The media has been awash recently with stories of the 50th anniversary of the assassination of President John F. Kennedy in November of 1963. Certainly this event was a landmark in time that continues to generate curiosity and controversy half a century later. But there were other “assassinations” happening around the world at about the same time: red-bellied gracile opossum, Hawaiian chaff flower, turgid-blossom pearly mussel, Arabian ostrich; all species whose last known individuals were recorded in the 1960’s. Many others have gone extinct in the fifty years since, most of which were doomed by some combination of the usual environmental impacts of human dominance: habitat destruction, environmental degradation, overexploitation, transport of invasive species, and the introduction of disease. Who remembers where they were the day the Arabian ostrich breathed its last? Why do we not mourn these losses or even remember them? Perhaps we don’t connect to extinctions because they seem to be happening somewhere else, in some other time. We see news stories highlighting the plight of polar bears and that might make us take note, but it is still distant. Perhaps it is a visceral, emotional reaction that will spur action. Must we always be so technical? Maybe we just don’t comprehend the finality of extinction. What does extinction look like? Perhaps it looks like this.

“Raphus cucullatus had become rare unto death. But this one flesh-and-blood individual still lived. Imagine that she was thirty years old, or thirty-five, an ancient age for most sorts of bird but not impossible for a member of such a large-bodied species. She no longer ran, she waddled. Lately she was going blind. Her digestive system was balky.

In the dark of an early morning in 1667, say, during a rainstorm, she took cover beneath a cold stone ledge at the base of one of the Black River cliffs. She drew her head down against her body, fluffed her feathers for warmth, squinted in patient misery. She waited. She didn’t know it, nor did anyone else, but she was the last dodo on Earth. When the storm passed, she never opened her eyes. This is extinction.” (David Quammen, The Song of the Dodo, 1997)

In fifty years, how will history view us? Did we prevent extinctions; did we cause extinctions; did we take action to curb the tide of the loss of biodiversity? This is our challenge and our mandate. This is also where the role of biological surveys comes to the fore. In pushing a movement to establish a national biological survey, E. O. Wilson wrote,

“Meanwhile the practical need for knowledge of biological particularity grows more compelling each year. With the growing stress on the world environment, with each turn of the screw, the need for complete biological surveys becomes more obvious. For how will it be otherwise possible to monitor the decline of genetic diversity and shifts in ecosystems?…Conducting research in applied biology without biological surveys is like trying to read an encyclopedia with a 200-word vocabulary.” (Foreword to Foundations for a National Biological Survey, 1986)

Surveys provide baselines and baselines allow us to gauge change. This is the first step in conservation—understanding what is out there and how it differs today from
It is only through an understanding of our current biodiversity that we can properly assess future changes, positive or negative, and develop appropriate conservation strategies.

I welcome discussion from our partners as we look for ways to leverage the expertise of our members and friends in order to create more baselines for more taxa. Conservation is not done in a vacuum but requires collaboration; collaboration requires compromise; and compromise requires prioritization of conservation objectives. We cannot prioritize without knowledge, and for over one hundred years, knowledge has been the currency of OBS. With your help we can once again be a more active participant in knowledge creation that helps us understand, maintain, and preserve the rich diversity of plants and animals that we have all come to appreciate here in Ohio and the larger region of which Ohio is part. In this way, our name becomes truly descriptive… Ohio Biological Survey.

Visitors will learn how females choose their partners and how males improve their powers of seduction. They will see how natural selection can lead to adaptation and evolution. Specimens and taxidermy showcase the diverse adaptations animals have evolved to get ahead in the mating game. These include snails that use love darts, animals that present dazzling displays, and animals with enlarged or detachable reproductive organs.

In addition, the exhibition features live animal displays. An aquarium of guppies will illustrate how the males pass sperm packets to their mates using adapted fins. A colony of naked mole rats will demonstrate the unique social structure of these mammals and selective breeding techniques of the female queen.

Nature's Mating Games: Beyond the Birds and the Bees was created by the Natural History Museum, London. The Cleveland exhibition is sponsored by Medical Mutual of Ohio.
THE 2013 OHIO NATURAL HISTORY CONFERENCE INCLUDED A RANGE OF EXHIBITS AND POSTER PAPER PRESENTATIONS ON STREAM ECOLOGY, INVASIVE SPECIES, LAND USE IN URBAN AREAS, AND MANY OTHER TOPICS. THE POSTER ABSTRACTS ARE PRESENTED BELOW.

THE NEXT OHIO NATURAL HISTORY CONFERENCE WILL TAKE PLACE ON FEBRUARY 15, 2014 AND WILL BE HELD AT THE OHIO HISTORICAL SOCIETY MUSEUM IN COLUMBUS. PLAN TO CONTRIBUTE TO THE CONFERENCE WITH POSTER PRESENTATIONS OF YOUR LATEST RESEARCH.

