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**REGENERATION**  
Sustaining Knowledge in the Next Generation

# SUBURBAN SPACE



# ECOLOGICAL PLACE

biology's research facility poised to lead emerging field

BIRDS ARE CAPTURED IN A FINE NET (TOP LEFT), AND ARE CAREFULLY REMOVED (CENTER), A NUMBERED METAL BAND IS THEN PLACED ON THE BIRD'S LEG (RIGHT). AFTER TAGGING THE BIRDS WITH METAL BANDS (BOTTOM), RESEARCH ASSISTANT IAN STEWART, RELEASES THEM UNHARMED.

IT WAS A SILENT LANDSCAPE. All that was left of the old family farm was a timbered barn, a crumbling silo and thousands of daffodils stretching out in front of the bare farmhouse foundation. In the long grass, birds, mice, foxes, coyotes, snakes, and other wildlife roamed the acres of land that made up the McCullough Farm, located just off Russell Cave Road in north Lexington.

Today the land is known as the UK Department of Biology Ecological Research Facility (ERF) and is a unique suburban biological research site still teeming with wildlife. It includes such features as natural and artificial ponds, aviaries, an artificial stream system, two research modules and the recent property addition of the old Lexington Northside Library building, which houses meeting spaces, offices, and an on-site student laboratory.

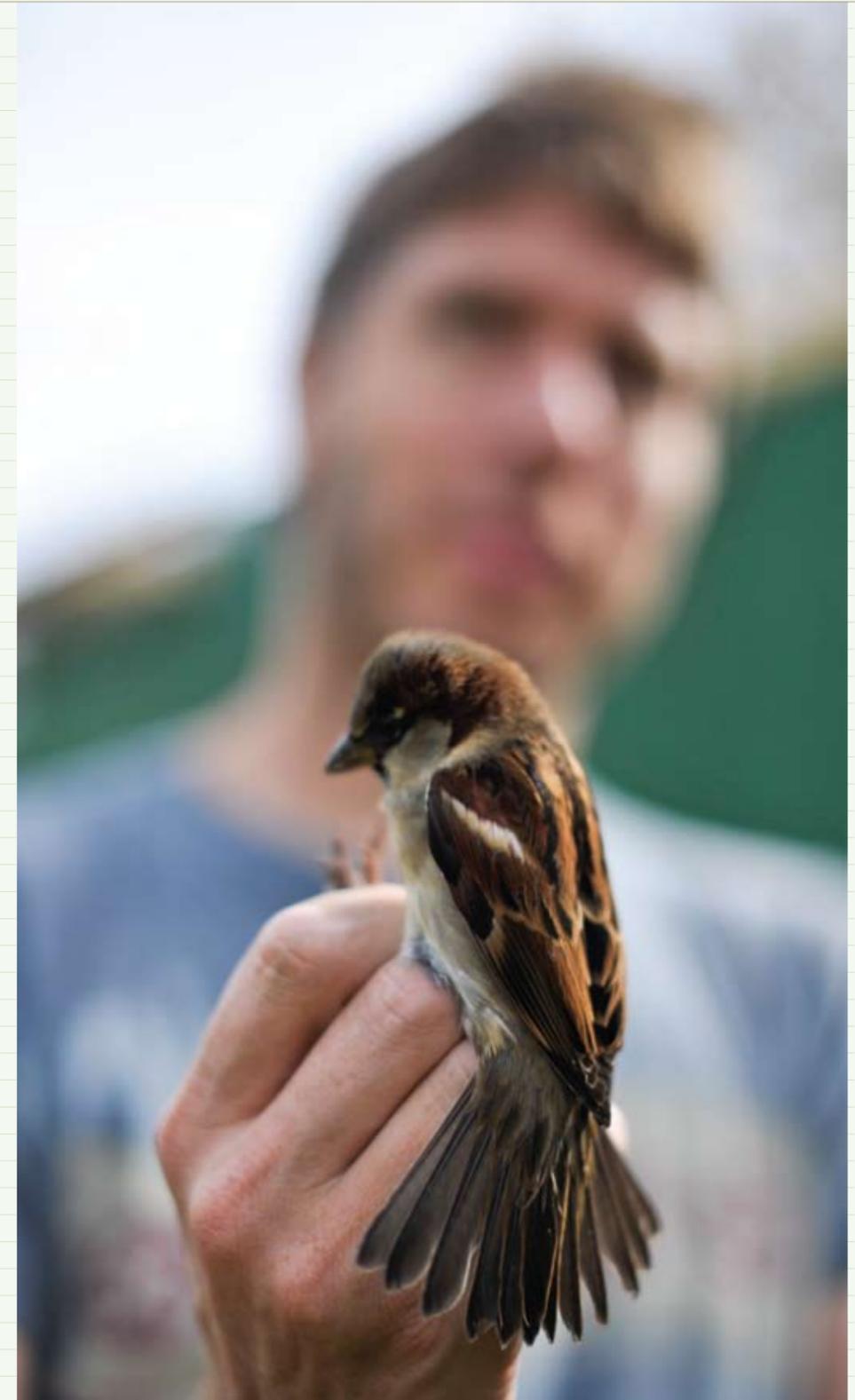
Back in 1988, the UK Department of Biology launched the Aquatic Research Facility (ARF) with funds from the National Science Foundation-Kentucky EPSCoR (Experimental Program to Stimulate Competitive Research). Located on Virginia Avenue, the facility consisted of a laboratory building and artificial research ponds, and was geared toward giving undergraduates training in aquatic research.

