

ANIMAL PROGRAMS

Captive breeding and reintroduction of the Guam Rail

Julia Ecklar, Registrar

When the first seemingly innocuous brown stow-away slipped off a Navy supply ship and disappeared into the island night, Guam was home to eleven endemic species of forest-dwelling birds. Because they evolved in the absence of snake predators, for the endemic birds of Guam the arrival of brown tree snakes was an ecological catastrophe. Less than forty years later, nine of the eleven species were extinct — and the Guam Rail and Guam Micronesian Kingfisher were reduced to fewer than fifty individuals.

In 1984, biologists at the Guam Department of Agriculture initiated an unprecedented intervention. The last of the wild rails and kingfishers were captured and transported to protected breeding areas on Guam, as well as to selected zoos in the United States. With these 21 captured birds lay the slim remaining hope for their species' survival.

Today there are more than 150 Guam Rails in captivity, and careful management has resulted in an impressive 83% genetic diversity in the captive population. The National Aviary has hatched 57 Guam Rails since welcoming its first wild-caught pair in 1984, and 23 of those are among nearly 200 rails released on Rota, a neighboring snake-free island with habitats similar to Guam. With the addition of a recommended breeding pair of Guam Micronesian Kingfishers to our new *Canary's Call* exhibit, we look forward to assisting with the recovery of that species, too. ■

HUMAN POPULATION IMPACTS

Pittsbirders attract National Aviary researchers to their backyards

Robert Mulvihill



Dr. Barbara Becich releases a Magnolia Warbler banded for Neighborhood Nestwatch in her Bradford Woods backyard.

“Build it and they will come...” — so says the mysterious disembodied voice heard over and over again by Kevin Costner in the movie classic “Field of Dreams.”

Every year thousands of people build boxes, hoppers and trays; they construct ponds and pools and drips; they plant flowers and shrubs and trees; they dole out seed, suet, fruit, and nectar, all in the hope that they will come — birds, that is!

There's no doubt about it, backyard bird watching and feeding are among the most popular pastimes in the United States. An estimated 50 million people in the U.S. feed and watch birds and other wildlife in their own backyards, which is more than the number of people who hunt and fish combined, and second only to gardening as the most popular outdoor pastime. The trend is the same within Pennsylvania, where 3.5 million people describe themselves as “at home” wildlife watchers.

In 2000, scientists at the Smithsonian Institute's Migratory Bird Research Center had the idea to take advantage of the strong interest that people have in attracting and watching birds in order to conduct some of the first-ever regional studies of bird populations living in human-occupied habitats. They invented a citizen science project called “Neighborhood Nestwatch” designed to investigate possible factors affecting bird survival and productivity across a range of landscapes:

- Urban** (>4 buildings per acre, both residential and commercial)
- Suburban** (1-4 buildings per acre, mostly single family residential with large yards)
- Rural** (<1 building per acre, within a predominantly agricultural landscape)
- Exurban** (<1 building per acre, within a mostly natural, e.g., forested, landscape).



NATIONAL AVIARY

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

Editor

Steven Latta, Ph.D.,
Director, Conservation and Field Research
steven.latta@aviary.org