A PRELIMINARY STUDY OF RED AUTUMN FOLIAGE & AN INSECTIVOROUS MIGRATORY BIRD SPECIES

CASEY J. TUCKER
PROJECT DRAGONFLY, DEPT. OF ZOOLOGY, MIAMI UNIVERSITY; CINCINNATI ZOO & BOTANICAL GARDEN; AMERICAN AVIAN CONSERVATION ASSOCIATION

Coevolution Theory suggests autumn leaf color change in deciduous tree species may be an adaptive characteristic that functions as a signal to potential plant predators and parasites that the tree is well defended. Several additional adaptive plant-predator hypotheses have been proposed; however, most do not seem to be well supported due to a number of different reasons. A potential better explanation is that leaf color change may be a means to attract insectivorous birds. I use a combination of citizen-science reports of forest color and bird frequency and digital color analysis of available satellite imagery to examine the relationship between a bird species and autumn leaf color change. I found that image analysis illustrated a positive change in red coloration over the course of the fall, that Ruby-crowned Kinglet frequency positively increased between September and October, and that there was a positive correlation between the increase of kinglets and red foliage.

CONTROLLING DENSE STANDS OF INVASIVE SWEET FLAG, ACORUS CALAMUS

DONALD R. GEGEL1 AND JAMES SCHNEIDER2
1 MARIANIST ENVIRONMENTAL EDUCATION CENTER, BEAVERCREEK OH; 2 BEAVER CREEK WETLANDS ASSOCIATION, BEAVERCREEK, OH

Rhizomatous, non-native sweet flag, *Acorus calamus*, forms dense, difficult-to-control populations in natural areas. We explored methods to remove stands of sweet flag that had invaded a pristine fen in the Hershner Reserve of Greene County Parks and Trails. Glyphosate-based herbicide, applied as a foliar spray or by wiping leaves, killed most of the above-ground vegetation but failed to kill rhizomes. We explored control by darkening the plants. After mowing to reduce biomass, we covered a stand with plastic film overlain with wood chips. The above-ground vegetation was killed but darkening failed to kill the thick mass of rhizomes. Next we exposed a mowed stand to solar heat applied by covering plants with clear plastic film sealed around the edges with wood chips. The above-ground vegetation was killed but leaf growth defeated the treatment by lifting the plastic cover and shading the soil. To inhibit leaf growth while applying solar heat, we covered the plants with opaque covers of black plastic or of discarded swimming pool covers. Heat was confined by sealing the edges with wood chips. Applying the treatments over a growing season killed both leaves and rhizomes. The few plants that possibly were alive were dug out. Inspection of the sites during the following year confirmed that sweet flag plants failed to re-sprout. We used this solarization method to eliminate sweet flag throughout the reserve on well over 10,000 square feet. Cleared areas were restored with seed gathered from native plants in adjacent fen vegetation.

EFFECTS OF URBAN LAND USE CHANGE ON SPIDER COMMUNITY STRUCTURE

CAITLIN E. BURKMAN AND MARY M. GARDNER
THE OHIO STATE UNIVERSITY, DEPARTMENT OF ENTOMOLOGY

Cleveland, Ohio, has 3,300+ acres of vacant land under consideration for revitalization efforts, including creating parks, community gardens, and grasslands established with native plants. Land use affects a variety of ecosystem services, especially those provided by arthropods. Spiders are important generalist predators and therefore may serve as a model system for examining effects of urban land use change. Ground-active spiders were collected with pitfall traps in summer 2011 within current vacant lots and two habitat conversion possibilities: community gardens and grasslands.

Habitats had similar family diversity levels in early summer, but diversity remained relatively high in grasslands and declined in vacant lots. Garden diversity decreased in mid-summer, but later rebounded. Spider abundance remained relatively high and stable in vacant lots, but lowest in gardens. Grassland catches rebounded. Spider abundance remained relatively high and stable in vacant lots, but lowest in gardens. Grassland catches decreased to levels equivalent to gardens in late summer. At the family and genus level, spider assemblage differences between the habitats become apparent. These results have implications for how habitat management may affect spider function within urban ecosystems.