Eventually, being located in a prime real estate location put ARF in the crosshairs of campus development and the program made the move out to the old McCullough Farm, in the process expanding its purpose and changing its name to the Ecological Research Facility. Ten of the property's 52 acres were fenced, research ponds and a research module were built, and the ERF became a teaching and research site for faculty and graduate and undergraduate students from UK and other surrounding colleges.

Two recent developments have made ERF one of the highlights of a biology department committed to rapid development through the hiring of talented new researchers, the acquisition of grant funds, and the expansion of research productivity and training. The first of these developments was the arrival of the new chair of the UK Department of Biology, Dr. Vincent Cassone.

"One of the things that really attracted me to UK was ERF," said Cassone, the former head of the highly regarded biology program at Texas A&M University. "In a research environment where research stations are closing all over the world, it is unique to see a field station not only still open, but one situated within a suburban area."

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# FIELD NOTES

1970

1976-1985 - JULIA BENEDICT MCCULLOUGH DONATES SMALL SECTIONS OF THE OLD MCCULLOUGH FARM PROPERTY IN NORTH LEXINGTON TO UK, EVENTUALLY TOTALING 52 ACRES.



1980

1988 - WITH FUNDING FROM THE NATIONAL SCIENCE FOUNDATION (NSF)- KENTUCKY EPSCOR, THE AQUATIC RESEARCH FACILITY (ARF) IS OPENED ON VIRGINIA AVENUE. IT HOUSES A LABORATORY BUILDING AND RESEARCH PONDS.

1988-1992 - FOUR YEARS OF NSF RESEARCH EXPERIENCES FOR UNDERGRADUATES GRANT SUPPORT AT ARF.



1990



1995 - THE AQUATIC RESEARCH FACILITY BECOMES THE ECOLOGICAL RESEARCH FACILITY (ERF) AND MOVES TO THE RUSSELL CAVE ROAD LOCATION ON OLD MCCULLOUGH FARM. TEN OF THE 52 ACRES ARE FENCED, PONDS ARE DUG, ARTIFICIAL STREAMS ARE CONSTRUCTED AND A LAB MODULE IS BUILT. STUDENTS FROM UK AND TRANSYLVANIA UNIVERSITY BEGIN USING THE FACILITY.



