



ANIMAL PROGRAMS

HUMAN POPULATION IMPACTS

To Rear or Not To Rear

Kurt Hundgen, Director of Animal Collections



Teri Grendzinski, Supervisor of Animal Collections, hand-feeds two five-day-old Honeysuckle chicks.

Each breeding season, National Aviary staff is confronted with a dilemma: for which species should we promote parent-rearing of eggs and young, and for which species should we artificially incubate eggs and hand-rear the young? There is no simple or single correct answer to the question; each species and every situation is different, so we have to consider many factors when making this important decision.

For example, has the pair ever raised chicks before? How well are the parents represented genetically in the overall zoo population? Do other species in the exhibit pose a risk to successful parent-rearing of eggs and young? Are there proven hand-rearing protocols for the species?

In a perfect avicultural setting, birds generally will do a better job of raising their offspring than people would. Parent-reared chicks usually exhibit faster growth rates, show more rapid development of natural behaviors, and, most importantly, are more likely to be able to breed naturally compared to their hand-reared counterparts. Simply put, they know they are birds! This is especially important

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From Billions to None

Robert Mulvihill

On September 1, 1914, when many of our grandparents or great grandparents were still alive, the last living Passenger Pigeon, a species whose population once numbered several billion, died at the Cincinnati Zoo. The 100th anniversary of that extinction is a cause to commemorate the life history of a bird that almost none of us alive today ever had the chance to see; importantly, it provides a compelling “teachable moment.”

Project Passenger Pigeon (P3) organizer, Joel Greenberg, put it this way:

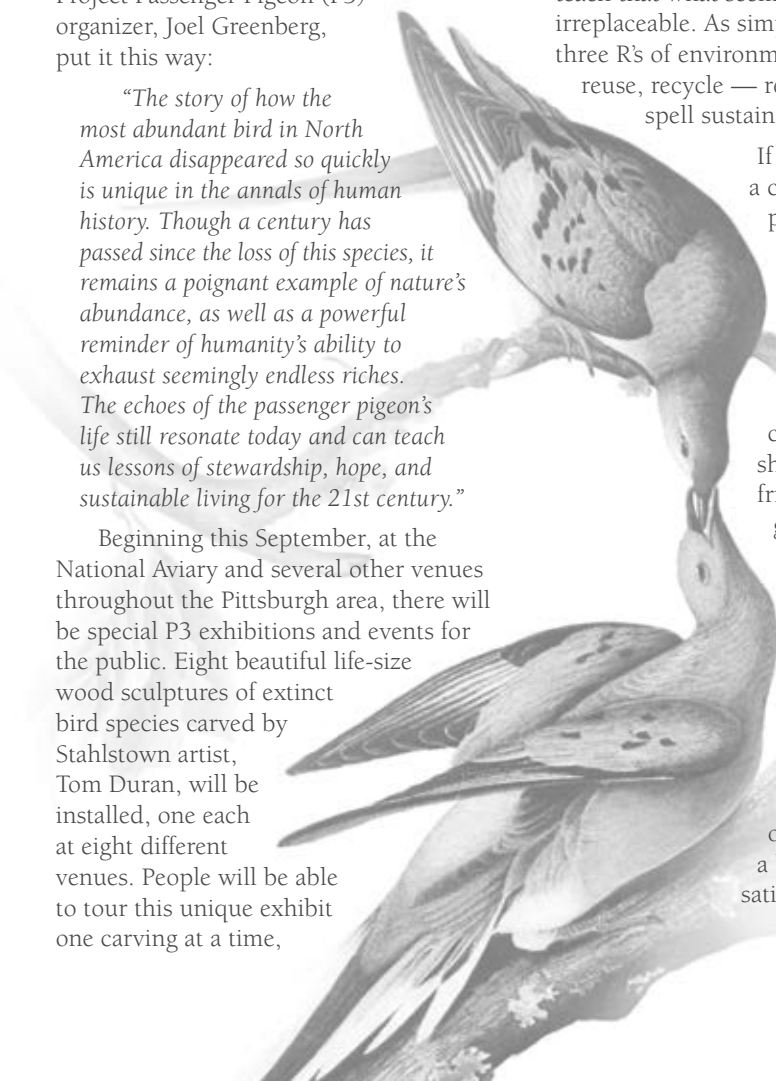
“The story of how the most abundant bird in North America disappeared so quickly is unique in the annals of human history. Though a century has passed since the loss of this species, it remains a poignant example of nature’s abundance, as well as a powerful reminder of humanity’s ability to exhaust seemingly endless riches. The echoes of the passenger pigeon’s life still resonate today and can teach us lessons of stewardship, hope, and sustainable living for the 21st century.”