QUANTIFYING THE POLLINATION SERVICE SUPPLIED TO PUMPKINS (CUCURBITA PEPPO) BY MULTIPLE BEE SPECIES IN OHIO

BEN PHILLIPS, SCOTT PRAJZNER, AND MARY GARDNER
THE OHIO STATE UNIVERSITY, DEPARTMENT OF ENTOMOLOGY

Pumpkin production relies on insect-mediated pollination and our goal was to measure the contribution of key pollinators
to this service. To accomplish this, we 1) quantified the amount of pollen deposited by individual bee species, 2) observed the ambient diversity and abundance of bees visiting open female flowers, and 3) measured how seed production is influenced by pollinator community composition. We hypothesized that multiple pollinator species contribute to pumpkin pollination, and that the pollination service provided varies by species. We determined the amount of pollen deposited by individual bee species by allowing single pollinators to visit female flowers. These flowers were either collected following the pollinator visit to determine the number pollen grains deposited or bagged to prevent additional bee visits and seed production was measured in mature fruit. We measured the ambient diversity and abundance of pollinators that visit a female flower within a 7 h pollination window using video surveillance. From these data we determined how variation in the community of bees influenced both pollen deposition and seed set. Future work will examine how pollinator communities and pollination services are influenced by the addition of floral resource strips to pumpkin production as a habitat management strategy.

**Improved Techniques for Handling Southern Flying Squirrels**

**Donald P. Althoff**  
*School of Science, University of Rio Grande*

Conducting studies of small mammals is commonplace for field labs and research because most species are relatively easy to handle and often pose few health risks to the captured animal and the handler. However, more recent concerns about contagious diseases (i.e., hantavirus) warrant reconsideration of handling procedures. Field handling of live animals is challenging because the animal must be restrained to avoid injury to both the captured individual and the handler, allow for collection of samples (i.e., tissue, droppings, urine, etc.), and make accurate morphological measurements (i.e., weight, length of feet, etc.). My objective was to evaluate use of cake icing bags and a customized handling tube made of clear PVC pipe for extraction and handling of southern flying squirrels (*Glaucomys volans*) from nest boxes. The icing bags, which are thicker than freezer bags as well as funnel-shaped, were trimmed at the tip to allow air flow. The flexible bags easily restrained the squirrels and facilitated weighing using spring scales. I have successfully processed over 100 animals using this technique with no mortalities or apparent injuries. The handling tube (with multiple chambers created by removable doors) allowed easier extraction of squirrels from multiple-occupant nesting boxes, thereby virtually eliminating escapes. Combined with the cake icing bags positioned at the exit of the handling tube, processing of southern flying squirrels was safe for both the squirrels and the handler, and was efficient under field conditions.

**Edge Effects in a South-Facing Successional Beech-Maple Forest: Preliminary Findings**

**Michael Benedict1,** Grace D’Angelo1,2, Nathaniel Frances3,1, Bryan Nemire1,2, and Matthew Hils1,2  
1Environmental Studies Program, 2Department of Biology, 1Religious Studies Department, Hiram College

Forest edges create altered microclimate conditions that influence the structure and composition of plant communities. Such edge effects have high ecological and conservation relevance because they decrease the size of functional forest-interior areas. Plant species richness is higher at edges than in the forest interior and may promote increased abundance of exotic invasive species. Edge effects are more pronounced on south-facing than on north-facing edges in the northern hemisphere because of greater sunlight exposure. The James H. Barrow Field Station (Hiram College) contains one of the few remaining old-growth beech-maple forests in the state of Ohio and is managed in part for its protection. Considering this site’s importance, and in support of its conservation-oriented management, this ongoing study investigates the extent of edge effects in a south-facing successional beech-maple forest by quantifying selected environmental parameters and the structure and composition of woody and herbaceous vegetation along an edge-to-interior gradient. Five 120-meter transects (10 meters wide) perpendicular to the edge were sampled at the following distances: 0, 1, 2, 3 meters, every five meters (from 5 to 45 m.), and every 10 meters (from 50 to 120 m.). Per distance, we record species presence and abundance (percent cover within herb, shrub and tree strata, and woody stem counts), estimated percent ground covers, slope, aspect, soil moisture and temperature, air temperature and relative humidity, wind speed, and light at the forest floor. We present project design and methodology, and report preliminary environmental and plant community results.

**Large-River Fish Host Identification for the Ohio Pigtoe (Pleurobema cordatum) Freshwater Mussel**

**Christa Hurak1,** Alex Boehm2, Kirstie Reilman3, Maria Vogel3, Meghann King1, and Christopher Lorentz2  
1Hanover University (IN), 2John Carroll University, 3Thomas More College (KY), TMC Biology Field Station and Center for Ohio River Research and Education

Freshwater mussels reach their greatest diversity in North America with approximately 300 recognized species, but are arguably the most imperiled group of organisms on this continent. The life history of most North American freshwater mussels involves infestation of a host fish with their larvae to complete metamorphosis into a juvenile. Knowledge of fish hosts for a variety of freshwater mussel species is essential in propagating juvenile mussels in captivity and reintroducing them in the wild. During the 2012 summer internship, undergraduate students at the Thomas More College Biology Field Station conducted a host fish test, infesting four large-river fish species with *Pleurobema cordatum* larvae (glochidia), a state endangered freshwater mussel in Ohio. Fish were collected via boat electrofishing for this test and included a freshwater drum, green sunfish,
black crappie, and smallmouth bass. These individuals were immediately acclimated to laboratory conditions for two weeks and then exposed to glochidia in individual buckets of water with heavy aeration. Each fish was placed in a separate tank of a recirculating aquaculture system. After infestation, the bottoms of the tanks were siphoned and sieved to 150µ daily and then examined using a dissecting microscope for the presence of recently metamorphosed juveniles. In the four-week period of detritus collection from the tanks, the presence of juveniles was not observed. The host fish tested may not be suitable hosts and future goals would be to test more replicates of the same fish species with *P. cordatum* in order to disprove these species as potential hosts.

