BIOLOGICAL RESOURCES

Biological Communities

Plants and animals exist in habitat communities, such as different types of forests, wetlands, and grassland regions. Diversity in biological communities promotes stability and equilibrium. Lack of diversity reduces stability, as in a large area of land planted in a single crop that can be devastated by insect or fungus diseases. In a diversified area of plants, this threat is minimized. For example, during the past century, two major tree species were decimated, the American chestnut, in the early 1900s and the American elm, in the mid-1900s, yet the character of the forest maintains its vigor.

Biological communities of natural vegetation yield many benefits. They furnish habitat for a wide variety of wildlife, provide protection against floods, replenish groundwater supplies, prevent erosion on slopes and uplands, and aid in reducing air pollution and noise pollution. Yet, in an ever-changing world, biological communities face many threats. The growth of human population and the increasing demand for natural resources greatly impact natural communities and brings about habitat fragmentation. Any imbalance of chemicals in soil or water can affect the organisms that inhabit these areas. Sensitive species will be the first to react to a change of environment.

Forests

Wooded areas of the Pine Creek Watershed consist of mixed deciduous forest, the most common forest type in temperate zones of the eastern U. S. This forest type has a preponderance of broad-leaved trees with dozens of species competing for light and space, nutrients and water. In comparison with more northern forest types, it is immensely diverse and productive.

The composition of the forest varies as a result of selective climate, soil and topographical features.

Most of the watershed consists of a very rocky forest with many seeps and small streams. Along the wetter areas there are narrow bands of dominance by tuliptree, beech, and sugar maple with some basswood and yellow birch. The understory of these wetter areas includes hornbeam, bladdernut, leatherwood and winterberry, as well as the commoner spicebush and witch-hazel that form the main part of the understory on the slopes. The dominant trees in these drier areas include various species of oak with red maple, black birch, hickory and tuliptree. In the highest and driest

areas there are some small chestnut trees with the dominant oaks, and blueberries occur in the lowest layer of the forest.

The whole area has a very rich herbaceous flora, including the more generally distributed mayapple, black cohosh, hepatica, wild ginger, jack-in-the-pulpit, and skunk cabbage, as well as showy orchids, nodding trillium, shinleaf, Indian cucumber-root, bishop's cap and round-leaved violet in smaller numbers here and there. Many kinds of ferns are also present, from the cinnamon fern and silvery glade fern characteristic of the wet areas to maidenhair, broad beech fern, marginal wood fern, and rock cap in drier areas or on rocks. All in all, there is a great diversity of native plants in the forests of the watershed. Very few non-native species are present, and where they occur they do not occur in large numbers or over large areas. The high diversity of native plants and the relatively undamaged structure of the forest with many saplings and seedlings present among the mature trees indicate the high quality of the community.

	SCIENTIFIC NAME	COMMON NAME	FAMILY
Wildflowers	Actea pachypoda	White Baneberry	Buttercup Family
	Cypripedium calceolus	Yellow Lady-slipper	Orchid Family
	Goodyera repens	Rattlesnake Plantain	Orchid Family
	Medeola virginiana	Cucumber Root	Lily Family
	Orchis spectabilis	Showy Orchid	Orchid Family
	Pedicularis canadensis	Wood Betony	Figwort Family
	Pyrola americana	Shinleaf	Pyrola Family
	Trillium cernuum	Nodding Trillium	Lily Family
	Viola rotundifolia	Round-leaved Violet	Violet Family
	Mitella diphylla	Bishop's cap	Figwort Family
	Saxifraga pensylvanica	Swamp saxifrage	Saxifrage Family
	Veratrum viride	False Hellebore	Lily Family
Non-flowering Plants	Adiantum pedatum	Maidenhair Fern	
	Dryopteris cristata	Crested Wood Fern	
	Equisetum sylvaticum	Woodland Horsetail	
	Osmunda regalis	Royal Fern	
Shrubs	Dirca palustris	Leatherwood	Mezereum Family
	Ilex verticillata	Winterberry	Holly Family
	Rhododendron periclymenoides	Wild Azalea	Heath Family
	Staphylea trifolia	Bladdernut	Bladdernut Family

Natural riparian buffers of trees, shrubs and wetland vegetation are found in many areas immediately adjacent to Pine Creek. These natural areas protect stream banks and provide shade for streams and food for aquatic life. Cool water temperatures benefit wild trout and other species of aquatic life that inhabit the watershed. Connected buffer areas serve as wildlife corridors. Many species of trees and shrubs are beneficial to wildlife for food and cover. Common plants are sycamore, willow, river birch, pin oak, winterberry holly, spicebush, hawthorn, serviceberry, dogwood, and viburnum.

