

---

**Site Selection for the VMC Long-term Soil Monitoring Project Plots  
at Lye Brook Wilderness**

**Thom Villars, Soil Resource Specialist, NRCS**

**July 18, 2000**

**Introduction**

Initial planning for the Vermont Monitoring Cooperative Long-Term Soil Monitoring Project was begun in 1998 with several meetings of a committee comprised of personnel from the USDA Forest Service and Natural Resources Conservation Service, University of Vermont, and the Vermont Agency of Natural Resources.

Project activities, including initial site selection activities, continued in 1999. A committee meeting on June 15th and a subsequent Research Plan outlined project goals and general site/study plot requirements. On July 8<sup>th</sup>, Thom Villars, NRCS, met with Nancy Burt, USFS, to discuss possible sites in and around the Lye Brook Wilderness and current research in the area. Villars spent a total of six days in September 1999 reviewing sites, primarily along the Lye Brook Falls Trail corridor and in the area from Bourne Pond south to the CASTNET site near Forest Road 6. Following a final office evaluation on September 29th, a field review of potential locations of the long-term soil monitoring plots and a soil temperature and moisture data collection station was held on October 13, 1999.

In 2000, the entire committee met on May 12 to review findings and re-visit site requirements. At this meeting, the committee decided to revise the size of the long-term study plots from 10 by 10 meters to 50 by 50 meters to better accommodate future research needs. On June 20-21, Villars and Scott Bailey, USFS Hubbard Brook Research Station, laid out two plots near the Branch Pond Trailhead, located soil sample pit sites and recorded basic vegetative data for the plots. Villars and Nancy Burt visited the Branch Pond area on July 11<sup>th</sup>, reviewing proposed sites and several additional sites outside the Wilderness at the request of the District Ranger. The Silvex data for the Branch Pond area was also reviewed extensively. A final site visit was held on July 14<sup>th</sup>, with Villars, Burt, Sandy Wilmot of VMC, Dennis Roy, USFS Manchester Office District Ranger, and Russ Eastwood, USFS Wilderness Coordinator, with discussion of the two long-term plot locations and also siting of the Soil Climate Analysis Network (SCAN) station.

**Site Requirements**

Selection of the long-term soil monitoring plots in and around the Lye Brook Wilderness was based on these general criteria:

**Soils** - soils that typify large forested areas in the Green Mountains were the objective of the site selection process, so that research findings could be extrapolated to many areas - because of the elevation and physiographic location, these soils are Spodosols and the parent material is glacial till; the soil series within the entire plot should be as uniform as possible to facilitate comparison of data over time; well drained or moderately well drained soils were desired, avoiding poorly drained soils that are saturated with water for long periods; depth to bedrock at least 20 inches deep, with preference given to soils deeper than 60 inches in order to study long-term weathering processes in the parent material; slopes gently sloping to moderately sloping were desired - steeper slopes that may be influenced by aspect were avoided; micro-topography (eg. pit and mound) though unavoidable, should not be too pronounced; the soils should have relatively few surface stones and boulders, which

greatly hinder sampling efforts.

**Vegetation** - The goal in Lye Brook was to locate plots on two forest types: 1. A "stable" northern hardwood site with few softwoods in any layer, and 2. A "transition" forest of hardwoods and softwoods. Scott Bailey and Nancy Burt assisted with vegetation analysis. In general, sites with older stands were desired, with no openings, and no recent logging activity. Stands dominated by softwoods were avoided. Silvex data was studied and used to eliminate sites that had favorable site topography but recent logging activity.

**Site** - access was considered, with locations less than 30 minutes (walking time) from any trailhead desired; one site near the boundary of the Wilderness was preferred, to co-locate the SCAN site in the vicinity, just outside the Wilderness boundary; as mentioned under Soils, slope less than 8 percent was preferred; the slope, soil type and forest stand had to be uniform over at least a 50 x 50 meter area, with larger areas preferred to accommodate possible complementary studies outside the plot boundary; convex or linear upland landforms were preferred over concave positions because of their influence on soil drainage; sites that coincided with or complemented current research sites were preferred; no roads, skid trails, hiking or any other type of trail in the plot or in the immediate vicinity - the plot should be in an area that will see little visitation by forest users; long-term site stability and security was a requirement to insure the investment in the plot was merited, thus areas that were subject to future development, logging activities, etc. were avoided. Wilderness areas presented the best alternative in regards to this concern, although other areas were considered due to the possibility of setting up special designation areas (eg. Research Natural Areas) outside the Wilderness within the Green Mountain National Forest.

## **Discussion**

Sites visited along the Lye Brook Falls Trail had several problems. First, the Cheshire Quartzite formation highly influences soils along that corridor. Soils in this area are unlike soils in other parts of the Green Mountains, hindering correlation of research findings. The hiking time to access possible sites was 45 minutes, at the minimum, from the Lye Brook Trailhead in Manchester.

Five candidate sites were reviewed on October 13, 1999. The CASTNET site area (Site 1), primarily the north-facing slope to the north of the facility, had extensive logging activity recently. It has bouldery areas associated with an outcropping of bedrock extending from the ridge northward. Because it is outside the Wilderness boundary, future site security is not assured. On further review of the vegetation, the site was not as enriched as it was first thought. No large (50x50m or greater) uniform areas were viewed.

A knoll just to the west of FR 70 (Site 2), a few tenths of a mile north of FR 6, was found to be a good site. It is the proposed site for the stable northern hardwoods plot. The 300 foot buffer zone from the road to the Wilderness boundary, on the same soils and landform, is an ideal site for the SCAN site and is the proposed site for that facility. A plus for this site is the existing amphibian study area just downslope near a wetland to the east. Soil temperature and moisture data will nicely supplement the amphibian monitoring data.

A 3060-foot summit (Site 3), located north of FR 6 and between FR 70 to the west and the Branch Pond Trail to the east, is about 45 minutes from the trailhead. Being outside the Wilderness, future security is not assured. Soils and vegetation at the site were not desirable, with shallow soils and stressed yellow birch and beech. Lower "benches" and

hilltops to the east of the 3000 foot summit, near the county line, were eliminated based on Silvex data.

A site north of Branch Pond, 140 meters west of the Branch Pond Trail (Site 4), is also an ideal site. It is the proposed site for the transitional northern hardwood-softwood forest. It is about 1/4 mile into the Wilderness.

Continuing north on the Branch Pond Trail, a small knoll of mixed vegetation (Site 5), was eliminated because of its small size and proximity to the trail.

An area to the east of FR 70, just north of Site 2, was reviewed and found to have extensive logging and skid trail openings.

A ridge to the east of Branch Pond and the Branch Pond Trail, just outside the Wilderness, was reviewed. It had hummocky topography, a few rock outcrops, uneven forest stands, and difficult access over areas of wetlands. It had marginal potential, but did not measure up to the two proposed sites.

### **Conclusion**

Two sites are proposed in the Lye Brook Wilderness for use as long-term soil monitoring sites. One of the sites includes an additional area proposed as the location for the SCAN facility, just outside the Wilderness boundary in the 300 foot buffer zone between FR 70 and the Wilderness boundary.