A New Citizen Science Initiative at Hiram College: FrogWatch USA Frog and Toad Monitoring Program

Gurneet K. Raina, Jennifer M. Clark, Jim E. Metzinger, and Cara M. Constance Hiram College

In January of this year, Hiram College (Portage County, OH) became an official chapter of FrogWatch USA. This nationwide program is managed by the Association of Zoos and Aquariums and provides an opportunity for citizen scientists to contribute to long-term monitoring of frogs and toads. While the overall goal of FrogWatch USA is to assemble a data set that identifies the diversity, range, and phenology of both native and non-native frogs and toads, it also provides a wide range of opportunities for institutions to interact with their community and get both adults and children connected with nature. Local chapter coordinators lead trainings each year to educate citizen scientists about the importance of amphibians and to train them to identify frogs and toads by call and to use the FrogWatch USA protocol for monitoring.

Hiram’s chapter is unique in that it is one of the only chapters hosted at a college. One of the major goals of our chapter is to connect college students with nature and provide an opportunity for them to collect biological data and to become leaders in their community through managing the citizen-science program. Through a seminar course, we have attracted not only college students as FrogWatch USA volunteers, but also many community members including both adults and children. Data collection will begin at the end of February at Hiram College’s James H. Barrow field station and our newly acquired Eagle Creek Restoration site and will continue through August with summer internship opportunities for students.

Decomposition Rate and Macroinvertebrate Colonization of Artificial Leaf Packs in a Forested Headwater Stream

Nicholas R. Cusick and Jennifer M. Clark Hiram College

Leaf packs are natural sources of nutritional input as well as habitat for invertebrates in stream ecosystems, and can vary widely in composition and colonization by organisms. In this study, we examined leaf decomposition rate and macroinvertebrate colonization using three different types of artificial leaf packs [American Beech (*Fagus grandifolia*), Sugar Maple (*Acer saccharum*), and a combination treatment of equal mixtures of each] in riffles (*n* = 3) and pools (*n* = 3) in an Ohio headwater stream (Silver Creek, Portage County). Subsets of the leaf packs were removed two, four, and six weeks after initial deployment during winter 2012. Dissolved oxygen, pH, water depth, current velocity, and temperature were measured during each sampling period. The dry weight of leaf species significantly decreased over the three sampling periods (*P* < 0.0001), with Sugar Maple having significantly more mass loss than the combination treatment and the combination treatment having significantly more mass loss than American beech (*P* < 0.0001). However, the effect of habitat type on leaf decomposition was not significantly different between riffles and pools (*P* = 0.9010). Further, macroinvertebrate abundance significantly increased throughout the three sampling periods (*P* < 0.05) but there was no significant difference between leaf types (*P* = 0.4165).

Significant variance in decomposition rates between leaf types, relatively insignificant difference in colonization of invertebrates between leaf types, and the lack of impact of habitat type on decomposition suggest that macroinvertebrate species rather than abiotic parameters play a strong role in leaf decomposition in system.

Effects of Habitat Type and Leaf Species on Macroinvertebrate Diversity in a Forested Headwater Stream

Zachary C. Nemec, Kailey N. Cooper, Nicholas R. Cusick, and Jennifer M. Clark Hiram College

Food webs in forested headwater streams tend to be driven by autochthonous inputs (i.e., leaves). Leaf species, however, can be highly variable in nutritional quality, and better-quality food resources tend to be decomposed more rapidly by shredder invertebrates. In this study, artificial leaf packs of three different types [American Beech (*Fagus grandifolia*), Sugar Maple (*Acer saccharum*), and a combination treatment of equal mixtures of each] were used to assess colonization of macroinvertebrates in riffle (*n* = 3) and pool habitats (*n* = 3) in a headwater stream in northeastern Ohio (Silver Creek, Portage County). Leaf packs used for comparison were pulled at approximate two-week intervals on 11 November and 1 December 2012. Kick samples were collected in five random locations within each habitat (total of 30 samples) to allow for comparison of macroinvertebrate diversity between leaf packs and the stream system proper. Macroinvertebrate diversity significantly increased from the two-week to the four-week sampling period (*P* < 0.05) and leaf packs from riffle habitats had higher diversity overall (*P* < 0.05). Regardless of habitat or leaf type, collector-gatherers and shredders tended to dominate the leaf packs, with Plecopteran shredders being most abundant. Our results suggest that macroinvertebrate colonization and diversity increase as leaves become more conditioned; however, macroinvertebrates appear to not show preference for a particular leaf type.
The Regionally Rare Flora of the Remnant Prairie “Buffalo Beats” of Athens County, OH

