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THE LEHIGH VALLEY

A Natural and Environmental History

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A KEYSTONE BOOK

Table 2.3 *The major soil types of the Lehigh Valley and some of their characteristics*

Characteristics and Resource Base	Major Soil Types		
	Perma-Berks (Bk)	Appalachian DeKalf-Lehew-Laidig (Dkt)	Alluvial floodplains
Location	Northern half of valley; coincides with shale belt	Blue Mountain (northern border of valley)	Along Delaware, Lehigh, Cedar, Jordan, Bushkill, etc.
Topography	Billowy hills, elevation 650–900 feet; hills flat-topped to rounded	Sinuous ridge, grading into steep colluvial talus slopes; elevation 1,000–1,600 feet	Flat alluvial areas bordering rivers, streams
Mean depth to bedrock, in feet (range)	2.5 (2–5)	4 (0–10)	4+ (3–10+)
pH (range)	5.5–6.0	4.0–4.5	5.0–6.0
Source material	Martinsburg shales; Illinoian glacial	Sandstones, quartzites of ridge	Flood deposits
Major crops/land use	Potatoes, small grains, corn, soybeans	Non-agricultural: wildlife; trails; wooded; game lands	Corn, pasture, fruit; protected park and recreation land
Texture	Silt loam, shaly	Stony, sandy loam; very stony	Silty to sandy
Moisture storage capacity	Good	Good/moderate	Good to excellent

Table 2.3 (continued) *The major soil types of the Lehigh Valley and some of their characteristics*

Characteristics and Resource Base	Major Soil Types		
	Washington, Hagerstown (Wh, Hg)	Womelsdorf-Annondale (WA)	Northampton-Kistler (Nh)
Location	Southern valley, roughly coincides with limestone	South Mountain	Northeastern corner of Northampton County; Bangor to Belvidere and northeast
Topography	Undulating hills to broad, flat interstream areas; hill elevation 400 feet	Irregular mountains, many steep slopes; elevation 500–1,000 feet	Large swampy areas
Mean depth to bedrock, in feet (range)	2–10+	3–5	3 (2–5)
pH (range)	6.0–6.5	5.5	5.5–6.0
Source material	Limestones; Illinoian glacial	Residual, from gneisses	Martinsburg shales; Wisconsinan glacial
Major crops/land use	Variety of crops, corn, etc.	Some crops; mostly forested; some development on top	General farming; potatoes
Texture	Silt to silty clay loam	Silt loam to silty clay loam; slopes rocky	Silt loam; shaly silt loam
Moisture storage capacity	Good to very good	Good	Good

SOURCE: Data after Higbee 1967.

NOTE: A narrow band southeast of South Mountain, including Saucon Valley, has some limestone and some Triassic red shale-based soils.

roadkills—a problem intensified by the opening of Route I-78. During the hunting season, in particular, the often frightened deer come down from South Mountain and blindly try to cross the expressway, only to become statistics.

On a much less dramatic level, one can look for the many varieties of galls during the cold months. Just as a tissue responds to some stimulus with a cancerous growth, *galls* are plant deformations caused by insects and are used by them for protection and as a food source. Some of the galls, such as those found on wheat, have economic ramifications; others, such as the spruce aphid galls, are not particularly damaging but are a bit disfiguring. Galls can have many shapes and sizes and are conspicuous in the winter months.

The daylight hours of December continue to shorten until December 21, the winter solstice, when the sun crosses the meridian at its lowest angle in the sky. At noon it is a meager 26° above the horizon. Shadows are long, the days feel cold, and the sky looks like steel. The last nine days of the month start the slow six-month 47° climb of the sun up the meridian—little surprise, then, that diverse celebrations have historically marked the waning days of December and the welcoming of the new six-month cycle.

From the climate and seasons, we move on to the patterns of plant and animal communities, the topic of the next several chapters.



 S I X

Native Vegetation

It has been said about Pennsylvania's dense pre-pioneer forest that a squirrel could run from Philadelphia to Pittsburgh without ever touching the ground.

—DAVID J. CUFF, *The Atlas of Pennsylvania*, 1989

Indeed, there was a time when most of Pennsylvania was clothed in a nearly continuous vegetation type—now formally called the Eastern Deciduous Forest. There were, to be sure, occasional exposed rocky ridges, sporadic “barrens,” open floodplains, recent burn areas, and the like, but for the most part the forest had a closed canopy of mature trees. Some of the earlier writings about the newly discovered forests of North America suggest that it was pristine, mature, cathedral-like, almost sacred. Even Charles Darwin, according to an entry in his journal, was stirred by this vision. During the voyage of the HMS *Beagle*, he wrote: “Among the scenes which are deeply impressed on my mind, none exceed in sublimity the primeval forests undefaced by the hand of man. No one can stand in these solitudes unmoved, and not feel that there is more in man than the mere breath of his body.” Yet our current understandings of the ecology of forests suggest that the forests had their own internal perturbations triggered by the destructive cycles of insect pests, natural fires, plant blights, and hurricanes, among others.

