That interest came from the U.S. Department of Defense Legacy Resource Management Program. A project was funded to undertake a rapid ecological assessment of the lands associated with the Panama Canal prior to the transfer of these properties to Panama at the end of the millennium. Under this umbrella effort, a project was born to follow up on the earlier Canadian effort and to provide a more detailed perspective into the strategic role that Panama serves in the passage of shorebirds to their wintering quarters.

So, with support from the Smithsonian Tropical Research Institute, we at the Center for Conservation Biology, began a detailed look into the dynamics of shorebird passage through Panama. Specifically, we were interested in how many birds were coming through the Bay of Panama, what species of birds were involved, what was their timetable for movement, and what were they foraging on. These were some of the more important questions that we were hoping to address. Our study concentrated primarily on the Canal Zone and those Department of Defense properties that lie adjacent to it at the Pacific entrance of the Canal. From there we also incorporated the adjacent shoreline of the Pacific entrance to either side extending from a point some 50

miles east of Panama City to approximately 12 miles west of the city. This area was surveyed to offer a comparison with the Canal Zone properties.

The extensive shoreline segment was surveyed weekly by low level airplane flights. The flights were flown at an altitude of approximately 75 feet in an effort to flush the birds from the intertidal zone and enable an onboard observer to estimate bird diversity and numbers. This gave us a running index of what kind and how many birds were present each week and how they were distributed along the upper Bay of Panama. Within the uplands, we conducted transect and roadside surveys of all accessible grassland and marsh sites adjacent to, or within the Canal Zone, to monitor species numbers and timing of movement. Because of the diversity of shorebird species moving through, all open habitats have to be monitored to understand the resources that are important to these species in transit. Of the 34 species that we detected over the course of the project, only about 20 % depended solely on the intertidal zone for all their resources. Approximately 50 % of the species occupy adjacent wetland and grassland habitats, and the remaining 30 % are able to utilize both habitat types.

A final survey technique involved trapping and marking individual birds in a manner that allowed us

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to re-sight them later if they were still in the area. To accomplish this, we selected an area along the shoreline just east of Panama City that still supported a diversity of habitats. It was characterized by extensive intertidal mudflats, with adjacent wetlands and grasslands for roosting birds that would ultimately be forced inland at high tide. We deployed a small array of mist nets in the adjacent marsh, timed with a nocturnal high tide. As the birds were pushed off the intertidal zone by the rising tide, they would be captured as they flew to roost in the marsh. Our truck served as a mobile field station, allowing us to hold and process several hundred birds at a time. We removed birds from the net, stored them in portable holding bins, then collected data on plumage, sex, age, weight, etc. Finally, before release, we would mark them with a unique identifying color for that week.

Following a trapping night, we would return to the site during the day at least twice within the week to search for and count marked birds. This process would enable us to get some idea of how long flocks of birds were staying in the area, based on how long we could continue to locate marked birds from a previous time period. Unfortunately, our study site was succumbing to development pressures literally as we worked there.

The results of our project yielded some impressive information. Although our techniques were not conclusive, we could safely estimate that between 1 million and 2 million shorebirds pass

through the Upper Bay of Panama in fall migration. On a single aerial survey in mid-October, we counted over 370,000 birds along the 62-mile shoreline segment that rims the Upper Bay. Of equal importance is the fact that 80 % of these birds were recorded within the first 18 miles to the east of Panama City. Within the intertidal zone, we found that shorebird concentrations corresponded closely to the distribution of adjacent mangrove forests. This makes sense only when we realize that the extensive intertidal mudflats that harbor so many food resources for shorebirds are also closely associated with mangrove forests. Over 95 % of the total shorebirds observed during the project were associated with the extensive mudflats east of Panama City.

Unfortunately, along this shoreline there is very little open land adjacent to the Bay to serve as roost sites for the shorebirds during high tides. This is perhaps what made our primary study site so significant. It was the site of a former mangrove forest, that had been converted to open land and marshes before being slated for development. As a result, the site played host to tens of thousands of shorebirds each time a periodic series of extremely high tides pushed birds in to shore. We felt that the site was drawing birds from at least 12 miles away, so it provided us with an ideal opportunity to conduct roost counts of mixed shorebird flocks and to better estimate the ratios of different species in flocks of small shorebirds. It is also highlighted the importance of open land for

shorebirds, even if for just brief periods of time.

Upon investigating these roosting flocks of birds and in conjunction with our trapping studies, we were able to determine that approximately 80 % of the small shorebirds detected during our aerial surveys were western sandpipers. This species became our focal species due to its overwhelming abundance. From an early August population of nearly 40,000 individuals, their numbers continued to build through the fall to reach a peak of nearly 300,000 birds by late October. In addition, based on our research, it became clear that these birds were going through a full flight feather molt while in the Upper Bay. The energy resources necessary for this are staggering, considering the hundreds of thousands of birds that are present at the same time. This tells us that the Upper Bay is an incredibly important region for these species. They are depending on this area as a reliable stopover site to gain the essential nutrition and resources to enable them to go through this molt.