Managing Editor

Robert Mulvihill, M.Sc.
Ornithologist
robert.mulvihill@aviary.org

Allegheny Commons West
Pittsburgh, PA 15212-5248
412-323-7235



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FROM THE EDITOR

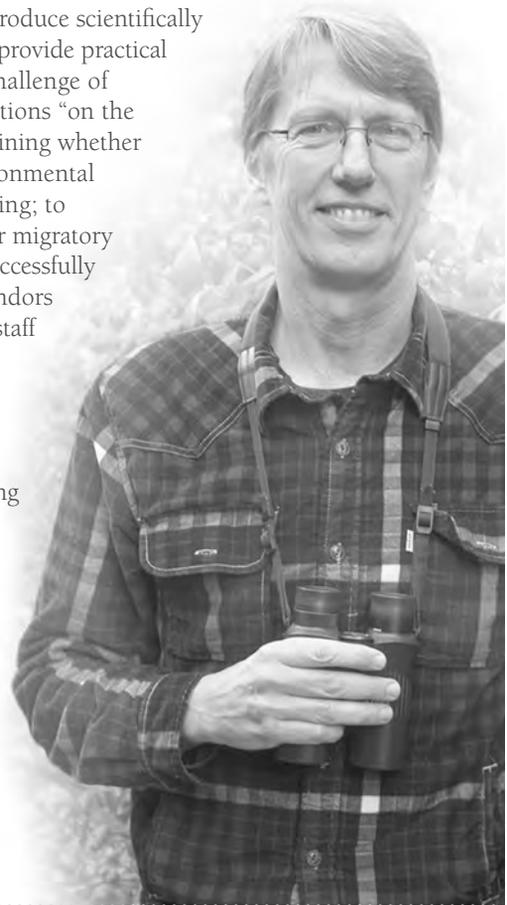
Welcome to *FlightPaths* from the National Aviary!

The National Aviary is proud to be the country's premiere bird zoo, but it is much more than that. For many years, the National Aviary has been a leader in recognizing the role that unsustainable human population growth and concomitant increased consumption of natural resources play in threatening overall environmental quality, ecological systems functioning, and global biodiversity. Accordingly, it is committed to being a proponent and supporting partner in many efforts to advance local and global conservation of birds and their habitats.

The projects that we participate in are designed to produce scientifically valid and publishable results and, just as importantly, to provide practical information and useful tools for people who face the challenge of conserving and sustainably managing wild bird populations "on the ground," every day, throughout the world. From determining whether a small songbird can provide an early warning of environmental contamination of surface waters from hydraulic fracturing; to assessing the value of early successional scrub habitat for migratory birds wintering in the Caribbean; to evaluating how to successfully breed, care for, and reintroduce endangered Andean Condors to their native range in South America; National Aviary staff regularly contribute their expertise to bird conservation efforts around the world.

Welcome to *FlightPaths*, a twice yearly publication to update our supporters and the broader national and international conservation communities about the ongoing conservation activities and accomplishments of the National Aviary. We hope you will enjoy reading it. We welcome your questions and comments, and we value your support in helping us to continue our efforts!

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



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PARTNERING FOR CONSERVATION

Dominican children learn protecting nature is “For the birds, the environment, and you!”

Andrea Thomen, Student Research Associate

Editor’s Note: In the Dominican Republic, the National Aviary has partnered with the local conservation organization, **Grupo Acción Ecológica** (Ecological Action Group) or GAE. Together we have pursued ornithological research, bird population monitoring, and community education projects. In 2012, GAE was the recipient of the prestigious Ford Motor Company Conservation Award to broaden community education efforts about the importance of clean water for birds, wildlife, and human health.

Campamento Barrancoli is an environmental education initiative serving children ages 6-13 in rural communities in the outskirts of San Francisco, Dominican Republic. The main objectives of this summer camp are to create a sense of responsibility for the health of the environment, and to promote awareness regarding wildlife and environmental issues. Using resident and migratory birds as flagship taxa, GAE targets a wide range of local issues including waste management, water pollution and hunting.

After two months of planning and preparation, and with the help of over 25 volunteers, the 2013 camp took place from July 19-21 in the community of Loma de la Joya, Dominican Republic. A total of 120 children participated, including many from neighboring communities. Camp sessions



combined traditional games with recycled art (see photo below), eco-drama presentations, interactive lectures, and hands-on

nature workshops. Groups were encouraged to learn about an assigned bird species, for which they prepared a skit during a community-wide talent show. Other bird-related activities included a lecture on avian anatomy and a workshop on songs and calls of birds, during which many kids were quick to supply their own knowledge of local bird song!

In addition to summer camp activities, throughout the month of July GAE sponsored a contest for children recording nest observations. The main goals of this project were to promote nest etiquette and tackle the issues of bird-taking, egg-harvesting and the illegal pet trade. Over 40 children participated in this program and recorded over 100 nest observations! The winning team recorded 62 individual nests within La Joya, and with each nest they included details on nest height, location, appearance and tree type.