Box 6.5

Places to See Hemlock Ravines

CAMP HORSESHOE. The camp is operated by the Boys and Girls Club of Allentown. From Route 22, take Route 309 north for several miles; make a left at the Kernsville Road light, and travel just beyond the iron bridge. Make a right on Jordan Road and drive to a stop sign. Turn left onto Horseshoe Road. The camp is at the second right. There is a fine hemlock ravine along the Jordan Creek. Call ahead for visitor information. (The seasonal phone number is [610] 481-9206; the phone number for the Boys and Girls Club is [610] 432-9323.)

HEMLOCK HEIGHTS, HAWK MOUNTAIN. For directions, please see Box 1.1 and Box 4.1. Hemlock Heights is a classic, north-facing virgin hemlock stand lacking a stream, accessible only by a rigorous steep climb from the parking lot below the Schaumbach house.

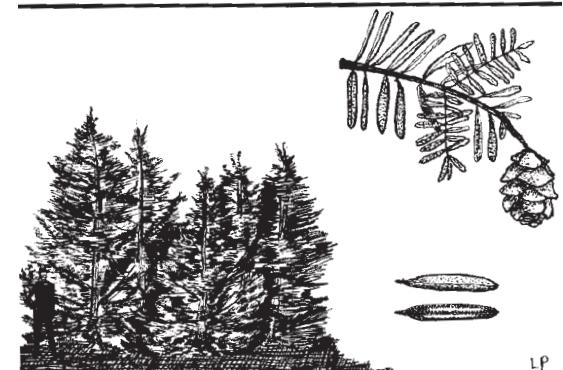
HENRY'S WOODS, JACOBSBURG STATE PARK. See Box 6.2 for directions. A pleasant trail follows the Bushkill Creek, which is the site of an old stand of hemlock. The look is classic: dimly lit, few shrubs or ground cover plants, and a cool, cathedral-like atmosphere.

TREXLER GAME PRESERVE. From Route 22, go north on Route 309 for several miles to the Schnecksville area. Turn left onto Game Preserve Road (there is a prominent sign for the Trexler Game Preserve).

of the channel widen it; the degree of slope retreat and configuration is governed, in part, by the bedrock. Thus, the southern limestone portion of the Lehigh Valley has broad interstream areas with very gentle slopes, while the northern (slate/shale) part has flat-topped stream divides, rounded slopes near the top, and steep slopes near the streams. The latter configuration lends itself to deep (and, if the native trees are not harvested, cool and moist) ravines—a perfect setting for the official tree of Pennsylvania, the Eastern hemlock. Hemlock was abundant on the cool Pocono plateau, where it was mostly lumbered out for the tanning industry; the relatively small patches in the northern Lehigh Valley, being in relatively inaccessible steep ravines or steep north-facing slopes, escaped the lumbermen. The hemlock, an evergreen, perpetuates itself in two ways: it forms tight, closed canopies that create dimly lit, cool and moist conditions (those central limiting factors!) on the ground, which help it to thrive, and it tolerates shade, which encourages “growing up in the shadows of its parents”—so self-replacement is natural. The needles,

Fig. 6.9 *The hemlock tree*

The hemlock typically occupies cool, moist ravines in the northern part of the Lehigh Valley. It is often planted in landscapes and can be recognized by the two white parallel lines on the underside of each needle (leaf).



which accumulate on the floor and slowly release their tannic acids, make the floor inhospitable to all but the shade-loving acidophilic plants. (The SAF classifies this as Type 23, an Eastern Hemlock community.)

The scene, then—a somewhat limited one in the northern Lehigh Valley—is that of a steep-sided ravine, the banks clothed in ferns, mosses, and liverworts, the floor devoid of all but occasional shrubs, a sparse ground cover of starflower, Canada mayflower, Christmas fern, trailing arbutus, and others, and large hemlocks presiding over a cool stream environment. Although this vision of a hemlock ravine might be typical, local conditions and history create a number of variations as well. The sometimes nearly pure hemlock stand may have other tree species as well: the oaks, white pine, yellow and black birch, sugar maple, basswood, and red maple.

