



# Ross Biological Reserve & Alton A. Lindsey Field Laboratory

Biological Sciences, Purdue University, August 2011  
Ecology and Evolutionary Biology

## RESEARCH FOCUS

### OPEN HOUSE OCTOBER 22

During Purdue's Homecoming weekend, we will have our annual pancake breakfast to celebrate the 62<sup>nd</sup> anniversary of the Ross Reserve and 12<sup>th</sup> anniversary of the Lindsey Lab. We welcome alumni, faculty, students, friends, and families 8:00am - 2:00pm at the Lindsey Lab. We will have short presentations of current research at 10:00. Directions below.

As the forest in the Ross Reserve slowly changes and is better understood, new experimental research programs have been initiated to complement long-term observational studies. Nancy Emery and students are studying herbaceous plant communities and their potential responses to climate change ("Research Focus" at right), and Esteban Fernández-Juricic and students are studying the ecological and aeronautical implications of bird visual systems.

They are asking whether understanding of birds' responses to radar on airplanes could be used to avert collisions, and whether variability among individuals in

response to predators is based on variability in visual systems. Josh Shields, working with Mike Jenkins of Forestry & Natural Resources has removed invasive Amur honeysuckle from large areas of second-growth and is measuring the response in plant and mammalian communities. Ken Henry and Mark Nolan, working with Jeff Lucas, completed the 19<sup>th</sup> and 20<sup>th</sup> PhD theses since 1980 on research conducted at the Reserve. Dr Lucas' lab has long studied the acoustic and informational structure of birds' vocalizations, and how they are used in communication within mixed-species flocks, often employing field experiments. Alton Lindsey's vision of a "living laboratory" still works.



Asya Ayrapetov, a PhD student in Botany & Plant Pathology, is working with Dr. Nancy Emery and four undergraduates to understand the



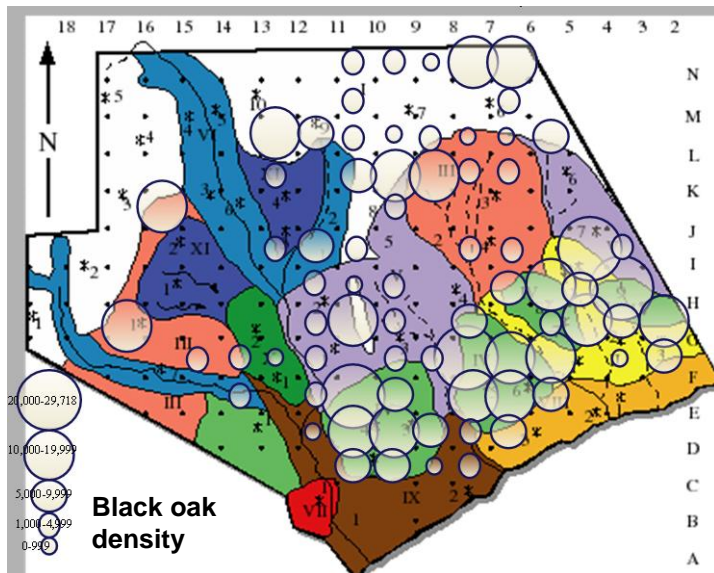
impacts of climate change on forests. The spring ephemeral community is a functionally important group of herbaceous perennials with emergence and flowering stages that are highly sensitive to environmental variability.

Focusing on the spring beauty (*Claytonia virginica*, above), Asya is measuring effects of soil and air warming and early spring canopy closure on the plants' timing of emergence and flowering. She is also asking whether altered pollinator interactions could curtail reproductive success through pollen limitation. Changes in pollinator behavior and abundance could also interact with other spring ephemerals like bloodroot (at left). She has established experimental plots in a quarter-hectare fenced study area in mature forest where some plots are heated to levels predicted by climate-change models. Biological Sciences staff have been instrumental in executing the technically sophisticated experimental design. This work is unique in focusing on a distinctly vulnerable plant community and complex species interactions in natural habitat, combining a naturalist's insight into plant and insect ecology with experimental



rigor. Asya has been awarded a National Science Foundation Graduate Research Fellowship for three years. The Ross Reserve's protected forest and infrastructure are ideal for this innovative work.





The decadal tree census, conducted by Matt Gasner and Anna Ciecka, was expanded to include most of the Reserve and more than 10,000 tagged trees. This database was employed by the Field Ecology class to ask whether Faulkner's soils map could explain plant community composition. Some species' distributions, like black oak (*Quercus velutina*; above) map closely onto particular soils (sandy and ridgetop soils), and statistical classification of tree communities results in three main community types: second-growth dominated by tulip poplar; dry soils dominated by black oak and hickory; and more diverse forests on richer, moister soils.



Another watershed event has been the demolition of the trailer ("ecologist-in-residence quarters") installed in 1978 with a National Science Foundation grant. This makes way for a planned second log structure modeled on the Lindsey Lab to house a graduate ecologist and researcher space. The Department is launching a fundraising campaign to match pledges already received from faculty and Friends of the Ross Reserve, including Elizabeth Lindsey, Marion Jackson, Steve Austad, Scott Wissinger, Bill Bromer, Stephanie Fabritius, Brian Keane, Pete Fauth, Cathy Mossman, Aaron Pierce, and Jill Jankowski.

contact: Prof. Kerry Rabenold (765-494-8120; [rabenold@purdue.edu](mailto:rabenold@purdue.edu)). If you would rather receive email, please send your address.



In May we honored Peter Waser on the occasion of his retirement with a picnic at the Lindsey Lab, attended by many faculty, grad students (some above), and families. Peter arrived at Purdue shortly before the retired trailer, and has stood the test of time much better.



As in many previous years, Biology Outreach veterans Isidore Julien and Clark Gedney made excellent use of the Lindsey Lab and Reserve. Students in their Summer Biology Experience, funded by the Howard Hughes Medical Institute, spent four days (above) exploring the Reserve ecosystems, ecology, and the scientific method. In addition, the team that won gold medals at the International Biology Olympiad in Taiwan studied plant biology with Nancy Emery at the Ross Reserve during their National Finals in June.

The Reserve lies between the Ravines golf course and the Ross Hills County Park, on the north bank of the Wabash in Tippecanoe County. From campus, follow South River Road (becoming Division Road) downstream (southwest) past Fort Ouiatenon, Granville bridge, and the Ravines golf course, turning south (left) on county road 875, with signs to Ross Hills. Just before a turn and the county park, after a golf-course service road, the Reserve sign and entrance are on the left.

