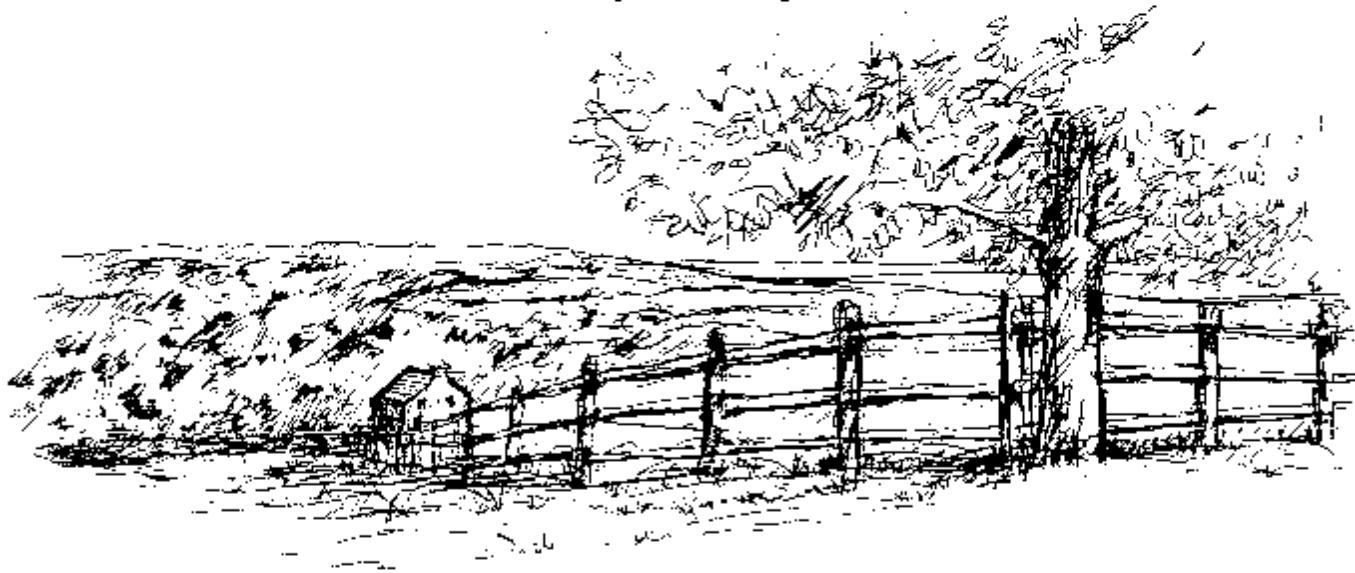


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Plan for Open Space, Recreation and Environmental Resources

West Bradford Township

Chester County, Pennsylvania



May 1993

West Bradford

PLAN FOR OPEN SPACE,
RECREATION AND ENVIRONMENTAL
RESOURCES

May, 1993

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With Funding Assistance from the Chester County Planning Commission

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Chapter 1

COMMUNITY BACKGROUND

1.1 STRUCTURE

1.1.1 History

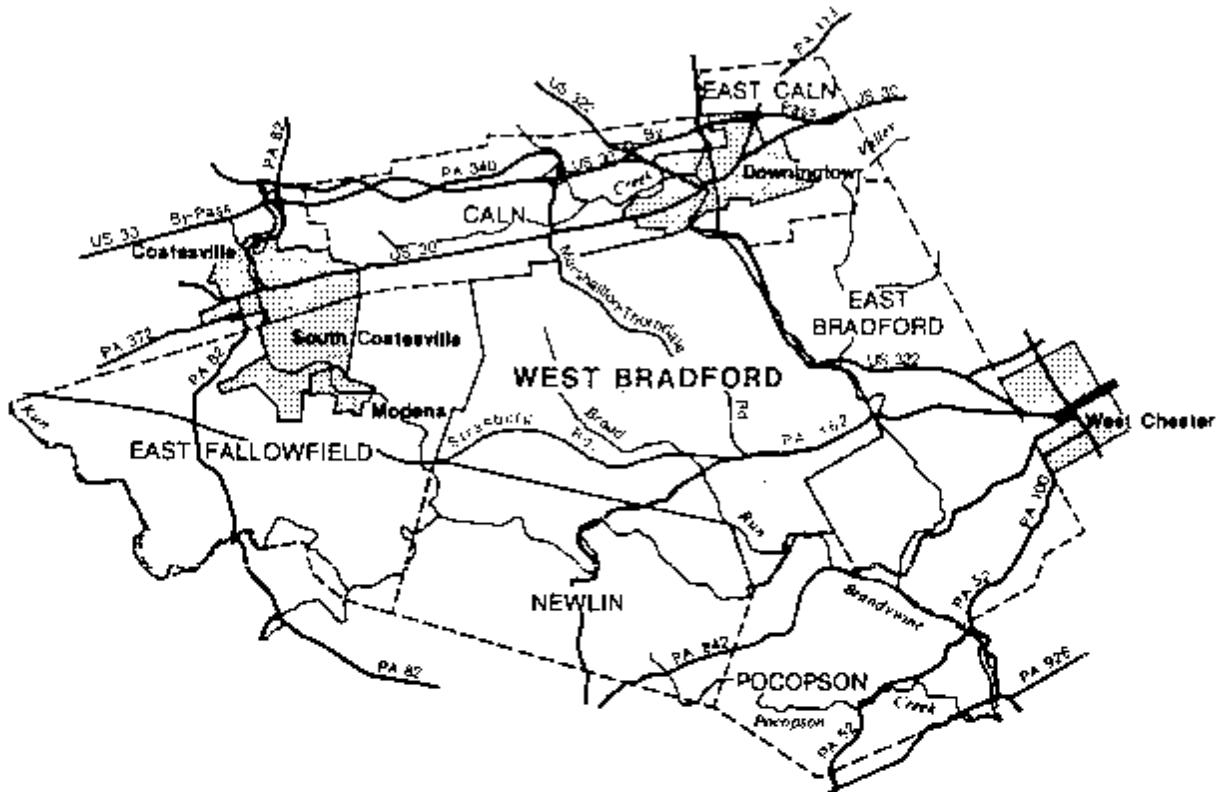
West Bradford Township is situated in southeastern Pennsylvania in the heart of Chester County, which is one of the earliest established counties in the State. It was the scene of numerous events during the American Revolutionary War.

West Bradford lies near three of the most populated and urbanized areas of the County, namely the City of Coatesville and the Boroughs of Downingtown and West Chester. More immediately the Township shares its borders with seven municipalities. The pattern of land uses and the degree of development vary considerably from one municipality to another.

Bradford Township was organized in 1705 and divided into East and West Bradford in 1731. Its boundaries changed in 1849 when a portion in the southeast was included in the formation of Pocopson Township. West Bradford's earliest settlers were English Quakers, most having acquired by patent large tracts of land which subsequently were divided into farms of a hundred or more acres. Settlement initially occurred near West Bradford's water resources, with Abraham Marshall settling along the West Branch Brandywine at Northbrook by 1707 and James Trimble and others along the Broad Run by the 1730's. Quaker meetings were held in homes in West Bradford as early as 1719, with the first Bradford Friends Meetinghouse erected on Marshall's farm in the 1720's. It was moved to Marshallton around 1730.

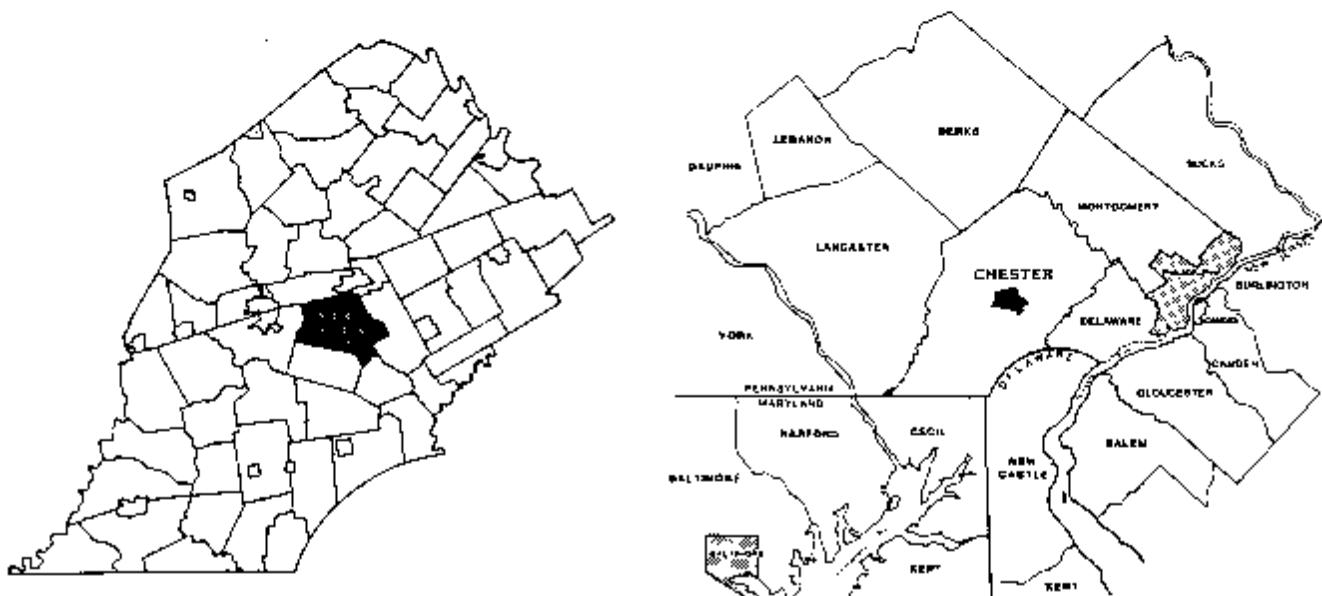
Agriculture clearly played a formative role in West Bradford history, with obvious impact upon the character of its historical landscape (farmsteads tucked into the hillsides) and types of building (e.g., farmhouses, springhouses, barns, corn cribs, etc.) The West Bradford villages of Marshallton, Romansville, and

MAP 1-1
REGIONAL LOCATION



WEST BRADFORD TOWNSHIP
IN CHESTER COUNTY

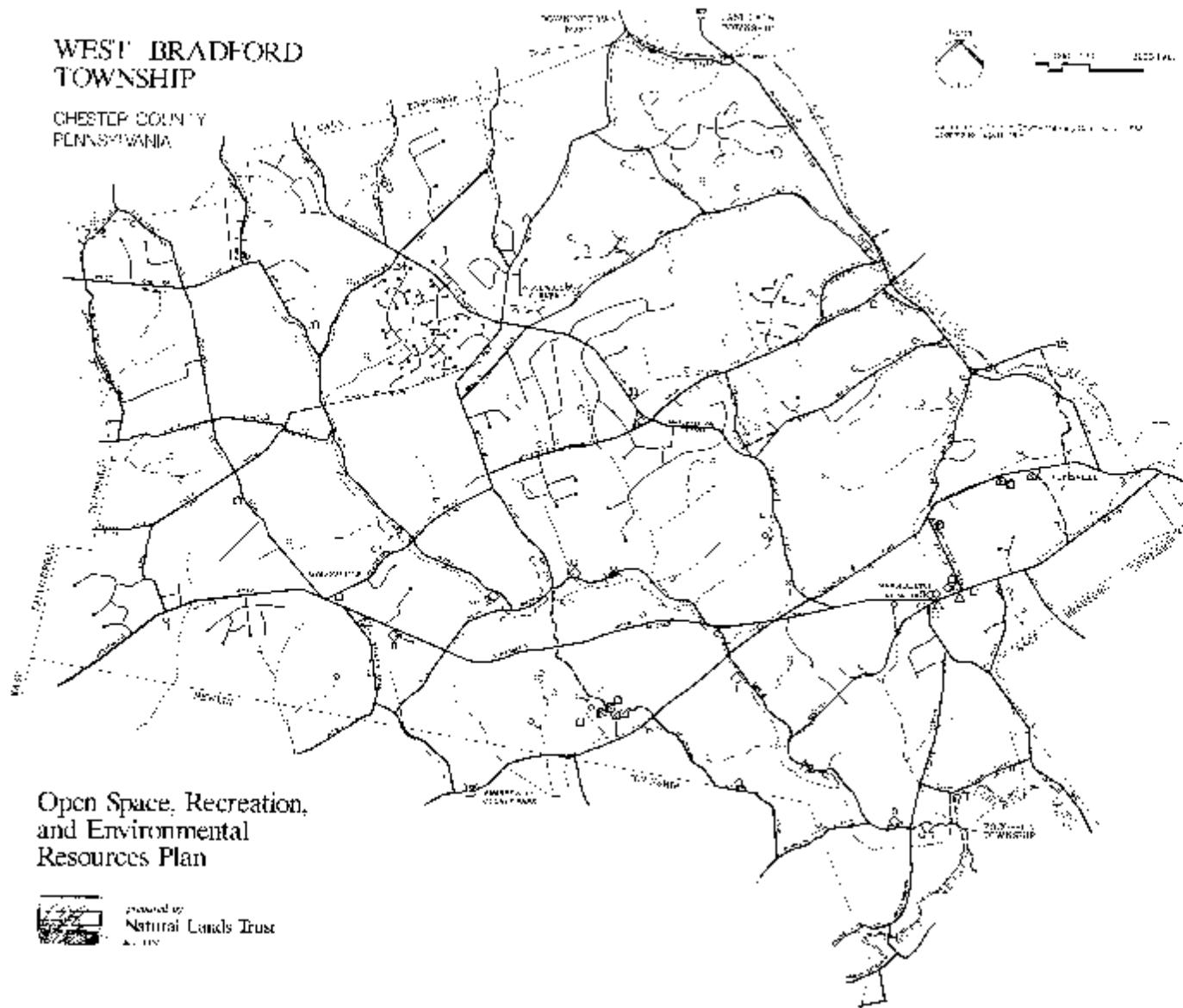
WEST BRADFORD TOWNSHIP
IN SOUTHEASTERN PENNSYLVANIA



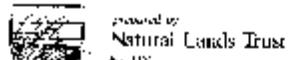
Location map from West Bradford Comprehensive Plan by Chester County Planning Commission

WEST BRADFORD TOWNSHIP

CHESTER COUNTY
PENNSYLVANIA



Open Space, Recreation,
and Environmental
Resources Plan



MAP 1-2

HISTORIC USE MAP (from 1873 Map)

Trimblesville did not expand greatly beyond their extent as of the middle of the 19th century, seeming to reflect the continued strength of the prevailing agricultural economy.

West Bradford has also exhibited a strong tradition of cottage industry, with blacksmiths, wheelwrights, joiners, coopers, pumpmakers, tinsmiths, shoemakers, and cigar makers at work both on the individual farmsteads and in the villages. Given the significance of West Bradford's water resources, milling was also very important in the Township's development. Numerous tanning, grist, saw, and fulling mill sites stood along Broad Run and the East Branch of the Brandywine.

The construction of Strasburg Road as a state road in the 1790's was the major reason for the growth and development of West Bradford's two important villages, Romansville and Marshallton. Although Strasburg Road had existed as a route west since the mid 18th century, its improvement as a state road combined with the nation's post-Revolution expansion led to its emergence as a principal and heavily traveled route west in the 1790's-1820's. Marshallton, which had existed as a sizable crossroad village since c.1760, responded to the increase in traffic by building inns, shops, stores, and houses along its path. Romansville developed about 1800, around the blacksmith shop operated by John Romans.

1.1.2 Government Organization

Under Pennsylvania Commonwealth Law, West Bradford is designated as a second class Township. The state establishes regulations which determine the administrative structure and governmental procedures for the various classifications of townships. West Bradford has a three member Board of Supervisors, a seven member volunteer Planning Commission, and a Zoning Hearing Board. The Township employs a full-time manager who performs the Township administrative duties, and a code enforcement officer to ensure compliance with the Township ordinances. There is also a Recreation Commission as well as an Historic Committee that helps prepare programs to protect and promote these resources.

The new Township Building is located on a 9 acre site at the southeast corner of the Marshallton-Thorndale and Poorhouse Road intersection. This facility provides space for public meetings, offices, outdoor public recreation, emergency services and Township vehicle storage. Provisions have been made for potential expansion and revision to meet changing needs. Local government has numerous responsibilities and performs many duties on behalf of the Township residents. In addition to providing essential services such as road maintenance, the local government must oversee the budget, regulate land development and

represent the Township in numerous situations. In areas such as West Bradford, in which development has accelerated significantly, these services have become increasingly important and at the same time complex. Adjacent to the new Township office is a new public works building for the storage of equipment and materials. It also serves as a recycling center.

Another significant element related to public administration is public participation. The Township recognizes that the implementation of many programs relies on the involvement and/or support of the local residents. Involvement and support can often decline as development increases in an area, diluting the sense of community. To reinforce citizen participation and concern in local matters, the Township has begun producing a newsletter to inform residents about various topics such as upcoming meetings or events, new housing or road construction, and community programs such as recycling or water conservation.

West Bradford Township is served by the West Bradford Fire Company in Marshallton which has a volunteer staff of thirty-five members, and also receives fire protection service from the Downingtown Fire Company in part of the northern portion of the Township. West Bradford residents receive ambulance service from the Good Fellowship Ambulance Company in West Chester, the Minquas Fire Company in Downingtown, and the Modena Volunteer Fire Company. Where advanced life support is needed as in the case of cardiac arrest, the Township is served by Chester County Hospital in West Chester and Brandywine Hospital in Cinn Township.

The Township does not have its own police force, but police protection is provided by the State Police Force at Embreeville. Embreeville Barracks employs 69 troopers serving a total of twenty communities with part-time police and seven with no police departments. The barracks maintains approximately twenty-eight patrol cars which provide twenty-four hour coverage to the municipalities served.

1.1.3 Municipal Budget

1.1.3.1 Tax Structure: West Bradford maintains an enviable position of having no real estate tax. The only tax it collects is a 1/2 % earned income tax.

1.1.3.2 Bonded Indebtedness: The Township currently has no bonded indebtedness; although it is paying off a demand note for its municipal building complex. In 1991, the Township's borrowing base was \$1,428,706.

1.1.3.3 Expenses: The budget is comprised of four different funds: the General Fund, the Capital Reserve Fund, the Highway Aid Fund, and the Refuse Fund.

The General Fund, which includes expenditures for recreation programs and park maintenance, contains \$1,509,427 for 1992, up \$86,276 (or 6%) from the previous year.

The Capital Reserve Fund, which contains expenditures for park land acquisition and improvements, contains \$237,645 - down \$29,000 from 1991.

The Highway Aid Fund, which includes expenditures for constructing and rebuilding streets, contains \$252,212 - up approximately \$20,000 over 1991.

1.1.3.4 Revenues: Revenues for 1992 are derived from a variety of sources, with the largest being real estate transfer tax - \$ 93,000, earned income tax - \$647,406, and waste removal fees - \$426,384. For 1992, the revenue budget is \$1,509,427 compared to the 1991 budget of \$1,423,151. No revenues are derived from parks and recreation.

1.1.3.5 Trends: The gap between excess annual revenues available for capital projects has been steadily narrowing; however, the initiation of a real estate tax is not anticipated within the next five years. This position could change dramatically if Township policies change however, i.e., the creation of a police department or discontinuing fee practices.

1.1.4 Other Sources of Plans

1.1.4.1 Township Comprehensive Plan: The Township's 1989 Comprehensive Plan contains several sections of pertinence to open space and recreation. In addition to the basic background information on trends in population, employment and housing, it also described land use patterns and policies. These aspects are treated in the next section entitled "Socio-economic Features". The Comprehensive Plan's treatment of recreation and open space facilities and needs was based closely on the Township's 1987 Open Space and Recreation Study. Briefly stated, West Bradford's existing shortfall with respect to community/neighborhood parks (vis-a-vis standards of the National Recreation and Park Association) is expected to be compensated for by 19 additional areas adjacent to Beacon Hill Park and a portion of the Embreeville Hospital site, both of which are proposed for Township purchase. These acquisitions will allow West Bradford to meet NRPA community park standards up to the year 2000, and further planning to maintain this position beyond that date is embodied in Section 5 of this document.

The Comprehensive Plan also discussed the 1987 Open Space and Recreation Study's findings with regard to trails and scenic roads, edited portions of which are reproduced below.

1.1.4.2 Township Trail Network Program: The 1987 Open Space and Recreation Study established Township policy concerning the development of a trail network in West Bradford. Trails, which may be used for hiking, jogging, running, biking, horseback riding, or cross-country skiing, may be incorporated into the Township Circulation Plan. According to the Study, informal trail opportunities can be found in parks, open space areas, railroad rights-of-way, utility easements, and scenic, low traffic volume roadways. They should be designed to link existing and planned recreation facilities, residential areas, schools, and centers of activity, such as commercial areas.

Residents in the southern part of West Bradford are currently assembling a network of hiking and equestrian trails to form a loop which would link into the future Embreeville County Park and extend into Pocopson and Newlin Townships. The residents expect to secure this trail system through easements.

One of the problems often associated with creating trail networks involves questions of liability, and responsibility for safety of the trail users. Pennsylvania Act 586, however, encourages landowners to open their land and water areas to the public for recreational purposes, by essentially removing the landowner from any liability associated with such a use, provided that no fee is charged to the user.

Establishing a Township-wide trail network is a long-range objective for which it is essential to plan potential links while such links are still available. As land is proposed for development, the Township can require that pre-identified trail corridors be set aside for future use. The Recreation Commission should pursue potential trail links and opportunities for securing the various corridors, as tentatively identified in this plan.