Beginning this September, at the National Aviary and several other venues throughout the Pittsburgh area, there will be special P3 exhibitions and events for the public. Eight beautiful life-size wood sculptures of extinct bird species carved by Stahlstown artist, Tom Duran, will be installed, one each at eight different venues. People will be able to tour this unique exhibit one carving at a time,

learning about each species’ extinction story and the lessons we can learn from them.

Today, there are more than seven billion of us, and if current trends continue, we will number almost ten billion by 2050. Our challenge will be to ensure that our collective impact on the environment and on biodiversity does not increase accordingly. The centenary of the extinction of the Passenger Pigeon is an opportunity to remember and to teach that what seems inexhaustible is also irreplaceable. As simple as it sounds, the three R’s of environmentalism — reduce, reuse, recycle — really do spell sustainability.

If we all will make a conscious effort to pursue the three R’s; if we will try to purchase more locally and organically grown foods; if coffee drinkers will purchase only certified organic and shade grown, bird-friendly, beans and grinds, then we will be contributing measurably to reducing overconsumption, pollution, and the rate of loss of biodiversity. At the same time, we will be treating ourselves and our children to a healthier, more satisfying lifestyle! ■





NATIONAL AVIARY

The National Aviary inspires respect for nature through an appreciation of birds.

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FROM THE EDITOR

The Added Value of Bird Monitoring Programs

The National Aviary collaborates with many organizations on long-term avian monitoring programs throughout the Americas. We use standardized monitoring methods so that we can not only address local management priorities, but also combine and compare our data with other studies to investigate regional trends in bird populations.



The editor carefully removes a Hispaniolan Woodpecker from a mist net.

In this issue of *FlightPaths* you can read about our bird monitoring in the Dominican Republic, which is modeled after a similar long-term study in Puerto Rico. We returned to our Dominican sites because of the very concerning, persistent downward trends in birds observed in the Puerto Rican study. Our question: Will we see the same worrisome patterns of bird population decline in our study areas?

But a long-term monitoring program is not just about bird numbers: no amount of scientific data alone can do the job of educating people and accomplishing real gains for bird conservation. That is why the National Aviary remains committed not only to conducting field research, but also to building capacity through training new biologists, developing community-based environmental education programs, and catalyzing other initiatives in support of bird conservation efforts throughout the Americas.

Steven Latta, Ph.D.
Director, Conservation and Field Research

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Monitoring Birds and Critical Habitats in the Caribbean

Steven Latta

It's 7:20 a.m. I am perched in the dry forest near the south coast of Hispaniola where I wait anxiously with my collaborators from the Grupo Acción Ecológica for the first round of birds. With much anticipation we had placed imaginary "bets" on which species would be the first to fall in our mist nets. Would it be the endemic ground-tanager or the emblematic "Cuatro Ojos?" Would we recapture any birds from a dozen years ago, when we wrapped up six straight years of intensive field work at these sites? Most importantly, would we still find the numerous Cape May Warblers, Prairie Warblers, Palm Warblers, and Black-and-white Warblers that in the past overwintered in large numbers at these sites? The air is hot even at this early hour, and we are dripping with sweat.

Tropical field work is not for the faint-of-heart. At our low-elevation thorn scrub sites, dog-tooth limestone tears at boots and cat-clawed shrubs rip into skin and clothes. Add dozens of toxic plants, and stinging ants and wasps, and one has a potent mix for field discomfort.

But the Sierra de Bahoruco is also one of my most favorite field sites in the world. As a globe-trotting itinerant field assistant, I discovered these mountains while searching for adventure. I chose to return here as a

doctoral student to set up a field station where I could conduct some of the first-ever ecological studies of birds in this remote region. These studies helped reveal the critical importance of these mountains to biodiversity protection for the first time. Unique for their geology and biogeographic history, they are home to 30 out of 32 Hispaniolan endemics.

One of our tasks as ornithologists is to monitor bird populations and the amount and quality of habitat available to birds. Using the same survey methods used previously, we can document any changes in the populations of both migrant and resident birds. The data we collect may reveal patterns of change in bird populations related to habitat or other factors that can be managed for positive conservation outcomes.

