



Ross Biological Reserve & Alton A. Lindsey Field Laboratory

Biological Sciences, Purdue University, September 2005

OPEN HOUSE OCTOBER 15

During Purdue's Homecoming weekend, we will have our biennial pancake breakfast to celebrate our Living Laboratory. We welcome local faculty, students and friends, as well as alumni from 8AM to Noon at the Lindsey Lab. For a map, please contact us (below).

The Reserve and Lab continue to be invaluable resources for Learning, Discovery, and Engagement, and our Department's Strategic Plan recognizes this. The spatial and historical complexity of the Reserve's habitats make great subjects for our courses. The upper- and lower-division Ecology courses each use the Reserve and the Lindsey lab, as will our new laboratory course in ecology for majors in the core curriculum. Conservation Biology and Field Ecology conducted several field studies of forest dynamics, exotic species, plant-community classification, and soils, and made it a focal case-study for applying concepts of reserve design.

A dozen undergraduate independent studies or Honors research projects were conducted in 2005 at the Reserve, including participants in Jeff Lucas' studies of chickadee language. Within the confines of its 100 acres, the Reserve shows surprising variety in both mature and second-growth forests. Nick Tackett's Honors thesis addresses variation in the latter that is driven more by local soil and seed sources than by history. The Reserve as a wildlife refuge is increasingly important as housing developments grow around it.



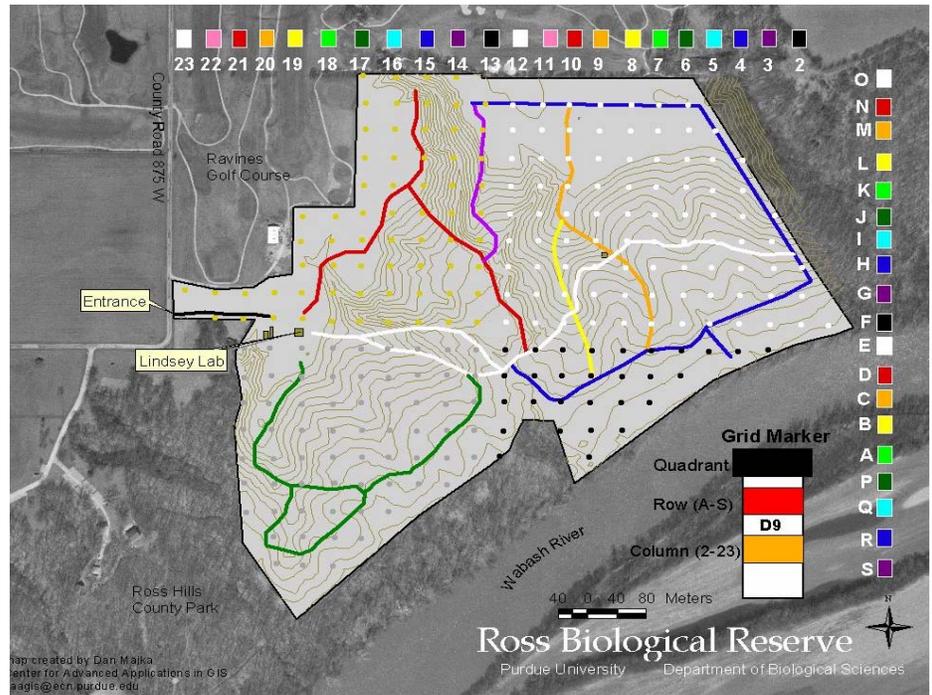
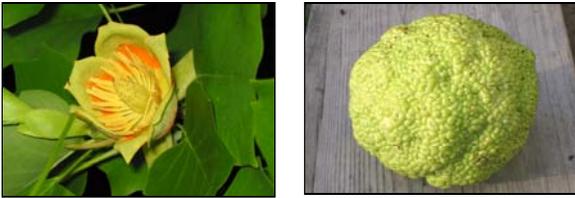
RESEARCH FOCUS

Mark Nolen has begun his doctoral study of communication by flocking birds at the Ross Reserve. Many forest birds travel in groups that contain several species, and many studies have shown benefits of flocking in both finding food and avoiding predators. It has been argued that because of these benefits, communication that facilitates flocking could be advantageous even between species, and that some birds respond to the calls of "nuclear" species that form the core of the flock. It is unclear whether communication would be advantageous to the core species, or if calls given to communicate with conspecifics are simply "overheard" by other species in the flock.

In addition to observations of natural calling, Mark is doing experiments to distinguish between these hypotheses using calls given by Carolina chickadees (*Poecile carolinensis*),

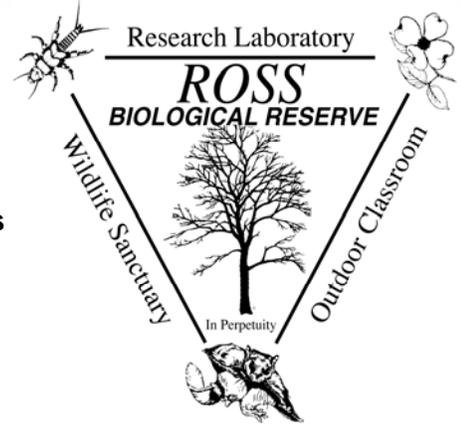


white-breasted nuthatches (*Sitta carolinensis*), and tufted titmice (*Baeopholus bicolor*). He presents models and playbacks of calls of predators (screech owls & great-horned owls), and then analyzes how a species' calls and the responses of other flocking species vary depending on the members of the flock. He also plays back "mobbing" calls of flocking species under a variety of circumstances to measure responsiveness to other species' antipredator calls. The Ross Reserve and surrounding forest are big enough to provide large populations of the species in question, and he has color-banded most of them to permit individual recognition and control of the experimental histories of individuals. The Reserve is also sufficiently protected to prevent disruption of these sensitive studies.



The Lindsey Lab has been used for classes, outreach, and conferences, including visits by local elementary schools, meetings of the Purdue Climate Change Research Center, the Biology Upward Bound summer program, and a research symposium of graduate students across our Department. The Purdue Ecology Club made a day of removing exotic shrubs around the Lindsey Lab and replacing them with natives. Invasions by species like honeysuckle, autumn olive, multiflora rose, and garlic mustard continue to be a challenge, although some of our experimental removal plots show that recovery is possible. Long-term class data also show that the interior of the mature forest still resists exotics. Our outreach activities have brought local teachers to the Reserve several times, and K-12 students have participated in studies with Biology faculty and graduate students of birds (below) and spring wildflowers.

Researchers in other departments are also conducting research at the Reserve, including studies of bark insects (Entomology) and temporal patterns of seed production by trees and implications for seed dispersal (Forestry & Natural Resources). Mapping of soils and forest types (now including some 7000 tagged trees) facilitates these kinds of interdisciplinary research



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