1.1.4.3 Township Scenic Road Opportunities: West Bradford enjoys an abundance of resources, both natural and man-made. Among these, its rural roads possess qualities which create unique and pleasant surroundings. Besides providing access to the many resources which are scattered throughout the community, they offer a form of recreation available to many different people. Ideally, the qualities which make roads an asset would be around forever but like many other resources they can be compromised due to increased development. There are steps which can be taken to minimize the loss of scenic road qualities while at the same time ensuring that safety and efficiency improvements are implemented. This section identifies some of the characteristics of a scenic road.

Qualities associated with the road itself which may be considered scenic involve the experiences one encounters while driving, such as entering an area

surrounded by a canopy of trees or a row of older buildings, or coming upon a section of the road in which the viewshed abruptly opens up (cresting hills or rounding a curve) presenting new sights. These elements create a varied landscape, full of anticipation and surprise, which make for an interesting and pleasurable journey.

Natural features along a road can contribute to the scenic road quality in numerous and dramatic ways. Expansive views, unique land forms, rock formations, watercourses, ponds, woodlands, individual unique trees, wildflowers, and changing leaf colors are all features which provide a pleasing and attractive landscape.

Man-made features that add definition and interest to the experience of travel along a particular route include old buildings, historical markers, cemeteries, rail facilities, building ruins, stone walls, landscaped features, village settings, old bridges, and examples of early local industry. The combination of these features can make the area an interesting and pleasant environment through which to travel by defining a sense of place, creating anticipation, and suggesting openness or confinement.

People may not know a road name or route number, but they can define a specific area or route by its unique features. These features are often removed as a road is improved to meet specified standards for safety or efficiency. When new development increases traffic, road improvements will be required for safety. The Township needs to evaluate proposed improvements to determine if the need for increased safety and efficiency outweighs the desire to protect scenic qualities. Road improvements can often be accommodated without significantly compromising the scenic quality of a particular route. Improvement options should be reviewed on a case by case basis to prevent unnecessary and avoidable changes to this important aesthetic resource.

The West Bradford Open Space and Recreation Study includes a section on roadside scenery and encourages the development of a scenic road network within the Township. Such a network could be a valuable asset to the Township, accessible to many of its residents including the elderly and the handicapped.

1.1.4.4 Township Scenic Roads Program: The Township's Open Space and Recreation Study provides the following criteria by which scenic roads are defined and identified:

- 1) Character of the road: curving and undulating vs. straight and flat; narrow sense of space as defined by adjacent buildings, berms, hedgerows, etc.; or open sense of space associated with a broad vista.

- 2) Character of the traffic: volumes and speeds conducive to pleasure driving; low levels of commercial and industrial traffic
- 3) Character of the roadside: visually pleasing and interesting views.
- 4) Vistas: attractive views discernible beyond the immediate roadside.
- 5) Unique association: association of the roadway with unique natural, historic, or cultural features or events.
- 6) Linkages: between major open space resources or population concentrations.

The road survey completed for the circulation element of the Township's Comprehensive Plan identified several road segments as having scenic qualities. According to the Open Space and Recreation Study, scenic roads need to be identified, inventoried, and monitored and the Township should designate a body (Historical Commission and/or Planning Commission) to do so.

The Study also maintains that property owners should be encouraged to preserve and enhance scenic qualities, possibly through the establishment of scenic easements, to afford permanent preservation. Zoning may be amended to require developers to reduce impacts on scenic roads as an element of the plan review process. The Study also notes that where road improvements are planned, the Township should attempt to maintain the scenic character of local roads and should request that PennDOT do the same on State roads.

1.1.5 Development Potential and Utility Network: Because new residential development simultaneously consumes potential parkland and open space while at the same time increasing the demand for both of these two types of areas, it is important to understand the potential for new subdivision activity in the Township. Such development is constrained by natural features in many locations (steep slopes, wetlands, floodplains, e.g.), but in other instances it is facilitated by the availability of central water supply and sewage disposal. The following sections from the 1989 Comprehensive Plan discuss these topics.

1.1.5.1 Water Facilities: West Bradford relies entirely on groundwater to meet its drinking water needs. This is an important condition which should be considered in land use, water resources, and wastewater planning programs.

Public water is available in some portions of West Bradford from the Spring Run Water Company and the B and E Water Company. The Spring Run Water Company is the largest public water company in the Township due to the recent interconnection of the Spring Run Company with the Bradford Glen and

Brandywine Greene systems. The recent interconnections have been made to improve service and reduce reliance on individual wells to serve customers. The Township and the Spring Run Water Company are continuing to explore interconnection options with the B and E Water system. Plans are also underway to expand service areas to locations such as Marshallton.

Areas not served by these public water companies rely on on-site groundwater systems.

The 1980 Water Resources Inventory for West Bradford Township conducted by the Brandywine Valley Association found a relationship between low stream flow and higher housing densities in the Township, suggesting a reduced groundwater level. This would imply that these developed areas are reducing aquifer supplies through greater use and less recharge. The study also estimated the available groundwater supplies for the Township.

Based on the importance of groundwater supplies to the Township, policies identified in previous studies (1980 Water Resources Inventory, 1977 Sewage Facilities Plan for West Bradford Township, Act 537) and conditions in the Township, policies protecting groundwater resources are being encouraged by the Township. These policies address aquifer recharge protection, limit use based on availability, regulate wastewater systems to avoid contamination, and guide public sewer service. The Township is considering developing a Groundwater Management Plan that will update previous data and establish a comprehensive set of policies designed to protect these resources.

1.1.5.2 Sewer Facilities: Public sewerage is available to some areas of West Bradford Township through the Broad Run Sewer Company. The Broad Run Sewer Company is a public utility which was established to provide sewer service. The franchise area includes developments in portions of the East Branch and Broad Run Drainage Basins.

The Broad Run Sewer Company operates a treatment plant which was originally permitted to treat and discharge 150,000 gpd (gallons per day), a volume which was permitted in 1981 to increase to 450,000 gpd. The facility provides both primary and secondary treatment. There were 510 reported connections in 1980 with a reported average daily flow of 200,000 gpd. The treatment facility discharges effluent into the East Branch at its location on Shadyside Road near Route 322.

The Embreeville Center operates a private package plant which discharges effluent into the West Branch of the Brandywine Creek in Newlin Township. The designed operating capacity of this plant is 200,000 gpd with an average daily flow of 68,000 gpd. This plant was built in 1920 and has been modified to

improve its performance. The 1977 Act 537 Plan for West Bradford Township indicates that the plant was adequate in bacterial content and suspended solids removal but poor in the removal of phosphates and nitrogen.

The areas of the Township not served by the Broad Run Sewer Company utilize on-site waste disposal systems. The 1977 Act 537 Plan for West Bradford analyzed the suitability of soils in the Township for both conventional and alternative systems which are permitted by the DER for use. The study found that most areas in the Township could support such systems with the exception of flood prone areas, high water table soils, and steeply sloping areas.

As indicated in the 1977 Act 537 Plan and the 1980 Water Resources Study for West Bradford Township, the groundwater supply is a very important resource to the Township because it is their sole source of water. For this reason the Township has adopted a policy aimed at protecting groundwater quantity and quality. Public sewerage which discharges effluent into streams can significantly impact groundwater supplies since there is a net loss of water from the system. This result is especially significant when public water from outside sources is not used in conjunction with public sewer service. Of equal concern is the amount of infiltration into or from underground sewage mains. If water leaks into a line (when below the water table) groundwater loss occurs; if effluent leaks from lines, groundwater contamination is likely. Inflow and infiltration from sewer lines are common in even the most well designed systems.

1.2 SOCIO-ECONOMIC FEATURES

1.2.1 Population

West Bradford's population grew by 3,063 persons, or 41.7%, between 1980 and 1990. This growth rate was more than double that of the County as a whole (18.9%). Within its subregion, the Township's numerical growth was exceeded only by East Bradford, which grew only slightly more, adding 3,221 new residents during the decade (Table 1). Despite this expansion, West Bradford's population density remains relatively low, at 560 persons per square mile (Table 2.) This is 41% higher than in 1980 (and 147% greater than it was in 1970). Although West Bradford's density is less than half that of neighboring Caln Township, and only one-sixth as dense as Downingtown, this increase is still a cause for concern in a rural-suburban municipality such as West Bradford. Expressed another way, the 18.6 square mile Township contains just 1.14 acres of land per person. This ratio could easily drop to 0.90 acres per person by the end of the decade, if the Township's population rises to 13,140 as projected by Chester County Planning Commission (a 26% growth rate over the present decade, as compared with the 41% rate obtained during the 1980s).

In the context of a shrinking base of undeveloped land (i.e., rural open space), the need to plan very carefully for future recreation requirements is essential. In order that such planning be appropriate for the type of people that should be served, components of total population growth must be examined. Looking at the increases in various age groups over the last decade as shown in Table 3, the ones registering the fastest increase were those over 65 (61.1%), those aged under five (51.37%) and the 25-44 year old group (37.8%). In each case, their growth rates outpaced those of the same age groups at the County level (where the increases were 42.8%, 35.5% and 37.8% respectively). Please see Tables 4 and 5.

Compared with the County, West Bradford's population is younger, with a higher percentage of residents in the 0-4 and 5-17 age groups, and less in the 45-67 and 65+ groups, as shown in the accompanying table. Whereas in 1970 the median age in West Bradford was 2.3 years older than in the County as a whole, twenty years later Township residents were, on average, 1.5 years younger than their counterparts in the County. (During this time, however, the median age in both the Township and the County rose, due to the aging of the large "baby boom" generation.)

Regarding minorities, West Bradford's proportion of non-whites remained constant at 5%, in both 1980 and 1990.

Table 1
Population Growth 1980 - 1990 By Township

	1980	1990	No. Change		% Change 1980-90
			1980-90	1980-90	
W. ST. BRADFORD	7,343	10,406	3,063	41.7	
Calm	9,638	11,537	2,350	24.5	
Downingtown	7,363	7,745	99	1.3	
East Bradford	2,219	6,440	4,221	100.1	
East Calm	2,157	2,610	432	19.8	
East Fallowfield	3,862	4,433	571	11.8	
Newlin	725	1,002	277	30.0	
Pocopson	2,321	3,268	935	43.1	
COUNTY	316,000	376,306	60,306	18.8	

Table 2
Changes In Population Density, 1970 - 90
(Persons Per Square Mile)

Area (Sq. Mi.)	1970	1980	1990	% Change		% Change 1980-90
				1970-80	1980-90	
WEST BRADFORD	18.6	159	393	580	+147	+42
Calm	0.8	766	1,104	1,303	+44	+24
Downingtown	2.2	3,380	3,477	3,522	+3	+1
East Bradford	15.0	218	215	429	-3	+100
East Calm	3.8	447	562	727	+26	+20
East Fallowfield	15.7	222	248	262	-12	+12
Newlin	12.0	72	60	51	-17	+50
Pocopson	2.3	184	276	294	-50	+40
COUNTY	756.0	(NA)	419	408	(NA)	19

Table 3
West Bradford Population Growth, By Age Group

Age	1980	1990	No. Change		% Change 1980-90
			1980-90	1980-90	
0-4	834	959	325	51.3	
5-17	1,836	2,343	507	27.6	
18-24	601	702	102	17.0	
25-44	2,819	4,122	1,303	46.4	
55-64	483	521	38	26.6	
65+	327	535	208	61.1	
Total	7,343	10,406	3,063	41.7	

Table 4

Percentage of People In Each Age Group, 1980 - 1990

	Year	0 - 4	5 - 17	18 - 24	25 - 44	45 - 64	65+
WEST BRADFORD	1990 (1980)	9.2 (8.6)	22.5 (25.0)	6.8 (8.2)	35.6 (38.3)	16.8 (15.3)	5.1 (4.2)
Cain	1990 (1980)	9.2 (7.5)	16.2 (17.8)	7.8 (10.0)	35.9 (32.6)	15.2 (22.0)	13.7 (9.1)
Downingtown	1990 (1980)	7.6 (7.0)	16.0 (19.3)	10.0 (14.3)	35.8 (38.4)	16.5 (20.4)	13.8 (10.5)
East Bradford	1990 (1980)	6.1 (6.9)	19.8 (21.2)	6.5 (10.1)	35.9 (32.1)	21.1 (19.6)	8.7 (10.0)
East Cain	1990 (1980)	6.9 (5.0)	15.0 (22.3)	10.2 (12.0)	35.7 (31.0)	23.7 (22.3)	9.4 (7.4)
East Fallowfield	1990 (1980)	8.4 (8.6)	20.4 (21.5)	7.0 (10.1)	36.6 (32.5)	17.6 (15.1)	10.6 (3.2)
Newlin	1990 (1980)	5.8 (7.3)	19.2 (24.6)	7.3 (7.0)	34.7 (35.0)	22.4 (17.0)	10.9 (7.2)
Pocopson	1990 (1980)	4.0 (5.4)	16.5 (21.1)	10.6 (10.2)	32.7 (28.6)	19.8 (17.0)	10.5 (17.3)
COUNTY	1990 (1980)	7.4 (6.5)	17.5 (22.0)	10.0 (12.6)	34.0 (29.3)	20.0 (20.6)	9.9 (0.0)

Table 5

Changes In Median Age, 1970 - 1990, By Township

	1970	1980	1990	Median Age Change	
				1970-80	1980-90
WEST BRADFORD	29.5	29.4	32.0	-0.1	+2.9
Cain	37.9	32.2	32.4	-5.7	+0.2
Downingtown	27.1	29.7	32.8	+2.6	+3.1
East Bradford	27.3	32.1	35.4	+4.8	+3.3
East Cain	21.7	31.9	34.4	-10.2	+2.5
East Fallowfield	27.8	29.7	33.6	+1.9	+3.9
Newlin	42.4	30.4	37.7	-12.0	+7.3
Pocopson	34.9	34.2	37.9	-0.7	+3.7
COUNTY	27.2	30.5	33.6	+3.3	+3.3

1.2.2 Employment and Income

Median household income in West Bradford was 16% higher than in Chester County in 1979, and 19% higher than the county average in 1989, according to the 1980 and 1990 US Censuses, respectively. Median family income in the Township followed similar trends, but to a lesser degree, being 5% above the county average in 1979 and 9% above ten years later (please see Table 6).

Employment types in the Township and in the County reflected the above comparisons: in 1989 West Bradford's managerial/professional workers comprised a larger proportion of total employed residents (39.1%) than they did in the County as a whole (34.6%), while "operators, fabricators and laborers" comprised a smaller share of the Township's labor force (7.9%, versus 10.7% in the County).

Table 6
Income and Employment Trends, 1980 - 90

<u>Income Measures</u>	1980			1990		
	<u>West Bradford</u>	<u>County</u>	<u>Twp/Co Index</u>	<u>West Bradford</u>	<u>County</u>	<u>Twp/Co Index</u>
Median Household Income	\$25,683	\$22,20	1.16	\$54,187	\$45,642	1.19
Median Family Income	\$26,794	\$25,53	1.05	\$57,020	\$52,325	1.09
<u>Employment Types</u>						
Managerial/Professional	28.5%	28.8%		39.1%	34.6%	
Operators, Fabricators, Laborers	13.7%	16.3%		7.9%	10.7%	

1.2.3 Housing

During the 1980s, West Bradford's housing stock increased by 1016 dwelling units, 907 (89%) of which were single-family detached (See Table 7). This matched the percentage of single-family homes in the community at the decade's start (90%). Most (80%) of West Bradford's housing falls into the \$100,000 - 149,999 and the \$150,000 - 199,999 ranges. As shown in Table 8, the percentage of homes in this price range is substantially higher than that found in the County as a whole, where slightly less than half the dwelling units are so priced. Compared with the County, West Bradford has much smaller proportions of moderately priced homes (under \$100,000) affordable to first time housebuyers, and very expensive residences (over \$300,000 per unit). Put another way, judging by its housing values, West Bradford is much more representative of the middle and upper-middle classes than is the County.

With regard to rental housing, West Bradford possesses an extremely small proportion (5.8%), which is noticeably less than the Township accommodated in 1980, when 9% of all dwelling units were renter-occupied (See Table 9). County-wide, one-quarter of all dwellings are rentals.

Perhaps reflecting this, the Township had, on a percentage basis, fewer one and two-person households, and more, three, four, and five-person households (Table 10).

1.2.4 Land Use Patterns and Policies

Historically, West Bradford Township has been a rural community dominated by agriculture and woodlands. Its highly dissected upland topography has both guided and constrained settlement patterns. Non-farm land uses were concentrated in the villages of Marshallton and Romansville. This essentially remained the case as recently as 1960. Between 1960 and 1975, a "boom" in residential construction resulted in a three-fold increase in the number of residential units and in the amount of land occupied by them. Nevertheless, when the 1976 Comprehensive Plan was prepared, West Bradford was still characterized as predominantly rural. While development, primarily residential, had taken place in scattered locations throughout the Township, it remained concentrated at Marshallton and Romansville and later also in the Crestmont Farms area in the center of the Township.

1.2.4.1 Land Use Survey of 1976: In 1976, agriculture still comprised the single largest land use, with almost 50% of the Township land area in some form of active or fallow agricultural use. Woodland areas comprised an additional 15%. Public and quasi-public institutions (including open lands in institutional

Table 7
West Bradford Housing Units, By Type, 1980 - 1990

	1980	1990	No. Change 1980-90	% Change 1980-90
Single Family Detached	1,921	2,665	744	48.8
Attached Units	110	76	-37	-32.7
Mobile Homes etc.	107	203	96	100.4
Total	2,138	3,044	906	45.2

Table 8
Value of Housing Units 1990

	WEST BRADFORD		
	Number	Percent	Percent
Under \$50,000	89	9.8	2.6
\$50,000 - \$9,999	123	14.9	16.8
\$100,000 - \$140,000	1,043	42.0	27.8
\$150,000 - \$199,999	567	38.2	21.1
\$200,000 - \$299,999	262	10.3	21.4
\$300,000 or more	77	3	10.3

Table 9
West Bradford Housing Tenure, 1980 - 1990

	1980	1990	No. Change 1980-90	% Change 1980-90
Owner-occupied	1,026	2,970	1,944	61.6
Renter-occupied	198	185	-13	-5.1
Vacant	77	53	-24	-31.2
Total	2,291	3,217	926	46.2

Table 10
Persons In Housing Unit

	WEST BRADFORD		
	Number	Percent	Percent
1 Person	502	9.5	20.2
2 persons	813	23.7	22.4
3 persons	702	22.2	18.5
4 persons	844	20.7	17.8
5 persons	353	11.5	7.7
6 persons	97	3.1	2.4
7 or more	43	1.4	1.2
Persons per occupied unit	3.20	2.72	
Persons per owner-occupied unit	3.75	2.50	
Persons per rental unit	2.47	2.23	
Units with more than one person/room	5.2%	1.4%	

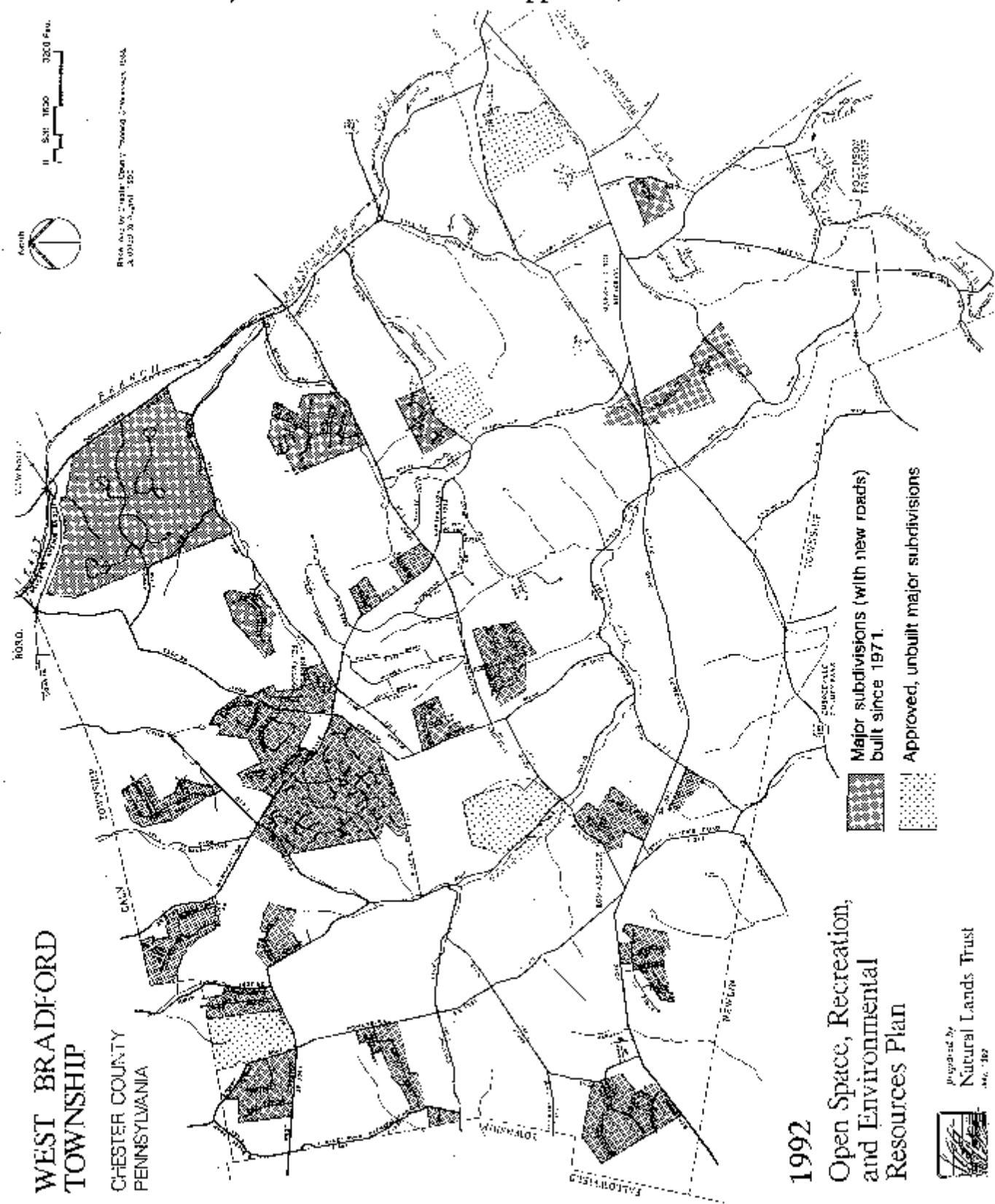
ownership) accounted for another 12.5%, including the Embreeville Center, the Brandywine YMCA Camp, the Devereux Foundation's Como Farm, Camp Linden, and the West Bradford Elementary School. Not including farm dwellings, residential uses occupied 20% of West Bradford's land area. Most residences were single-family detached dwellings, with some semi-detached and apartment units, particularly in the old villages. In addition, the mobile home park at Highland Orchards had opened, accommodating about 100 mobile homes by 1976.