GAE hopes to continue to raise funds to carry on with *Campamento Barrancoli* in 2014 and to develop a variety of youth leadership programs in this region. ■

RECENT PUBLICATIONS

Ruta Barrancoli



The Dominican Birding Trail (*Ruta Barrancoli*) was conceived and developed by Dr. Steven Latta, the National Aviary’s Director of Conservation and Field Research. The trail consists of 44 of the best sites for

bird watching across the Dominican Republic, including Watchable Wildlife Sites, Important Bird Areas, Alliance for Zero Extinction Sites, nature trails and locally known prime birding locations.

The trail (*ruta*) was named for the charismatic Broad-billed Tody, or *Barrancoli*, a diminutive emerald green and rose-red colored bird distantly related to kingfishers. But it was not only built to help birdwatchers; it was created to be a figurative path for local communities leading to more sustainable economic development by stimulating eco-tourism and by showing local residents the value tourists place on “their” birds. This shift in ideology is always an important step in the process of changing from a culture of consumption of natural resources to one of conservation and stewardship.

A beautiful full-color book describing the birding trail recently has been published with help from the National Aviary and many Dominican collaborators. The book includes site descriptions; hand-drawn maps; driving and walking directions; lists of expected bird species; and recommendations for food, accommodations, and other cultural attractions. Beautiful new illustrations of all the endemic bird species were painted by renowned California artist Dana Gardner. A condensed version of the book has been translated into Spanish and placed on the internet for free use by Spanish-speaking tourists and local birdwatchers.

Copies of *Ruta Barrancoli: A Bird-Finding Guide to the Dominican Republic* can be purchased in the National Aviary’s gift shop, or by contacting steven.latta@aviary.org. ■



Appreciating Bald Eagle increases

Robert Mulvihill



PHOTO BY THOMAS MOELLER

A Bald Eagle stands guard over its newly constructed nest on Pittsburgh's Southside.

There probably hasn't been a nesting Bald Eagle along Pittsburgh's three rivers in over 200 years — that is, until this past year! Along with fellow eagle watchers Roy Bires, Jerry and Annette Deviney, Debra Trader, Thomas Moeller, and others, I helped to monitor the activities of a pair of eagles on Pittsburgh's Southside, along the banks of the Monongahela River. We charted the progress of this eagle pair for more than three months, documenting hatching, countless feeding trips by the parents (bringing food items ranging from fish to frogs to rats and even groundhogs!), and the successful — if slightly premature — fledging of a single young bird after the nest partly collapsed under its weight.

Throughout the nesting cycle, the public was invited to join me in viewing the eagle nest, and thanks to the generous donation of a Vortex spotting scope by Pittsburgh-area Wild Birds Unlimited stores, hundreds of people enjoyed spectacular close-up looks at these majestic birds. For many it was the first time they had ever seen an eagle in the wild, and for all it was a welcome sign that the city's three rivers are cleaner than they've been in many years.

Through its ongoing sponsorship of two local Peregrine Falcon nestcams, the National Aviary has long enabled thousands of people from around the world to witness to the drama of raptor courtship, nesting, and chick-rearing. By giving people the opportunity to view nesting Bald Eagles up-close and in-person, the National Aviary hopes to give people another way and even more reasons to appreciate birds and be inspired to respect nature.

Editor's Note: *As of this writing (late November) the pair has been busy building a new, sturdier nest near their old nest site, and we look forward to sharing the experience of watching their nesting behaviors with lots of people again next year. Follow us on Twitter @National_Aviary, like us on Facebook.com/NationalAviary, or sign up for our eNewsletter, Airmail, via aviary.org to be among the first to visit the new nest site with Bob next spring. ■*

American Crows are caught by a motion-sensitive camera in the act of depredate a mock nighthawk nest in Laramie, Wyoming.