Certain species of plants and animals have reached serious overpopulation in some areas of the watershed. White-tailed deer leave their forest domain to graze on farmers' crops and homeowners' shrubbery. Canada geese gather along streams and ponds and feed in farm fields. Both are causing severe damage and economic hardship. In addition, invasive non-native plant species are out-competing native species and threatening the ecological balance in wetlands and open areas. These plants include multiflora rose, Japanese honeysuckle, common reed and purple loosestrife.

Wetlands

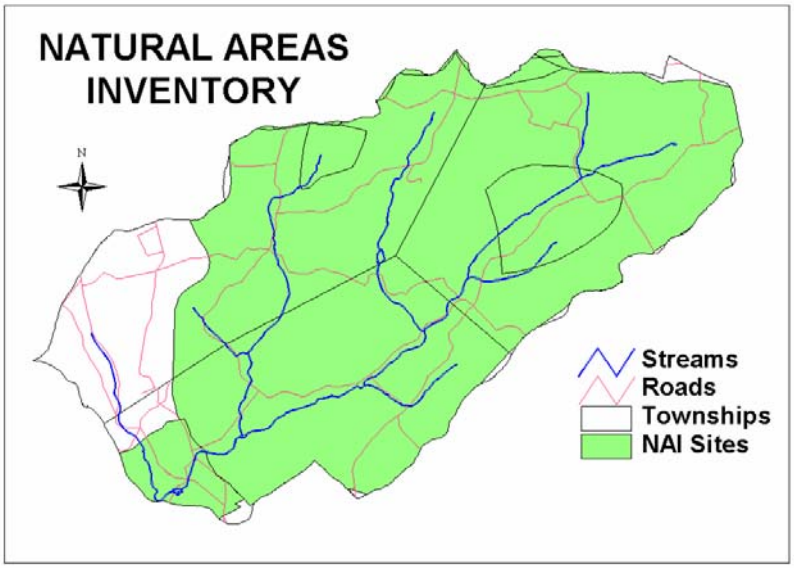
Important wetland areas are found in the Pine Creek watershed and adjacent watersheds. Wetlands connected with EV streams can also be classified as Exceptional Value when they provide habitat for protected species of plants and animals listed as Endangered or Threatened in Pennsylvania. As an example, a detailed study of a 26-acre spring-fed EV wetland along the

floodplain of Pine Creek in Pike and Oley Townships was undertaken in 1996 to determine the potential effect of the installation of a bulk water supply well which would pump 288,000 gallons a day at the edge of the wetlands complex. The site is a forested wetland with a canopy of 60 to 70 feet, and a typical diameter at breast height of 20 inches or more. The plant species identified included 95 kinds of herbs, 20 shrubs, and 23 trees. Dominant trees are red maple and black ash, and other common species are black gum, American elm, pin oak, musclewood, eastern white pine, northern red oak, and eastern red-cedar. Small hummocks support tuliptree, American beech, sweet birch, white ash and shagbark hickory. The understory is composed of northern spicebush, highbush blueberry, southern arrow-wood, brookside alder, American

elderberry, leatherwood, poison sumac, downy serviceberry and maleberry. The herbaceous layer includes yellow marsh marigold, golden saxifrage, watercress, log fern, royal fern, broad-leaf cattail, Solomon's seal, cinnamon fern, swamp lousewort, and white nodding ladies-tresses. PNDI *endangered* species are log fern and swamp lousewort; *threatened* is rigid sedge; *rare* are wooly-fruited sedge, and cranefly orchid. Studies of the biology and hydrology of the wetland area concluded that operation of a large water extraction well at its edge would effectively dewater the wetland, altering habitat conditions for the populations of rare and endangered wetlands plants, and also impacting the flow of Pine Creek, an Exceptional Value, Class A Trout stream. These studies were used in the PA Department of Environmental Protection hearings that resulted in remanding of the permit for the spring water extraction proposal. The wetlands continue to be monitored regularly by Albright College botany students.