By the end of our study, we understood why the timing was so critical. By mid-October, peregrine falcons and merlins, 2 efficient avian predators, were appearing with regularity each day to hunt shorebirds. The resulting impact on the shorebirds was a dramatic loss in foraging opportunity, since so much time now had to be spent on vigilance and predator avoidance. The advantage clearly went to the birds who had completed their feather molt.

Our project perhaps generated as many questions as answers, but it certainly opened the door to a complex ecological system that can only be observed in a few places in the world. We know without a doubt that the Bay of Panama is of critical importance to migrating shorebirds. We suspect the region attracts and holds these birds because of the prey-rich mudflats that characterize the shoreline east of Panama City. We suspect the mangrove forests contribute to the development of these mudflats, or at least to the maintenance of the energy sources within them. And, as our primary study site is covered over by bulldozers in preparation for development, we know too that open lands serve a critical function in providing safe harbor to these birds during the highest tides.

Finally, it's amazing that all of these incredible numbers and species of birds, the teeming marshes, and the vital, prey-rich mudflats, all occur right in the shadow of the city. In half an hour you can be at a handful of sites where amazing numbers of shorebirds are concentrated in small areas, a sight that people almost nowhere else in the world can see. This is an extremely special thing, from a biological and ecological perspective. If nothing else, we would like to think that this can gain more attention in Panama where it may be critical to the survival of these species. Thank you.

Question:

The real estate value of that Costa del Este area is extremely high. What does that mean for

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protecting the site for shorebirds?

Answer:

The time may have passed to protect this site, but that should not preclude efforts to protect other sites. And I am not trying to target development as the opposition here, as much as trying to suggest that maybe there are other options that could offer the same economic benefit without sacrificing all the natural resources. The natural resources of a site need to be weighed in the early stages, whether at the community planning level or some higher level. The land as a base has multiple uses, and too many times we look beyond the types of uses that a land area can have and still bring in the same economic benefit. Perhaps ecotourism is an issue that needs to be considered as a viable alternative to development in some cases. Costa del Este would have been a great candidate for an international ecotourism site unlike any other.

Question:

There are no spaces left for birds, and not only in the coastal areas. Where I live right now, I have a group asking the construction companies for some green space. They didn't leave a single tree. I am attending the symposium seeking help and guidance on this problem. Now that we don't have any trees, all we do is see birds perched on trees at a distance.

Answer:

I can't offer a solution to this issue, but I will suggest what often has to happen to get

results. There has to be a strategy implemented that works at 2 levels at the same time. There first has to be a grass-roots response. There have to be enough people that sympathize with you and feel the same way about these issues. Then they can start spreading the word, getting together with people like Panama Audubon and other local groups. But at the same time, there have to be people like Jackie Howard, who can bring people together and make them aware of these issues at the highest levels of decision making. Once these 2 factors are in place, it makes it a lot easier for the 2 to meet in the middle. And then things can actually take place. Unfortunately, there is no single-stroke solution. That is why it has taken literally decades in the United States for us to get effective conservation measures in areas that are much simpler to deal with than what you have described. So don't think there is an overnight answer. But don't give up, either.

Dana Bradshaw is a biologist with the Center for Conservation Biology at the College of William and Mary in Virginia. For 9 years, he worked as an endangered species biologist with the State of Virginia. He is active in the Partners in Flight Migratory Bird Initiative in the southeastern United States. He is currently involved in research projects in the mid-Atlantic region of the U.S., geared primarily toward conservation of birds and bird habitats, particularly from a socio-economic perspective. Mr. Bradshaw was part of a team of scientists who just completed a study of shorebirds in the Bay of Panama, in coordination with the Smithsonian Tropical Research Institute.



Radar Ornithology Research, Migration, and Bird Watching

Sidney A. Gauthreaux, Jr. and Carolyn S. Belser,

Department of Biological Sciences, Clemson University

It's a real pleasure to be here. Yesterday, Dr. Rubinoff said that this initiative represented science, the people, and commerce all coming together. This morning, we would like to emphasize the science portion and how that feeds into the whole notion of ecotourism. We are going to emphasize radar ornithology and our studies of bird migration, but we are also going to emphasize a strong conservation message—by protecting habitat for your native species you are also protecting habitat used by migrant birds that pass through Panama. Because of the size and geographical orientation of Panama, the country functions as an important “bottleneck” or funnel for many species moving from North America through Central America to South America in fall and back in spring.

As you are probably aware, there are a number of birds that breed in North America, pass through Panama, and spend the non-breeding season in South America. For instance, let us consider the density of species per ecoregion in the wintering ranges of Neotropical migrant birds. The greatest number of species occurs from southern Mexico

through Panama. Eighty-one to 100 species of neotropical migrants winter in this region. In northern South America the number of wintering species drops to 41-60; still an impressive number of migrant species. This translates into tremendous numbers of birds that pass through the narrow country of Panama en route to wintering grounds in South America.