As our first day in the Sierra de Bahoruco ends, we find dramatically lower captures of some of our formerly abundant birds. But, we have two more weeks of intensive field work to confirm these patterns, and at the end of this long, hot day, an inviting glass of cold papaya juice awaits. ■

Steve Latta and Research Associate Maria Paulino process birds at a study site in the dry forest of Sierra de Bahoruco, at the border of Haiti and the Dominican Republic.

Building Condor Numbers

Steven Latta

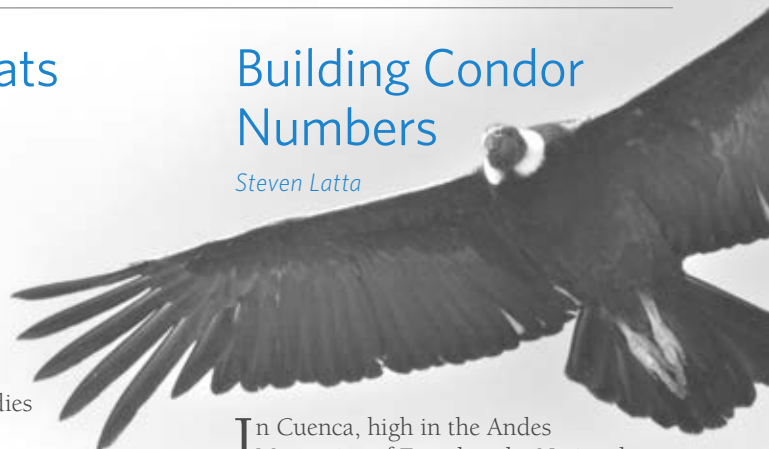
In Cuenca, high in the Andes Mountains of Ecuador, the National Aviary is aiding in the construction of a full breeding center for up to eight pairs of majestic Andean Condors. Innovative enclosures will incorporate native plants, natural rock outcrops, and an existing ravine, providing for a very natural breeding environment. A new breeding facility is also planned for two pairs of condors at the National Aviary.

The Andean Condor is considered "Near Threatened" by BirdLife International, but it is endangered in Ecuador and other central Andean countries. The partnership stems from a long-term commitment by the National Aviary to Andean Condor conservation, building on the knowledge that effective and economical conservation efforts must be expanded *in situ*, that is, where the birds naturally occur.

The National Aviary recently signed a memorandum of understanding with Bioparque Amaru in Cuenca, Ecuador, that establishes a partnership that will promote the conservation of Andean Condors. A key component of our joint condor conservation program will be the development of a release site in Cajas National Park near Cuenca.

This ambitious effort to ramp up the production of condors that can be released back into the wilds of Ecuador has been supported by an internship exchange program between the National Aviary and Bioparque Amaru. Former intern Nikki Becich already has devoted several months to working in Ecuador as a Field Associate of the National Aviary; a second intern will be at Amaru through the summer of 2014.

Fundraising is underway, first, for a new exhibit at the National Aviary, then to expand further in Ecuador. Your donations can help! ■



NOTES FROM THE FIELD

No Place for Owls

Robert Mulvihill



The author (left) and citizen science volunteer, Doug Cunzolo, take some final measurements of a Snowy Owl before passing it off USDA wildlife specialist, Bobby Hromack (bottom photo) for release into suitable habitat some 50 miles away from the Pittsburgh International Airport.

Airports are busy places, and not just for human travelers and airplanes. They frequently attract significant numbers of wildlife, and some of these can pose a danger to themselves and to air traffic when they venture too close to runways.

Wildlife is attracted to the long, wide swaths of short grass that commonly separate runways. These grassy strips can support a surprisingly dense population of small mammals, like voles, and before long these food sources attract the attention of predators, both four-footed and winged. Most airports have on site Wildlife Services personnel from the U.S. Department of Agriculture, whose job it is to keep both wildlife and people safe. Often this means

trapping and relocating animals that can't be coaxed away from the area by other means.

As the endangered Short-eared Owls, and eventually this Snowy, were caught, USDA personnel reached out to the National Aviary to band the owls before they were relocated — without banding the birds, it would be impossible to know if they returned to the airport.