In 1989 the Shannon Airport occupied 60 acres along Marshallton-Thorndale Road in the northern part of the Township. Otherwise, relative to the large geographical extent of West Bradford Township, there were very few commercial or light industrial uses in 1976, and correspondingly little land devoted to them. That fact could essentially be attributed to two primary factors which continue to hold true: 1) West Bradford's location in close proximity to already existing and developing commercial and employment centers at Coatesville, Thorndale, Downingtown, Exton, and West Chester; and 2) West Bradford's limited arterial roadway network and highly dissected topography which impedes development of additional or more direct routes.

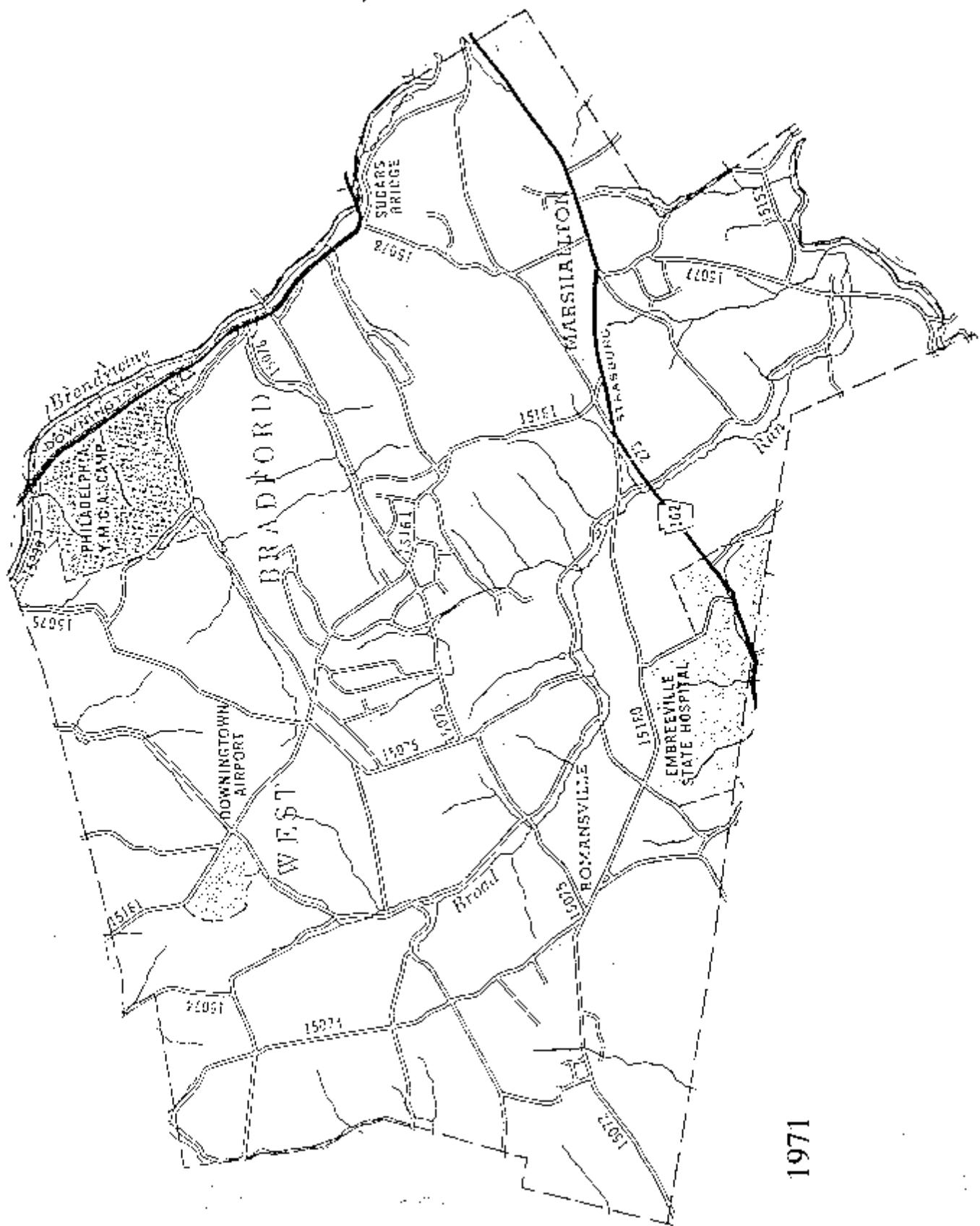
The 1976 Plan proposed further concentration of higher density residential development and convenience commercial uses in four "villages": at Marshallton and Romansville, in a relatively large area to the northwest of Crestmont Farms, and in the vicinity of Highland Orchards. Residential densities for these "villages" were proposed in a range of 2.5 to 6 dwelling units per acre, presuming service by public sewer and water. Such concentration was aimed at accommodating foreseeable growth in a pattern which could engender a sense of community, avoid undifferentiated dispersal of development, and refrain from intrusion into the most environmentally sensitive areas.

1.2.4.2 Land Use Survey of 1988: Extensive development has occurred in West Bradford since completion of the 1976 Plan. That development has continued to be almost exclusively single-family residential, and has since 1976 again doubled the available housing stock. Subdivision activity has occurred in every corner of the Township, largely at the expense of former farmland. Even so, residential uses now occupy just over 25% of the land area. Very few new commercial or industrial uses have appeared; even including the airport, such uses still account for less than one percent of the total land area. West Bradford is served by such businesses in surrounding municipalities, where topography and circulation systems are more accommodating. As the population of West Bradford continues to increase, the degree to which residents might support commercial construction is a question that should be periodically addressed. By contrast, employment oriented development of light industrial, "flex", or office uses would draw labor from outside of West Bradford, further taxing the circulation

MAP 1-3 Major Subdivisions Built or Approved, 1971-1992

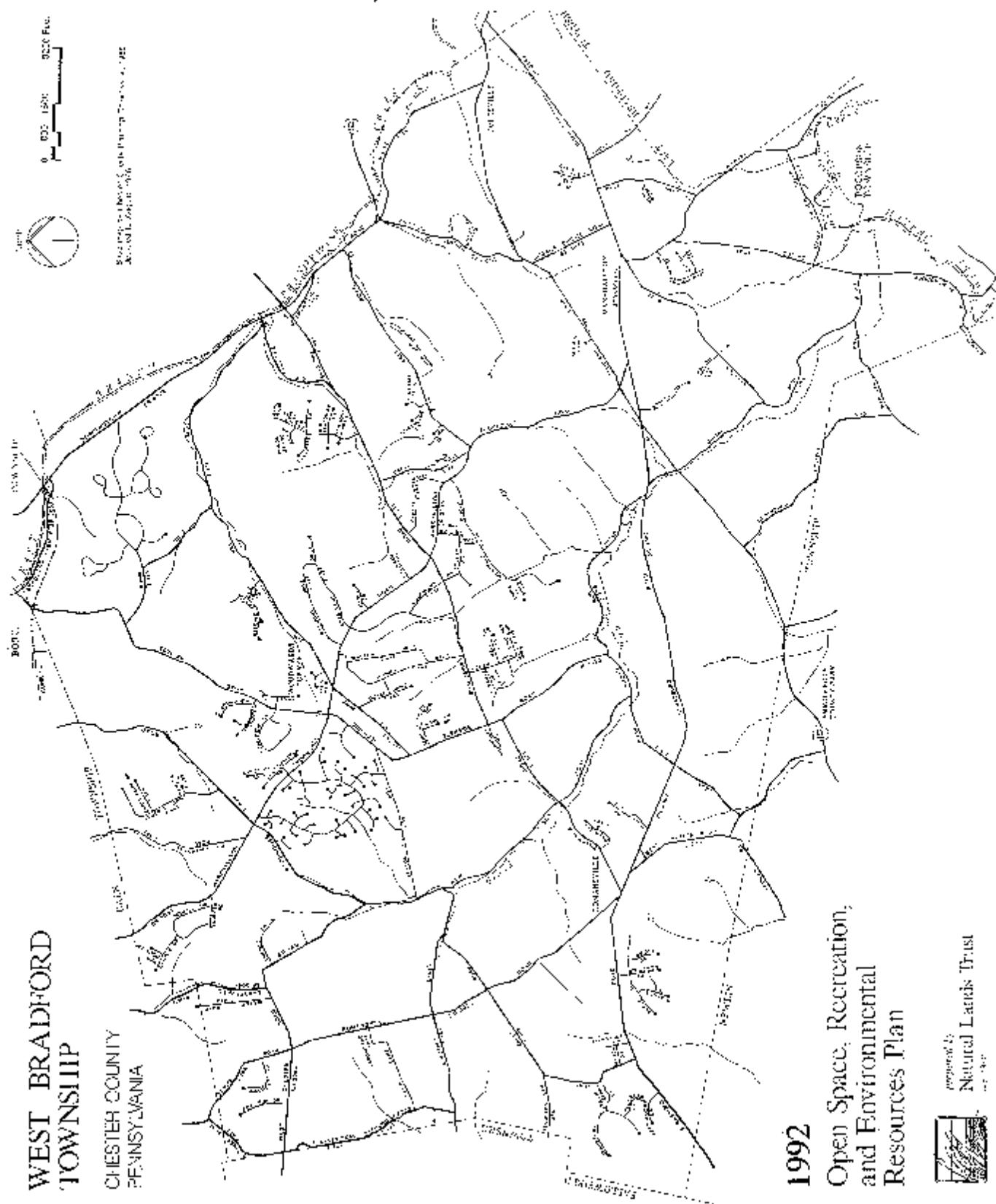


MAP 1-4 Road Network, 1971



1971

MAP 1-5 Road Network, 1992



1992

Open Space, Recreation,
and Environmental
Resources Plan



system that has apparently discouraged such development, along with other factors, to date.

Interestingly, development patterns have conformed to the recommendations of the 1976 Plan to a noticeable degree, in that many new subdivisions have been built near Marshallton and Romansville and particularly in the extended Crestmont Farms area. However, the low densities at which most subdivisions have been designed has contributed to sprawl and has altered the rural character of those areas. The north-central portion of the Township is now largely committed to single family development. That development has not expanded greatly beyond Broad Run Road, nor has any range of higher densities been breached, as had been suggested in 1976. The lack of higher densities and absence of convenience-commercial development seems to have precluded the evolution of perceived "villages", as had been recommended. Nor has new development concentrated in the Highland Orchards area, other than expansion of the mobile home park.

Large areas remain in agriculture and woodland, particularly in the west-central, southeastern, and northeastern portions of West Bradford. In 1988, nearly 40% of the Township still remained in active agriculture or lay fallow. An additional 32% comprised woodland. The three-quarters of West Bradford that remain in farm and forest present a significant opportunity to preserve a portion of such lands by balancing conservation and development interests in each new subdivision that is proposed.

The historic village areas also remain essentially "intact", with few intrusions that had not already existed in 1976. In the case of Marshallton, a National Register historic district, the fringes of the village remain visibly open, offering the potential to "buffer" the historic village setting rather than promote its further integration into a broad suburban landscape. Plans to carefully treat development in and around the edges of Marshallton and Romansville might best emphasize moderate density coupled with open space buffers and sensitive design that both "fits" the village setting and results in the creation of a "buffer" landscape separating the villages from more typical "suburban" development outside them.

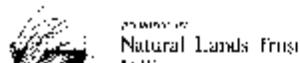
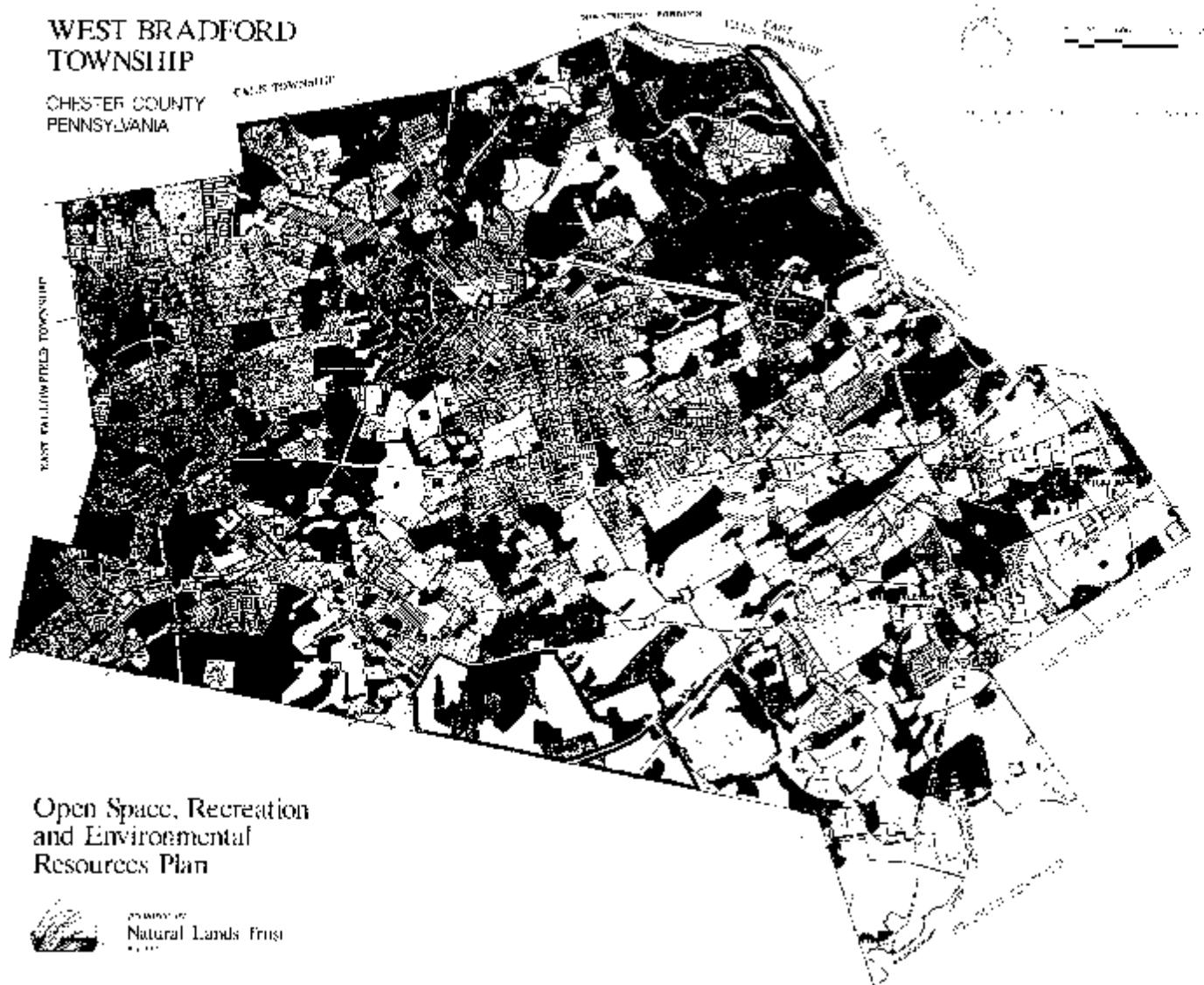
Two former institutional properties, the Brandywine YMCA Camp and Devereux's Como Farm, are either currently being developed or are subject to development proposals that together could result in the conversion of some 1,000 additional acres of farmland and forest. In contrast, large portions of the Embreeville Center grounds, in both West Bradford and Newlin Townships, are now earmarked as parkland. The largest open portions of the Center grounds have been transferred to Chester County; added to these are lands acquired from the former King Ranch and other private parties, ultimately creating a park of

some 700 acres. That future park will encompass over two miles of the West Branch of the Brandywine and will preserve an area arcing across rolling upland from the scenic corridor of the West Branch to that of the Broad Run, creating significant new opportunities for meaningful preservation of West Bradford's scenic open space resources.

Development patterns to date have generally not yet affected the Township's most sensitive and scenic area. Thus, the opportunity to aim future planning efforts even more purposefully toward their retention still exist. Continued concentration and perhaps clustering of future development, predicated upon positive preservation of open space resources, thus spaced, would seem the most feasible way to accommodate anticipated growth while retaining community character. However, new clustered development concentrations should not be allowed to over-tax natural systems. Relatively extensive areas of higher densities, dependent upon public sewerage, had been suggested in the 1976 Plan. As demonstrated by the degree to which the Broad Run sewer system can already deplete groundwater resources, such concentrations of higher density development would appear inadvisable, particularly to the extent that future public sewer systems might depend upon stream discharge of treated effluent.

WEST BRADFORD TOWNSHIP

CHESTER COUNTY
PENNSYLVANIA



MAP 1-6

LAND USE (1992)

- Single Family Residential
- Two Family/Multi Family Residential
- Motels/Inn/Parks
- Retail Service/Office/Commercial
- A-type
- Industrial
- Public Institutions
- Private Residential, Religious, Residential
- Public Park, Recreation, Open Space
- Under-Rock, Recreation, Open Space
- Utilities, Pipelines:
 - Surface Pipeline
 - Underground Cable
- Agriculture
- Woodlands
- Woods
- Approved: Overall Subdivision Plan

1992 Land Use Map, as of May of 1992
1:250,000 Scale
Source: U.S. Census Bureau
Data: U.S. Census Bureau, 1990
Data: U.S. Census Bureau, 1990

Chapter 2

GOALS, OBJECTIVES AND POLICIES

2.1. BACKGROUND

West Bradford updated its *Comprehensive Plan* in 1989 with technical assistance from the Chester County Planning Commission and the Brandywine Conservancy, working together with a local task force comprised of representatives from the Township Planning Commission, the Historical Commission, the Park and Recreation Commission, the Fire Company and the Township Manager. This general plan addressed land use, open space, environmental, recreation and historic preservation issues broadly, incorporating many of the ideas contained in the Township's 1987 *Open Space and Recreation Study*, which had been completed two years earlier by an advisory task force assisted by John Snook of the Brandywine Conservancy.

During the summer of 1992 a third task force was convened to oversee preparation of a new *Open Space, Recreation and Environmental Resources Plan*. This group included the Township Supervisor, the chairman of the Township Recreation Commission, the chairman of the Township Planning Commission, the Township Manager, and a Township resident long active in local planning and open space issues. After reviewing the goals and objectives stated in the two preceding plans which had been completed within the past five years, the members of this task force reaffirmed them as ones that still represented the Township's aspirations for the future.

Building upon the goals and objectives statements contained in the 1989 *Comprehensive Plan* and the 1987 *Open Space and Recreation Study*, this chapter presents four categories of policy statements outlining West Bradford's future policies with respect to land use, historic preservation, natural features and community facilities.

2.2 UNDERLYING PHILOSOPHY

The Township's proactive philosophy toward open space, recreation and environmental resource protection is perhaps best reflected in a statement in its 1987 *Open Space and Recreation Study*:

"Every municipality should assume a direct role in ensuring the conservation of notable open space resources. Such areas can be made available for passive recreation while protecting critical natural features. The Township role may involve implementation of restrictive ordinances, direct land acquisition, and advocacy of conservation efforts on the part of others..."

"Municipal governments also have a primary role in providing for the day-to-day park and recreation needs of their residents, close to home. This is usually accomplished through the provision of a system of community and neighborhood parks, typically including playgrounds, hard surface courts, regulation athletic fields, and picnic areas, as well as passive and/or natural areas..."

It is also appropriate for the Township government to see to the provision of a broad range of recreational programs... Programming should aim to serve all sectors of the community, including children, youth, adults, senior citizens, and handicapped individuals."

2.3 GOALS AND SUPPORTING OBJECTIVES

2.3.1 Open Space and Environmental Protection

Broad Categorical Goal for Open Space and Environmental Resources:

Township policies, as implemented through municipal regulations, acquisition programs, and landowner outreach efforts, shall be coordinated not only to protect critical resources (such as farmland, woodland habitat, wetlands, steep slopes, stream corridors, scenic vistas and byways, and historic/cultural features, as shown on the Resources Composite Map), but also to create an interconnected network of greenways and greenspaces for habitat conservation, environmental protection, agricultural viability, rural character preservation, and passive recreation. This greenway system should be the product of several complementary, coordinated efforts including, among others, voluntary agreements with landowners, land purchases, and open space reservations created through clustered residential development layouts.