Some of the most spectacular migrations on the planet are the migrations of raptors, and Panama experiences some of the most spectacular raptor migrations in the world. Neal Griffin Smith of the Smithsonian Tropical Research Institute (STRI) has done some of the pioneering work on the migrations of broad-winged and Swainson's hawks through Panama. Here you see a photograph of a Swainson's hawk. The next slide shows the breeding areas in North America and the wintering grounds in South America. It's obvious that the birds have to come through Panama when they migrate. We know this for certain, because Swainson's hawks carrying satellite telemetry radio packs on their backs have been tracked from breeding to wintering areas. This

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slide shows actual positions of migrating Swainson's hawks tracked by satellite. In addition to Swainson's hawks, tremendous numbers of turkey vultures and broad-winged hawks also use this corridor. One can see clearly the importance of the narrow land bridge we call Panama to the migration corridor between North America and South America.

Raptors, when migrating, actually expend relatively little energy, their lift and climb in the atmosphere is accomplished by riding heated bubbles of air called thermals. When they reach high altitudes they leave the thermals and glide so that the combination of rising and gliding actually takes them over the countryside. Panama has tremendous thermal developments. As soon as the sun comes up and starts to heat the ground, thermals develop, and this is absolutely essential for raptor migration through the country. Our radar studies of bird migration at Howard Air Force Base, located just to the west of the Pacific Ocean entrance to the Panama Canal, began in October 1997. We would like to acknowledge the field assistance of Kent Livezy during our migration work in the fall of 1997. In our preliminary work we wanted to determine: (1) if we could see the hawks migrating with ground-based observations; and (2) if the hawk movements could be detected on airport and weather surveillance radars. Could we, in fact, use radar to monitor the hawk migration through Panama?

As you can see, we were successful at sampling hawk migra-

tion from the ground. We recorded 8.3 hawks per minute flying over on October 23, during 60 minutes of observation. On October 24, during 159 minutes of observation with very good weather for raptor movements (i.e., a long period of thermal development in the morning), we recorded up to 40.5 hawks per minute. On October 26, the rate was 7.7 hawks per minute during 269 minutes of observation. Overall, with relatively little ground-based observation, we were able to see 8,700 raptors in about 488 minutes of observation.

This slide shows the air traffic control radar at Howard Air Force Base. It is located on the south side of the base very near the coastline. This is the Panama Canal entrance and the range marks in this image are 2 nautical miles apart. Most of the data we gathered on hawk migration is actually within 6 nautical miles or roughly 12 kilometers of the radar site. So imagine looking out from here 1-3 range marks. Let's see what hawk migration looks like on the radar screen. This is just a single revolution of the radar antenna. There is a lot of ground clutter in the center of the display, but the dots that you see are echoes from birds. They are scattered about and show no evidence of movement. However, on images time-exposed for 15 antenna revolutions, the movements of raptors are fairly spectacular. The streaks here and here are flocks of migrating Swainson's hawks, broad-winged hawks, and turkey vultures. These images were acquired about 9 a.m. The movements typically

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continue until the cloud cover cuts off the thermal development in the late morning or early afternoon. Once this occurs, the raptors disappear from the radar and land before the rains begin. Here's another photograph. One can see spectacular streaks of raptors moving over Howard Air Force Base and then toward the northeast. Over the 3 days we made observations, this pattern seemed to be fairly typical. This is what the radar screen looks like when there are virtually no birds in the atmosphere. This image was taken late in the afternoon after hawk migration had ended and before the nighttime migratory movements of songbirds had begun. In mid-March we will monitor the spring movements of raptors going back to North America as they pass through Panama. Next fall, if all goes well, we will monitor hawk migration using mobile radar from the beginning of the fall migration to the end.

I have given you a thumbnail sketch of how incredible radar is as a tool for monitoring the migrations of raptors in the atmosphere. But there are other migrants that pass through Panama. Perhaps a little less spectacular, but nonetheless, important. For a specific example, let's look at the birds that breed in this black area, the eastern deciduous forest of the United States. The next slide shows the areas where those birds winter. Again, you can see that many of the species that breed in North America either winter in or pass through Panama. These are birds that we actually saw in the scattered

shrubs and trees on the beach south of Howard Air Force Base in good numbers—prothonotary warblers, bay-breasted warblers, and summer tanagers. These songbirds do not migrate during the daylight hours; they migrate under the cover of darkness.

Except for one very short scientific paper by a former graduate student of mine at Clemson University, nothing has ever been published on the nocturnal migration of birds in Panama. In the fall of 1997 we were able to evaluate radar systems in Panama to see if they could pick up the nighttime migration of these small songbirds. We made observations with binoculars of birds passing through a vertical light beam. Over 3 different nights, we saw about 40 birds per hour passing through the field of our binoculars. On the last night we had some rain moving in that affected observation. This slide shows the direction of movement of birds through the vertical light beam, and as you can see there are 2 components of the nighttime movements. One component is moving eastward, which is also taking the birds out over the Gulf of Panama. And then another component is taking the birds straight out into the Pacific. That actually makes sense if we look at the steering currents in the atmosphere—the wind currents that the birds use in aiding their flight.