Other wetlands in the watershed are known to furnish habitat for breeding populations of a Pennsylvania Endangered animal. Some of these areas have been the subject of scientific studies by the Nature Conservancy (TNC) and others. The Nature Conservancy is an international conservation organization whose mission is to preserve and protect rare, threatened and endangered species and the land and waters they need to survive. TNC has initiated an outreach program to expand awareness about the need for biodiversity conservation in Pennsylvania. It has selected high-ranking biodiversity sites for Conservation Site Planning, in cooperation with the property owners, and local conservation organizations. One of selected sites is a wetland area in the Pine Creek watershed.

Rare, Threatened and Endangered Species



The Pennsylvania Natural Diversity Inventory (PNDI) is a listing of the Commonwealth's rarest and most significant ecological features. These features include plant and animal species of special concern, rare and exemplary natural communities, and outstanding geological features. The PNDI information is continually updated to include recently discovered locations and to describe environmental changes affecting known sites. The PNDI classifies species as Endangered, Threatened or Rare. Natural communities can be located through species records and other sources including aerial photos, soil surveys and geological maps. Field surveys are conducted

to further verify and describe the resource. Sites rich in diversity are identified and monitored for future conservation efforts.

The Nature Conservancy's Pennsylvania Science Office (PSO) is part of the national system of Heritage Programs whose task is to inventory, assess and assign rankings for rare, threatened and endangered species. PSO catalogs this information on a database specific to Pennsylvania (but whose format is used nationwide by the Heritage Network) called the Biological Conservation Database, or BCD. PSO also has a system for determining the biological and ecological value of any sites of concern. According to this system, significant PNDI sites have been identified and mapped. They have also been given priority ranking by the County in the *Berks County Natural Areas Inventory.* Sites are ranked from 1 (the highest priority for protection based on state or national significance) to 5 (the lowest priority for protection). Ranks take into account potential threats, management needs, and existing protection. Descriptions and rankings of the sites follows:

Lobachsville Wetland/Pine Creek Watershed – Rank 1

This Pine Creek watershed, in its entirety, is listed as a significant Natural Community. Within this site is a series of connected wetlands of West Pine Creek and the Main Branch of Pine Creek. The wetlands are open with varied vegetation including cattail marshes, sedge marshes and some shrubby areas. Several sub-populations of a PA-Endangered animal species have been found within this site, including an excellent quality breeding population. All of the wetlands within this site provide potential migration or breeding habitat. Protection of the Pine Creek watershed is very important for this species in PA. A good quality population of a plant species of concern was found in a wet meadow under a canopy of ash, elm, and swamp white oak, growing with blue lobelia, horsetails, mountain mint, water hemlock, ironweed, asters and ladies-tresses.

Long Lane Site – Within Pine Creek Watershed

This is a forested wetland along Pine Creek where an animal species of concern was found. More surveys are needed to evaluate the habitat and the population.

Bitting Road Site – within Pine Creek Watershed

An animal species of concern was found here in a wetland adjacent to Pine Creek.

West Pine Creek Seeps – Within Pine Creek Watershed

The headwaters area of West Pine Creek located in Rockland Township supports a forest of mature tulip poplar. Although logged in the past, the forest maintains a high diversity of plant species because of the various wet and dry microhabitats. The area does not contain natural communities or species of special concern, but is significant at the county level and should be preserved in order to protect the water quality of Pine Creek. Pine Creek and its watershed are designated Exceptional Value.

Botanical Site Analysis

Besides the wetlands, several areas within the watershed stand out because of their physical and botanical features. The State Gameland and the areas adjoining it on the southeast facing slopes and in the main valley of the upper Pine Creek have relatively rich soil, and the native flora is more diverse than in other parts of the watershed. At least three species of native orchids occur here, and the best population of the uncommon shrub leatherwood.

On the upper part of West Pine Creek the steep descent of the stream among very large boulders is outstanding among the tributaries. The presence of the rare aquatic lichen Hydrothyria in the lower part of this stream presumably indicates a reliable flow of high quality water.

Another area outstanding for its physical features is the plateau east of Baldy Hill Road where the headwaters of Pine Creek flow in a very narrow area of alluvial soil surrounded by a rocky pavement. The chestnut oaks growing there form a very open canopy, and rock cap fern grows on horizontal rather than vertical rock faces.

Fewer rocky areas are present along the southeast side of the main valley where many small tributaries flow through somewhat more disturbed forest logged about twenty years ago. The large number of seeps and springs, however, make this area important. Although a few more