Cornell University's Arnot Teaching and Research Forest: Integrating Teaching, Research and Extension

Overview

The Arnot Forest is unique within the College of Agriculture and Life Sciences, and the state, as a facility that integrates virtually all programs across teaching, research, and extension functions among student, educator, landowner, and manager audiences. Program participants are better able to make informed decisions about the management, conservation and economic impacts of how they utilize natural resources. Student- and faculty-based research programs are integrated with teaching and extension in support of college and department missions. It is through this integration that the Arnot Forest supports the Department of Natural Resources' mission to create knowledge and facilitate learning. Arnot Forest programs further contribute to the College of Agriculture and Life Sciences mission areas in student education, extension education, productive and sustainable agriculture, environmental stewardship, safe and secure food supplies, and economic vitality.

The Arnot's Mission & Philosophy:

The mission of the Arnot is to document and disseminate the ecological and economic functions of a managed hardwood forest. This mission is embedded within a conservation ethic that strives to maintain balance between sustainable production and ecosystem function.

Arnot Forest Service to Department, College and University

Through program areas, stakeholders, and integration of functions, the Arnot Forest brings life to the mission of the department, college and university. A synopsis of the Arnot's contribution to academic functions includes:

- TEACHING – Academic departments commonly bring 12+ class sections per year to the facility involving an average of 400 students. Sixty interns in 10 years have worked on summer research projects and taught 4-H youth through Career Explorations. Importantly, the Environmental Career Skills program provides faculty-based pre-freshmen orientation that grounds the freshmen, eases their transition, and creates long-lived bonds among students and faculty that encourages stability in the lives of students.

- RESEARCH – Current and recent research involves faculty and students from Natural Resources, Horticulture, Biology, Ecology and Evolutionary Biology, Neurobiology and Behavior, Crop and Soil Science, and Entomology. Additional institutions are also involved in research. Projects span the basic to applied spectrum.
- EXTENSION – The research and management activity within the Arnot Forest offers unique extension education opportunities for the Master Forest Owner volunteer training (19 years), Cornell Maple Program (11 years), Game of Logging (9 years), Conservation Education (8 years), Forest Resources Extension SHaring (FRESH) educator in-service (7 years), Camp Mushroom (4 years), and Master Naturalist (2 years). Applied research and demonstration areas support extension education.

Academic and Operational Program Areas

- UNDERGRADUATE RESEARCH – The Arnot Forest Research and Extension Internship program is the cornerstone of undergraduate research activity at the Arnot. Since 2000, more than 60 undergraduates have worked with a faculty mentor from one of five departments in the college.

Faculty mentors guide undergraduates in their research projects. Students are mentored in extension education through learning experiences where they engage youth and adults. In 2009, interns began creating webinars of their projects to gain skill in an emerging technology and to more broadly showcase their projects. Additionally, some undergraduates work on projects in conjunction with a class. Intern project leaders during the last five years include: Chabot, Curtis, Fahey, Goodale, Goff, Lassoie, Morreale, Mudge, Schneider, Smallidge, Sparks, Sullivan, and Yavitt .

- FOREST RESOURCES AND BIOGEOCHEMICAL CYCLES – The Arnot Forest is the most intensively studied, monitored, and used forest of the university's properties. The Northeast is dominated by private working forests and woodlots. As a model of the region, the Arnot Forest provides opportunities for research, extension and teaching. Research projects occur across the full continuum of basic to applied questions and typically involve student researchers and extension education components. Examples of projects include silica movement in plants, earth worm impacts in CO_2-rich litter, nitrogen dynamics, forest biomass harvesting intensity, production of high quality sawtimber, and organic and conventional control of interfering and invasive forest weeds.

- WILDLIFE CONSERVATION AND MANAGEMENT – Wildlife are a pervasive force in the regions' forests, through their scarcity or abundance. Arnot Forest projects address the impacts that human activities have on forest wildlife populations, and develop meaningful guidelines that woodland owners and managers can adopt for use in the state and region. Examples of projects include forest biomass harvesting intensity, logging landing debris management, hunter attitudes and utility in deer management, amphibian response to forest manipulation, deer impacts on forest regeneration, and establishment of warm season grasses.

- NATURAL RESOURCE ECONOMIC ENTERPRISES – As a working forest, the Arnot is positioned to offer research-based and practical learning in the areas of timber production (see below), maple syrup production and agroforestry. The Arnot Forest, and the Uihlein Forest, are central to research and extension projects of the Cornell Maple Program. Among the other maple research institutions, only Cornell through the Arnot and Uihlein are conducting silvicultural manipulative research. The Cornell Maple Program integrates with the production operations of maple syrup. The Arnot serves as a primary host site for agroforestry projects that address forest farming for gourmet mushrooms, ginseng and goldenseal. These projects are heavily interactive involving students, researchers, extension educators, landowners, and commercial producers.

- FIELD CAMPUS – The field campus links people to the forest and thus is the hub for groups and projects. In recent years, field campus use has averaged 15 Cornell-based academic groups of undergraduates, 400 Cornell students, and almost 1200 people-days. Further, the field campus has annually averaged 34 other groups (many as Cornell affiliates) and 3022 people-days.

- TIMBER MANAGEMENT – The primary income source for the Arnot Forest is timber production. As a working forest, faculty and managers experiment with and demonstrate techniques in response to real issues, such as overabundant deer, invasive insects and interfering plants. These efforts serve as a model for owners, managers and practitioners throughout the state and region. Timber management creates opportunities and provides logistical and financial support for teaching, research and extension programs.