New England Botanical Club - Minutes of the 1005th Meeting

4 March 2005

Jennifer Forman Orth, Recording Secretary

The 778th meeting of the New England Botanical Club, being the 1005th since its original organization, and the 110th Annual Meeting, was held on Friday, March 4, 2005, in the Lecture Room of the Fairchild Biochemistry Building, Divinity Avenue, Cambridge MA. There were 34 members and guests in attendance.

The night began with the reading of annual reports from the following committees: Finance, Vascular and Non-Vascular Herbarium, Library, and Graduate Student Award. The slate of officers for 2005-06 was then presented by Alice Schori, Chairperson of the Nominating Committee, and was approved by club members. President Art Gilman thanked outgoing Curator of Non-vascular Plants, Anna "Nancy" Reid, and outgoing Recording Secretary, Jennifer Forman Orth, for their many years of service.

Vice President Karen Searcy then introduced the night's speaker, NEBC Student Councilor Julie Richburg. Karen noted that Julie spent several years doing work for The Nature Conservancy before she began the graduate work that was the focus of her talk, "Timing treatments to the phenology of root carbohydrate reserves to control woody invasive plants."

Having come to UMass Amherst with a background in natural area management, Julie was interested in finding practical, herbicide-free methods of invasive species control to assist land managers. She focused her research on a set of native and non-native weedy shrubs and small trees, looking specifically at the effects that timing of fire and mechanical treatments had on these species. To assess impact on the woody plants, Julie measured above-ground growth and also sampled root systems to measure TNC (total non-structural carbohydrates), the reserves stored in the underground parts of a shrub that support leafout in the spring. Her goal was to test the idea that the most effective control treatments would involve applying the first treatment when TNC reserves are lowest, theoretically causing stored resources to be used up, and then following up with a second treatment soon after to deplete reserves even further.

The three study sites for Julie's research were Naushon Island, MA (catbrier and Scotch broom), the Nature Conservancy's Berkshire Preserves, MA (Japanese barberry and shrub honeysuckle), and Montezuma National Wildlife Refuge, NY (gray dogwood, multiflora rose and common buckthorn). At each site, there were four ¼-hectare plots, each subject to one of four treatments: 1) untreated 2) dormant season burn or cut 3) growing season cut in 2001, cut again in 2002 and 4) growing season cut and burn in 2001, cut again in 2002. All sites were tracked from 2001 through 2003. The cutting of invasive shrubs was done using a power brush cutter or a mower, and the prescribed burns were completed with assistance of The Nature Conservancy, the National Park Service, and the Fish and Wildlife Service.

When looking at both above-ground growth and root reserves, Julie found that a single treatment (cut or burn) was not very effective, especially when done during the dormant season. All species resprouted, but the vigor of the sprouts was significantly lower in the multiple growing season treated plots. Root reserves temporarily declined following all treatments but recovered following one growing season without any treatments. High levels of TNC corresponded to greater sprout growth. There was much less sprout biomass if treatments were done during the growing season.

There was typically a positive impact on plant diversity following the treatment of the invasive shrubs, many of which were present as virtual monocultures. At the Montezuma site, all treatments resulted in a 40% increase in species richness, though Julie noted that some of the new species, including black swallowwort, were not native. At the Naushon site, catbrier cover was decreased, but was replaced by Scotch broom in some of the plots.

Julie concluded her talk by discussing some of the implications of her research for invasive plant management. She reiterated that timing is important when employing cutting and burning as a control. Multiple treatments in a single growing season need to be close enough together to stop replenishment of root reserves. If sprouts are allowed to grow, the TNC will be replenished quickly, even after two years of treatment. However, if managers are persistent and apply treatments over several years, they are likely to have success.