Corey K. Kapolka¹, Cheryl R. Coon², and Brian C. McCarthy³
¹Department of Environmental and Plant Biology, Ohio University; ²Wayne National Forest, USDA Forest Service

The Buffalo Beats Research Natural Area of Wayne National Forest (Athens County, OH) is a remnant prairie at the edge of Transeau’s prairie peninsula, home to rare populations of Andropogon gerardii Vitman, Eryngium yuccifolium Michx., and Gentiana alba Muhl. ex Nutt. Research activity at the site dates back over 50 years, and includes several publications documenting the natural history of the prairie community and its surrounding forest. In the mid-1980s, encroachment by forest species into the prairie prompted the U.S. Forest Service to begin managing the site with fire treatments and woody species removal. Periodic surveys of permanent plots have accumulated valuable data on this changing community, but have been restricted to late summer sampling. Beginning in early March 2012 and continuing through October, biweekly floristic surveys of Buffalo Beats were collected to compile a more complete plant species list of the prairie than previously published. Permanent plots were also sampled for vegetative cover in mid-September. Nineteen species not previously published for Buffalo Beats were identified, including two species not previously documented for Athens County: Ranunculus fascicularis Muhl. ex Bigelow and Sisyrinchium albidum Raf. Using cover data collected over several decades from permanent plots, a continuing increase in the number of forest species within the prairie is apparent despite conservation activities, resulting in an increase in overall species diversity. However, vegetative cover and frequency of rare species have remained largely unchanged since the initiation of conservation by USFS, in contrast to losses observed prior to the beginning of management.

Remediation of an Acidic Pit Lake at the Muskingum Valley Scout Reservation Located on Reclaimed Mining Land in Coshocton County, Ohio

Zachery Beres, Curtis Clevinger, and Jennifer Clevinger
Walsh University

Increased understanding of global climate change and the dangers associated with burning fossil fuels have caused industrialized nations to search for cleaner sources of energy. This has led to the abandonment of coal mining operations where open pits become susceptible to backfill with surface and groundwater to form acidic pit lakes. Crystal Lake, Muskingum Valley Scout Reservation Coshocton County, Ohio, is one example of an acidic pit lake. These lakes pose certain ecological dangers to surrounding groundwater and adjacent land. The purpose of this study was to determine a suitable remediation technique for Crystal Lake to restore the quality of water back to that found in natural lakes. During a ten-week period from June to August 2012, remediation techniques were explored on Crystal Lake on a small scale using floating 2.5 gallon plastic carboys and on a large scale using the entire lake. Remediation techniques applied included the addition of grape-to-dust-sized limestone (large- and small-scale) and the addition of organic matter in the form of fruit and sawdust (small-scale only) on a weekly basis to maintain proper pH levels between 6.5 and 8.5. Water quality was monitored by measuring the pH, the concentration of nitrate, SRP, TP, DOC, and TN. Molecular data (TRFLP) was collected and is currently being processed to see how the bacterial community has changed, if at all, as a result of remediation. Initial observations indicate that both limestone (large-scale 3.24 to 4.11) and sawdust remediation are plausible remediation techniques to improve the quality of Crystal Lake.

Amphibians of Ohio Available Now!

Amphibians of Ohio represents the most comprehensive treatment to date of the state’s 40 species of frogs, toads, and salamanders; covering all aspects of natural history, taxonomy, systematics, conservation, sampling techniques, and more. The Ohio Biological Survey, in cooperation with the ODNR Division of Wildlife, is pleased to offer this approximately 900-page, casebound book.

(Nota: OBS Institutional Members will receive one gratis copy upon publication.)

Edited by Ralph A. Pfingsten, Jeffrey G. Davis, Timothy O. Matson, Greg Lipps, Jr., Doug Wynn, and Brian J. Armitage.

Price: $90; OBS Member Price: $72
Order online or contact us for additional ordering options.
Researchers have transported two endangered freshwater mussel species from Pennsylvania to Illinois in an attempt to re-establish their populations in the western part of the Ohio River Basin. The team of biologists, led by Jeremy Tiemann, of the Illinois Natural History Survey (INHS), traveled to the site of a bridge-replacement project on Pennsylvania's Allegheny River to collect northern riffleshell (Epioblasma rangiana) and clubshell (Pleurobema clava) mussels. The INHS is a division of the Prairie Research Institute at the University of Illinois.