Each owl was transported more than 30 miles away from the airport and released into suitable habitat, where everybody hoped they would decide to stay! The process worked, because no banded owls were resighted at the airport the rest of the winter. ■

Tiny Technology Tracks Songbird Migration

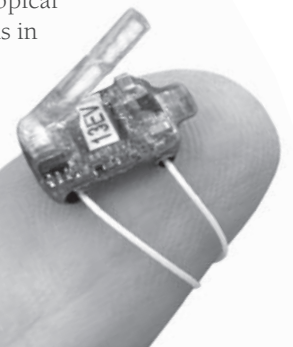
Steven Latta

It once was a pipe dream of field ornithologists to be able to track a small migratory songbird from its nesting area to its wintering grounds and back again. But the stuff of dreams has become reality with the development of increasingly small and more sophisticated geolocators.

Geolocators are data-loggers that can be attached directly to a bird and which collect data on light intensity minute-by-minute, hour-after-hour, and day after day. If the bird is outfitted with a geocator on its breeding grounds, then recaptured after it completes its migration to and back from its wintering grounds, the data from the geocator can be downloaded and analyzed to obtain information about exact sunrise and sunset times every day that the bird wore the unit. These data can then be converted to precise daily locations (latitude and longitude) for the bird. By “connecting the dots,” a bird’s timing and path of its southward migration, its overwinter location and length-of-stay, and the timing and path of its return to the breeding grounds can all be revealed.

In April 2013, Dr. Steve Latta, Bob Mulvihill and several colleagues joined forces to begin placing geolocators on 75 Louisiana Waterthrush at five sites across the breeding range of the species. We hope to learn new details of the species’ migration ecology for the very first time, such as whether the different breeding populations over-winter in distinct regions, or if they overlap. This technology has thus far been used on only a handful of birds as small as the waterthrush, but the information it promises to provide will help conservation efforts for this and other Neotropical songbird migrants in the future. ■

Right: Only recently have light-sensitive data loggers been miniaturized enough to attach to birds weighing <20 grams. The unit pictured here weighs only 0.6 grams, just 3% of the body weight of a Louisiana Waterthrush.



Avian Conservation Scholarship

by Steven Latta

A big hello from Argentina! First of all, I want to thank everyone involved for this most enriching opportunity. The course helped me to learn much more about the operation and management of zoo exhibitions and collections. It was very helpful to interact with people from other zoos, to think about sharing research projects together, and to share different ways of working. During my stay at the National Aviary, I met very nice people committed to animal welfare and the sustainable maintenance of the collections. In my role as Research Specialist in the Department of Conservation and Research at the Temaikèn Foundation, I have done extensive banding studies of the Saffron Finch. So, the most interesting experience I had during my stay with the National Aviary was visiting

the Powdermill Avian Research Center. The bird-banding research work going on in that place is awesome.

— Andrés Palmerio



Andrés Palmerio, Senior Biologist at the Temaikèn Zoo in Buenos Aires, Argentina was the recipient of the 2013-2014 National Aviary Avian Conservation Scholarship. The scholarship enabled Andrés to attend the Association of Zoos and Aquariums (AZA's) "Avian Management, Biology, and Conservation" professional training course at the Oglebay Resort in Wheeling, WV. As part of the National Aviary's scholarship award, Andrés also spent a week in February at the National Aviary, shadowing our conservation, husbandry, training, and veterinary staff in order to gain more experience that he will be able to share with his colleagues at Temaikèn.

The AZA's Zoo Conservation Outreach Group (ZCOG) focuses on building conservation leadership capacity in Latin American zoological institutions and promoting the development of collaborative zoo and aquarium-based wildlife and habitat conservation programs throughout the Americas. ■

Teachable Moments

Patricia O'Neill, Director of Education

Teachable moments are unplanned times in the education process when learning is made easy. Serendipitous by their very nature, they can happen at a moment's notice, and when discerned by educators, can help catapult students to new levels of interest and understanding.

The National Aviary's education team experienced a teachable moment of international proportions when teachers from Braddock Hills High School in Pittsburgh, PA registered for a student experience at the National Aviary in March. The teachers explained that program participants would include not only their own students, but also students from Belmont House in County Derry, Northern Ireland. The Irish students would be attending the program via web-conference.