2.3.1.1 Land Use Sub-Goal

Retain and enhance the historic, semi-rural atmosphere of West Bradford Township, through careful limitation and guidance of continued development in balance with critical environmental and community service needs and constraints, and in recognition of existing diverse patterns of land use, and significant scenic and historic resources.

Supporting Objectives: Residential Land Use

- In scenic, historic, agricultural, and environmentally sensitive areas, permit only low density residential development, appropriately sited and buffered to conserve the nature of those areas to the greatest degree feasible.
- Protect the viability of existing neighborhoods and promote the maintenance of existing residential dwellings.
- Permit continued opportunities for a variety of dwelling unit types and lot sizes, compatible with existing land use patterns and environmental and community service resources and constraints.
- Allow for future developments of higher residential densities in logical growth areas, only where critical environmental resources will not be compromised and where sufficient and appropriate community services (e.g., roads, water, and sewage disposal) can be made available in a cost-and-energy-efficient manner.
- Promote the retention of agricultural uses as a viable industry and an important land use. Encourage the use of available organizations and programs which help to make farm retention possible.

2.3.1.2 Historic Preservation Sub-Goal

To preserve, protect, and enhance the integrity of West Bradford's historic resources and the historical atmosphere of both village and rural areas that offer an appropriate setting for those resources, Township officials, particularly the Historical Commission, should seek to implement the following objectives.

Supporting Objectives: Historic Preservation

- Identify all potential historic districts, clusters, and individual historic resources in West Bradford Township. Assemble sufficient information to evaluate their historical merit and discern priorities for preservation.

- Secure appropriate certification of the historical significance of all eligible historic resources.
- Devise strategies for preservation appropriate to identified historic districts, clusters, and individual historic resources.
- Develop opportunities and incentives for the continued use or compatible reuse of West Bradford's historic resources.
- Strive to minimize impacts of new construction and development on historic resources and their settings.
- Encourage the proper maintenance and continued integrity of West Bradford's historic resources.
- Foster public education and support private actions that promote the preservation and protection of historic resources.

2.3.1.3 Natural Features Sub-Goal

To conserve the critical natural features of West Bradford Township through careful and sensitive management of growth and development, including those features that contribute to its community character and setting, that comprise resource opportunities, or that pose threats to public health or safety if managed improperly.

Supporting Objectives: Natural Features

- Ensure that land areas subject to flooding or otherwise not suitable for any buildings or structures because of steep slopes, poor soil bearing qualities, or with poor or impossible water and/or sewage capabilities are not used for building development purposes.
- Protect and maintain groundwater resources. Minimize any exportation of groundwater from the Township.
- Protect and maintain surface water quality.
- Maintain woodland areas and otherwise encourage the establishment of trees and other vegetation, creating windbreaks, controlling soil erosion, screening undesirable views or features, and contributing to visual amenities and the character of the community.

- Maintain scenic, historic, and unique natural landscape qualities, including those inherent in West Bradford's stream valleys and its scenic and historic roadways and villages.
- Minimize the loss of topsoil and erosion and sedimentation of soils. Employ effective stormwater management techniques.
- Promote energy conservation and the effective utilization of renewable energy resources.
- Promote public awareness of and sensitivity toward natural and scenic features of West Bradford. Support local (private) efforts to conserve and enhance natural features.

2.3.1.4 Open Space Sub-Goal

To create a township-wide network of interconnected open space including natural areas, farmland, and neighborhood parks for habitat preservation, crop production, and provision of passive recreational opportunities, all of which will enhance community character and contribute to the quality of life for township residents.

Supporting Objectives: Open Space

- Require the conservation of environmentally constrained lands as open space throughout West Bradford Township (see Natural Features objectives for elaboration).
- Promote the continued economic viability of agriculture and agricultural business. Explore alternative land development design standards and natural resource regulations that make possible the retention of agricultural land.
- Require maintenance of sufficient open space within new development to be used for: passive recreation, internal landscaping, perimeter buffering, and overall as a site design feature aimed at compatibility with the existing visual character of the Township.
- Encourage the use of private means to preserve and maintain open space.
- Support the establishment of recreational trails between open space areas and, as feasible, linking residential areas to other recreational and community facilities.

2.3.2 Recreational Lands and Facilities Provision

Broad Categorical Goal for Recreational Lands and Facilities

The Township shall coordinate its land use regulations, land acquisition efforts, and recreational programs to ensure that future needs of its residents for passive and active recreational opportunities are satisfied, in a hierarchy of formal facilities and informal open spaces that are geographically distributed in a rational manner consistent with the community's residential neighborhoods as they continue to grow and develop.

2.3.2.1 Community Facilities Sub-Goal

To ensure the provision of community services adequate to serve the needs of existing and future residents of West Bradford Township, and to limit and guide future development to a type and form that requires community facilities which are compatible with resource constraints and otherwise in conformance with Township land use policies.

Supporting Objectives: Community Facilities and Services

- Provide for the adequate administration of Township functions and coordination of the activities of township boards, commissions and committees. Maintain and, as necessary, improve Township building facilities
- Ensure adequate and safe water supply and sewage disposal throughout the Township; minimize exportation of wastewater via sewers, instead utilizing on-lot or on-site systems wherever feasible, including the effective use of alternative systems where appropriate.
- Support, where appropriate, the development of non-vehicular travel ways through the Township (e.g., bicycle routes, walking trails, equestrian trails) Seek to resolve points of potential conflict between vehicular and non-vehicular traffic.
- Provide for the establishment of permanent open space areas as development occurs, ensuring the availability of areas appropriate for active and passive recreation in developed areas.
- Provide for community and neighborhood park facilities and programs; encourage and support public access to semi-public community recreation facilities and programs.

- Support the continuation and expansion of facilities and programs at regional parks, preserves, and recreation areas provided by the State and County governments and others. Promote and support County efforts to establish, develop and maintain a sub-regional park at Embreeville.
- Support the establishment of recreational trails between open space areas, linking residential areas to other recreational and community facilities, wherever feasible.

2.3.2.2 Recreational Sub-Goal

Acquire the land necessary for the proper development of community and neighborhood park sites to meet the long-term recreation needs of the entire Township.

Supporting Objectives: Recreation

- Acquire at least one more centrally located community park site to meet the long-term active recreation needs of the entire Township.
- Acquire neighborhood park sites throughout the Township as the community grows in population, relying primarily upon open space dedication requirements of the Township's subdivision regulations and the open space set-aside requirements in the Township's cluster standards.
- Participate in the Downingtown Area Regional Consortium's inter-municipal recreation programs, to provide playground activities, creative and performing arts, league sports, and other recreation activities to Township residents.

Continue to make Township recreation facilities available to private league sports groups such as West Bradford Youth Athletics.

- Continue to make Township parks available to athletic associations and other user groups, to enable their use for sports and other appropriate recreation activities, provided that such facilities will also remain available to the general public

2.4 POLICY OPTIONS FOR CONSERVING OPEN SPACE THROUGH CREATIVE DEVELOPMENT TECHNIQUES

2.4.1 "Menu" of Choices

Amend the Township's zoning and subdivision regulations to administratively provide a "menu" of "by-right" subdivision choices for landowners or developers, to design development projects which best reflect the varying circumstances associated with their individual properties.

Sample menu of uses permitted "by-right"

- a) Improved conventional subdivision with some usable open space.
- b) Compact development plan at same density but with significant open space provision.
- c) Conventional development without open space but built at substantially lower gross densities.
- d) Country property plan (with streamlined review).

Such development should be encouraged in special overlay zones designated to protect particular types of resources (riparian areas, farmland, woodland, historic settlements, etc.), and should be laid out according to design standards based upon the goals of preserving scenic viewsheds, retaining significant wildlife habitats, conserving agricultural lands, and linking active and passive open space areas.

2.4.2 Improved Conventional Subdivisions

Amend the Township's subdivision regulations or take other appropriate actions to strengthen standards for designing specific kinds of recreational open space in conventional suburban subdivisions and connecting such open spaces among contiguous suburban neighborhoods.

2.4.3 Compact Development With Significant Open Space

Enact the proposed zoning regulations to encourage "compact development" at gross densities equal to those allowed under current zoning, as determined either by a formula based on "net buildable land" and the Environmental Impact Assessment report, or on a realistic "yield plan" prepared by the applicant (his choice). Such a zoning amendment should also include requirements for substantial open space set-asides (50% or more), and this open space should include sufficient areas of flat, dry land suitable for active outdoor recreational use, in addition to steep slopes, wetlands, and wildlife habitat.

2.4.4 "Country Properties"

Amend the Township's zoning regulations or take other appropriate actions to provide greater incentives for low density "country property" subdivisions (one dwelling per 20-25 acres), protected by conservation easements or deed restrictions, particularly in those areas which still retain a strong rural character. A relaxation of Environmental Impact Assessment requirements, minimized road specifications, and quicker township approvals are possible incentives for low density development. Eased or otherwise restricted country properties could become part of a broad greenbelt program for open space conservation.

2.4.5 Conservation Plans

Adapt the "Environmental Impact Assessment Report" in the Township subdivision regulations to require "conservation plans" for all subdivision and land development proposals, as a means of minimizing impacts on the community's natural and cultural resources. Such plans should focus on specific protection goals, and must also address land management issues (including the choice of management objectives and the assignment of management responsibilities).

2.4.6 Historic Preservation

Enact a township-wide historic preservation program. Offer density incentives and/or free professional architectural consulting advice to encourage owners of historic buildings to follow the recommendations of an advisory historic commission, whose review of proposed alterations should be required but non-binding.

2.4.7 Overlay District

Create a new "Greenbelt/Greenway Overlay Zoning District" to define priority protection areas on each parcel of land over 10 acres in size. Developers would be either strongly encouraged or required to use this map when laying out their houselots, streets, and open space areas. This would help to ensure that open space created in new subdivisions will be in those areas of highest importance for protection, and that such open spaces will ultimately connect with similar areas on adjoining parcels yet to be subdivided.

2.5 POLICIES FOR CREATING A GREENWAY AND PARK SYSTEM

2.5.1 Greenbelts, Greenways, and Trails

Take those actions that could ultimately create a network of interconnected open space throughout the Township comprising stream valleys, agricultural lands, woodlands and historic settlement corridors. These greenbelts could be established with conservation easements, open space set-asides in new developments, and through land acquisitions by the Township or non-profit conservation organizations working with landowners on a voluntary basis. Within the greenbelts a coordinated system of trails should also be created as a greenway system. Such trails could be for walking, hiking and/or equestrian use, and should be designed to connect protected open space such as Embreeville Park, Township parks, and stream corridors with neighborhoods, schools, shops, etc.

2.5.2 New Community Parks

Acquire land necessary for proper development of one or more centrally located community park sites to meet the long-term recreation needs of the entire Township. The community park complex could have facilities such as a community center, regulation athletic fields, a tennis complex, group picnicking areas, walking trails, and parking areas.

2.5.3 Neighborhood Parks

Acquire neighborhood park sites throughout the Township in advance of anticipated population growth, relying primarily upon upgraded open space dedication requirements of the Township's subdivision regulations. Such parks would typically include playground facilities, a multi-purpose field and some parking provision.

2.5.4 Regional Recreation Programs

Participate in a regional recreation program, such as one based on school district catchment areas, to provide playground activities, creative and performing arts, league sports and other recreational opportunities supervised by trained staff.

2.5.5 Funding

Encourage open space protection through a Township 'Special Fund' created by one or more of the following mechanisms.

2.5.5.1 Open Space Set Aside Fee

Assess new commercial and industrial development with an open space set aside fee.

2.5.5.2 Bond Issue

Create a fund with a Township 'Bond Issue' (such as the one Middletown Twp. established) to purchase open space in fee simple

2.5.5.3 Easement Purchase

Purchase easements (for conservation, trail access, and agriculture) to protect critical open space parcels, large parcels, and linkages, while maintaining existing ownerships and uses. Properties such as Highland Orchards may be particularly applicable for this approach.

2.5.5.4 Fees in Lieu of Open Space Dedication

Increase fees paid by developers in lieu of open space dedicated with their subdivisions. Subdivision applicants should be required to pay such a "fee in lieu" for any requirement that they fail to meet. For example, providing adequate land for passive recreation would not relieve one from meeting other requirements, such as those pertaining to active recreation facilities (and vice versa)

Chapter 3

INVENTORY OF EXISTING RESOURCES AND LANDS

3.1 OVERVIEW OF RESOURCE INVENTORY

The maps that comprise the inventory of existing resources and lands were produced by Natural Lands Trust from June through December of 1992. The data presented were taken from existing sources identified in detail in Appendix A. Some of the map data are derived from field work by the Trust or input from the members of the Task Force. This is particularly the case for the Biotic Resources Map and the Scenic, Historic and Cultural Resources Map. Maps that required original research represent our best effort to thoroughly document a particular resource, but in reality are somewhat incomplete. We are able to document only the conditions visible from public roads or areas familiar to the Task Force members. Since some of the information on the inventory provides the basis for decisions and policies described in subsequent chapters, relevant map data should be updated as new information becomes available.

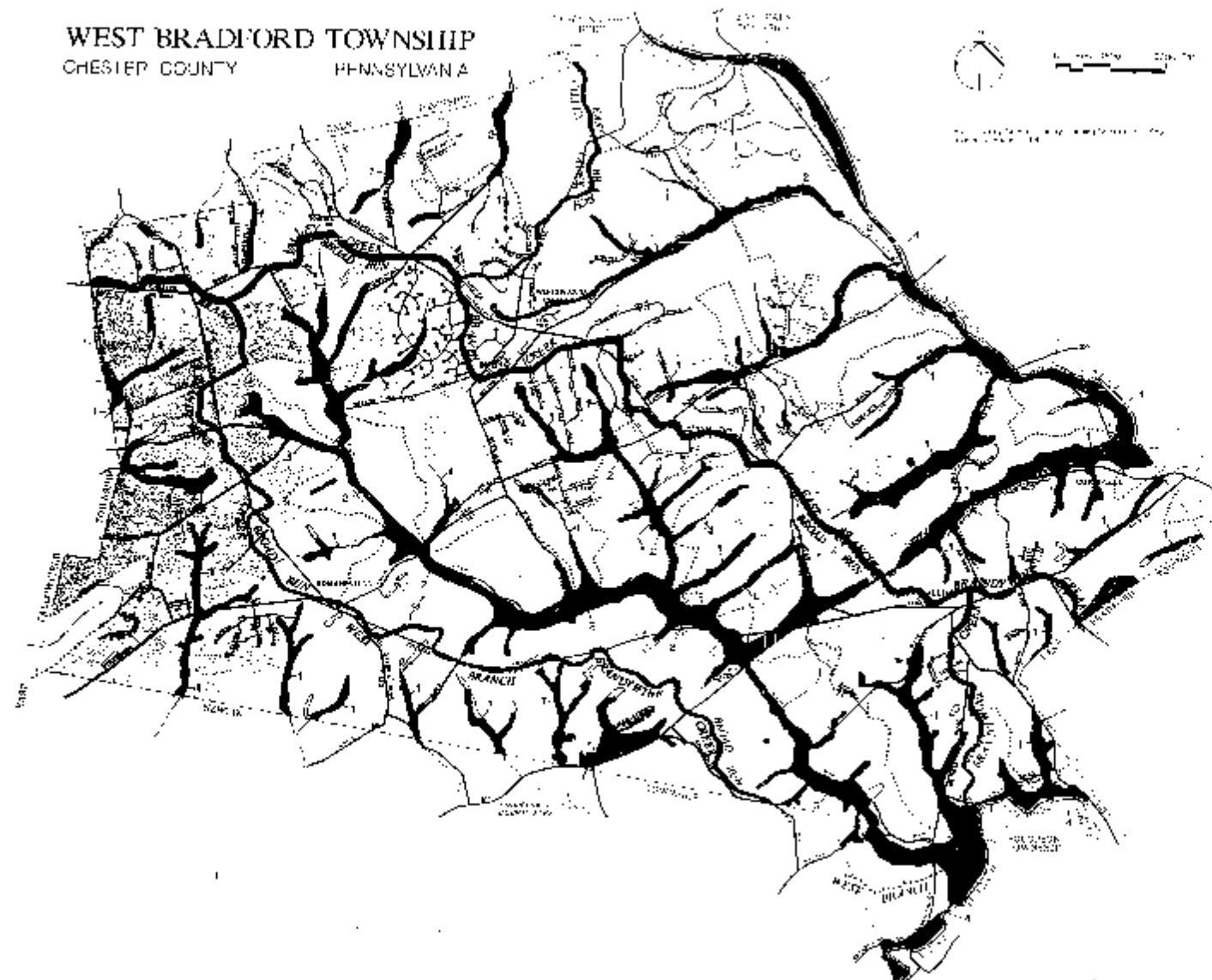
The original maps were produced at a scale of one inch to sixteen hundred feet on either a road base map by the Chester County Planning Commission, 1988, revised in 1990, or a parcel line base map updated by Chester County Planning Commission in 1990. A description of each of the resource maps follows.

3.2 WATER RESOURCES

3.2.1 Watershed Boundaries, Stream Order Classification, and Headwater Areas

West Bradford Township is entirely within the drainage basin of the Brandywine Creek Watershed, a 290 square mile watershed in Pennsylvania and Delaware. The Brandywine is a tributary of the Christiana River, joining it about a mile from its confluence with the Delaware River in the city of Wilmington, Delaware. Approximately one half of the Township drains to the East Branch and one half drains to the West Branch of the Brandywine from a divide that runs west to east across the Township. The divide between the Branches is on or near roads throughout the Township, following in the west, West Chester Road, Winfield Drive, crossing over to Boulder Road and following Marshallton-

WEST BRADFORD TOWNSHIP
CHESTER COUNTY PENNSYLVANIA



MAP 3-1

WATER RESOURCES

-  100 Year Floodplain and Alluvia Sub
-  Additional Seasonal High Water Table
1 To 1 Foot from Ground Hydro
-  Additional Seasonal High Water Table
1 To 5 Feet from Surface
-  Wetlands
-  Watershed Boundaries
-  Headwaters, Drainage Areas or First Order Streams
-  Street Order Classification
-  Aquifer Areas Underlain by Carbonate Bedrock

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Thorndale Road almost to the intersection with Strasburg Road, which it follows until the intersection with Lucky Hill Road which demarcates the divide until it exits the Township in the east.

The watershed divides were plotted using the USGS contour data. Since the watershed divides follow roads that have undergone adjacent development, with grading and stormwater management structures altering the original contour of the land, the watershed divides should be considered approximate in developed areas.

The streams and waterways mapped and coded for stream order categorization are from the USGS quadrangles. Other streams that are mapped, but not coded for stream order, are either from the base map, or from the National Wetlands Inventory maps.

The East Branch drainage is subdivided into the tributaries draining to the north to Valley Creek, a tributary of Beaver Run, and the tributaries draining to the east directly into the East Branch of the Brandywine Creek. Most of these streams are first order streams, located at the highest point of the watershed and draining hillsides and steeply sloping valleys that do not afford a branching, dendritic drainage pattern. The East Branch as well as the West Branch are Pennsylvania Scenic Rivers for their entire lengths within West Bradford Township.

The Valley Creek watershed drains the South Valley Hills with elevations over 590 feet above sea level to about 320 feet at the lowest points along the northern boundary of the Township. Its stream gradients are very steep, and most watershed areas are defined as headwaters.

The East Branch tributaries drain from west to east at almost a right angle to the East Branch. These streams primarily drain narrow valleys that run west to east and generally form a trellis pattern. Over fifty percent of this land area is defined as headwaters, with a very small areas draining directly into the East Branch, a forth order stream. Most of the non-headwater areas are in the eastern edge of the Township, the drainage areas of second order streams before their confluence with the Brandywine. The elevations of this drainage area range from 590 feet to 200 feet above sea level where the East Branch leaves the Township near Copesville.

Almost forty percent of the Township, including its entire central portion, is drained by the tributaries of Broad Run, a DER designated exceptional value water quality tributary of the West Branch Brandywine Creek. Only about a hundred acres of the Broad Run watershed lie outside the Township. This stream flows from west to east and joins the West Branch at Trimble's Ford. About half of this watershed drains into first order streams and is defined as

headwaters. Almost the entire length of Broad Run is a second and third order stream. The stream order classification would imply that many lengths of the stream are capable, through dilution, of handling the input of wastewater without degradation. The stream's designation as being of exceptional value water quality gives all of its reaches protection through tough water quality standards mandated by the Pa. Department of Environmental Resources (DER). The subdivision of the tributaries into stream order categories is perhaps less significant in this watershed as all require equal protection.

The western and southern portions of the Township that drain to the West Branch Brandywine are almost entirely headwater basins of first order streams. A few small areas drain directly into the West Branch, and are therefore part of a fourth order watershed. The lowest elevation in the Township, under 190 feet above sea level, is where the West Branch leaves the Township near Wawaset. The highest elevations, above 590 feet, also drain into the West Branch. However, almost all of the headwater tributaries in the watershed have a gentle gradient.