The two mussel species historically had inhabited the Ohio River Basin, an area that stretches from Illinois to Pennsylvania and New York to Kentucky. The 2- to 3-inch-long northern riffleshells and their larger clubshell counterparts make their homes three or more inches beneath the surface of the gravel layer they live in, Tiemann said. There are more than 30,000 individual mussels of these species living under Pennsylvania’s Hunter Station Bridge. The bridge-replacement project brings with it the potential for huge losses of the already endangered species.

Mussels reproduce by attaching their juveniles to certain species of fish, so finding a suitable habitat for them can be a challenge. The northern riffleshell was “last seen alive in Illinois about a hundred years ago,” Tiemann said. There are sites on the Vermillion River in Illinois that serve as the perfect backdrop for the re-establishment of populations in the species’ historical range.

“It is a win-win situation for everybody,” Tiemann said. “We save the mussels and get a new population here in Illinois.”

The team collected the mussels over a two-day period in late August, and then brought them to their lab in Illinois to be tagged with a “microchip similar to what you put in your dog or cat. (It’s) the size of a large grain of rice,” Tiemann said.

Last year, the group collected and transported 1,000 northern riffleshells and 200 clubshells. The team has seen an 80 percent survivorship within this group. This year, they transported 750 clubshell and 250 northern riffleshell mussels.

The benefit of the project stretches beyond simply removing these species from the endangered list. Mussels have “their own little niche within the ecosystem and food webs” of their habitats, Tiemann said. Their shells provide a home for many fish and insects. They also are effective biofilters that help clean the water.

“A group of mussels in a tight area can filter as much water as a treatment plant,” Tiemann said. “Hopefully we will one day be able to pinpoint the exact monetary value of these Vermillion River mussels so policymakers can translate the science into dollars.”

For now, Tiemann is happy to see the restoration making waves among enthusiastic farmers, government wildlife agencies and concerned citizens. “A lot of people like to be outside, and this is one thing we can do to restore this scenic river to its pre-settlement condition,” Tiemann said.

The above story is based on materials provided by University of Illinois at Urbana-Champaign.

Feral Cats Avoid Urban Coyotes and Are Surprisingly Healthy

Cats that live outdoors in the city do their darnedest to steer clear of urban coyotes, a new study says. The cats cause less damage to wildlife in urban green spaces, such as city parks and nature preserves, because of that dodging, the study suggests. And they live longer and are healthier than previously thought.

“Free-roaming cats are basically partitioning their use of the urban landscape. They’re not using the natural areas in cities very much because of the coyote presence there,” said the study’s lead author, Stan Gehrt, associate professor of environment and natural resources at The Ohio State University. “It reduces the cats’ vulnerability to coyotes, but at the same time, it means the coyotes are essentially protecting these natural areas from cat predation,” he said.

The study, which was published recently in the online journal PLOS ONE, is the first to show how coyotes and free-roaming cats share space and interact with each other in urban areas. Gehrt and his colleagues monitored the health, home ranges, habitat selections, and other characteristics of 39 feral and stray cats near six parks and nature preserves in greater Chicago. The Chicago area has some of the densest populations of coyotes ever recorded.

The scientists found that most of the cats shunned the urban coyotes’ “core activity areas”—fragments of natural habitat within the city, as represented by the study’s parks and nature preserves. Instead, the cats restricted their own core activities to developed parts of the city, such as near homes and shops. Core activity areas are the areas within an animal’s home range where the animal spends most of its time and concentrates most of its activities, including hunting.

“Coyotes essentially exclude cats from natural habitat fragments in cities either directly through predation or indirectly through the threat of predation,” said Gehrt. “The cats avoid these areas.”

Coyotes are known to prey on free-roaming cats, whether ferals, strays, or pets, while free-roaming cats, on the whole, have been shown to kill great numbers of birds, small rodents, and reptiles. Both cats and coyotes can annoy city dwellers by...
howling at night, digging through trash, and threatening pets. And both can pose a public health risk: cats can spread a disease called toxoplasmosis; on rare occasions, coyotes have bitten humans.

The findings paint both animals in a more positive light, Gehrt said. “Free-roaming cats aren’t as diseased and short-lived as we often hear, and they’re not as harmful to wildlife as some other studies have suggested, at least not in urban natural areas,” he said.

For their part, coyotes provide a beneficial ecological service in urban natural areas by limiting the impact of cats. While urban coyotes often go into the developed parts of the city, such as streets and people’s yards, those places aren’t part of the coyotes’ core activity area, the study found.

“The way coyotes use developed areas is completely different from how cats use them,” he said. “They’re moving through those neighborhoods or commercial areas very quickly, using every bit of cover they can find, to get from one hunting area to another, whereas the cats are sticking as close to the buildings as they can.”