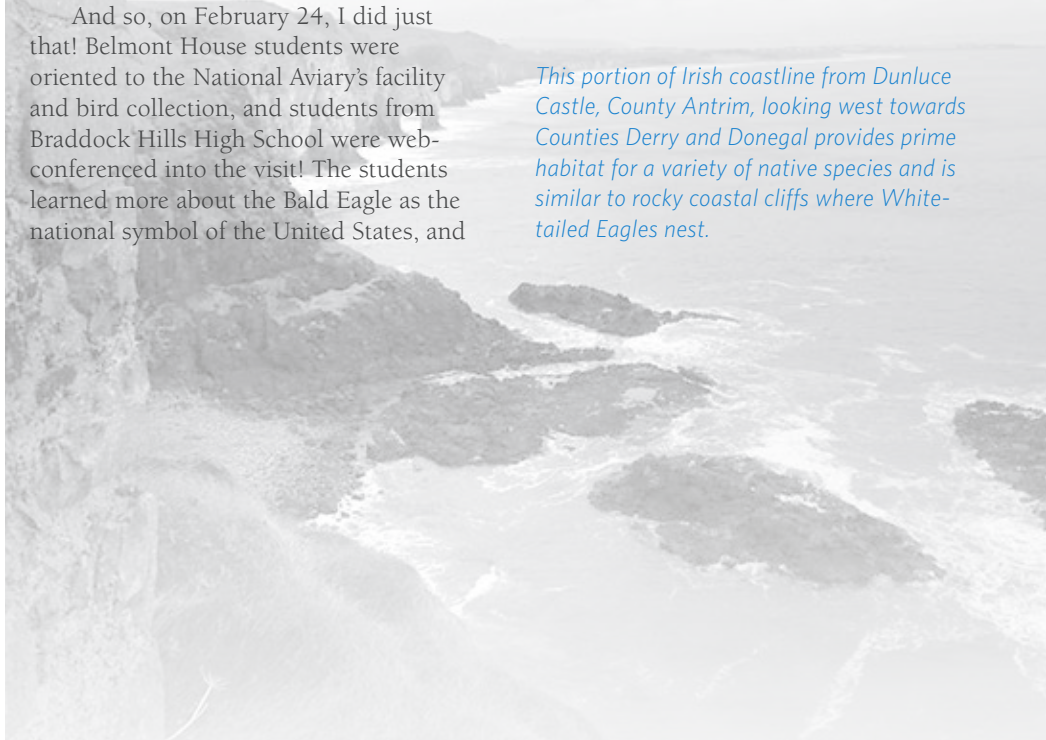
Upon learning of this unique opportunity, the education team leapt into action. It just so happened that I planned to travel with my husband to visit his family in Northern Ireland in February. As we would be staying within an hour's drive of Belmont House, I could easily visit with the students in person, introduce them to the National Aviary prior to their virtual "visit" in March and, in the process, help to make their connections with Pittsburgh more compelling.

And so, on February 24, I did just that! Belmont House students were oriented to the National Aviary's facility and bird collection, and students from Braddock Hills High School were web-conferenced into the visit! The students learned more about the Bald Eagle as the national symbol of the United States, and

they had the chance to handle American money, looking for eagles on \$1, \$5 and \$20 bills! They also heard the story of the Bald Eagle's return to western Pennsylvania and how the whole city of Pittsburgh is regaling in their active presence along the Three Rivers. They even learned that their own native White-tailed Eagle, analogous to Bald Eagles and once extinct on the Irish isle, is now breeding on the island after successful reintroduction efforts.

Upon my return to the States, we began preparing for the second half of our program. On March 26, students from both schools were introduced to several of the National Aviary's birds of prey via a live web-conference from Pittsburgh. Squire, our Lanner Falcon, and Sarabi, our Black Vulture, demonstrated their flight behaviors, while Fleury, our Snowy Owl, and Prince, our Red-tailed Hawk, fascinated the students with their unique adaptations and stories of survival. One of the crowning achievements of the entire program was that Irish and American students agreed on an important construct — that humans can all work together to support eagles, hawks, owls and falcons across the globe no matter where we live on earth. What a teachable moment for the ages. ■

This portion of Irish coastline from Dunluce Castle, County Antrim, looking west towards Counties Derry and Donegal provides prime habitat for a variety of native species and is similar to rocky coastal cliffs where White-tailed Eagles nest.



STUDENTS, FIELD ASSOCIATES, AND RESEARCH ASSOCIATES

Unlocking the Mystery of Ridgway's Hawk Declines

by Steven Latta, with Adrell Nuñez

What can be done when one of the world's most endangered hawks faces perplexingly high nestling mortality? Adrell Nuñez, a veterinary professional and former intern at the National Aviary specializing in wildlife and conservation medicine in the Dominican Republic, faced this dilemma last year. As head of the Conservation Department at Parque Zoológico Nacional, Adrell was called on to help determine why nestlings of the endemic Ridgway's Hawk (*Buteo ridgwayi*), with fewer than 300 individuals left in the wild, were dying.

