

## New England Botanical Club – Minutes of the 979<sup>th</sup> Meeting and Field Trips 7-8 June 2002

The 752<sup>nd</sup> meeting of the New England Botanical Club, being the 979<sup>th</sup> since its original organization, met on Friday, June 7, 2002, in Shaler Hall, Harvard Forest, Petersham, Massachusetts with ?? members and guests present. Paul Somers, NEBC President, made some announcements about upcoming field trips and meetings, before introducing the speaker.

Glenn Motzkin, plant ecologist at the Harvard Forest, spoke about “Historical Influences on the Vegetation of Massachusetts: Ecological and Conservation Implications.” Glenn spoke about his studies and others on Montague Plain and other barren systems in the Northeast, with an emphasis on sand-plain heathlands, grasslands, pitch pine–scrub oak barrens, and ridgetop pine communities in Massachusetts. Conservation of these communities is of particular concern because they support the highest concentration of rare species in the Northeast and because most of the large barrens have shrunk during the historical period in response to succession and residential and commercial development.

Montague Plain is a sandy, outwash delta, originally deposited in glacial Lake Hitchcock. Its land-use history is reflected in the soil profile and in today's vegetation (see the report on Friday's field trip). A sample of 120 plots on the plain showed three categories of plants based on their distribution today relative to plowing. Species such as *Lysimachia quadrifolia*, *Prunus serotina*, and *Lycopodium obscurum* have similar frequencies today on sites that were formerly plowed for agriculture as well as on sites that were never plowed. In contrast, species such as *Cypripedium acaule* and *Polytrichum* mosses occur much more frequently today on former agricultural lands, even though these sites have been abandoned from agricultural use for >100 years. Areas that were never plowed are virtually the only habitats occupied by several species that are characteristic of pine barrens, including *Gaultheria procumbens*, *Gaylussacia baccata*, *Viburnum cassinoides*, *Pteridium aquilinum*, and *Q. prinoides*. In particular, *Gaultheria procumbens* is almost entirely restricted to never-plowed land, with less than 5% of the former agricultural lands having any *G. procumbens* in the plots. *Polytrichum* species, in contrast, are restricted almost entirely to previous agricultural lands. Similar relationships between modern species distribution patterns and historical land use occur on outwash plains across the Connecticut Valley.

Studies of other barrens systems in coastal Massachusetts (Martha's Vineyard, outer Cape Cod, and Nantucket), Block Island, and Long Island show similar patterns of species segregation with past agricultural use, but several of the plant species differ from the inland barrens. The coastal suite of plants that indicates formerly plowed or otherwise disturbed land includes *Pinus rigida*, *Deschampsia flexuosa*, and *Arctostaphylos uva-ursi*. Sediment cores from several studies suggest that grasslands were less common before European settlement than during the historical period. Ridgetop barrens (such as Mount Tekoa or Mount Everett in Massachusetts) also are dominated by *Pinus rigida*. Ridgetop barrens typically occur in areas with little soil and harsh growing conditions; whereas some sites have experienced frequent fire, others have been influenced by frequent ice storms.

To maintain or restore barrens systems, active management may be necessary in order to simulate the effects of the disturbances that allowed these communities to develop, including prescribed fire, mowing, and grazing. Although many barrens originated during the historical period from overgrazing or other severe disturbances, they now harbor numerous rare species. As Glenn said, a legitimate question is, "What are appropriate objectives for these systems?" We frequently choose to manage for early successional habitats, although it may not be possible to maintain every rare species or unusual tree form.