Understanding Nighthawk declines

Steven Latta

Peent!.... Peent!.... Peent!

For Pittsburghers of a certain generation the strident call of the Common Nighthawk, given as it flies buoyantly overhead catching insects on the wing, was a very familiar sound on balmy summer evenings. Their calls are no longer being heard in many places, because populations of nighthawks have mysteriously declined in recent years.

One factor may be American Crows, which have increased in numbers in urban areas over the same period of time. The nighthawk nests flat on the ground or, in urban areas, on gravel rooftops. Crows are notorious scavengers of all sorts of foodstuffs, including eggs and chicks of many types of birds — perhaps they are preying on nighthawk nests.

Together with students from the Honor's College at the University of Pittsburgh, I have initiated a study to test hypotheses to explain the decline of the Common Nighthawk at field sites in Wyoming. We placed quail eggs, which closely mimic eggs of the Common Nighthawk, in a variety of locations in both urban and rural settings. At each mock nest we also placed a motion-sensitive camera.

Preliminary results suggest that urban crows are indeed a factor in nighthawk declines — we found higher rates of predation on nests in urban areas than rural areas, and the photo surveillance showed that crows frequently were the culprits. Further experiments (right here in Pittsburgh) will help us determine how widespread this pattern may be. ■



EDUCATION

continued from page 1

Neighborhood Nestwatch

They wondered: how does the survival and nesting success of eight bird species common to all these landscapes differ, and how similar are the patterns from one part of the country to the next? In their pursuit of answers, they have now published more than a dozen scholarly papers, as well as many popular articles and educational resources.

Dr. Pete Marra, creator of *Neighborhood Nestwatch*, writes, “Scientists, myself included, prefer to study birds in pristine rather than in disturbed or managed habitats. But these latter habitats are not only the reality, but they are also starting to dominate the global landscape. So a light bulb went off in my head: why not create a citizen science project where we gain access to private property for ‘study sites’ to collect data on reproduction and survival of common backyard bird species? Not only that but, much like the folks waiting for ‘their’ phoebes to return, get the property owners themselves engaged in the science.”

Neighborhood Nestwatch began in the Washington, D.C. metro area in 2000 with 45 backyard participants, 188 banded birds, and 39 nests. It quickly expanded to >200 backyards and has now collected data for >7,000 birds and 800 nests! In 2012, *Neighborhood Nestwatch* expanded to two other urban systems, Springfield, Massachusetts and Gainesville, Florida; this year Pittsburgh became just the fourth urban center to enroll in *Neighborhood Nestwatch*. We had a very successful pilot season, with 36 participants and >500 birds banded! (see www.aviary.org/NeighborhoodNestwatch for more details). More than 50 additional households have invited us to visit their backyards in 2014; depending on our funding levels, we will try to get to all of these and more.

If you are interested in attracting National Aviary researchers to your backyard, send an email with your name and street address before the end of April to Bob Mulvihill (Robert.mulvihill@aviary.org). ■

New exhibit asks, “Are we listening?”



PHOTO BY CHUCK BEARD PHOTOGRAPHY

Canary's Call has beautiful mixed media content and brand new bird displays that will provide many new education opportunities at the National Aviary.

The proverbial “canary in a coal mine,” is anything that forewarns us of danger. A century and a half ago the caged canary that miners carried deep into mine shafts could be a literal life-saver. In the poorly ventilated tunnels where toxic coal gases could accumulate, the canary’s call assured miners that the air was fit to breathe. If the more sensitive birds suddenly stopped calling, this provided the miners advance warning to evacuate the mine before they, too, succumbed.

This vivid, historical example of people’s knowledge that birds are reliable and sensitive barometers of the environments we share with them inspired the name for the National Aviary’s newest exhibit: *Canary’s Call*. Earth is an island where humans, birds and other living things compete with one another for limited natural resources. Like the canary in a coal mine, birds show earlier symptoms of an unhealthy environment and of the effects of our unsustainable use of resources. But, are we listening to their calls?