2000-2004 - FOUR SEPARATE NSF DOCTORAL DISSERTATION IMPROVEMENT GRANTS ARE AWARDED TO STUDENTS WORKING PRIMARILY AT ERF.



2000

1995-2009 - GRANT AWARDS FROM THE NATIONAL SCIENCE FOUNDATION AND THE NATIONAL INSTITUTE OF MENTAL HEALTH FOR RESEARCH CONDUCTED AT ERF TOTAL ALMOST \$1.5 MILLION.

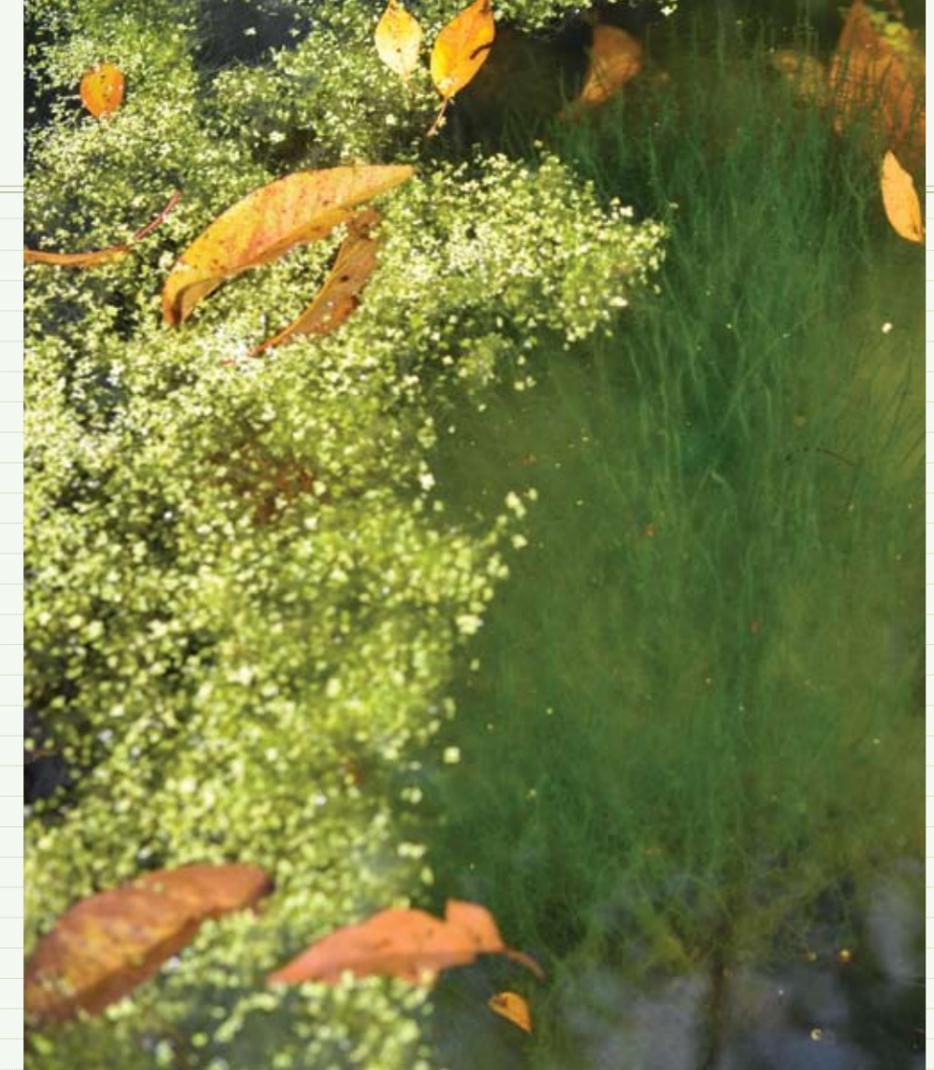
2008 - DR. VINCENT CASSONE BECOMES THE NEW CHAIR OF THE UK DEPARTMENT OF BIOLOGY.