The significance of West Bradford's drainage basins and headwater watersheds, there is a need to maintain a relatively natural "balance" in the surface water "budget." The use of surface waters for domestic purposes is largely limited to the East Branch Brandywine and Beaver Creek (both intake points are outside of the Township's boundaries). Treated wastewater is returned to the system at a single location, the sewage treatment plant on Sawmill Road, which discharges to the East Branch Brandywine. If the groundwater map mirrors the surface drainage, and well water withdrawals are entered into the equation, there is a large transfer of water from Broad Run and the West Branch to the East Branch. The Township maintains a self sufficiency in water use. It does not depend on water outside of its boundaries, except in the area of groundwater withdrawals, which may remove water from aquifers that are replenished outside of the Township. At this point not enough is known about groundwater supplies to determine if the Township's withdrawal debit or recharge credit are in balance. Water based limitations to Township population growth may become a reality at some point in the future, either to manage unbridled growth, or required by regional utility authorities serving large populations and industries.

3.2.2 Floodplains and Alluvial Soils

Floodplains and alluvial soils, shown on Map 3-1, coincide with the Flood Hazard District mapped in the Township Zoning Ordinance. The Ordinance defines the Flood Hazard District as the greater of the recorded high water mark of past floods, the FEMA "100 year flood," or the alluvial and seasonal high water soils that are subject to inundation or formed by deposition from previous floods. Chewacla, Wehadkee, and Worsham soils, as identified in the Soil

Survey of Chester County, are the three flood hazard soils identified in the Ordinance. The Zoning Map includes all of these soils plus soils in the Glenville series along with the FEMA 100 year floodway in their Flood Hazard District. There are a few small exceptions at the upper ends of the floodplains and where soils are not contiguous to the stream valleys. The dendritic pattern mapped can be considered the maximum floodplain district.

The importance of protecting floodplains cannot be overstated. The issues of public health and safety, as well as the protection of property in the floodplain are identified in the Zoning Ordinance. Floodplains should remain in an open, natural condition to protect the surface and subsurface waters from potential pollution and to enhance the groundwater recharge capability of pervious alluvial soils. Development within or the alteration of the floodway can cause additional flooding, an increase in volume or rate of flow, and the deposition of sediment on adjoining lands. In order for landowners to qualify for Federal flood insurance the Township must strictly regulate the development of flood prone lands.

Perhaps equal in importance to the hydrologic features of floodplains are their biologic attributes. Floodplains provide a habitat for many plant and animal species that require specific aquatic and hydric environments for survival. The linear and dendritic pattern of floodplains permits the migration of animals and genetic material. The health of a variety of types of natural areas contributes to a diverse wildlife population in the Township and the hemisphere.

3.2.3 Wetlands

The wetlands shown on the Water Resources Map are those identified on the National Wetlands Inventory (NWI) of the U.S. Fish and Wildlife Service. Wetlands, areas with periodic standing water and adaptive vegetation such as cattails, phragmites, skunk cabbage, and arrowhead, provide important wildlife habitat and hydrologic functions. They serve as recharge areas for groundwater and filtration areas for surface water. Perhaps the most visible contribution wetlands make to our environment is as habitat for fish, reptiles, amphibians, birds and mammals. Their role as nursery, food source, shelter, refuge and hibernation sites is critical to the emerging spring peepers as well as migrating Canada Geese.

Wetlands are typically identified by the presence of three characteristics, hydrology, soils and vegetation. The wetlands shown in Map 3-1 are identified through aerial photography by the NWI as riverine, those relating to rivers and streams, or palustrine, those relating to freshwater marshes, swamps, bogs, or small shallow ponds. The palustrine wetlands range from open water (farm ponds) to emergent, shrubby and wooded swamps. The greatest number of the

palustrine wetlands mapped in West Bradford Township are open water. However the most extensive wetlands, found on the floodplains of Broad Run and the East and West Branches of the Brandywine, are dominated by emergent, broad leaved deciduous plants. The riverine wetlands are typically perennial streams.

All wetlands are intolerant of disturbance, and are vulnerable to pollution. Development proposals on lands with wetland indicators, such as hydric or seasonal high water table soils, should be rigorously examined, and construction and filling activities should be required to be placed outside of wetland areas. Mitigation procedures for the replacement of wetlands destroyed by unavoidable development, are both expensive and time consuming. Frequently these mitigation sites take years to approximate the natural diversity of an undisturbed wetland.

3.2.4 Hydric and Seasonal High Water Table Soils

Most hydric soils are included in the floodplain areas on Map 3-1. They consist of Wehadkee silt loams and Worsham silt loams and may also be present in Glenville silt loams. Located in floodplains, depressions and low lying areas, they exhibit a high water table, within 18 inches of the surface, for a portion of the year. These soils are usually indicators of wetlands.

Hydric soils are unsuitable for development and most agricultural uses. Their high water table prevents the percolation of wastewater from drainfields, and they may cause wet basements. Groundwater is susceptible to contamination from wastewater disposal on these soils. The high water table makes them unsuitable for cultivation, and the Soil Conservation Service recommends their use as pasture or wildlife areas.

Groundwater quantity and quality, as well as wildlife habitat, are most benefitted by the maintenance of hydric soils in a natural, undeveloped condition.

The Army Corps of Engineers has regulatory authority of hydric soils through the permitting process for construction, grading or filling.

3.2.5 Protected Waters

The Broad Run watershed is listed as an "Exceptional Value" watershed by the Pa. Department of Environmental Resources (DER). According to DER criteria, this watershed is an outstanding resource and possesses substantial recreational or ecological significance. The designation is noted on Map 3-4, the Biotic Resources Map. The implications of this designation are significant in terms of development and growth management in the Township. DER regulations

regarding water quality standards will prohibit most ordinary point source discharges to the streams of the watershed. The designation will also require the control of disturbance to the natural woodland vegetation along stream banks.

All other streams and watersheds within the Township are considered warm water fisheries, and require no extraordinary protection measures.

3.2.6 Aquifers

Areas with significant potential for groundwater yield are limited to three small areas of Franklin Marble found in a linear band along Telegraph Road and Route 162 south of Strasburg Road. Two of these sites have been quarried; the easternmost one in the 18th century, the westernmost probably in the 19th century. The eastern quarry has filled with water, demonstrating the aquifer characteristics of carbonate rock formations: numerous solution channels permitting the storage and flow of groundwater. Typical of most aquifer formations, Franklin marble is found in valleys, near or beneath streams. Most of the surficial area of the formation is currently within the existing floodplain zoning district, hopefully affording an existing and potential source of groundwater protection from development and pollution.

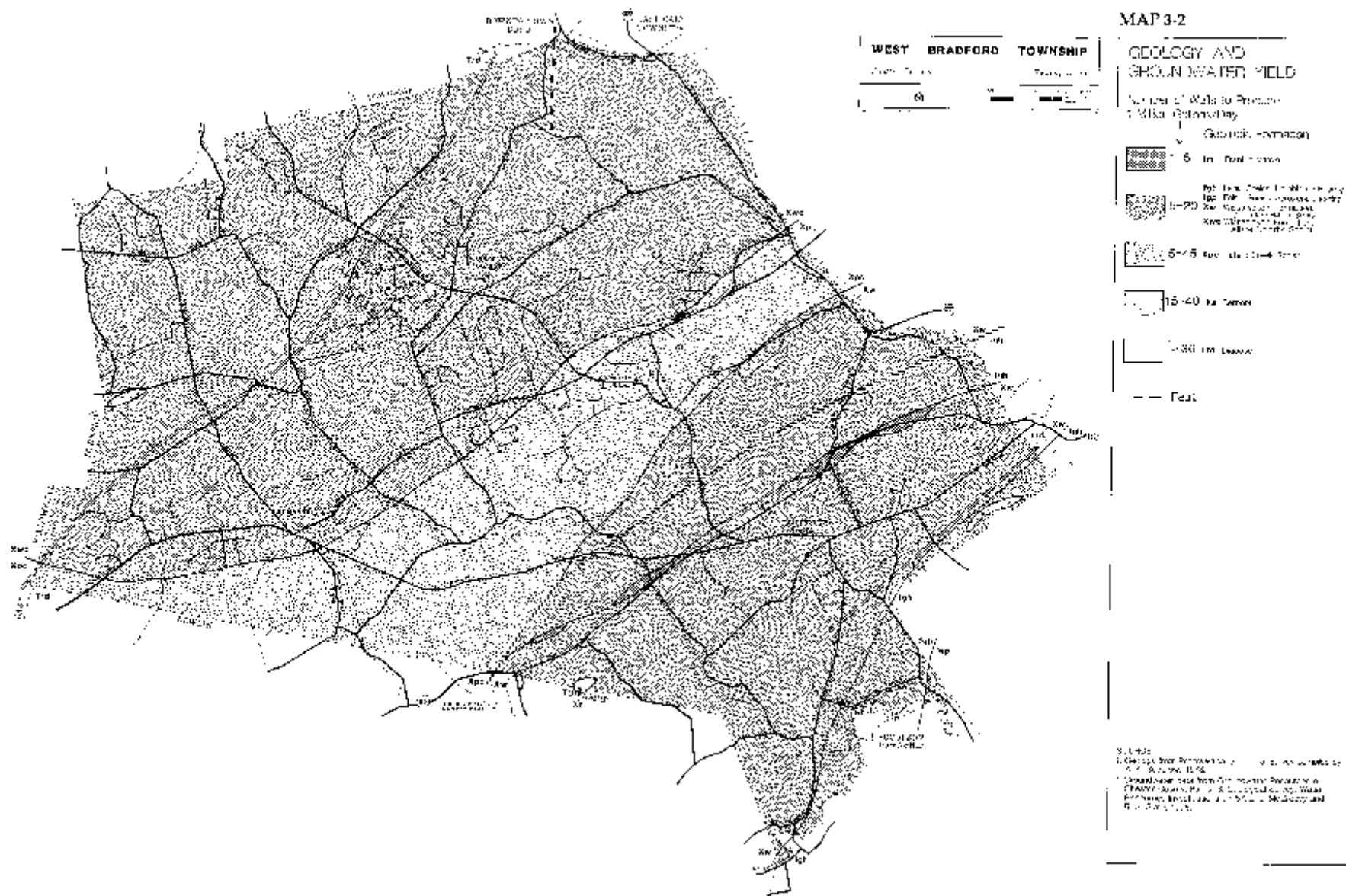
These areas should continue to be safeguarded from development and paving to guarantee a continued recharge of groundwater and minimize chances for pollution. The potential for problems may already exist with the possible past use of the existing as dumps or landfills.

A more detailed inventory of geology and groundwater yield is shown on Map 3-2, and follows.

3.3 GEOLOGY AND GROUNDWATER YIELD

The groundwater resources of Chester County were analyzed by the U.S. Geological Survey in 1975 in Water Resource Investigation 77-67, and are summarized in Map 3-2. The study by L. J. McGreevy and R. A. Sloto is being updated, and is likely to show a slightly different nomenclature for formation composition and adjusted groundwater yields. The mapping of formations, however, is not expected to change, even though the generalizations regarding groundwater yield and geologic formation will be revised. Since the existing information regarding groundwater is presented as a range, we do not believe that it will become inaccurate.

In general, the geologic formations of the Township are moderately productive as a source of groundwater, requiring between 5 and 45 wells to yield one million



gallons of water per day. Approximately eighty percent of the Township is underlain by the Wissahickon Formation and felsic gneiss. These formations are generally more productive than Peters Creek Schist and serpentine that underlay the remaining twenty percent. Of note are two linear diabase intrusions running across the Township in an east to west direction. Diabase is a poor source of groundwater, requiring over 30 wells to provide a million gallons of water per day.

Other geologic features important to groundwater resources are two faults, located in valleys and beneath lengths of streams. The fractured and broken rock of fault lines usually acts as an aquifer by permitting the storage and movement of groundwater. The fault lines should be regarded as aquifers, and afforded special protection against unnecessary development and possible pollution. The faults that underlay streams may already receive adequate protection from the Floodplain Zoning District.

3.4 LAND RESOURCES

3.4.1 Steep Slopes Greater than 20%

The steep slope areas shown on Map 3-3 were calculated from the contours on the USGS quadrangles. These areas should closely approximate the areas regulated by the Township's Zoning Ordinance, which is based upon actual site survey.

The distribution of lands with slopes greater than 20% relates largely to the stream network within the Township. The most extensive areas of steep lands, including the steepest slopes, are found along the East Branch Brandywine, the tributary that parallels Sawmill Road, the tributaries that drain the South Valley Hills, and Broad Run and its tributaries. Notable steep slope areas that do not border streams are the line of south-facing hills north of, and parallel to Shadyside Road, and the line of hills parallel to and north of Telegraph Road and its extension to the west, Route 162. The hill north of Route 162 and south of Strasburg Road just west of Broad Run is referred to as "Mount Como" on geologic maps.

Steep slopes are vulnerable to erosion when their vegetative cover is removed. Grading, construction, and even ordinary cultivation can cause massive soil losses in a single heavy rainfall. The accelerated erosion caused by man's activities can cause damage to adjoining sites, but it is particularly damaging to streams and waterways. The transport of sediment into streams not only causes turbidity that may threaten aquatic life, but also leads to the deposition of sediment that certainly damages aquatic biodiversity and habitat. Not only are biotic resources endangered by sedimentation, but so are the structural

capabilities of streams. Sedimentation can reduce the volume of water a stream can carry and thereby cause additional flooding downstream.

The Steep Slope regulations of the Zoning Ordinance require special engineering and design standards areas on slopes greater than 20%, but do not prohibit the development on these areas, nor do the regulations require specific measures to prevent tree loss or siltation. Development proposals must include provisions to revegetate disturbed areas as quickly as possible. The Township must be prepared to monitor and enforce site disturbance regulations.

3.4.2 Prime Agricultural Soils and Additional Farmland of Statewide Importance

Prime agricultural soils are those categorized as those in Capability Class I and II by the Soil Conservation Service. Additional soils of statewide importance are those in Capability Class III. These soils are deep, relatively fertile, and relatively well drained. The primary distinction between the two groups is generally the slope of the land on which they are found, and consequently the number of precautions necessary for tillage. Prime agricultural soils are generally found on flatter ground, and are more tolerant of a variety of crops and tillage practices. Soils of statewide importance require somewhat more careful management to maintain productivity.

Prime agricultural soils are widely distributed, and cover an estimated one half of the Township. Soils of statewide importance are usually found adjacent to prime agricultural soils and cover less than ten per cent of the Township.

These soils present the best opportunities for the production of food and fiber crops. Agriculture remains the predominant land use in the Township, with 3900 acres or 32% of the land area in agriculture in 1988. Its value to the economy and cultural identity of the Township is considerable. The residents enjoy the scenic contributions of their neighboring farms as well as the availability of fresh fruit and vegetables.

Soils that are well suited to agriculture are (with the exception of Chewacla and Glenville soils) are also well suited to residential development, particularly the on site disposal of wastewater. The limitations of wastewater disposal in the exceptional value waters of Broad Run or in the already intensely used East Branch Brandywine will place an increased value of land disposal, either subsurface or surficial (by spray irrigation methods). The soils information can be read as a multiple resource. To the extent that residential subdivision can be clustered on less prime soils, with productive farmland irrigated through spray application of recycled wastewater, the Township may be able to enjoy the best of both worlds: conservation simultaneous with development.

3.5 BIOTIC RESOURCES

3.5.1 Woodlands

Woodlands of approximately 2 acres or greater are shown on Map 3-4. In 1988 woodlands covered 3815 acres, 31.9% of the Township. Since 1988, there has been a small loss of woodlands, most notably in the northeast as a result of the residential development of the former YMCA camp. Woodlands are the second largest land use in the Township, according to the 1988 Comprehensive Plan, with approximately 100 fewer acres than are in farmland. The largest expanses of woodlands are (in spite of recent development) in the northeastern portion of the Township on the South Valley Hills, and along the hills and valley through which Sawmill Road descends. Other large woodland tracts are adjacent to Broad Run and in the southwest corner of the Township. Woodlands are frequently found on steep slopes, and no quadrant of the Township is without large woodland tracts (greater than 30 acres).

Woodlands are important ecologically. They enhance the infiltration of rainfall into the water table, add oxygen to the atmosphere, moderate the extremes of summer temperatures, and provide important habitat for wildlife. They contribute to the health of streams by decreasing silt laden run off and moderating temperature extremes. In the suburban landscape woodlands provide visual buffering and diffuse noise. In rural and agricultural areas woodlands act as windscreens, provide cover and food for wildlife, and provide an economic resource in the form of saw timber, veneer logs, and firewood. Native eastern hardwoods are valued in the export market for flooring and furniture manufacturing.

Woodlands are probably most appreciated in West Bradford Township for their scenic properties and their value as wildlife habitat. They support a varied and abundant population of songbirds and raptors. An area in the easternmost portion of the Township near Copesville recorded the nation's largest concentration of screech owls in the spring and winter count of 1990-1991 by the West Chester Bird Club. Not only are bird populations enhanced by woodlands, but so are mammals including the most visible Whitetailed Deer, Raccoon, Opossum, Red Fox, Squirrels and Flying Squirrels.

3.5.2 Impact Zones of the Pennsylvania Natural Diversity Inventory (PNDI)

Along the East Bradford Township boundary just east of Lucky Hill Road is the site of a Pennsylvania rare, threatened or endangered species. The species is associated with serpentine bedrock. Due to the chemical composition of soils derived from serpentine, plants on this formation appear to be either stunted or many hundreds of miles from their ordinary range. The plants that are able to

WEST BRADFORD TOWNSHIP
CHESTER COUNTY
PENNSYLVANIA

W. WILKES BARRE
WILKES BARRE
TOWNSHIP

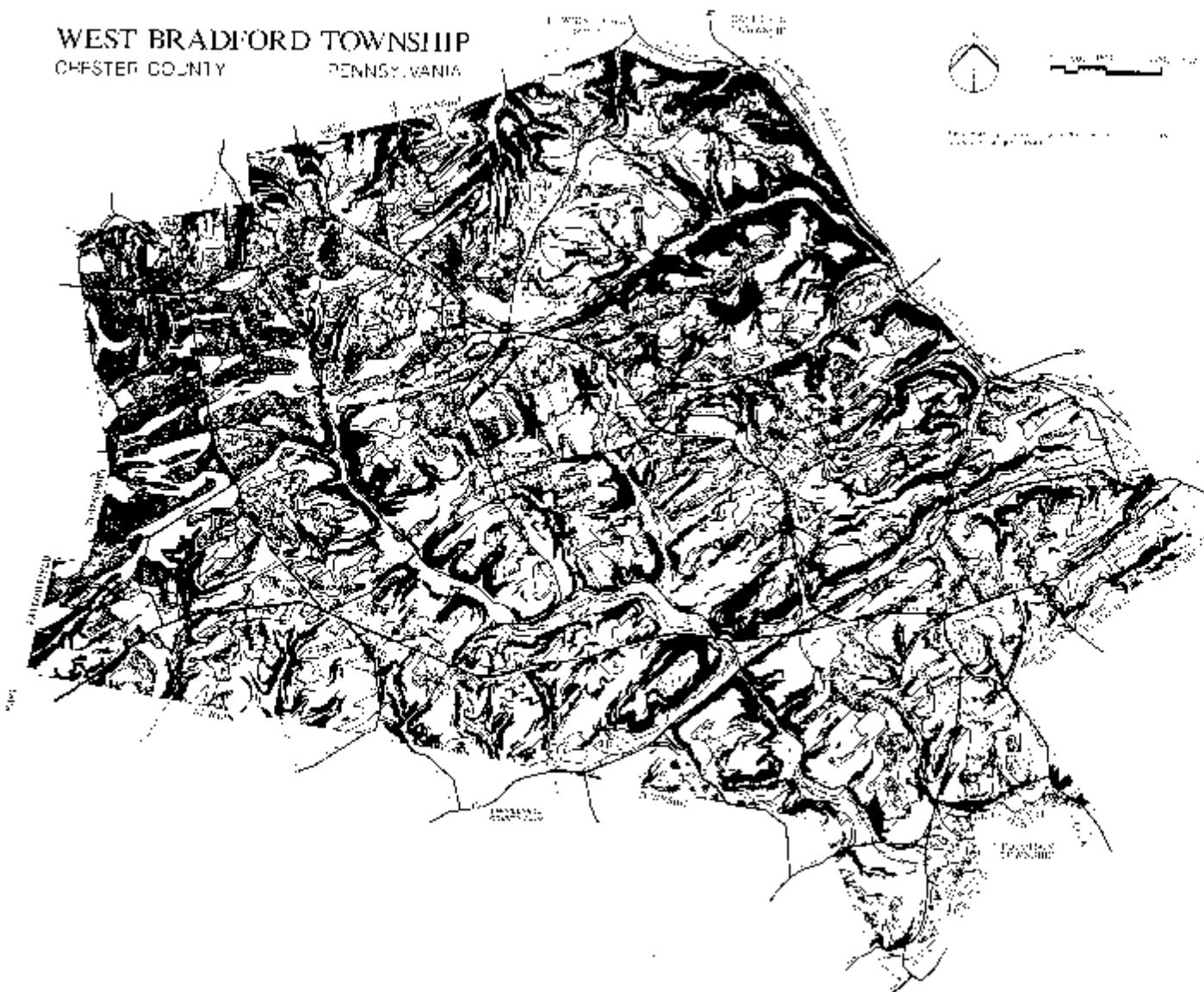
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MAP 3-3