Through living birds and other animals, beautiful photography, thoughtful messages,

and interactive games, *Canary’s Call* is designed to engage, teach, and remind visitors that our own survival depends on heeding the call to preserve biodiversity by reducing our individual and collective impacts on the environment. Habitat loss, invasive species, pollution, population growth, and overconsumption all need to be reduced if we hope to live in a world where “canaries” always call.

We are currently developing new school programs that will link the messages of *Canary’s Call* with state and national academic standards for environment and ecology. The programs will support study of important ecological concepts, like carrying capacity, as well as provide opportunities for students to address environmental ethics and decision-making. Additional interpretive activities will become available during 2014, through the generous support of the ALCOA Foundation.

We are grateful for the support of the Allegheny Regional Asset District, Dollar Bank, Colcom Foundation, and an anonymous donor, all of whom helped to make this exhibit possible. ■

STUDENTS, FIELD ASSOCIATES, AND RESEARCH ASSOCIATES

Collaborations with an Ecuador zoo

Nikki Becich, Field Associate

Editor's Note: Nikki Becich is interning with our friends at the Bioparque Amaru wildlife rehabilitation center and zoo in Cuenca, Ecuador. Among other conservation objectives, the National Aviary is hoping to help Bioparque Amaru breed Andean Condors for eventual reintroduction to native habitats.

As a graduate of Pomona College aspiring to a career in veterinary medicine, I have been taking a year to travel in order to learn about the state of conservation and veterinary medicine in Central and South America. Currently I am living in Cuenca, Ecuador, and working for the Bioparque Amaru zoo.

The incredible Bioparque Amaru is a center for rescued wildlife, public conservation education, and a station for biological investigations in the high Andes of southern Ecuador. The zoo, only two years old, is organized into various zones representing Ecuador's diverse ecosystems, with each zone containing animals on exhibit that have been rescued from illegal trafficking. Even the few animals they have in the exotics section, such as ostriches and

African lions, are rescues from circuses. Every month Bioparque Amaru receives 20-60 illegally obtained wild animals seized by the Ecuadorian government. Providing medical treatments, proper diets, and suitable housing for these animals is a huge challenge for a small organization like this.

As an intern at the National Aviary, I learned a lot from the experiences of avian veterinarian, Dr. Pilar Fish, about the preventative medicine measures needed to keep a wide array of species healthy and comfortable during necessary checkups and hospital stays — knowledge that is invaluable in trying to establish veterinary protocols and facilities from the ground up. Animals at Bioparque Amaru are getting very cramped with all the new arrivals, and the zoo is planning to build a veterinary clinic on their property, as well as a large flight aviary for the many birds that have been seized from illegal trafficking activity. Together we have developed new floor plans and material lists and are raising the needed funds.

Dr. Steven Latta, my mentor at the National Aviary, told me when he put me in



Edwin, age 20, zookeeper and trainer at Bioparque Amaru, assists Nikki Becich in the primary examination of a juvenile Black-and-chestnut Eagle.

touch with Bioparque Amaru, that this is a wildly impressive organization founded on the ambitious passions of a small group of amazing biologists. He was right! I am very humbled and grateful that I get to learn and work here, and I hope that my time spent here will help them in some small way to realize their important mission to preserve the threatened wildlife of this amazingly biodiverse region. For more zoo updates, details about the zoo's needs, future plans, and conservation programs, and to see many pictures of the birds, wildlife, and interesting people and places I've seen, visit my blog: onehealth47.blogspot.com ■

On the fracking grounds of the Fayetteville Shale

Leesia Marshall, Research Associate

Editor's Note: Dr. Leesia Marshall completed her Ph.D. at the University of Arkansas studying the behavioral ecology of the Louisiana Waterthrush. She continues her work with waterthrushes as a Postdoctoral Research Associate at the National Aviary, studying impacts of hydraulic fracturing, or "fracking," on water systems using the Louisiana Waterthrush as a bioindicator.