At the same time we were recording the amount of bird migration passing through the vertical light beam, we also recorded the amount of migration displayed on weather and airport

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surveillance radar. This is the radar display on channel 25, the National Association for the Conservation of Nature (ANCON) weather surveillance radar. It's not a great picture, but it was taken from a T.V. screen in our hotel room. All the green you see here is not rain, it's echoes from migrating songbirds in the night sky. The picture would have been much better had I been at the Panama Canal Commission taking the photograph right from the radar screen. But it's still fairly spectacular. So it's possible for you at home to turn on your television and look at that radar, and when you see a nice green patch around the middle and its starry out at night, you know it's not rain--it's migrating birds.

This is the air traffic control radar again. Earlier I showed you the displays of hawk migration; now I'll show you what songbird migration looks like on that radar system. This is after sunset, before migration started. Within 20 minutes we can start to see echoes from birds flying into the radar beam and as the night progresses the pattern becomes even more spectacular as more and more birds fill the radar beam. Migrating songbirds are producing the fine echoes you see in the radar image. About an hour to an hour and a half after dark, peak numbers of birds are recorded on this air traffic control radar. How many birds are we talking about? The number of birds we saw flying through the vertical light beam gives some index of the quantity of migration overhead. But having worked with similar radars in the United States, I can tell you that based

on the density of echoes in the radar images, the migration traffic rate (MTR = the number of birds crossing over a line one mile long per hour) is approximately 15,000-20,000. This is the first time an MTR has been measured in Panama, and it's actually a fairly high number. This slide of the radar display will give a little bit of the geography. This is Howard Air Force Base and there's the location of the radar, right in the middle. You can see the entrance to the Panama Canal and Panama City. On this night, as residents of Panama City went to bed, thousands of colorful songbirds were flying overhead on their way from North America to wintering areas in South America. In the fall of 1997 we were here only 5 days, and we were interested in learning more about the entire seasonal pattern of nocturnal migration through Panama in the fall and in the spring. We were also hoping to see what some of the spectacular shorebird migrations that Dana Bradshaw showed you in the last presentation look like on radar.

I'd like to say something about winds. On the night of October 22, when we had birds migrating east, we had winds up at 5,000 feet moving from the northwest to the southeast. Birds flying in those winds would have had wind assistance flying over the Gulf of Panama, toward the Darien, and even into Colombia. We are finding that small songbirds readily use following winds to fly over large bodies of water to reach their migratory goals. In addition to the obvious biological importance of our radar work,

it is also very important with respect to aviation safety. As you develop ecotourism and get more tourists into the country, it is likely that air traffic will increase. This will cause more worries about potential bird/aircraft collisions. Our work, which is funded by the Department of Defense Legacy Resource Management Program and by Partners In Flight, has a dual function. One is to gather more information about migration patterns of birds through countries like Panama, and the other is to develop techniques that will help prevent bird/aircraft collisions. In Panama, where tremendously dense bird migrations occur, the issue of bird/aircraft collisions should be of particular concern.

So, remember migration when you promote ecotourism. It is an important bird watching resource in Panama. Ecotourists from North America and elsewhere are interested not only in seeing your native species, but many are very interested in seeing North American migrants wintering in or passing through Panama. You have areas and habitats that concentrate migratory birds during migration, and these areas should be preserved and protected so that future generations of Panamanians and ecotourists can enjoy spectacular migration displays of raptors, songbirds, and shorebirds during spring and fall, in addition to an extremely diverse native fauna. Thank you.

Sidney A. Gauthreaux, Jr. is a professor of biological sciences at Clemson University in South Carolina. His research interest within the last decade has focused on the use of radar to study bird movements in the atmosphere with particular emphasis on migration across the Gulf of Mexico and much of the Eastern United States in the spring and fall. Carroll G. Belser is a research associate in the Department of Biological Sciences at Clemson University. She has worked in the area of radar ornithology for 8 years.

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Important Bird Areas Program for the America's Birds, Birders, and Birdwatching.

Jane Lyons,

Head, Americas Division, Birdlife International

Thank you very much to everyone who organized this extremely important and very interesting event. Birdlife International is an international non-governmental organization (NGO) working for the conservation of birds. It was founded in England in 1922 as the International Council for Bird Conservation, and the name was changed to Birdlife International 4 years ago. Its goals are to prevent the extinction of bird species, to reduce the number of endangered species worldwide, to maintain and increase the conservation status of wild birds, and to conserve important biodiversity sites and habitats.

Birdlife International is a federation of NGOs and representatives in 80 countries around the world. It is represented in Panama by the Panama Audubon Society. Birdlife has its headquarters in Cambridge England, and has regional programs in 6 regions of the world. Aside from its global program, it has offices in Indonesia, Belgium, the Netherlands, Jordan, and Ecuador. The region of the Americas includes North America, Central America, the Caribbean, and South America. The countries of this region share an enormous wealth

of birds. In many cases, they share the same species, and in some cases they share the same individual birds.