In other words, the cats are trying to stay close to people; the coyotes are trying to duck them.

“What the coyotes are doing is totally amazing,” Gehrt said. “They have to live in the urban matrix while avoiding people, which is pretty darn hard to do.” The new information paints a clearer picture of both animals’ behavior in urban areas and may refine how park and wildlife officials manage them, he said. But there’s a caveat: the study didn’t monitor the impact of cats on wildlife in the developed parts of the city.

“Even though we found that the cats’ impact on urban natural areas was low, that doesn’t mean that their impact would be low in the developed areas where they’re spending a lot of their time,” he said. “There’s a potential strong impact by cats on systems outside of those natural areas, but monitoring that was beyond the scope of our study.”

Coyotes in the study’s six parks and nature preserves were already being monitored as part of the wider, long-term Cook County, Illinois, Coyote Project, which Gehrt has been conducting since 2000. For this latest study, the researchers live-trapped free-roaming cats in or near those parks and nature preserves. They recorded each cat’s age, weight, fur coloration, body condition, and other traits; took blood samples for later testing; fitted the adult and juvenile cats with radio collars for tracking their movements; and released all the cats at or near their capture sites.

Findings showed that most of the sampled cats were in good body condition, with only a few mostly minor health problems. Blood tests indicated, for example, that the cats had little exposure to feline immunodeficiency virus, also called FIV or feline AIDS, and to feline leukemia virus. Cats that had been spayed or neutered were in even better shape.

“There’s definitely a need to sterilize (free-roaming cats) to control their overall population, and in some cases it may help them maintain better body condition,” Gehrt said. “That’s another finding of this study.”

In fact, only 20 percent of the cats died during the two-year study, with vehicle strikes and predation—probably by coyotes, he said—the main causes. Based on that survival rate, coyotes preying on feral cats “doesn’t happen as much as people think it does,” although the predation rate on indoor-outdoor pet cats may be greater, he said.

The study cats’ survival rate surprised him, he added. “I thought it would be much lower, whether because of the traffic we have in the region, which is pretty intense, or because the coyote densities are so high,” he said. “The assumption would be that it would be impossible for cats to survive under that pressure. But they do.”

In all, the sampled cats lived about as long as the area’s coyotes, longer than the foxes and skunks, and were second only to the raccoons. “The condition of the cats was generally much better than what we expected,” he said. “Their overall health and ability to survive in the landscape is greater than what people think.”

Gehrt’s co-researchers on the study were Evan Wilson, also of Ohio State’s School of Environment and Natural Resources, Justin Brown of the Max McGraw Wildlife Foundation and Chris Anchor of the Forest Preserve District of Cook County. Gehrt also holds appointments with the Ohio Agricultural Research and Development Center and Ohio State University Extension.

The above story is based on materials provided by Ohio State University. The original article was written by Kurt Knebusch.
**The Herbert Osborn Award**

**Purpose:** The Ohio Biological Survey, in honor of its founder, established the Herbert Osborn Award to recognize noteworthy accomplishments and service in the field of biology pertaining to the objectives of the Ohio Biological Survey. The Award is presented on an annual basis, and was initiated in 1991.

**Qualifications:** Recipients of the Herbert Osborn Award will be individuals who have made an exceptional contribution through consistent research publications to the advancement of knowledge concerning the occurrence, distribution, taxonomy, and/or ecology of the flora and/or fauna of Ohio. The intent of the Award is to recognize relevant accomplishments and service over a period of years.

**OBS Naturalist Award**

**Purpose:** The Ohio Biological Survey wishes to honor those individuals who have made significant contributions to our understanding and conservation of the natural heritage of Ohio.

**Qualifications:** An individual selected to receive the Ohio Biological Survey Naturalist Award will have worked energetically to acquire or disseminate knowledge, conserve natural areas, and/or foster our understanding of the fauna and flora of Ohio. The awardee will be an active contributor over a period of years in pursuit of the activities concerning the natural heritage of Ohio.

**Small Grants**

OBS offers small grant programs to support work that occurs partially or wholly in Ohio, and that promotes the Survey’s objectives. The Survey offers this support to individual members and institutional/corporate members from monies derived from a portion of dues income. Applicants for individual small grants must be current individual members of the Survey or employees/members of the institution or corporation that is a Survey member. Proposals should be received on or before February 1 of each granting year.

You can find more information, including an application form, at [www.ohiobiologicalsurvey.org/projects/](http://www.ohiobiologicalsurvey.org/projects/).