LAND RESOURCES

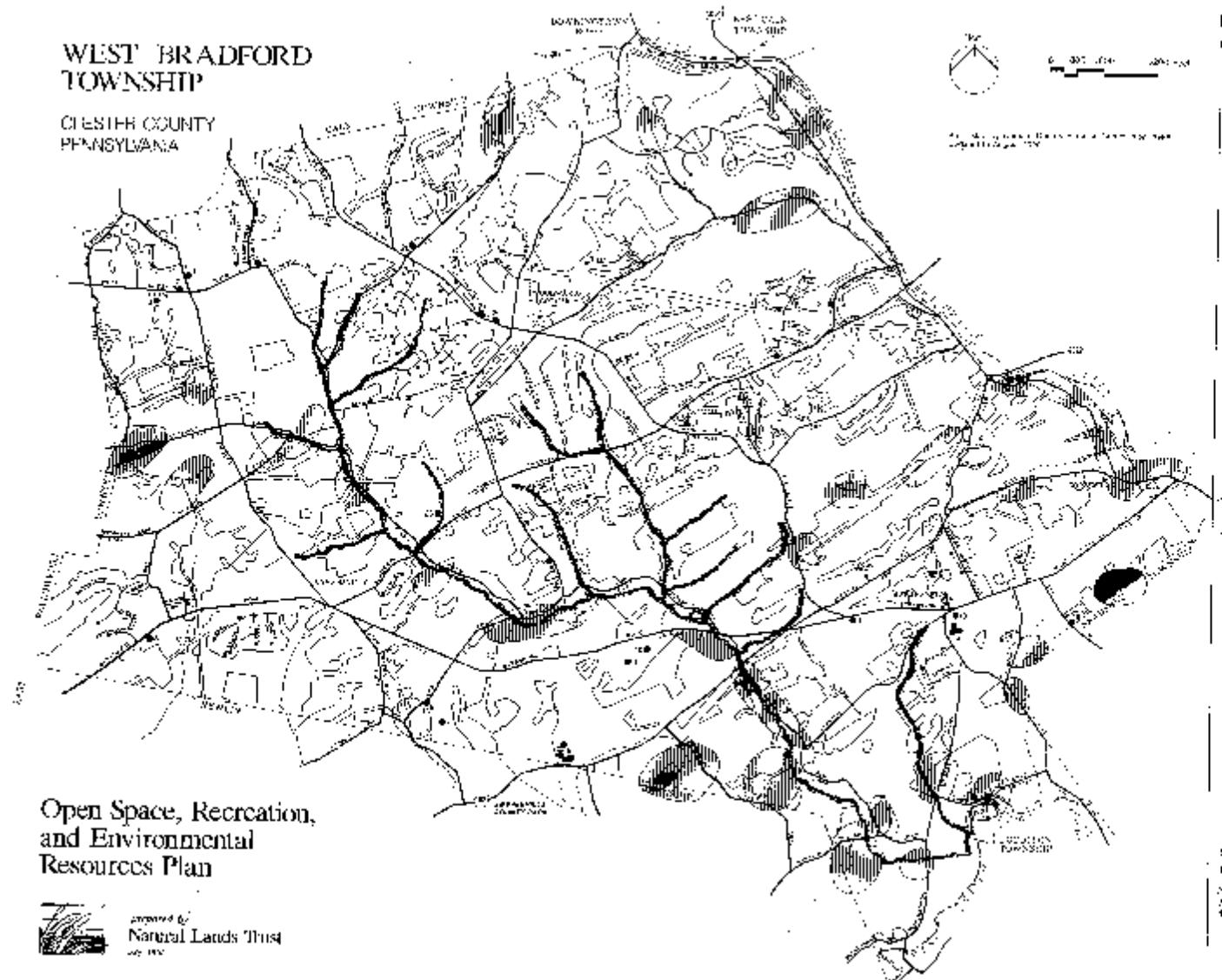
- White Agricultural Soil
- Additional Farmland of Statewide Importance
- Sheep Grazing Greater than 20%



1000' 1000' 1000'
WILKES BARRE TOWNSHIP
WILKES BARRE, CHESTER COUNTY, PA

WEST BRADFORD
TOWNSHIP

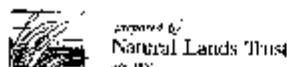
CHESTER COUNTY
PENNSYLVANIA



MAP 3-1

BIOTIC RESOURCES

1. *Planning for the Future of the City* – Study Planning Commission, Sept. 1950.
 2. *A City Geography* 1950.
 3. *Geographic Survey of the City of New York*, Vol. 1, 1950.
 4. *West Bronx and Bronx Park*, 1950.



grow on serpentine are usually slow growing, and are unable to recover quickly from disturbance, leaving the surface susceptible to damage from rainfall and erosion. The impact zone of the PNDI site is intended to act as a warning. Development and disturbance in areas adjoining a PNDI site can impact the threatened species when environmental systems are altered. Dust or particulates in the air, sediment in water, or a change in the groundwater table can place stress on the rare species, and cause its disappearance.

3.5.3 Areas Underlain by Serpentine Bedrock

Serpentine bedrock occurs in two other sites in the Township. There is no inventory of species on these sites available at this time. One of the sites appears to be wooded, the other is in pasture, and is unlikely to have any of the plants typical of serpentine "barrens". Both of these areas should be inventoried at the time of development. The association of chrome and asbestos with serpentine may require special design and stormwater engineering for development on these sites.

3.5.4 Exceptional Value Waters and Habitat Waters

The significance of "exceptional value" waters and "warm water fisheries" were discussed in the Protected Waters section of the water resources inventory.

3.5.5 Individual and Groves of Large Trees

Large trees, subjectively identified as trees with a breast-height diameter of approximately 36 inches, were identified by field survey in November, 1992. a few large trees were identified by members of the Open Space Task Force, and one surviving specimen in the publication Penn's Woods, 1682-1982. The threshold diameter of 36 inches is somewhat arbitrary, and the difficulty of locating trees not visible from public roads is a limitation of the inventory process. The inventory should be updated and expanded in a methodical manner. A list of species and approximate size of large trees is in Appendix B.

Large trees are perhaps more important as a cultural and scenic resource than as a biotic resource. The stature and dominance of massive oaks, sycamores, tulip poplars or silver maples are more valuable to the viewer in reinforcing a sense of place than they are as a source of genetic material for future forests. More numerous woodland members of these tree species are more important for wildlife habitat and the regeneration of woodlands. Interestingly, large trees have very little commercial value as saw timber, because of their age, lack of management and consequent imperfections due to decay and disease. Large trees do have value to the community, however. They represent our connection to the past and our linkage with the natural world. They have a perceived

agelessness and mark the passage of time. Large trees present, at the very least, an opportunity to employ development design techniques that respect their significance, provide areas of non-disturbance to help them grow, and enhance their visibility.

3.5.6 Concentrations of Birds

Generalized sites of concentrations of birds were identified by the West Chester Bird Club. The Bird Club has conducted population counts in the Spring and at Christmas in West Bradford Township for over twenty years. The sites on the map had the greatest number of birds during those surveys.

The areas mapped are important to bird populations as feeding, nesting, or migration sites. A mixture of woodlands, shrublands, wetlands and open meadows, these sites have remained relatively undisturbed. The particular feature or features of importance to bird populations in these sites should be identified at the time of proposed development to determine if mitigation or design alternatives can be employed to minimize the destruction of habitat.

3.6 SCENIC, HISTORIC AND CULTURAL RESOURCES

3.6.1 Archaeological Resources

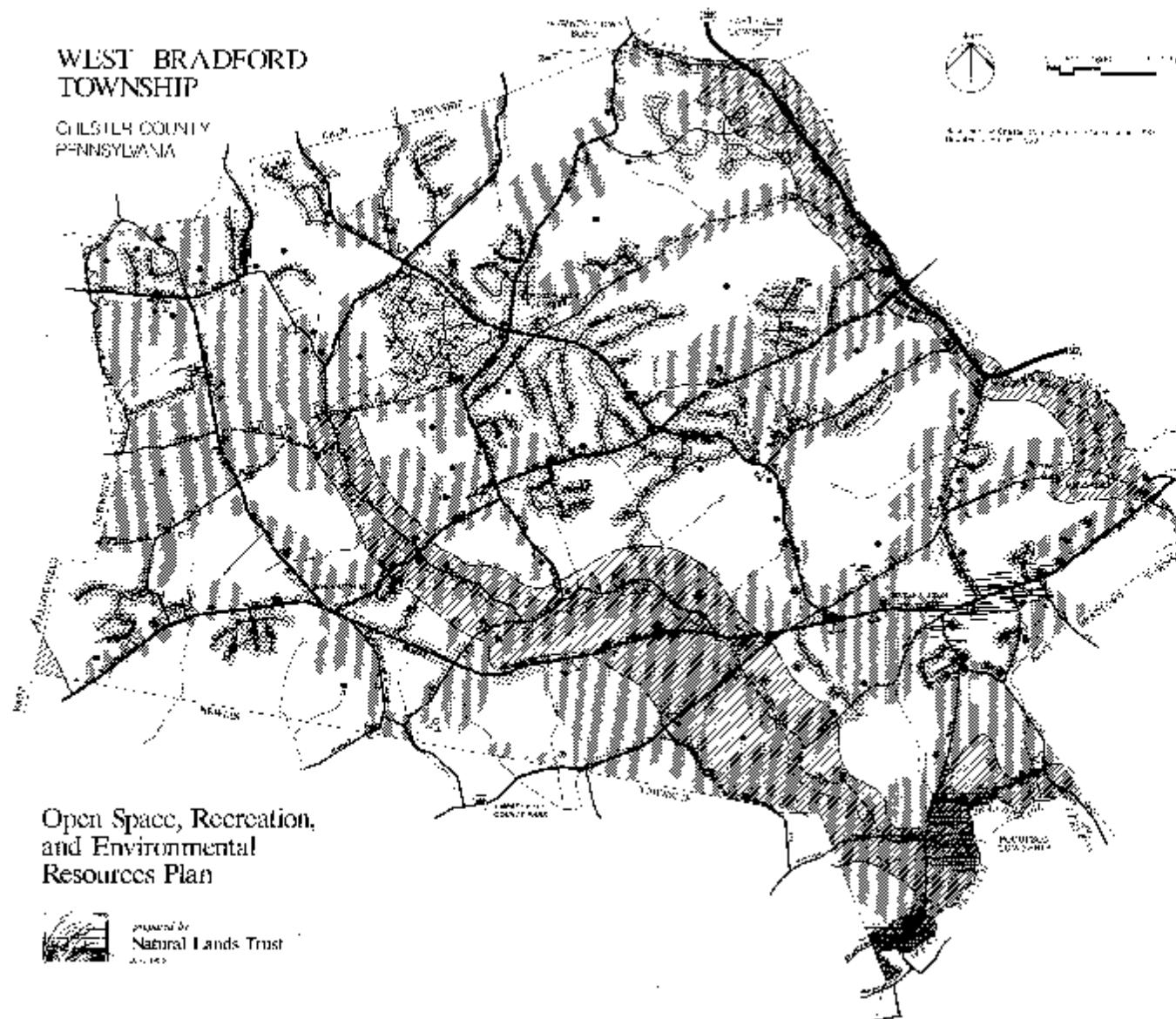
Archaeologic resource data were not available from the Pennsylvania Historic and Museum Commission at the time of the inventory. Alternative sources, such as the academic expertise and publications of regional Universities were not researched by the Trust due to the limitations of time and budget.

We anticipate that important sites of past civilizations exist throughout the Township, particularly along both Branches of the Brandywine and Broad Run. Several sites near the East Branch are known to amateur projectile point collectors. The legendary Indian site of Deborah's Rock lies just across the township line in East Bradford. Less than a half mile east of Deborah's Rock is a major Lenni Lenape habitation site, considered the most significant archaeologic site in Eastern Pennsylvania. Along the West Branch, just outside of West Bradford in Newlin Township is the well known burial ground of the Lenni Lenape. The West Branch Brandywine was designated as a Lenni Lenape "Reservation" during William Penn's Proprietorship, and the historic use of the West Branch by the Lenape is documented in various histories of early Pennsylvania.

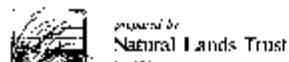
It is recommended that archaeologic resources be added to the inventory when they become available from the Pennsylvania Historic and Museum

WEST BRADFORD TOWNSHIP

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Open Space, Recreation, and Environmental Resources Plan



MAP 3-5

HISTORIC, SCENIC, AND CULTURAL RESOURCES

SCENIC RESOURCES

Dual Purpose Roads

- Active
- Collector
- Local Paved
- Local Unpaved

Non-Scenic Roads

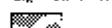
- Urban/Rural Roads (No Developed Road Corridor in 100 feet = length)

Scenic Roads

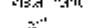
- Historic (NRHP), Cluster or Village

Rural

Significant Visual Landscapes



Visual Light



Duck Culture

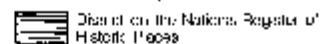


Brandywine Scenic River Corridor



HISTORIC RESOURCES

- ◆ Sites on the National Register of Historic Places
- ◆ Sites Listed for Listing on the National Register of Historic Places
- Sites on the Chester County Historic Sites Survey



- Human Site or Structure

- Site of Quarry

Commission. The Commission has extensive records of many existing artifact locations, and are notified when earth disturbance is proposed. Their review of large development proposals will alert the Township of possible damage to archaeologic resources on a site by site basis. It would be preferable for the Township to have a more proactive role in the protection of archaeologic resources.

3.6.2 Scenic Resources

3.6.2.1 Functional Classification of Roads: Four functional classes of roads were identified for the purposes of scenic road categorization: arterial, collector, paved local, and unpaved local. These four classes can be considered a prioritization of scenic roads in the Township, each having particular features and considerations requiring somewhat different approaches for protection as development proceeds. Further discussion follows.

3.6.2.2 Scenic and Non-Scenic Roads: The process of identifying scenic roadways started with the premise that all roads within the Township are scenic if they are bordered by either landscapes that are natural, meaning landscapes that would have evolved if not disturbed by human activity, or landscapes that are characteristic of the historic development of the Township. The historic development of the Township is generalized as agrarian. The land has been divided into family owned farms, each with cropland, pastures and small woodlots. Schoolhouses, inns, stores, and the shops of tradesmen were established on historic roadways or at crossroads. Mills would be located along the larger streams. Clusters of mill workers houses were built along roads leading to the mills. Villages, such as Marshallton and Romansville, supported not only a number of commercial activities, but also churches and a school.

Much of West Bradford Township today can be viewed as a rural, agrarian landscape. An exception to the characteristics described as agrarian are the tract housing and small lot (1 to 3 acre) residential development that has occurred over the last thirty years or so. Although most of the residential development is landscaped and thoughtfully designed, its repetitive, non-traditional qualities exclude it from scenic designation. Road frontage development of approximately 1500 feet or more and cul-de-sac roads were designated non-scenic on the Scenic Resources Map, Map 3-5.

Scenic roads can be categorized based on functional classification. The most important and highest priority scenic roads, the arterials, are viewed by the greatest number of motorists. Unfortunately these roads afford the smallest number of design options as they are improved. Traffic must efficiently enter and leave these highways, and safety structures such as rails, lights and highly visible directional signs must be installed. Leverage over the Pa. Department of

Transportation (PennDoT) is also limited. Route 322, the only arterial highway in the Township, is perhaps one of the most scenic of the Township's roads. The long and expansive vistas, primarily of East Bradford Township, of steep wooded hills and the East Branch Brandywine, are contrasted by rock outcrops and jagged rock cuts on the opposite side of the road. Access to this road will hopefully be limited, due to topography and natural constraints. If this is so, the need for acceleration and deceleration lanes, widening, and other development related improvements will be limited.

Scenic collector roads are the most vulnerable to change. These roads have largely retained their rural character, including narrow shoulders, sharp road cuts, numerous trees very close to the cartway, and many other features that contribute to the rural feel of the roadway, but do not contribute to traffic movement efficiency. Collector roads are seeing increased use as the County's population grows. The Township's ability to influence PennDoT decisions is also limited, as most of the scenic collector roads are also state highways.

Both categories of local scenic roads provide the greatest opportunities for Township management. Right of way improvements on most of these roads are the responsibility of the Township. Improvements necessary for improved efficiency can be controlled somewhat by maintaining low speed limits. The Township cannot directly control the demand for access to roads that subdivision activity requires. Local roads are well suited to the type of development most common to the Township, low to moderate density residential. Performance stipulations entered into the subdivision agreements can help maintain the existing roadside character. However, no methodology currently exists in the subdivision approval process that will protect the entire viewshed, or that will mitigate proposed development impacts to the viewshed.

The best opportunities for scenic roadway protection are for unpaved local roads. These roads have low speed limits and a lesser demand for improved efficiency. As subdivision occurs on these roads, improvements within the right of way can be negotiated. Cartways can be kept narrow, and parallel rights of way for pedestrians, bicycles or horses can be acquired or placed along the edge of the cartway within the existing right of way. The scenic qualities of these roads would be best protected if the pattern of low speed, low volume use can be maintained.

Lengths of certain roads have particular scenic importance to the Township, because of vast dramatic vistas, undisturbed rural views, or a combination of topographic and cultural features such as hills, streams, and historic buildings. These roads are identified as follows:

Route 322 from the high trestle bridge at the Downingtown Boro line to Shadyside Road/Harmony Hill Covered Bridge

Strasburg Road From the eastern Township line to Embreeville State Hospital.

Broad Run Road from the Intersection with Poorhouse Road south to the intersection with Northbrook Road.

Northbrook Road including Brandywine Drive from the Newlin Township line to the intersection with Wawaset Road

Wawaset Road from the Pocopson Township line to the intersection with Cann Road

Camp Linden Road in its entirety.

Telegraph Road (unpaved length) from the East Bradford Township Line to a point about one quarter mile east of the intersection with Sugars Bridge Road.

Waltz Road in its entirety.

Sawmill Road from the intersection with Old Shadyside Road west to the intersection with Fox Trail Road.

Ground Hog College Road from the Newlin Township line to the intersection with Route 162.

Chestnut Lane from the intersection with Oakwood Road east to the intersection with Lone Eagle Road, and Lone Eagle Road from the intersection with Chestnut Lane east to the intersection with Broad Run Road.

3.6.2.3 Significant Visible Landscapes: The 1987 application for Scenic River status for the East and West Branch Brandywine (including Broad Run) included extensive viewshed analysis by Turtle Creek Design. Landscape features were characterized on the basis of cover type and landform, such as ridge or valley, and identified on maps. The limits of viewsheds from public roads and the waters of the Brandywine were identified. In the fall of 1992 field work was performed to extend the viewshed limits to all scenic, public through roads in the Township. The results of that fieldwork are shown on Map 3-5. These areas signify the open space considered most important to a large segment of the population, the lands visible when travelling through the Township.

3.6.2.4 Vista Points: The Scenic River Study for the Brandywine also identified vista points, sites along the public roads that afford a panoramic view of lands undisturbed by development, and features characteristic of the Township's development. Thirty one vista points were identified by Turtle Creek Design and the Open Space Task Force. Some of these points are impacted by the vast open spaces in the surrounding townships: East Bradford, Newlin, Cahn and East and West Brandywine Townships.

3.6.2.5 Rock Outcrops: Certain features were considered particularly notable as scenic resources. Rock outcrops were identified by field survey in the fall of 1992. The most impressive rock outcrops are found along Route 322 and above the

stream that parallels Sawmill Road, particularly near its confluence with the East Branch.

3.6.2.6 Brandywine Scenic River Corridor: The area plotted on Map 3-5, shows the boundary of the Scenic River Corridor adopted by the Pennsylvania General Assembly. Inclusion in the Scenic Rivers System requires that actions and policies of the State "maintain the intent of the Scenic Rivers Act. The protection effort is equally dependent upon the ability of local governments, citizens groups and interested individuals to implement effective management programs through voluntary approaches."

3.6.3 Historic Resources

3.6.3.1 Sites on the National Register of Historic Places: Eight individual sites within West Bradford Township are accorded the recognition of listing on the National Register of Historic Places. The protection of these sites, though limited to federally funded actions, is minimal. As an open space feature, National Register sites include little more than the land immediately surrounding the structure. In order to maintain a meaningful context, historic agricultural buildings on the National Register should encompass a few protected acres if not an entire farmstead. These sites are not protected from modifications by private ownership.

3.6.3.2 Sites Eligible for Listing on the National Register of Historic Places: Twenty four individual sites are identified on the historic resources map of the West Bradford Comprehensive Plan as eligible for listing on the National Register. Compiled in 1989, the Comprehensive plan gives extensive narrative on the methodology of identifying historic resources. Protection methodology, regulatory measures, and recommendations are also discussed in detail. Appendix 2 of the Comprehensive Plan lists the individual sites on the Register and those eligible for listing.

The greatest concentration of Eligible Sites is in the Marshallton area. Some of the structures have a rural context and should consider the inclusion of surrounding farmland when nominated. Others are residences that relate to crossroads or have a roadside context.

3.6.3.3 Sites on the Chester County Historic Sites Survey: These structures, primarily rural residences with their associated barns and outbuildings, were also plotted from the 1989 Comprehensive Plan map of historic resources. These sites contribute to the visual and cultural fabric of the Township, a community with an agricultural origin that has retained a working agricultural base. Its architecture is functional and materially derived from its woodlands and quarries, resources identified as valuable open space features.

3.6.3.4 Districts on the National Register of Historic Places: West Bradford Township has three National Register Historic Districts within its boundaries. Marshallton, as mentioned earlier, developed as a commercial and community center. Trimbleville, which includes land in Pocopson Township, is significant for its role in the Revolutionary War as a ford of the Brandywine used by the British troops on their march to the Battle of the Brandywine in 1777.