Birdlife has a very strong scientific base and we have published numerous books, including the *Red Book of Threatened Birds of the Americas* and *Birds to Watch 2*. This is a map which shows the analysis of globally threatened bird species. You can see in this slide the importance of North, South, and Central America to globally threatened birds. In Central America there are 78 species of globally threatened birds--more than in Europe and Russia. Within the Americas region, 9 % of the threatened birds are in Central America. You can see that Panama has a very high density of globally threatened bird species. In 1996, we published the book *Key Areas for Threatened Birds in the Neotropics*. It includes a listing of some 600 sites in the Neotropics, from Mexico to Argentina, which are the most important sites for globally threatened birds. This list includes 5 species of globally threatened birds found in Panama, and 11 places in Panama considered to be critical for the survival of these 5 species.

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We have a program called the Important Bird Areas program, or IBAs, for conserving the specific sites that are most important worldwide for birds. The criteria used to identify these sites are the following: Sites that are internationally important for globally threatened species, for restricted-range or endemic species, for biome-restricted assemblages, and for congregatory species. These are based on standardized, internationally-agreed criteria, so that IBAs in Bolivia or Panama or Mexico have the same biological value as IBAs in Australia or Zimbabwe or the United States or any other country. All IBAs have similar biological value. Begun in 1985, this program has been underway in Europe, the Middle East, several countries of Asia, 10 countries in Africa, and 15 countries in America, including Panama. The work at the IBAs includes the documentation of the species and the sites, the maintenance of the database, the analysis of these data to address the most significant problems, and site-based conservation actions.

The program may include scientific research to discover information that is lacking concerning some of the species. The program attracts the attention of ornithologists and other scientists, and at the same time it attracts the attention of teachers and provides opportunities to students. Identifying and docu-

menting the sites is a key element, but conservation action is the ultimate goal. Conservation action often includes ecotourism, or specifically, birding tourism.

As we have seen yesterday and today, the ecotourism sector is growing. For example, according to the Los Angeles Times newspaper, 20 % of the people of the United States are birdwatchers, and they spend billions of dollars per year on their bird and wildlife watching hobby. Birdwatchers, or birders as they're now called, want to see the rare and endemic species of birds, and we know they will travel great distances to see these birds. On one weekend in England this last year, some 3,500 individual birders went to see one bird—a single gyrfalcon on a single weekend. I think Wilberto Martinez used the term “maniac.” But there are many people in many countries who will travel extensively to see the world's most interesting species of birds. According to the University of Georgia, birding has increased 155 % in the last 10 years in the United States. This is something that Dick Payne mentioned this morning. In 1996, 2.3 million people in the United States traveled in order to go birdwatching. This provides an incredible economic opportunity for those interested in conserving birds and their habitats.

One private ecolodge in the Pantanal of Brazil in 1996 had

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2,218 visitors, and each one of those visitors spent \$225 per day to stay there. So that one small lodge earned over \$500,000 in one year, from a little over 2,000 birders. In Rutland, England, over 13,000 people came to celebrate a 3-day bird festival in 1997 and raised over \$90,000 net for an IBA project in Ecuador. It is clear that birds serve as a great economic attraction and that birding tourism is a growing sub-sector of the ecotourism industry. Birders are willing to pay to travel just to see birds. They don't hunt them, bother them, or want to take them home, they just want to see them.

Birdlife's IBA program helps to conserve those sites most important for the world's endemic, threatened, biome-restricted, and congregatory species of birds, and identifies ways to promote bird watching as one mechanism for funding the program. Several years ago, Birdlife International purchased an island in the Seychelles specifically to save one species of bird that was found there. Today, the income from birders visiting that island pays 100 % of the costs associated with the project, while also protecting the species of concern. The IBA program also helps with gathering data and monitoring sites, which is a critically important part of the program. As we have learned from the bald eagle, peregrine falcon, Swainson's hawk, and many other species, birds can serve as valuable indicators of the health of ecosystems. Thus, often by monitoring the populations of species of birds, we can detect changes in the ecosystem, changes which

are most likely also affecting other species of animals and plants. Birders often help to conduct monitoring programs often as volunteers.

In fact, birding itself must be monitored to ensure that there is no adverse impact on the species. As we know, certain species are highly sensitive and simply cannot tolerate much human intrusion. In ecotourism terms, we certainly do not want to kill the goose that lays the golden eggs. The IBA program also provides opportunities for NGOs and government agencies to work together for the benefit of conservation. It especially provides governments the opportunity to fulfill their responsibilities and obligations under international conventions. I am happy to say that the Panama Audubon Society, our Birdlife Partner here in Panama, has secured the official approval of the Panamanian Government for the IBA program here, and I think that was no small achievement, so congratulations to Panama Audubon. Osvaldo Jordan will talk much more about the Panama IBA program later this afternoon.