I am a native of the hilly Ozark Mountains in northwest Arkansas and of Cherokee and Scotch-Irish descent. My education began in the oak/hickory forests and rough



Leesia Marshall and her dog take a break from waterthrush field work in Arkansas.

terrain of these old mountains. My first "field work" began when I was a child, fortunate to have been given an instinctive compassion and assurance from my family that all living things had spirits and languages of their own, and that my world was green and brown — a living thing, full of mysteries and beauty. The birds provided brilliant flashes of color and they spoke a

language I was certain that I could learn to understand.

As an adult, I have changed very little, though my field work has taken on a different hue and greater importance. With education came wisdom. I have come to see nature through the eyes of a scientist, but what I see remains inherently beautiful. I have also come to understand that what I have loved for a lifetime is threatened and quickly disappearing before my very eyes.

With my dissertation research, and now with the National Aviary, I strive to learn more and more about what threatens a tiny bird that teeters among the rocks in tumbling wooded streams draining the hills of northwest Arkansas — most importantly, how to preserve the bird and its habitat. No longer simply a child with a sense of wonder for these old mountains, I am a trained ecologist and, I hope, their ardent steward and strong protector. ■

MEETINGS

Decoding fecal DNA

Brian Trevelline, Student Research Associate

Editor's Note: Brian Trevelline is a graduate student at Duquesne University in Pittsburgh. As a Research Associate of the National Aviary, he is working on a novel method of identifying a bird's diet by decoding DNA fragments that occur in the bird's droppings!

Human-caused environmental stressors such as climate change, pollution and development have all been identified as potential impacts on Neotropical migrant songbird communities. Water pollution is particularly dangerous to riparian songbirds, such as the Louisiana Waterthrush, which utilizes streamside habitats for breeding, nesting and foraging on aquatic insects.

Currently, we are seeking to quantify potential differences in diet between waterthrush that breed on acidified and circumneutral streams in Pennsylvania by developing a new molecular approach to diet analysis known as DNA barcoding, in which residual DNA found in avian feces is used in order to identify the insects the bird has eaten. This approach will enable us to identify essential components of waterthrush diet and to see how these may differ under the influence of water pollution. This technique has the potential to be broadly applied to other insectivorous avian taxa as a non-invasive, quantitative means for analyzing diet, something that could be particularly valuable in the study of threatened or endangered species. ■

Brian Trevelline holding a nestling waterthrush.



National Aviary contributes to Marcellus Shale research symposium

Steven Latta

The use of birds as pollution bioindicators has a long history as a catalyst for environmental protection. In the 1900s, the women of the National Audubon Society led a campaign against the killing of egrets and herons for feathers for hat decorations. In the 1930s, Rosalie Edge struggled to protect migrating raptors from being gunned down at Hawk Mountain. Rachel Carson successfully argued against the use of the pesticide DDT, as detailed in her book, *Silent Spring*, published in 1962.

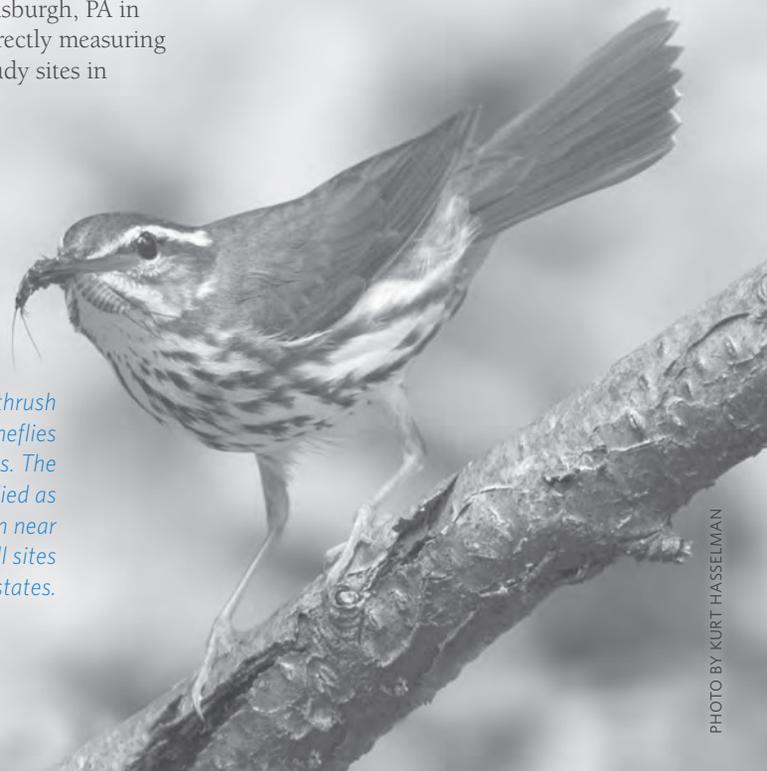
In a study currently underway at the National Aviary, field researchers have been using the Louisiana Waterthrush as a sentinel species to understand the effects of Marcellus Shale drilling on water quality, ecosystem dynamics, and human health. Because of previous work with my Aviary colleague, Bob Mulvihill, the species already is scientifically well-documented as being a reliable “canary-in-a-cage” for measuring the environmental impacts of coal extraction and use.