Northbrook's significance relates to the historic and pre-historic Lenni Lenape. Extending into Newlin and Pocopson Townships, this district is the site of a Lenni Lenape burial ground, the site of "Indian Rock" a boundary of the 1706 land purchase from Lenni Lenape, and the site of the cabin of Indian Hannah.

Trimbleville and Northbrook Historic Districts are uniquely tied to open, undeveloped land if their integrity is to be maintained. Both districts are of national significance, and both give us an understanding and appreciation of important historical events and processes, but only as open and undeveloped sites. The origins of treaties and land purchases toward the establishment of reservations were developed by William Penn in Southeast Pennsylvania. Our independence was fought for in Southeast Pennsylvania. These historic districts played a role in these processes.

3.6.3.5 Ruins, Sites of Structures: Ruins, and the masonry remains of structures, were identified during a field tour of the Township in the fall of 1992. The mapped sites, often former mills or dams, are only a partial inventory of ruins and sites of former buildings in the Township. These features have both scenic and historic interest.

3.6.3.6 Sites of Quarries: Three inactive quarry locations were noted in the southern portion of the Township. The rock walls of two of the quarries are visible from public roads, the third is on or immediately adjoins the Embreeville County Park. Considered historic structures, quarries can provide recreational opportunities for rock climbers. Probably none of these quarries are suitable climbing sites.

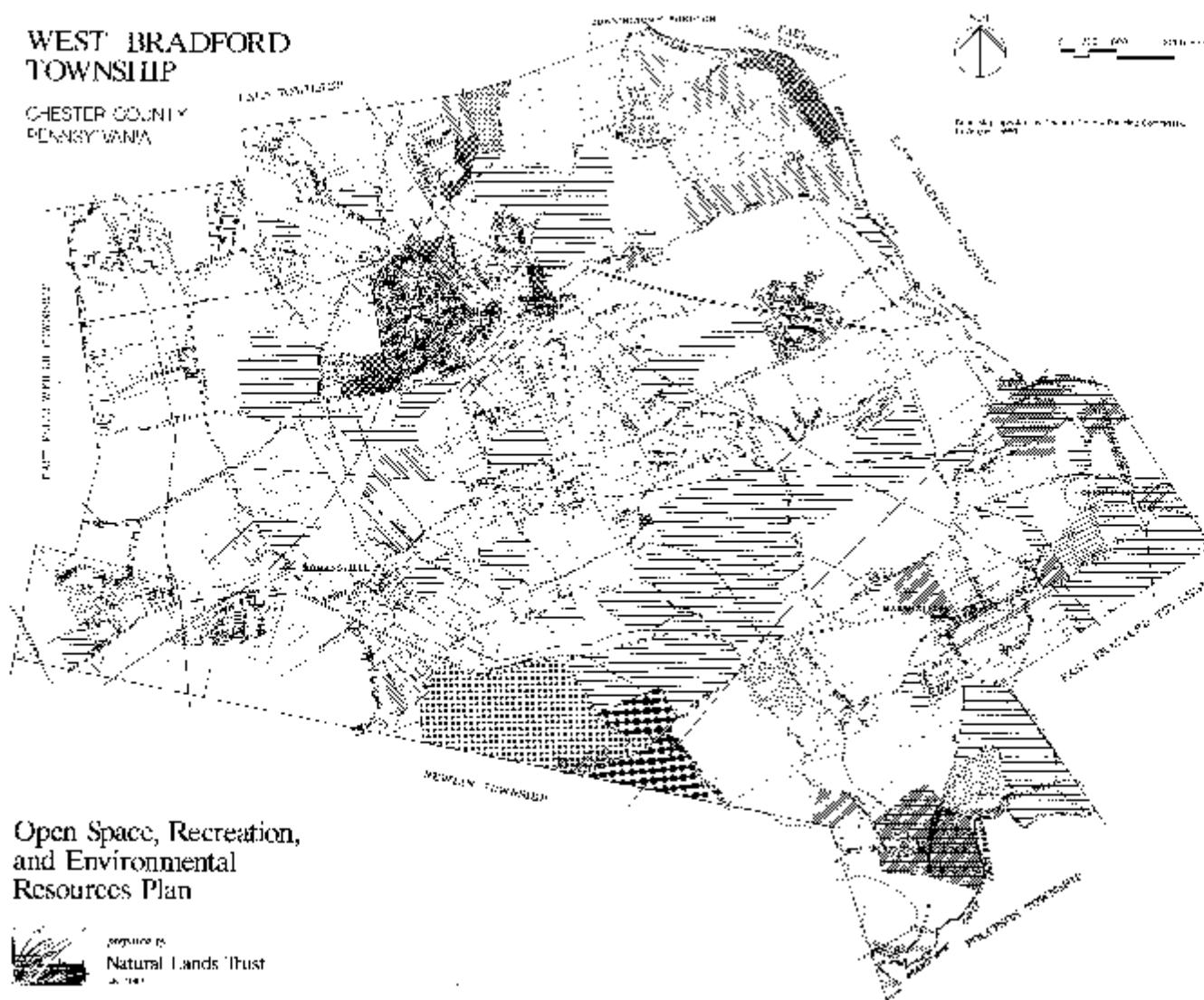
3.7 PROTECTED LANDS

3.7.1 Overview

The lands shown on Map 3-6, range from permanently protected open space to unprotected landholdings. The map categories are based largely on ownership. The State, County and Township are the larger landowners of both open lands and facilities with limited open space potential. Much of the land mapped is privately owned and voluntarily restricted. Some restrictions such as

WEST BRADFORD TOWNSHIP

CHESTER COUNTY
PENNSYLVANIA



MAP 3-6

PROTECTED LANDS

Public Parks and Open Space

□□□□□ County Parks

□□□□□ Township Parks

□□□□□ Private

Other Public Lands

□□□□□ State Parks

□□□□□ Lower Merion Township Parks
Downtown Park Authority

□□□□□ Reserves

Land with Open Space or
Scenic Value

□□□□□ Compounds Available

□□□□□ Protected Available

□□□□□ Private, Program Easement

□□□□□ Lands Under Conservation Easement

□□□□□ Agricultural Security Area

□□□□□ historic District on the National Register

□□□□□ Pa. Statewide River Corridor

Utility Corridor or Right of Way

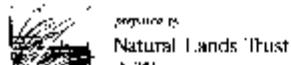
— Connected Roads

— Unconnected Roads

— Unconnected Roads

Dred-Protected Lands (private land)

Open Space, Recreation, and Environmental Resources Plan



Property
Natural Lands Trust
2010

conservation easements are perpetual, others such as agricultural security enrollment are temporal. Privately owned open land and resources have restricted public access. A significant area of privately owned land not shown on this map are the lands protected by municipal ordinances. The various types of protected lands, and their permanence as open space are discussed below.

3.7.2 Public Parks and Open Space

3.7.2.1 County Owned: A portion of Embreeville Park, currently undeveloped as parkland, is in West Bradford Township. See Chapter 5 for a more detailed description.

3.7.2.2 Township Owned: Ten separate tracts are owned as either open space of parkland by the Township. The size and proposed use for these parcels are described in Chapter 5. The Township's lands range from about one acre to 48 acres. Some of these lands are used for stormwater basins, others are undeveloped woodlands. The largest and environmentally most significant is the parcel along the East Branch Brandywine, east of Route 322. Largely meadow, with some wetland, this site has approximately 3200 feet of frontage on the East Branch Brandywine.

3.7.3 Other Public Lands

3.7.3.1 State Owned: One tract, the Embreeville State Hospital is mapped in this category. Approximately 300 acres, this facility includes the hospital campus and power plant, a Pa. State Police Barracks, woodlands, open fields and the ballfields of the West Bradford Recreation Association. The westernmost portion of this tract has been proposed for transfer to West Bradford Township. These lands have considerable amounts of open space, and are critical to the Recreation Association's existing programs and continued growth. The future use of the hospital facility is uncertain, and this tract can be viewed as either an open space opportunity or threat.

3.7.3.2 Township Campus, Stormwater Facilities, Water Authority Facility: Five parcels or portions of parcels have been mapped in this category. Three tracts are generally small, less than two acres, and have little or no potential for recreational use. An exception is the Downingtown Water Authority tract, 35.6 acres in size, and largely in mature woodlands. This sloping parcel has a large area that is not occupied by water treatment facilities. This facility will undergo extensive an upgrade required by tougher new drinking water standards by DER. The Authority's plans for this parcel are not known at this time.

Another significant open space and recreation parcel in this map category is the Township Municipal Campus ballfield and playground. The recreation facilities at the Campus are described in Chapter 5, Section 3 in the recreation inventory.

3.7.3.3 Schools: Two elementary schools are located in West Bradford. Playing fields and open lawns are currently used as recreational sites by the schools, and informally by the community. These sites are both relatively large, 28 acres and 21 acres, and important recreational lands.

3.7.4 Quasi-Public Lands with Open Space or Recreation

3.7.4.1 Homeowners Associations: The most protected of these types of lands are those held by Homeowners Associations (HOA). There are five different Homeowners Associations within the Township, two of which, Bradford Glen/Victoria Crossing and Brandywine Green hold considerable acreage. Most of the acreage in this ownership is in relatively small parcels along roads, along tract boundaries, and bordering sensitive natural features such as wetlands, steep slopes or streams. It is important as recreational land for the immediate neighborhood. In two cases the HOA lands adjoin Township open space.

The HOA lands of "Brandywine Ridge" subdivision are the highly visible island areas within the cul-de-sac loops. These islands present opportunities for recreational uses or horticultural efforts by the residents.

3.7.4.2 Recreation Associations: The West Bradford Youth Association (WBYA) lands shown on Map 3-6 are actually owned by the Embreeville State Hospital. Leased to WBYA, these graded and well maintained ballfields are intensely used by hundreds of participants in recreational programs. Additional fields are currently being developed at the Hospital for an increasing number of participants in their programs. WBYA also uses the fields of Beacon Hill Park and the Township Municipal Campus.

The West Bradford Athletics parcel on Great Road has no known recreational use. A residential type of structure occupies this 1.9 acre parcel.

3.7.4.3 Institutional, Religious, Educational: Private institutions own two relatively large tracts within the Township. One is the Society for Ethical Culture, which owns approximately 60 acres on Camp Linden Road at Northbrook Road. A children's summer camp was operated by the Society until the mid eighties. The camp's buildings were sold for residential use, but a swimming pool and wooded tract of land remain unused. The status of this land is uncertain.

The second institutional holding, also in the southern portion of the Township on both sides of Broad Run Road, are the recently acquired lands of the Swedenborgian Church. The Church has recently applied for building permits for retreat residences and other structural improvements for their programs. There are currently two residences on the 45 acre parcel. They have been informally approached concerning trail rights of way through their lands, and have been receptive to the idea. The church property is an important open space parcel bordering a scenic stretch of Broad Run.

3.7.5 Lands under Conservation Easement

The several parcels under conservation easements are held by four different institutions. West Bradford Township holds easements prohibiting development of two residential parcels on Sawmill Road totalling less than five acres.

The Chester County Agricultural Easement Program in participation with the State funded Agricultural Easement Program has purchased a conservation easement on an approximately 123 acre farm along Northbrook and Broad Run Roads in the southern portion of the Township. The farm is permitted an additional building lot.

Natural Lands Trust holds conservation easements on five parcels on both sides of Waltz Road just south of Sugars Bridge Road. The easement covers a total of 94 acres, and permits the construction of 13 residences. The critical open space between the East Branch Brandywine and Waltz Road is largely protected from future development by the easement.

The Brandywine Conservancy holds conservation easements on six separate landholdings in West Bradford, all in the southeast quadrant, totalling 101 acres. These easements for the most part prohibit all development. One of the easements covers the Humphry Marshall house within the Marshallton National Register Historic District.

3.7.6 Agricultural Security Areas

Twenty seven landowners and 2269 acres are enrolled in the West Bradford Agricultural Security Area. The participating farms are located throughout the Township, the largest being the Highland Orchards properties. The statewide program is designed to give farmers the "right to farm" by protecting them from actions by adjoining landowners, such as nuisance complaints, and other regulations. Farms in the Security Area are given priority for purchase of development rights by the State or County Agricultural Easement Program.

Enrollment is voluntary and is no guarantee that the farmlands will remain open or in farming.

3.7.7 Historic Districts on the National Register of Historic Places

The three districts, as discussed in the Historic Resources section of the inventory, are afforded minimal protection from the actions funded by the Federal government. There are opportunities to create an historic zoning overlay district on these areas, but such regulations, focussing on the built environment, do not usually address the open space issues that two of these districts require.

3.7.8 Pennsylvania Scenic River Corridor

The Pennsylvania Scenic Rivers Act 283 (1972), as amended by Act 110 of 1982, authorizes the Scenic Rivers System that provides for the protection of designated streams through cooperative and voluntary resource management. The actions of State agencies must maintain the intent of the act. Since most of the land in the scenic corridors is privately owned, the protection afforded natural and open space resources is minimal.

3.7.9 Utility Company Easements and Rights of Way

Three types of utility easements and rights of way were mapped: overhead electric, underground pipeline and underground cable. Of the three, the overhead electric lines were the most visually intrusive. Their rights of way were generally wider, and consequently presented the greatest opportunities for recreational use as trail corridors. Running generally from west to east, these Philadelphia Electric corridors present numerous opportunities for linkages between open lands and resource areas. The issue of trail use of these lands needs to be investigated to determine if the rights of way permit non-PECO use. Some of the lands under the transmission lines are in farm or orchard use, further complicating possible pedestrian use.

Underground pipelines present more desirable linkage corridors. Narrower rights of way, and invisible facilities make for more attractive pathways. Again, the lands above these pipelines are, in places, planted with crops, fenced for pastures and consequently unsuitable for pedestrian passage. The issue of use by non-utility company persons must also be resolved.

The cable right of way that crosses the Township from west to east is relatively narrow, about 16 feet, and threads through many residential properties. Its use as a trail, if permitted, is probably limited to short distances.

3.7.10 Deed Restricted Lands (Greater than 5 Acres)

Properties with development restrictions are also shown on Map 3-6. The Township, in the process of subdivision approval, has placed deed restrictions on large parcels capable of further subdivision based on acreage. "Brandywine Ridge", the Johnson Tract, and the Johnston Tract are three recent subdivisions with large deed restricted areas. We were not able to research the deeds recorded in the County Courthouse, and have only mapped large restricted properties brought to our attention by the Task Force.

3.7.11 Lands Protected by Township Ordinance

The two resource areas protected by Township ordinances appear on other maps of the inventory. They are the floodplains on the Water Resources Map and Steep Slopes Greater than 20% on the Land Resources Map. The protection measures of the Zoning Ordinance are discussed in the corresponding sections of the Inventory. In summary, the floodplains are well protected, though probably not to the aerial extent of the map, and the steep slopes appear to be only moderately protected. These features will appear on a the Resource Composite, Map 4-1.

Chapter 4

PLAN FOR OPEN SPACE

4.1 OPEN SPACE INVENTORY AND RESOURCE ASSESSMENT

4.1.1 Organization of the Chapter

This chapter is divided into four major sections. The first analyzes and describes the Township's open space network, and identifies and discusses those elements of that system that are the most vulnerable to change. The second section evaluates the need for additional protection of those most vulnerable elements, in relation to the environmental functions performed by that open space, and the degree to which those elements contribute significantly to the community's natural or cultural heritage. The third section compares the Township's open space network, as shown on the Composite Resources Map, to a map of protected lands, and discusses those areas which are revealed to be the most vulnerable. The fourth and final section offers recommendations for preserving the highest priority areas, according to specific protection strategies.

4.1.2 Overview of the Inventory

West Bradford's existing open space network is extensive and mostly free of intrusions. However, it is also relatively discontinuous and much of it remains unprotected. The elements that are perhaps best protected and most continuous are the stream corridors, where the lower elevations tend to be classified as floodplains and wetlands. In several cases, riparian parcels that would otherwise be vulnerable to development have been protected by permanent conservation easements, along both the East and West Branches of the Brandywine Creek. (Other corridors that are also protected, under different kinds of easements and rights-of-way, are those owned or held by various utilities, for electric transmission lines and oil pipelines.)

The Township's natural and cultural resources have been described in Section 3, which provides a textual summary and interpretation of the six major inventory maps (water resources, land resources, biotic resources, scenic/historic/cultural resources, resource composite, and protected lands). The following section (4.1.3)

examines those parts of West Bradford's open space system which are most vulnerable to alteration, degradation, fragmentation or loss. By way of summary, those elements of the Township's open space system that are perhaps the most fragile and threatened are the working farmlands that comprise much of West Bradford's historic and cultural landscape, and which figure highly in the scenic resources inventory. The long sweeping views across fields, meadows and orchards, which give the Township its rural character, include lands that are typically easy to develop, and which are also usually not protected in any formal manner, either through public programs or municipal regulations, or by private arrangements.

4.1.3 Assessment of Open Space Resources

This section describes and discusses the most vulnerable elements of the Township's open space system, lists objectives for their protection, and suggests various ways in which that protection could be achieved. Following the structure of the Resource Inventory in Chapter 3, and the mapping prepared as part of that work, this section examines four different aspects of the Township's open space network: water resources, land resources, biotic resources, and scenic/historic/cultural resources.

4.1.3.1 Water Resources Protection: The only type of water resource that is adequately protected at present is the 100-year floodplain. Although wetlands are protected from filling, they are not sufficiently buffered from adjoining land uses and new development, which typically produce runoff that negatively impacts them. Outside the floodplain zoning district (as shown on Map 3-1 of the Water Resources Inventory), West Bradford possesses very few soils with seasonally high water tables (typically small areas at upper ends of stream systems), and these are generally protected from development because they are located in unsewered areas and would not support subsurface sewage disposal systems.

Broad Run, the East and West Branches of the Brandywine Creek, and their numerous stream tributaries, are largely unprotected because zoning setback requirements for new construction are not very restrictive, and woodland clearing and land regrading activities are virtually unregulated. However, the steepness of the slopes along much of the length of these watercourses has, in a practical manner, severely constrained development in many streamside locations. Nevertheless, many places exist along these creeks and streams where developers could subdivide land, replacing forest cover with lawns sweeping

down to the edge of the water, eliminating valuable habitat and creating significant potential for water quality degradation from runoff enriched by lawn fertilizers. A short tributary of Broad Run and a longer tributary of the East Branch cross through aquifer areas underlain by carbonate bedrock, which is typically criss-crossed with fissures capable of conducting pollutants over long distances. In both cases these limestone streams are abutted by easily developable lands that are neither flood-prone nor steeply sloped.

Under an overall objective of protecting the Township's water resources from degradation, the township should consider:

- * designation of zoning overlay districts prohibiting storage of materials that could easily pollute surface waters or groundwater, and
- * establishing minimum setbacks from watercourses and waterbodies within which construction, vegetative clearing and regrading would be prohibited.

4.1.3.2 Land Resources Protection: West Bradford is blessed with a high proportion of soils rated as "prime" for agricultural production. Much of the other soil that is not too steep for cultivation is rated in the next highest category soils of statewide importance for farming. Not all of these areas are actively farmed today, however, and a considerable area has regenerated as second-growth forest, while some have produced their last crop: houses and other forms of suburban development. Because top quality farmland is not steep or wet (and only in some instances is it prone to periodic flooding), it is usually highly suitable for new construction. It has therefore been the most difficult form of resource land for townships to protect. Apart from voluntary, temporary agreements in which farmers pledge not to develop their land for a certain number of years, in return for reduced property tax bills (Act 515 properties), and except for areas where farmers are protected from nuisance suits (such as occurs within designated "Agricultural Security Areas"), there is no active farmland preservation program operating in West Bradford. Unfortunately, programs to purchase "development rights" from farmers at fair market value are simply too expensive to accomplish significant results, although specific individual parcels can occasionally be saved through this "buy back" technique. Under an overall objective of preserving prime farmland and other agricultural landscapes figuring prominently in the Township's inventory of scenic vistas and scenic roads, development rights purchases should be combined with other efforts such as easement purchases or donations (especially in stream corridors), "transfer of development rights", density exchange options, limited development, cluster layouts, and landowner compacts (which will be described in further detail in Section 4.4, "Recommendations/Implementation"). Steeply sloping land is also vulnerable to development, although it is much

more easily protected through municipal land use regulations prohibiting regrading on certain degrees of slope, and restricting the amount of earthmoving that may be conducted on somewhat lesser slopes. Although houses may be constructed on piers, thereby reducing the need to recontour building sites, environmental impacts are not unavoidable due to the need to create access roads and driveways, and to install septic systems on level terraces. All these actions reduce woodland habitat, increase the potential for soil erosion and subsequent sedimentation of streams, and create unsightly gashes on scenic hillsides. Under an overall objective of protecting hillsides from such activities, the Township's current restrictions on construction and road building in areas having slopes greater than 20% should be carefully reviewed, and compared with "state-of-the-art" regulations from other jurisdictions, particularly as they relate to allowing 100-foot wide corridors of clearing, cutting and filling for new roads, and unlimited tree removal to open up 180-degree panoramic views.