The IBA program also gives the business community and the private sector specific opportunities to put into practice their corporate green policies and to help conserve the country's national natural heritage. It also provides incentives for local people to work together for nature conservation, since by conserving their natural areas they will be able to attract the birders of the world, if they want to. The countries that conserve the world's endemic

and rare birds will gain the world's admiration and applause. For example, this is the last surviving species of macaw in the wild, and with this bird goes the image of Brazil. Does Brazil want to be known as the country that saved this beautiful bird, or the country that allowed this species to go extinct? In fact, Brazil is working very hard to try to save this species from extinction.

As you've heard numerous times, Panama serves as a bridge and a crossroads for birds and biodiversity. Panama has 11 species of birds that are found nowhere else in the world. Panama has the infrastructure and the ability to serve as a model and leader for ecotourism and especially for birding tourism. I'm extremely encouraged by the remarks of Dr. Rubinoff, Dr Ayala, and Dr. Rodriquez concerning the various groups that are working hard to protect the biodiversity and specifically the avifauna of Panama. We look forward to assisting in those efforts as much as we can in the future. Thank you very much.

Jane A. Lyons is Head of the Americas Division of Birdlife International, based in Quito, Ecuador. She is responsible for coordinating and facilitating the work of the Birdlife Americas Partnership in 17 countries of the Americas. Prior to working for Birdlife, Jane was Director of Natural Resources Programs for the U.S. Peace Corps in Uruguay and Argentina, was the National Audubon Society's Regional Representative for Texas and Latin America, and served as Manager and Wildlife Coordinator at the Natural Science Center/Austin Nature Center in Austin, Texas. She holds a Ph.D. from the University of Texas at Austin in Biogeography, with minors in Zoology and Public Affairs and a specialization in bird conservation in Latin America. She was a founder of the Texas Partners in Flight program, Chair of the Golden-cheeked Warbler Recovery Team, and a founding member of the Balcones Canyonlands Habitat Conservation Plan Committee for the conservation of the golden-cheeked warbler, black-capped vireo, and various other endangered species.

"Panama has the infrastructure and the ability to serve as a model and leader for ecotourism and especially for birding tourism."



Luncheon Presentation: Conserving Nature with Foundation Support

Juan Marco Alvarez,
Executive Director, SalvaNATURA

Thank you very much to the Legacy Program for inviting me to share the experiences of SalvaNATURA, one of the leading conservation and environmental non-governmental organizations (NGOs) in El Salvador. The original title of my presentation was "Support of a Foundation Toward the Conservation of the Environment," but I have decided to focus it more on fund-raising strategies and innovative ways of generating income, and basically to share our experiences with you. I feel truly honored to be representing El Salvador at this Panamanian conference.

As an NGO we are relatively young. We began our activities in 1990. Our initial projects were financed by the United States Agency for International Development (USAID), specifically to conduct studies of the Salvadorean environment. For instance, a policy inventory for natural resources gave us seed money and the necessary office equipment to be able to get some more funds and initiate formal operations. However, we had a clear focus on protected area management, particularly in the country's most endangered natural area. I am talking about the

National Park El Imposible, which is approximately 12,000 acres in size. Don't ask me why it's called "The Impossible." All I know is we are making it possible. No, actually, it gets its name from a rugged mountain pass. It is the largest natural area left in El Salvador and has the highest level of biodiversity.

El Salvador has only 2 % of its territory covered by natural vegetation, and El Imposible is the most important portion of our national heritage. We began operations with the support of this seed capital, as well as the gathering of funds from the private sector to purchase land and to consolidate the core zone of the park. We also gave equipment and training to the then 14 government-paid park rangers. Most importantly, we signed a contract with the National Parks Service to jointly manage the area. In El Salvador, the institutions that manage the parks are so weak in regards to an adequate budget and qualified personnel, that they have no other option than to delegate the management to environmental NGOs. That being the case, since 1991 we have been practically managing the park ourselves. The State

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just supervises our work. In reality, we have a lot of autonomy regarding what we do in the park, but then again, we have proven ourselves by our action-oriented work and tangible conservation results.

We also began obtaining local funds by developing a membership, though I will give further details on that later. After 4 years of struggling with local membership funds, along comes the Panamerican Development Foundation (PADF) with a project to strengthen environmental NGOs. We also received a grant from a local endowment known as the Initiative of the Americas Fund, created by the U.S.. So we obtained significant outside resources, but only after 1994. This means that during our initial 4 years, we survived and did our work through local fund-raising efforts, mainly from membership dues. In those critical years we had our first contacts with international NGOs, particularly with The Nature Conservancy, World Wildlife Fund, and the Rainforest Alliance.

When you visualize the management of an NGO like ourselves, you must visualize fund-raising through 4 main strategies or sources. Strategy number one is the collection of funds through various events such as concerts, bingos, or even in-kind contributions that you can sell for cash.

These are unrestricted funds, that is, the cash may not be tied to a specific project or investment. Those funds really pay for a significant percentage of the operational costs of any organization.