The future of these ravines is not clear, however. A destructive alien, the hemlock woolly adelgid (a small aphid-like insect native to Asia), has become a serious parasite on the hemlock trees. It sucks the juices from the needles and, if invasion is high enough, may kill the trees. Although the situation is being monitored, the question remains: Will the hemlock go the route of the fabled American chestnut?

As we consider the threat to the hemlock, we should also remember the ecological value of dead trees. It is true, as Malcolm Hunter (1990) notes, that “to many people there is nothing quite so useless as a dead tree, except possibly the fifth wheel on a cart, and when people are called ‘deadwood’ it is not because they are mature and respected members of an organization. It is hardly surprising that people find dead things unattractive.”

But a dead tree, contrary to popular perception, has a plus side. Called a *snag*, it plays host to a variety of insects, fungi, spiders, and

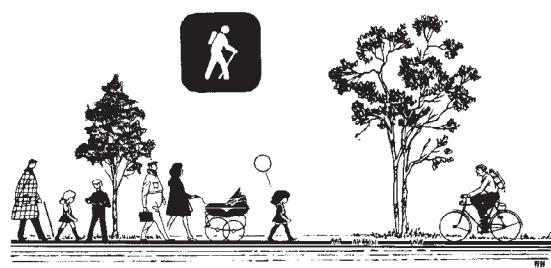


Fig. 11.3 *A hiking trail*

Abandoned railroad rights-of-way, now sometimes privately secured and part of the Rails-to-Trails system, offer a variety of outdoor opportunities—allowing people of all ages and interests to walk, bike, and run. The region boasts a range of trails, from level canal towpaths to the famously challenging Appalachian Trail.

THE FIRST EARTH DAY AND THE 1970S

The first Earth Day, on April 22, 1970—the brainchild of Senator Gaylord Nelson—spotlighted the numerous environmental woes that faced the nation. Local Lehigh Valley colleges, including Cedar Crest and Muhlenberg, canceled classes and conducted rallies, demonstrations, and panel discussions. Nationally known environmentalists, including Paul Ehrlich and Barry Commoner, presented lectures to large audiences. Most of the colleges in the region had student groups that took on specific projects, such as stream cleanups or air pollution monitoring. Soon, a League of Concerned Voters was created to track the voting records and position statements of members of Congress.

Environmental groups expanded their efforts in the 1970s. The Environmental Defense Fund, for instance, led most environmental battles in the courts. Alternative groups—much less conservative than the old-style conservation organizations—also took up the environmental cause. Greenpeace was confrontational in its approach, while Earth First! resorted to “eco-sabotage” techniques—the most widely publicized being “monkey wrenching.” In their efforts to halt timber clearcutting, for example, they would spike trees with large nails that could damage the cutting saws or the operators or both.

Even so, the first oil crisis experienced by U.S. citizens in 1973 dampened much of the enthusiasm for environmental concerns, and rollbacks on environmental standards for air and water quality were quickly sought by some of the public and their elected officials. The Carter



C A M E O . . .

Gertrude Fox (1917–1995)

Known as “Mrs. Monocacy” to many local environmentalists, Gertrude Fox was a native of Boston whose first association with the Lehigh Valley was as an industrial biologist and metallurgical investigator at the Bethlehem Steel Corporation. She later taught math at Moravian Preparatory School, Notre Dame High School, and Lehigh County Community College and helped establish innovative methods of environmental education for the Lehigh County School District. She was interested in historical preservation (especially at Burnside Plantation) and in regional planning, and she served as a member of the Planning Commission of Hanover Township. But Gertie Fox was best known for her long-term involvement with the Monocacy Creek Watershed Association.

She highlighted—earlier than many others in the environmental movement—the importance of streamside vegetation to the well-being of aquatic ecosystems. She also assisted volunteers in monitoring water quality, and she readily testified before the U.S. House and Senate Appropriations Committees and the state Department of Environmental Resources on varied environmental issues. Gertie kept close watch on the activities of local industries and developers to insure that waterways would not experience further degradation. Her efforts, along with those of others in the Bethlehem area, started the Monocacy on the road to recovery—to the extent that a section of the waterway won a distinction shared by only a few other Pennsylvania streams: “Trophy Trout Area.” In 1987, Northampton County Council named a section along the Monocacy the “Gertrude Fox Conservation Area.” In 1990, she was one of seventy-five persons honored by President George Bush with the first Theodore Roosevelt Conservation Award. Gertrude Fox’s example demonstrates that an individual, with determination and dedication, can be an effective advocate for the environment.

administration was generally sympathetic to the goals of the environmentalists, but economic woes undermined most of President Carter’s attempts to address important environmental issues. Even the creation of a new cabinet department, the Department of Energy, accomplished little in the way of energy conservation and the development of renewable