



## Research

### **Native Plant Propagation Program**

In 1998 Pam Gallery, plant enthusiast and collector of flora of the central Blue Ridge, began the Native Plant Propagation Program under the auspices of The Wintergreen Nature Foundation (TNFW). Its purpose is to study and document the propagation requirements of wildflowers in the central Blue Ridge. Today, Jean Bertelsen and many volunteers continue to collect and germinate seeds, and study the many varieties of wildflowers found throughout the mountains and valleys of the area. The staff and volunteers at Trillium House are knowledgeable about the care of plants that thrive in this mountainous region. Purchasing the mountain's native plants supports the Foundation's research efforts. Native plants are for sale at the Trillium House from April through October. No shipping is possible.

### **Native American Archaeological Project**

In the spring of 2003, TNFW and archaeologists from the Department of Sociology and Anthropology at James Madison University (JMU) began a multi-year program to identify and record archaeological sites on the Wintergreen Resort property, where the Blue Ridge has a long cultural history. Archaeological sites date from 10,000 years ago, to the time of early Native American hunter/gatherers, and span to the farmsteads and narrow gauge railroad grades of the early 20th century. Directed by Carole Nash of JMU and developed as a volunteer-based program, TWNF members are regularly invited to participate in archaeological fieldwork and related programming. Announcements of field days and lab work are posted on the website.

### **Orchid Research at Wintergreen**

Strangely enough, all orchids digest fungi to obtain nutrients, at least at some stage in their lives. When people think of orchids, the first thing that generally comes to mind is usually one of the large showy tropical varieties grown in greenhouses, although many people are at least familiar with lady slipper orchids. What most people do not realize is that 10% of all plant species are orchids and there are approximately 150 species of orchids native to North America (not even including Mexico and Florida).

These orchids depend strongly on the fungi they associate with. Many orchids will not even germinate unless there is an appropriate fungus present. Orchid seeds are so small that they are like dust and contain essentially no energy reserves. After germination all orchids must digest their root-dwelling fungi to obtain the energy needed to grow large enough that they can begin to photosynthesize. Many orchids continue to receive substantial nutrition from fungi throughout their lives, and some, like the coralroots (*Corallorhiza* and *Hexalectis*), have lost their ability to photosynthesize altogether and must depend entirely on fungi. Because fungi are so essential to their growth and survival, the majority of native North American orchids cannot survive being transplanted (one reason not to dig them!).

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During the summer of 2003, Stephanie Pimm and Melissa McCormick worked with the Smithsonian Institution on a project to identify and describe the diversity of fungi associated with several of the fringed orchids (genus *Platanthera*) found in the Blue Ridge Mountains. Leaf and root samples were taken from several species at a number of different sites throughout the property. From these samples the DNA of each plant and its associated fungus were extracted. Using DNA sequences is the only way to accurately identify these fungi, which are cryptic and do not produce easily identifiable mushrooms. It was found that certain groups of closely related species of *Platanthera* rely on particular groups of fungi. Some of the species sampled appear to always associate with one particular species of fungus.

Because orchids so strongly depend on their fungi, this type of one-on-one relationship means that identifying and culturing the fungi will be essential to orchid conservation and restoration efforts. We have grown fungi from many of these species in the lab and these cultures may prove useful for propagating orchids from seed, as well as possibly reintroducing the fungi and, in turn, reintroducing the orchids to areas where they have become locally extinct. This project brings man one small step closer to preserving some of the most beautiful and fascinating plants in the Blue Ridge.

#### **Education & Field Science Advisory Committee**

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