The second fund-raising strategy is membership development. It is ideal to have 50 % of the NGO's operational costs covered by membership dues, but then again, this depends on how strong your other strategies are. In the case of SalvaNATURA, the membership covers 1/3 of its overhead costs, which is great.

Obtaining restricted funds for specific projects is the third strategy or source. The funds are invested according to the approved budget, but they also strengthen the organization through project overhead. In other words, you assign a percentage to the overall project's budget to cover indirect costs. A good overhead allows any organization to adequately manage the project but does not represent an administrative burden.

Lastly, and definitely the most important strategy in fund-raising, is to develop an endowment or trust fund, because it gives long-term financial stability to an NGO.

The ability to efficiently manage these 4 sources of income is the key to the success of any NGO.

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"The important point here is 'profitability.' These events are done with volunteers. You have to minimize costs and guarantee income that will more than compensate for effort; otherwise it's not worth it."

In the case of source number one, we have a Mega Bingo where we annually join forces with a Rotary Club. We ally with these service clubs because, through their members, they can support a lot of our activities. This bingo generated \$12,000; 50 % went to each organization. By the way, this is net profit. Please don't laugh at this next example, which is an event called "First Environmental Tequilá Party." This doesn't mean that the participants will get drunk. The first "Tequilá Party" was held in a Mexican restaurant that just opened in San Salvador. A margarita and a tequila were given for free, as well as hors d'oeuvres, to each person who purchased the entrance fee of 150 colones or \$17. A slide show presentation of our work enhanced the evening and a raffle contributed to the event's success. We raised \$3,000 at this event. Let me make something clear. The important point here is "profitability." These events are done with volunteers. You have to minimize costs and guarantee income that will more than compensate for effort; otherwise it's not worth it.

Another example worth mentioning is the collection of unrestricted funds collected through royalties. We get 5 % from the sale of 3 HILASAL brand towels, because we designed them. I have a sample here. These are sold throughout Central America, but not here in Panama. We have been receiving around \$500 per month. Something is something, right? Particularly when the fund-raising is effortless. On the other hand, sales of promotional mate-

rials such as calendars and T-shirts is an interesting source of income, but requires serious supervision and follow-up. We must place these in stores since we don't have our own shop. You need volunteers for this. We can't do it with our own paid staff.

This coming example is something unique in El Salvador. We still haven't received any funds yet, because the credit card is new, but imagine, 1.5 % of the purchases made with this VISA credit card goes to SalvaNATURA. This alliance with the credit card company began in September of last year. Affinity cards are used a lot in the United States. I think the national Association for the Conservation of Nature (ANCON) has one of these here in Panama.

You can also form a cooperative venture with a multi-national company, as in this case with Gillette of El Salvador. Five percent of the sales of all Gillette products for men in 1996 were given to SalvaNATURA. In 1996 we collected more than \$11,500 for our El Imposible efforts, thanks to the marketing and promotion that Gillette made with these products. These are examples of diverse mechanisms for successful fund-raising and must be taken into account when considering corporate donors.

Many people may question the strategy of receiving funds from the private sector because it is considered polluted money. There are NGOs that think that way, but we certainly don't. We have the philosophy that those who pollute must pay, clean, and

compensate in proportion to the environmental damage they have caused. We give presentations of our funding needs and projects to corporations and ask them for specific amounts. That is exactly what differentiates us from other NGOs. We are not lending ourselves to greenwashers, though some might believe that. What we have received as contributions from the private sector is really nothing in comparison to their obligation of cleaning up their business-as-usual practices. Obviously, they must invest in their own manufacturing processes to reduce emissions and other contaminants if they really want to have green credentials. And in the case of Gillette, yes, they are investing in pollution prevention and control in their plants in the United States.

Our example of strategy number 2 is membership dues as a source of unrestricted cash. SalvaNATURA has 500 members. Seventy-five percent are individuals and 25 % are corporate donors. We have a goal of 650 members for 1998. You will see how our membership has grown. And though it looks like very few members, the truth is that membership is an unlimited source of funding for any organization and it has certainly helped us.

These are the results of what we have raised as unrestricted funds since 1990. Unrestricted money is not tied to a specific project. One third of it covers operational costs. The rest goes to park rangers, environmental education projects, etc. But this transparency shows yearly results and our projected budget for 1998. Look

at the growth in unrestricted cash! It's interesting how it went up from 1995 to 1996. What happened here? We conducted a very aggressive direct mail campaign.

How did we achieve this annual growth, really? Through personal visits, of course, to selected companies, more than anything else. Direct mail, influence from Board members, and an adequate follow-up with the donors--not only with personal visits, as is the case with the corporate donors--but also with correspondence reminding them of their annual dues. "Please give us your donation because it's necessary to do this and that," for example. We also give them an informative quarterly newsletter because it keeps them informed of what we are doing with their money and it serves as a motivator to renew the membership dues. And we seek high visibility through the media, such as press conferences about the work being developed, articles in newspapers, etc. For example, I write in the editorial section of an important newspaper about SalvaNATURA's work and other environmental issues. It is critical to keep the general public informed, not only the membership. One never knows how a potential bilateral donor, with offices in the country, might react to the work being done.