— Joann M. Hoy, Recording Secretary *pro tempore*

## June 2002 NEBC Field Trips

### June 7 to Montague Plain, Montague, MA, lead by Glenn Motzkin and Dr. William Patterson

Glenn Motzkin of the Harvard Forest and Dr. William Patterson of the University of Massachusetts, Amherst, led more than 45 Club members and guests (surely a record!) on an ecological tour of Montague Plain, most of which is a preserve held by the Massachusetts Division of Wildlife and Fisheries. After Glenn's introduction to the postglacial and human history of the site, the group examined soil pits just meters apart, but separated by an old ditch-and-mound fence. One pit has a deep plow layer of homogeneous soil; it had been plowed for decades and was abandoned as a field 75–100 years ago. The overstory is *Pinus rigida*, and there are no ericads, just a few scattered herbaceous plants. The other pit has a shallow A horizon, shading into a natural B horizon, the product of 10,000 years of postglacial development. There the overstory is a mixture of hardwoods and pines with a dense understory of ericads, including *Gaylussacia baccata*, *Gaultheria procumbens*, and *Vaccinium angustifolium*. Several factors may contribute to the limited colonization of old agricultural fields by these ericads, especially poor dispersal or establishment on xeric sites. At another site on the plain near power lines, Bill Patterson described how fire and cutting are being used to prevent succession and to thin the *Quercus ilicifolia*. These operations have the combined effect of making the habitat more friendly to some rare moths and to human hunters. The group walked through patches that are at different stages of recovery after prescribed burns.

— Joann M. Hoy, Recording Secretary *pro tempore*

### June 8 to South River State Forest, Conway, MA, lead by Jesse Bellemare

This trip on a beautiful June day provided the opportunity to explore the flora of the rich mesic forest, and to see the effect of past land use on its herbaceous layer with an expert in both, Jesse Bellemare, a graduate student at Harvard Forest. Jesse just completed master's theses on the effects of historic land use on herbaceous plant diversity in rich mesic forests in western Franklin and Hampshire Counties, and the South River State Forest was one of his study sites. The site is on Waits River Formation bedrock that includes outcrops of limestone and marble and some calcareous seeps. The Conway area was settled in the late 1700's, and by the early 1800's seventy-five to eighty-five percent of the land was cleared and much of it was converted to sheep pasture. The state park includes land that was maintained as a sugar bush, and never cleared, as well as land that was cleared for pasture and then abandoned in the early 20<sup>th</sup> century, and has since regenerated to secondary forest. The difference in herbaceous species diversity between the areas with different land use histories was dramatic. The area that had never been cleared had an impressive diversity of herbaceous plants while the reverting pasture had very few herbaceous species and those we did see were widely scattered. Jesse Bellemare suggested that the difference in diversity was due to two factors. Many of the herbaceous plants of the rich mesic woods are ant dispersed or are drop dispersed and so have limited dispersal ability. This combined with their lack of a persistent soil seed bank makes these plants slow to re-colonize secondary forest. He also suggested that a second factor limiting successful colonization was related to the low light levels produced by the almost closed canopy of the young sugar maples.

Although the trip was a little late for the earliest spring flowers, we still saw many of the herbaceous plants that are characteristic of rich mesic forest. The forest was dominated by sugar maple (*Acer saccharum*), but included white ash (*Fraxinus americana*), bitternut hickory (*Carya cordiformis*), yellow birch (*Betula alleghaniensis*), and beech (*Fagus grandifolia*). We also found one large individual of Slippery elm (*Ulmus rubra*). The uncut, primary forest area was rich in ferns including Ostrich fern (*Matteucia strutheropteris*), Goldie's Fern (*Dryopteris goldiana*), Glade Fern (*Diplazium pycnocarpon*), and Silvery spleenwort (*Deparia acrostichoides*), all characteristic of rich mesic woods. Other ferns included *Dryopteris intermedia* and the hybrid *Dryopteris triploidea*. Herbaceous plants included *Carex plantaginea*, Wood-nettle (*Laportia canadensis*), Sweet Cicely (*Osmorhiza claytonii*), Foam flower (*Tiarella cordifolia*), Squirrel-corn (*Dicentra canadensis*), (identifiable by its yellow corms), Dolls eyes (*Actaea pachypoda*), Blue cohosh (*Caulophyllum thalictroides*), Canadian violet (*Viola canadensis*), Purple trillium (*Trillium erectum*), and Two-leaved Toothwort (*Cardamine diphylla*). We were lucky enough to spot Ginseng (*Panax quinquefolius*), and Massachusetts State Watch-list species *Sanicula trifoliata* and Three-leaved Toothwort (*Cardamine x maxima*). The site also had some interesting bryophytes. Susan Williams also found *Freullania bolanderi* at what appears to be its southernmost station and *Cyrto-hypnum minutulum* (*Thuidium minutulum*), which is a new county record.

— Karen B. Searcy, Recording Secretary *pro tempore*