The present study was recently described at a two-day conference, *Facing the Challenges: Foundation Funded Research on Shale Gas Extraction*, held at Duquesne University in Pittsburgh, PA in November 2013. We are directly measuring contaminants in birds at study sites in

Pennsylvania, West Virginia and Arkansas, where shale formations are subjected to hydraulic fracturing (or “fracking”) to release natural gas deposits. Because fracking involves the use of a variety of unknown “proprietary” chemicals, we are not able to search for those directly. However, fracking also releases naturally occurring elements in the shale layer, such as barium and strontium; therefore, we used these as indicators of the possible presence in surface-flowing waters of toxic additives used in hydraulic fracturing of shale layers deep underground.

If feathers collected from waterthrushes nesting in areas with a greater number of active gas wells contain high levels of barium and strontium as a result of bio-accumulation, this would raise serious concerns about environmental contamination from fracking — something the industry asserts is not occurring. If the waterthrush reveals that potentially dangerous chemicals are present in the food chain supported by our surface-flowing waters, then the implications for wildlife and human health are serious. ■

A Louisiana Waterthrush carries a beak full of stoneflies back to its nestlings. The waterthrush is being studied as a bioindicator for pollution near shale gas well sites in three states.





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National Aviary in Pittsburgh, Inc.
Allegheny Commons West
700 Arch St.
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In this issue:

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- New exhibit highlights birds as bioindicators
- Aviary supports bird conservation in Latin America
- Studies explore impacts of fracking on birds

BUILDING CAPACITY

Helping with bird conservation... one bird at a time

Pilar Fish, DVM, Director of Veterinary Medicine

Walking across his pasture, an Oklahoma farmer was surprised to find a grounded Bald Eagle, apparently injured or sick and unable to fly. He took the bird to his local wildlife center where they determined the eagle did not have any fractures, and no cause of illness was found after a battery of routine tests. The wildlife center called the National Aviary Teaching Hospital for a consultation, and, based on their description, we suggested the eagle might have been poisoned with a rodenticide, Brodifacoum, that is extremely hazardous to wildlife. Tests quickly confirmed the eagle had ingested a poisoned rat and the necessary antidote was immediately given, saving the eagle's life.

In addition to providing free consultations, the National Aviary Teaching Hospital trains veterinary and wildlife professionals in advanced medical procedures developed specifically for birds. Every day hundreds of birds collide with windows or are hit by cars, attacked by cats, or poisoned. Wildlife centers throughout the world are faced with the daunting challenge of triaging and treating wild birds, often after an injury or illness has gone untreated for a long time. We care daily for the medical needs of the National Aviary's 500-plus birds, but through our teaching, training, and consultations, we strive to help the cause of bird conservation...one bird at a time. ■



Dr. Fish gives a routine exam to one of the National Aviary's Bald Eagles.