I'd like to talk for a minute about our experience with direct mail. We sent a package to 45,000 homes in the greater San Salvador area. This is the envelope with the free decal ad written on the outside, this is the

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decal, and this is the coupon. This package and the campaign was designed professionally, following the experiences of direct mailings in other countries, especially in the United States.

Though the final results were not bad at all, actually, we had hoped to achieve even greater results. To send a letter with a free decal to 45,000 homes is a big investment, especially when you have also invested in back-end premiums like T-shirts. We sent a similar letter to companies, but without a decal and with a different coupon because the companies' categories are higher than individual donors. We sent the letter to 10,000 companies. Incredibly, the companies responded more than the individuals. This campaign was profitable.

In both cases we had a 0.3 % response. In the case of the 45,000 letters sent to households, the campaign did not succeed because of the high investment in decals and T-shirts. We did not get a complete return on the investment. We are talking about 45,000 decals that we were giving away, but we also failed to follow up with these 45,000 households. We wanted to send a second letter, but we didn't have any more money to do it. We did do some follow up with the companies, because you can call the companies on the phone and talk with the managers or the CEO. But we did not follow up with the individuals. I guarantee you that a second or third letter, or even a fourth letter, as many NGOs do in the United States, would have made the campaign more successful. Or, if we wouldn't have

given the decal for free, which in English is called a "front-end premium," the campaign would have been profitable indeed.

Something else that made the campaign expensive was our "back-end premiums." That is, we had 1,000 T-shirts made because we gave a T-shirt to any person who would give 500 Colones or \$57. This is very expensive, and was too aggressive for a country not used to direct mailing such as El Salvador. Our conclusion is that we should have done more follow-up and not given away decals. Free decals (or any front-end premium) are supposed to stimulate the individual to give at least the minimum contribution in the coupon.

This is an example of a letter that we sent to our members last Christmas. That is, the member not only gives a yearly contribution, he can give a second contribution at Christmas. So, at Christmas we sent a letter to all the members with a front-end premium—we gave away 2 post-cards. Obviously that has a cost, but this cost is more than paid back with the Christmas donations. So, we get more money from some of the members. Obviously, just a minority of the membership gives the Christmas contribution, but it's highly profitable. At least it works with our members. And an NGO with a membership must experiment continuously. Remember that in Latin America, an NGO needs matching funds to be able to negotiate with the donors, specifically with U.S. donors like USAID. We get matching funds from our membership.

The third fund-raising mechanism that I mentioned before is the collection of funds through specific projects that will leave an attractive overhead. That is, the project must be profitable for the NGO. One example is the funds collected from Phillip Morris in the United States, specifically for the purchase of land in the El Imposible National Park. Phillip Morris gives us \$50,000 per year that comes through The Nature Conservancy for tax purposes, and we receive the money in its entirety to buy land. Another example, Coastal Technology Salvador, a local utilities company, gave us \$15,000 last year for a project related to the development of grassroots nurseries in the communities bordering the park.

Industrias Cristal, also a Salvadorean company, bottles drinking water and sells it throughout the entire country. It has paid for a research project that we proposed to them related with waste management in the San Salvador metro area. Worth mentioning here is that through that research, we are evaluating and improving the mayor's proposed solution to the urban waste dilemma in the city. Actually, we are going to improve the proposal with Swedish technology because the student studies at a Swedish university. So, we obtained local sponsorship specifically for that project. Research in waste management is a secondary activity to SalvaNATURA, and it is really a small project in comparison to what we have invested in the management and conservation of El Imposible.

Bilateral cooperation. We have accessed funds directly from USAID and the Spanish Agency for International Cooperation (AECI) which is very active in our country. Here the NGOs must have a little vision and analytical capacity. For instance, Spain is showing strong feelings of remorse because of its "conquest" of Latin America. Spain wants to compensate this by contributing economically to social and environmental projects, mainly to Central America. Those are things that must be analyzed from an NGO's point of view and should be taken advantage of. The Spanish Agency is a great, new source for us and we are going to continue working with them.

Technical bilateral assistance, in this case a USAID-financed consortium of U.S. NGOs, developed an environmental restoration project known as "Promesa" (Promise) in El Salvador. In our case, they partially financed the management plan for El Imposible. It's the only management plan that a national park has in El Salvador at this time. They also helped with activities related to technical assistance concerning sustainable agricultural and soil conservation, extension, training, etc.

El Salvador has 2 endowment funds where money for projects can be accessed by NGOs. The Canadian fund, known as FON-AES and the U.S. fund known as FIAES. SalvaNATURA has projects with both.

"SalvaNATURA has initiated a literacy program with the communities inside the park's buffer zone. Last year we taught 800 adults how to read and write. As most conservation and environmental NGOs end up doing, we have had to become involved with social projects in the buffer zone in order to alleviate pressure from the surrounding communities."