Biologists from The Peregrine Fund had found very high mortality of nestlings, with data from 2011 and 2012 indicating a survival rate of 49% and 52%, respectively. Adrell's investigation of nests and chicks revealed severe infestations of a parasitic botfly, *Philornis pici*, which lays its eggs on birds. The developing larvae can cause

tremendous tissue damage, leading to death of the bird host.

Adrell devised a novel protocol using a modified tuberculin needle to remove larvae from infested chicks. The needle, modified with a small hook at the tip, was carefully inserted into the cavity formed by the larvae. The botfly larva was hooked and the parasite removed without touching the edges of the wound. The area was then disinfected with an iodine solution, and the chick treated with Fipronil, an insecticide widely used in veterinary products. Chicks without obvious botfly infections were also treated with Fipronil as a preventative. Using these treatments, in 2013 the survival rate of Ridgway's Hawk chicks went up to 83%!

Adrell Nuñez discovered that nest parasites led to nestling mortality in Ridgway's Hawk.

Adrell recalls that "working hand-in-hand with Dr. Pilar Fish and Dr. Steve Latta at the National Aviary was one of the most interesting and gratifying experiences." Adrell says he returned to the Dominican Republic "with a lot of ideas, and anxious to put in practice the things learned during my stay at the Aviary." ■



Bird Banding Experience Inspires Young Biologist

by Steven Latta, with Hodali Almonte

Hodali Almonte, a young biologist from the Dominican Republic's National Museum of Natural History, recently completed a four-month internship in bird

Hodali Almonte measures a waterthrush.



banding at the Palomarin Field Station of Point Blue Conservation Science (formerly Point Reyes Bird Observatory). Located north of San Francisco, Palomarin provides unique, daily opportunities to practice bird banding skills. This internship is one of a number partially funded by the National Aviary as part of an innovative partnership between the National Aviary and Point Blue that has given a growing number of Latin Americans the opportunity to train at this prominent field station.

Hodali, a former student and collaborator of mine, sought the internship to "learn more about birds, specifically how to better determine age and sex, and to learn different aspects of processing banding data." She reports that through her internship she "gained new knowledge of the management of mist nets and the processing of captured birds." She was especially impressed observing how to operate a large and successful banding lab and field station. Hodali was able to master new skills for determining sex and age, and in regard to the management of banding data, Hodali learned how to

correctly use the different codes for each of the many variables assessed during the banding process.

"Something that really impressed me at Palomarin, and in California, was the great interest shown by most people toward the conservation of birds and of natural resources in general. This is particularly awesome to see because in the Dominican Republic we face so many conservation issues, but we do not have many environmental education programs, and our environmental authorities lack interest in conservation."

On her return to the Dominican Republic, Hodali hopes to use her new knowledge to improve her work and to help the next generation of ornithologists and naturalists to participate in avian field studies. She dreams of building the scientific basis for embarking on a similar bird banding program in the Dominican Republic that can help foster an increased environmental ethic in her country. ■

Self-made Scientist

by Steven Latta

One of the benefits — and great pleasures — of field research is the opportunity to train and mentor young people who represent the future of conservation. This is particularly true in developing countries where opportunities for field training are scarce or non-existent. In the Dominican Republic, investments by the National Aviary in the monitoring and field study of birds have enabled local students and aspiring young biologists to develop the expertise needed for pursuing careers in conservation.

One such beneficiary is Julio Mercedes Medina. Of Haitian and Dominican descent, Julio (a.k.a., Gullén) was one of the many children who showed up at our field sites curious to see what we were doing. With schools rarely in session in these remote areas, word of scientists



Julio Mercedes Medina holds a Black-faced Palm-Tanager.

catching birds and placing rings on their legs – for whatever crazy reason – was a big draw! Beginning in 2003 many children, and even adults, stopped by to see what we were up to.

But Gullén was always different. Growing up with absent parents, he

showed up every morning before dawn, waiting outside our little house for the day to begin. He was a fast learner and, before long, was extracting birds from the nets and applying aluminum rings and plastic, colored bands. Over the years he became a valued member of our team, and in the process learned not only about birds, but also about the importance of timeliness; responsibility; education; attention to detail; and respect for others. He became aware of life and opportunities far beyond the confines of his obscure border village.