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**Ohio Biological Survey - Individual Membership**

The Ohio Biological Survey, an inter-institutional agency dedicated to the natural history and conservation of Ohio’s flora and fauna, has opened its membership to individuals. Individual members are entitled to a 20% discount on all Survey publications, will receive the Survey’s newsletter, *BioOhio*, can participate in hosted or co-hosted workshops, field trips, or lecture series, and are eligible to apply for research monies through the Survey’s Small Grant Program. All dues money will be returned to these benefits.

**Dues schedule:** Students and Retired Members: $15/year; Regular Members: $25/year; Lifetime Regular Membership: $500; and Lifetime Retired Membership (60 or older): $100. If you are interested in becoming a member, please send your name, address, and dues to Ohio Biological Survey, P.O. Box 21370, Columbus, OH 43221-0370.
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<tr>
<th>Institution</th>
<th>Address 1</th>
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<th>Phone 1</th>
<th>Phone 2</th>
<th>Email 1</th>
<th>Website 1</th>
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<tr>
<td>The Ohio State University</td>
<td>210 Kottman Hall</td>
<td>Columbus, OH 43210</td>
<td>(614) 292-2205</td>
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<td>senr.osu.edu</td>
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<td>Ohio University</td>
<td>107 Irvine Hall</td>
<td>Athens, OH, 45701</td>
<td>(740) 593-2290</td>
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<td><a href="http://www.biosci.ohiou.edu">www.biosci.ohiou.edu</a></td>
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<tr>
<td>Ohio University</td>
<td>315 Porter Hall</td>
<td>Athens, OH, 45701</td>
<td>(740) 593-1126</td>
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<td><a href="http://www.bio.ohiou.edu">www.bio.ohiou.edu</a></td>
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<td>Ohio Wesleyan University</td>
<td>61 S. Sandusky St.</td>
<td>Delaware, OH 43015</td>
<td>(740) 368-3885</td>
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<td><a href="http://www.ohiowildlifecenter.org">www.ohiowildlifecenter.org</a></td>
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<td>Royal Ontario Museum</td>
<td>100 Queen’s Park</td>
<td>Toronto, ON</td>
<td>MSS 207</td>
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<td><a href="http://www.rom.on.ca/collections/">www.rom.on.ca/collections/</a></td>
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<td>Otterbein College, Dept. of Biology and Earth Science</td>
<td>1 Otterbein College</td>
<td>Westerville, OH 43081</td>
<td>(614) 822-1517</td>
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<td><a href="http://www.otterbein.edu/public/">www.otterbein.edu/public/</a></td>
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<td>Ramser Arboretum</td>
<td>24565 Danville-Jelloway Rd.</td>
<td>Danville, OH 43014</td>
<td>(740) 501-4166</td>
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<td><a href="mailto:ramsers@axom.com">ramsers@axom.com</a></td>
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<td>Shawnee State University</td>
<td>940 Second Street</td>
<td>Portsmouth, OH 45662-4344</td>
<td>(614) 842-8200</td>
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<td>Stantec</td>
<td>11687 Lebanon Rd.</td>
<td>Cincinnati, OH 45241</td>
<td>(513) 842-6200</td>
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<td><a href="http://www.stantec.com">www.stantec.com</a></td>
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<td>Strategic Environmental and Ecological Services, Inc.</td>
<td>653 McCorkle Blvd, Suite G</td>
<td>Westerville, OH 43082</td>
<td>(614) 891-6905</td>
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<td>Ohio University</td>
<td>Summit County</td>
<td>Akron, OH 44313</td>
<td>(330) 867-5511</td>
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<td><a href="http://www.summitmetroparks.org">www.summitmetroparks.org</a></td>
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<td>Ohio University</td>
<td>Crestview Hills, KY 41017</td>
<td>Bowling Green, OH 43402</td>
<td>(859) 341-5800</td>
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<td><a href="http://www.thefieldbiologicalsurvey.org">www.thefieldbiologicalsurvey.org</a></td>
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<td>Ohio University</td>
<td>333 Thomas More Parkway</td>
<td>Springfield, OH 45501</td>
<td>(330) 935-2590</td>
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<td>Ohio University</td>
<td>5100 W. Central Ave.</td>
<td>Toledo, OH 43615</td>
<td>(419) 407-9700</td>
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<td><a href="http://www.metroparks.com">www.metroparks.com</a></td>
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<td>18729 Mercer Rd.</td>
<td>Wooster, OH 44691</td>
<td>(330) 263-2379</td>
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<td>Ohio University</td>
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<td>Zanesville, OH 43701</td>
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<td>Ohio University</td>
<td>4625 Morse Road, Suite 104</td>
<td>Columbus, OH 43230</td>
<td>(614) 416-8993</td>
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<td>13700 US Highway 33</td>
<td>Nelsonville, OH 45764</td>
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<td>Ohio University</td>
<td>1 University Plaza</td>
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<td>Cincinnati, OH 45221</td>
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