2008 - UK EXPANDS ERF WITH THE ACQUISITION OF THE OLD NORTHSIDE LIBRARY BUILDING AND PLANS TO RENOVATE THE FACILITY TO HOUSE ON-SITE ECOLOGICAL LABS, MEETING AREAS AND OFFICES.

2009 - AN ADDITIONAL RESEARCH MODULE IS CONSTRUCTED AT ERF, ADDITIONAL AVIARIES ARE ADDED AND THE ARTIFICIAL STREAM SYSTEM IS RENOVATED.

2009 - A NATIONAL INSTITUTE OF HEALTH GRANT PROMISES \$200,000 PER YEAR FROM 2009-2014 FOR THE STUDY OF AVIAN CIRCADIAN BIOLOGY.

2010



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Cassone is spearheading significant changes in the biology curriculum set to take effect in fall 2010, a key part of which is giving undergraduates the dynamic experience of hands-on, on-site laboratory research.

To that end, UK purchased the old Northside Library building adjacent to ERF, which is being remodeled to house an undergraduate student laboratory as well as offer expanded state-of-the-art research facilities for faculty and graduate students.

"We've shifted our emphasis from huge freshman labs to realizing that we need to train our majors better and give them lab experiences at the next level," said Dr. Philip Crowley, who has been actively involved with ERF since its conception on Virginia Avenue.

Under the new curriculum, all biology majors will be required to take an ecology course, and the plan is for the ecology lab to take place at ERF. With six or seven lab sections and 25 students in each section per semester, the addition of the old library building will make it possible for undergraduates to have the kind of hands-on field educational experience that has become increasingly rare in biology programs.

"Ecology should be taught outside as much as possible. The problem is you can't take students to Red River Gorge easily. But this way, every week they can be outside doing a field-oriented experiment or project, and that's just a much higher quality education," said Dr. James Krupa, an ecology professor in the UK Department of Biology.

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One of the key features of ERF is its location. Suburban ecology is an emerging field and ERF is uniquely situated within a suburban environment that allows researchers to examine the ecological impact of suburban phenomena such as the effects of certain toxins on animals, insects and birds. Study at ERF can also provide insight into how the plants we grow in our yards can accidentally become pests, which has happened with the invasive species kudzu, which kills native plants throughout the Southeast.

“Many plant invaders began as horticultural species that people planted around their homes and businesses,” explained Megan Poulette, a doctoral student who is currently writing her dissertation on invasive species. “Plants like bush honeysuckle, wintercreeper and oriental bittersweet readily escape urban and suburban areas and invade Kentucky forests, parks and wilderness areas, choking out native species.”

ERF attracts researchers with a wide variety of expertise from different departments and even different universities. Dr. James Wagner of the Transylvania University Biology Program has been an active researcher at ERF since 2000 and regularly brings his entomology and ecology students to ERF for instruction on things such as ecological sampling techniques and pollination biology.

“I am excited by the prospect of the UK Department of Biology becoming joint users of the old library space because that will give the researchers who use ERF a common space in which to meet and interact with each other,” Wagner said. “With increased communication between the various groups conducting research at ERF, then the potential for collaborations will increase.”

With the acquisition of the library building as well as a second research module, updated aviaries and a renovated artificial stream system, ERF is poised to enter a new chapter of excellence in research and teaching.

“I think that as we build modern biology departments in the 21st century, we really need to pay attention to what the real biological challenges are in the 21st century,” Cassone said. “Those challenges are the long-term effects of climate change, the effects of human overpopulation on biological and biomedical processes and the effects of urbanization on life.”

Going forward, the goals for ERF are clear: an increased level of science outreach by partnering with other science education groups both on and off campus, high quality ecological instruction in the form of on-site undergraduate labs, and the development of an ecological research facility in the broadest sense, in which funded research related to environmental problems in modern society is conducted.

“We’ve expanded our research footprint on that small site, and expanded the kinds of research we are able to do out there,” said Crowley. “We’re definitely fired up about that.” &