A decade later, Gullén is dedicated to birds and conservation. He has formed youth environmental clubs in several towns, and he is now preparing to become caretaker and principal naturalist guide at the Campamento Barrancoli, a premiere site for bird-watching on Hispaniola. Only a few miles from his roots, it offers a whole new world of opportunities for this ambitious young conservationist. ■

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To Rear or Not to Rear

when captive populations are being managed for possible reintroduction to the wild, as is the case with our Guam Rails. As an added benefit, parent-reared birds typically live longer in captivity than hand-reared birds. Furthermore, adult birds that successfully rear their young generally form a stronger pair bond, and this can both improve their breeding success in subsequent seasons and make them generally easier to manage in captivity.

Despite the benefits, there are some drawbacks to parent-rearing in captive situations. As with wild birds, first breeding attempts frequently are unsuccessful, and in

Blue-faced Honeyeaters (Entomyzon cyanotis) are native to eastern Australia and occur in a wide range of habitats.

some situations this may not be acceptable (for example, when an endangered species is involved). In multi-species exhibits we have to take into account changes in behavior of a nesting pair (such as increased aggression in defense of their chicks) and of other species in an exhibit, some of which can pose a danger to the eggs or chicks.

There are advantages to intentionally removing eggs and hand-rearing. When you pull a clutch of eggs for artificial incubation shortly after they are laid, most birds will recycle and lay another clutch. Thus, a captive breeding program can potentially produce a greater number of offspring during a single breeding season than with parent-rearing alone. For some species that are not plentiful in captivity, this is an especially important consideration.

However, there are drawbacks to hand-rearing. For many species hand-rearing

protocols are not well-established. As previously mentioned, parent-reared offspring tend to be much better at nesting when they mature, because unlike hand-reared young birds, they do not become behaviorally imprinted on humans. Of course a major consideration is the fact that hand-rearing is time intensive for staff: altricial chicks (those that are naked and incapable of feeding themselves for many days) need to be fed every hour, twelve hours a day for up to three weeks.

In the case of our Blue-faced Honeyeaters, we decided to pull the eggs and hand-rear the chicks despite the fact that hand-rearing protocols for this species are not well established. We pulled the eggs primarily because our Blue-faced Honeyeaters are housed with Keel-billed Toucans, a species that will opportunistically rob eggs and young from other bird nests. The offspring from our honeyeater pair are considered to be highly genetically valuable to the captive program for this species, so we did not want to take any chances. Our decision to rear has led to the successful addition of two new female honeyeaters to the overall captive population and improved the sustainability of this carefully managed species. ■





NATIONAL AVIARY

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In this issue:

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- Aviary follows up on Caribbean bird monitoring
- Things are looking up for Andean Condors in Ecuador
- Geolocators shed light on songbird migration
- Aviary staff educates students on both sides of the Pond

NOTES FROM THE FIELD

A People's Eye View of Birds

by Robert Mulvihill

To be able to watch a Peregrine Falcon bow and call to its mate, or to see a Bald Eagle land at the side of its nest with talons full of food for its downy chicks: these are experiences once reserved for a handful of wildlife researchers working in remote locations in the field, hidden in a blind with a spotting scope. But now this is possible for thousands of people from the comfort of their home or office.

Thanks to generous donations to the National Aviary from Peregrine Falcon aficionados in Pittsburgh and around the country, a new video camera was purchased this spring for the Peregrine Falcon pair that nests on the 40th floor of the Cathedral of Learning on the University of Pittsburgh's Oakland campus (see photo, far right). The old camera began to malfunction last season, so a high quality, high definition Vivotek camera was purchased by the National Aviary and installed in early February, with help from WQED's IT specialist and bird-blogger, Kate St. John, and building managers at the University of Pittsburgh.

A second Peregrine nest cam, unused for two years because the downtown Peregrine pair switched nesting locations in 2012 and 2013, is back in business this year atop Pittsburgh's Gulf Tower. The pair pleasantly surprised everyone by returning to its old nesting box. You can help the National Aviary to upgrade this camera next year with a high definition camera like the one just installed at Pitt — just send a donation and direct it to our *Nest Cam Fund*. ■



The Hays Bald Eagle nest cam installed last December by the Pennsylvania Game Commission and PixController, Inc., along with two Aviary-sponsored Peregrine Falcon nest cams can be viewed from the National Aviary's website at: www.aviary.org/nestcams.