Although West Bradford possesses few areas of geological interest, it does contain a small area of serpentine bedrock outcrop, a relatively rare occurrence in Chester County. Due to the presence of certain toxic trace elements in this type of formation, only a few varieties of plants are able to grow there, hence the term "serpentine barrens". Because their natural environment is stressful, serpentine flora tend to be rather fragile, and are easily disturbed. The Township's subdivision regulations could be updated to require that such areas be designated on the approved plan as special natural features that may not be altered (by placing them inside "preservation envelopes" within individual houselots, locating them within commonly held open space subject to permanent conservation easements, or deeding them over to the Township or to a land trust or conservancy group).

The Township possesses relatively few rock outcroppings, and the major ones lie within the public right-of-way along Waltz Road, where scenic byway regulations could be enacted to protect them from road widening improvements. Other significant rock formations lie along Route 322, but their protection may be beyond the control of Township officials because this thoroughfare is a state highway. However, their positive contribution to the Brandywine Scenic River Corridor should be considered if road improvement plans are presented by PennDOT to the Township for review and comment.

4.1.3.3 Biotic Resources Protection: Protection of West Bradford's native plant and animal species involves issues of both quantity and diversity. The interconnectedness of habitats and the flora and fauna living within them has been correctly described by biologists as a "web of life", in which changes in one part of a natural system produce consequential side-effects. Like ripples from a

stone dropped onto the surface of a pond, those effects are much broader than the initial impact might suggest to an untrained observer.

Although the Township contains only one site listed in the Pennsylvania Natural Diversity Index (PNDI) -- which is the small serpentine barren mentioned above -- approximately one-quarter of West Bradford's land area is covered by woodlands, providing essential habitat for a wide range of forest wildlife species which could not find shelter or hospitable living conditions on the intensively managed open farmlands. These include birds and mammals, as well as their primary food sources (such as insects, small reptiles and amphibians, and various types of plants and trees). Those woodlands that are not steeply sloped, wet or flood-prone are vulnerable to fragmentation by rural subdivisions, especially those where houses are spaced at typical one-acre densities across the length and breadth of the entire development site. A sub-set of woodlands is the network of hedgerows separating farm fields, which provide mini-habitats for many birds and small mammals. These natural features are also visually significant as defining elements of the agrarian landscape, but are particularly vulnerable to change, not only from development patterns that are insensitive to their intrinsic values, but also from the farming community, which sometimes clears them away to increase both field size and the efficiency of their machinery operations. Under an overall objective of protecting woodland habitat, the Township should consider the following:

- * requiring that new rural subdivisions be designed to minimize tree clearing and
 - * establishing new standards to minimize habitat fragmentation in certain critical areas by requiring that new homes be located closer together in a traditional neighborhood fashion.

Another biotic resource of significance in West Bradford is Broad Run, a major tributary to the West Branch of the Brandywine Creek. This watercourse has been classified by the state Department of Environmental Resources as having "Exceptional Value Waters". All other streams in the Township are warm water fisheries. This classification protects Broad Run from certain types of degradation, such as would be produced by new sewage treatment facilities and other "point-source" pollution threats. Unfortunately, most of the pollution entering surface waters can be attributed to "non-point sources" such as runoff from farms, lawns, roads and parking areas. However, until such time as the Township adopts stricter standards for buffering and limiting the extent of site disturbance caused by new development within this important corridor (through clearing, regrading, and building), all upland areas with moderate or level slopes will remain vulnerable to intrusion and fragmentation by new residential subdivisions (because construction is prohibited only on wetlands and floodplains, and is severely constrained only on steep embankments).

4.1.3.4 Scenic, Historic and Cultural Resources Protection: For many Township residents, the most important open space resource is probably the land they see while driving through the countryside on their way to and from work, shopping, etc. In many instances the "view from the car" encompasses resources that also possess significant environmental values. However, as noted above, unless those features are protected from development by regulations (as are floodplains and wetlands) or through private voluntary arrangements (such as permanent conservation easements or temporary agreements linked to reduced property taxation), or unless they are constrained by steep terrain, they remain vulnerable to fragmentation and loss. The great majority of areas identified as of scenic value involve unprotected resources (primarily farmland); this applies to the 31 scenic viewpoints as well. Views from creeks, as enjoyed by canoeists, fishermen, and hikers, are equally subject to change, as the riparian landscape consists, in many cases, of rolling upland meadows, fields, and forests, which can easily be cleared and regraded for housesites, lawns, and subsurface sewage disposal systems, under existing regulations. In addition to the approaches listed above, the Township should consider:

- * allowing density exchanges between non-contiguous parcels (which can be accomplished without cumbersome "TDR" mechanisms),
- * encouraging "limited development" of very low density "country properties" (by simplifying subdivision requirements for such proposals),
- * encouraging landowner compacts involving adjacent parcels, (wherein density can be shifted around among the parcels to conserve the most significant parts of the entire acreage), and
- * requiring clustered layouts for new subdivisions when none of the above approaches are taken.

At minimum, these techniques should be considered for application in new overlay zones designated to protect major scenic, cultural and historic resources.

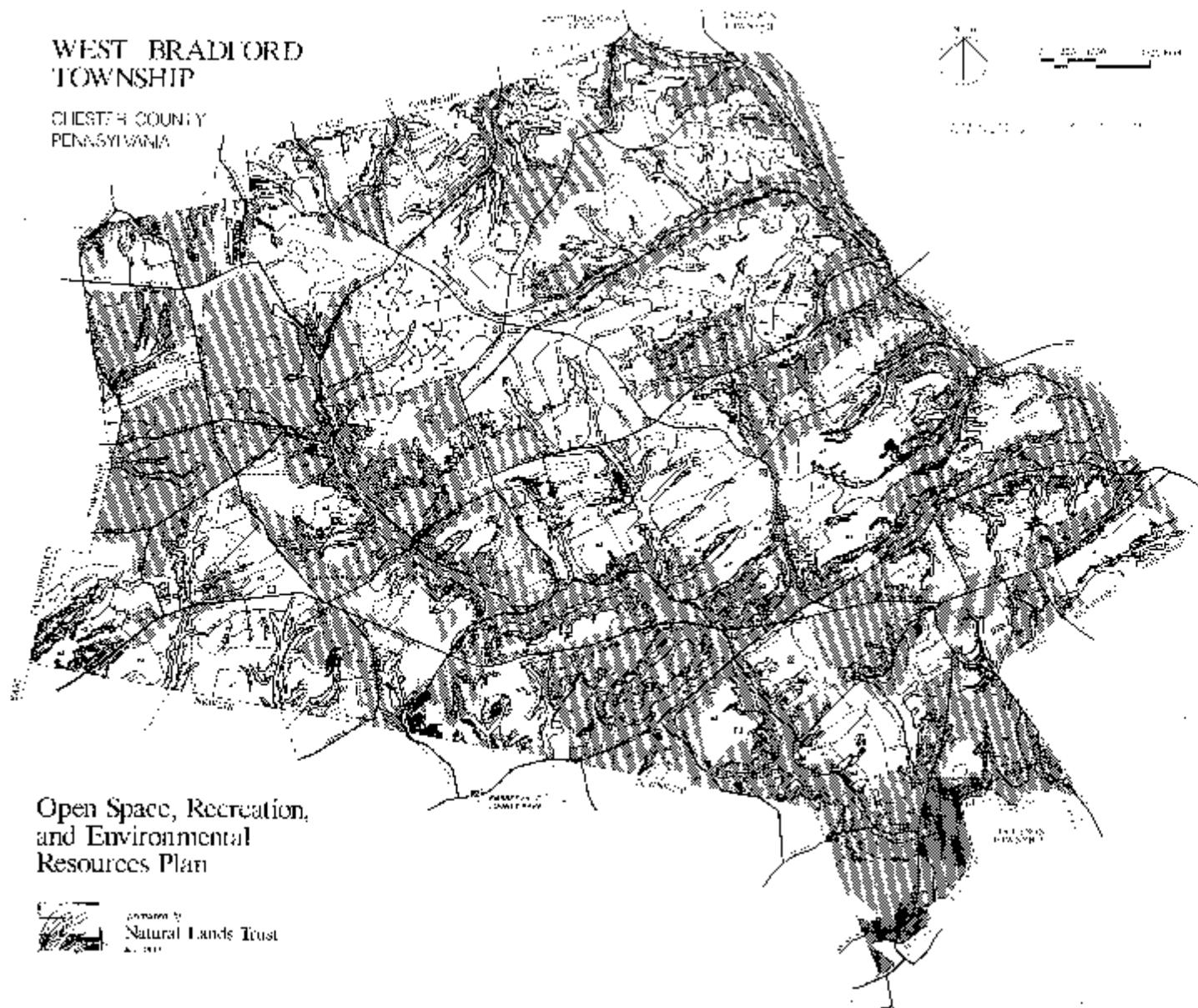
4.2. EVALUATION OF NEEDS

4.2.1 Overview

This section prioritizes West Bradford's resource protection needs by evaluating the importance of the environmental functions performed by each type of resource, and assessing the community benefit provided by those elements of the natural or cultural landscape that comprise the Township's open space network. This network is then compared to the County's 1988 Land Use Plan, to the Township's future land use map (in its latest Comprehensive Plan), and to the Township's current zoning ordinance map, so that differences may be critically discussed. Priorities reflect those resources that provide the greatest

WEST BRADFORD
TOWNSHIP

CHESTER COUNTY
PENNSYLVANIA



MAP 4-1

RESOURCE COMPOSITE

OPTICA NATURAL RESOURCES

 Localized Alcohol and Illicit Drug Use, Wellbeing

 Group Shape Greatest risk 20%

SENSITIVE NATURAL RESOURCES

- Seashore-Hgt. Water Table -15 Ft.**
Available Water, PFTD record Area
Soil profile: Horiz. Woodlands
- Agumbe (and Lushai) 1000 ft.**
- Kerosene Department, Khandwa
District, Madhya Pradesh, India
- Average Rainfall: 1000 mm
- Chennai Open Space and Reserve Gds.**
Brown Woods, Sri Lanka
- High Conservation Value Forests and Open Spaces, Sri Lanka**

SENSITIVE CULTURAL RESOURCES (OVERLAY)

-  **Reserve Books, Natural Resources
Heritage Requests**
-  **Significant Visitor Use Requests**



partnered by
Natural Lands Trust
& WH

environmental benefit and/or which are most representative of West Bradford's natural or cultural heritage.

4.2.2 Priorities Map for Open Space Resources

West Bradford's open space resources are depicted on Map 4-1 according to their relative degree of importance to the Township. While any such ranking is partly subjective, great effort has been taken to be as objective as possible in this evaluation. The Advisory Task Force was assisted in this endeavor by the Township's 1987 Open Space and Recreation Study and by the subsequent 1989 Comprehensive Plan (which was based partly on results from a residents' questionnaire, 47% of which were completed and returned to the Township Office).

Chief among the resources that provide the greatest environmental benefit are the complex of wetlands, floodplains and stream corridors, because of their multiple benefits including wildlife habitat, recreation potential (particularly for trails), and their key role in maintaining clean water.

Closely related to the above system are the steep slopes bordering many of the Township's stream corridors, and the hydric soils in their watersheds. In many cases those slopes and soils are wooded, but woodlands in general assume a relatively high significance in West Bradford, for so much of the land area has been cleared for farming or fragmented by suburban development. Such areas provide essential habitat and food sources for many wildlife species, including small mammals, songbirds, insects, amphibians and reptiles.

Looked at in terms of those resources that are most representative of the community's natural or cultural heritage, perhaps the most significant open space features are the fields and meadows reflecting West Bradford's agrarian past. These farmlands provide the vast majority of scenic vistas in the Township, and the most scenic roads pass through those areas, offering long uninterrupted views across the rural landscape. Other scenic roads worthy of greater protection from modern "improvements" are the winding, gravel-surfaced byways such as lower Broad Run Road, Great Road, Waltz Road, and parts of Saw Mill Road and Chestnut Lane.

West Bradford's open space network consists of these critical elements together with the other open space resources mapped on the Resources Priorities Map. Many of these resources overlap and some are functionally interdependent, so that the importance of taking an integrated, holistic approach to their protection cannot be underestimated.

4.2.3 Comparison with the County's 1988 Land Use Plan

The 1988 County Land Use Plan divides West Bradford into six types of land-use categories: Suburban Development, Reserve, Rural Development, Agriculture, Recreation, and Stream Valley Greenways.

Some but not nearly all the elements of the Township's open space network were identified as areas worthy of preservation in that county-wide plan. This is understandable because the scale of that effort did not allow sufficient opportunity to pinpoint all the locally significant open space resources existing in each municipality. Among those that were included are the Broad Run corridor, both branches of the Brandywine Creek, and most of the farmland southeast of Marshallton (between that village and the two branches of the Brandywine). Areas to the north and west of Marshallton, and most of the land surrounding Romansville, were classified for very low density "Rural Development". In addition, long-distance trails were recommended along both branches of the Brandywine, consistent with the county-wide trail network in the 1982 County Open Space and Recreation Study. The balance of the Township was classified as existing Suburban Development or as a reserve area for future suburban growth.

The general policies and the more detailed strategies proposed by the 1988 County Land Use Plan for the six land use categories are as follows:

- 1) **Suburban Development:** These areas are designated to continue receiving new residential development of various densities, plus ancillary retail, office, light industrial, and institutional development, but not in a concentrated fashion. The area classified as "Suburban Development" is basically the north-central part of West Bradford, where the greatest number of housing developments can be found. Provision for community and neighborhood parks, golf courses, and other types of open space is encouraged. Of particular relevance here is the recommended strategy to "enhance the open space system with protection of existing areas and creation of new areas", including specifically both community parks for active recreation, and natural areas for wildlife habitat, environmental protection, and passive use.
- 2) **Development Reserve:** These areas are earmarked for future suburban development of the kind that is described immediately above. Areas classified as "Development Reserve" include most of the land in the northern half of the Township that is not designated for "Suburban Development", and land in the immediate vicinity of Romansville. The general idea is that utility lines and other facilitating infrastructure would not be extended into such areas until the land supply in the Suburban Development zone has been substantially exhausted. As in the Suburban Development zone, open space protection

strategies are recommended for community parks and natural areas in the Development Reserve.

3) **Rural Development:** The policy for these areas is that their open rural character be preserved by allowing only low-intensity uses such as agriculture, woodlands, support businesses and low density residential uses. Areas classified as "Rural Development" include lands lying to the north and west of the historic village of Marshallton, most of the Broad Run corridor, and much of the land around Romansville. Regulatory techniques mentioned include the transfer of development rights (TDR), performance zoning, and clustering. In terms of open space preservation, the most effective "performance zoning" approach involves the use of an "open space ratio" that essentially requires developers to reserve a certain percentage of land within their subdivisions as permanent open space, in addition to those areas that standard regulations would ordinarily prohibit or restrict construction (wetlands, floodplains, and steep slopes). Several Bucks County communities have implemented performance zoning for many years, while two other townships (Lower Merion and West Manchester) have essentially achieved the same objective by requiring developers to submit density-neutral cluster layouts designed to preserve significant areas of open space. Corollary policies include restricting sewer and water line extensions, and encouraging farmland preservation.

4) **Agriculture:** The basic policy here is to support agriculture as the primary land use and as a valued element of the county economy. Areas classified as "Agriculture" include most of the land south and east of Marshallton. Strategies recommended in the 1988 County Plan include giving highest priority to agricultural easements in such areas, concentrating efforts to create "Act 43" agricultural districts, promoting the concept of development rights transfer (TDRs), and encouraging agricultural zoning (typically excluding development not related to farming, and/or establishing minimum "lot" sizes consistent with the smallest acreage deemed necessary for viable agricultural operations).

5) **Recreation:** Under a general policy of maintaining and expanding recreational areas in the county, land located on both sides of Rt. 162, lying to the east of Embreeville State Hospital, are classified as being for recreational purposes. In addition, the long-distance trail corridors identified along both branches of the Brandywine are recommended for implementation through a combination of land acquisition and coordinated development (presumably meaning the coordination of open spaces reserved in new subdivisions in this area, to provide a continuous ribbon of open space).

6) **Stream Valley Greenways:** The fundamental policy in these areas is to restrict development along streams in order to protect natural resources,

preserve open space, and to provide for a continuous stream valley system. At the county scale, the stream valley network identified in the 1988 plan included both branches of the Brandywine, plus Broad Run. In addition to offering property tax abatements and encouraging the donation of conservation easements, recommended strategies include zoning the stream valleys in such a manner that natural resources and open space will be protected, while not adversely affecting the equity of landowners.

Discussion: Because of West Bradford's location with respect to major arterial routes and its convenience to many jobs within easy commuting distance, the County's Future Land Use Map shows most of the Township as becoming rather more suburbanized over the next 20 years. To the extent that this reflects essentially unalterable trends in population growth within the region, this prediction is probably quite accurate.

By contrast, however, the open space network identified in the current effort is considerably larger and more extensive than that shown on the County Land Use Map of 2010. This is partly a function of the current effort being performed at a much more detailed scale, with a finer grain to the inventory and analysis (assisted immeasurably by the input of Township officials and residents). For example, the current plan identifies more stream valleys, additional farmland (contributing to scenic roadside vistas), and ecologically valuable upland forest habitat as worthy of protection, over and above the lands shown on the county-scale maps -- which tended to reflect more of a "broad-brush" approach.

Fortunately, the spatial distribution of future development patterns within West Bradford, and the percentage and configuration of open spaces reserved in new subdivisions, are both prerogatives of the Township, that it may determine through its land-use regulations. In addition to implementing its existing restrictions on building in wetlands, floodplains, and on steep slopes, the Township should also adopt additional standards requiring that developers design new subdivisions in a manner that provides for neighborhood open space. These open spaces should follow an overall pattern established on a Township-wide "Map of Conservation and Development" (as part of a revised zoning ordinance) so that they will eventually connect with each other, forming continuous corridors of undeveloped land, including relatively dry level terrain to protect agriculture, upland forest habitat, and to provide areas suitable for both active and passive recreation. As an alternative to requiring "open space subdivision design" (at least in certain overlay districts), the ordinance could allow conventional layouts as another option, but only at substantially reduced densities (such as one dwelling unit per three acres of developable land), providing subdividers with a strong economic incentive to utilize clustering concepts at standard densities.

4.2.4 Comparison with County Open Space Plan of 1982

By and large, all the areas identified in the County's 1982 Open Space Plan as meriting conservation in West Bradford have in fact also been identified by this current effort. They include the Broad Run Corridor and both branches of the Brandywine Creek. In addition, the predominantly agricultural area lying southeast of the village of Marshallton, and the land north of Romansville (between Broad Run and the West Branch), are also identified for "Agricultural Reserve Preservation". The current effort, which has been conducted at the smaller scale of the Township, has identified more detailed opportunities for open space protection along all the stream tributaries and those fields and pastures contributing to scenic vistas from many local roads, in addition to upland forests providing essential habitat for the Township's remaining wildlife population. Significantly, none of the above are adequately protected under current zoning and subdivision regulations, which allow, by right, for the subdivision of all these areas into conventional checkerboard developments with no designated open space for active or passive recreation, and affording no protection to either upland or lowland forest habitats (including those on steep slopes or in wetlands), which may be cleared without restriction under existing ordinances.

4.2.5 Comparison with Township's Comprehensive Plan of 1989

Although West Bradford's current comprehensive plan does not contain a "Future Land Use Map", it does include a detailed map of land uses as they existed in 1988, plus another map depicting the "Land Use Management Plan". The latter basically divides the Township into two categories of developed land ("Neighborhood/Built Environment" and "Village Setting") and four categories of undeveloped land ("Rolling/Open Lands", "Stream Corridor", "Woodlands: High Sensitivity" and "Woodlands: Moderate Sensitivity"). The Comprehensive Plan tacitly acknowledges that all vacant and buildable land in the Township is zoned for some form of development, but it also contains policy recommendations to increase the degree of protection afforded the rolling open lands, stream corridors, and woodlands.

The map entitled "Land Use Management Plan" essentially classifies all vacant land, whether buildable or not, into the four categories of undeveloped land noted above. As such, these categories include all the open space resources identified in the current planning effort. And because the Comprehensive Plan recognizes that considerable future development is inevitable throughout most of West Bradford, it suggests various approaches to mitigate the possible negative

issue of creating open space networks for passive recreational use, or setting aside adequate land within subdivisions for more active outdoor pursuits.

4.2.6 Comparison with the Township's Zoning Ordinance

The map of zoning districts in the existing zoning ordinance shows that, with the exception of floodplains, the entire Township is zoned for residential, commercial and industrial development. The majority of undeveloped land is designated for one-acre houselots. In other words, most of the Township's open space network, as mapped in the new open space plan, is slated for checkerboard development. Two significant factors not shown on the zoning map are the wetlands and steep slopes, where development is either prohibited or allowed only under very specific circumstances. Although new development in such areas is restricted by inherent site constraints and by the Township's land-use regulations, these factors alone would not ensure that passive recreational opportunities (such as trails) would become available for local residents to enjoy, because it is customary for developers to draw their lot lines so that all land within their subdivisions -- including steep slopes and wetlands -- is part of one private houselot or another. This issue is discussed more fully in the following chapter on recreational land and facilities. Another consideration is that current regulations, while restricting construction *per se*, do not prevent the clearing of environmentally important woodlands anywhere in the Township (not even on steep slopes or in wetlands).

4.3 ANALYSIS OF OPEN SPACE NETWORK

4.3.1. Overview

This section compares the Resource Composite Map, Map 4-1, with the protected lands inventory, Map 3-6, and discusses the areas that are revealed to be vulnerable.

4.3.2 Identification of Vulnerable Open Space

Comparing the open space network shown on Resource Composite Map with the Protected Lands Map, it is evident that the majority of areas considered important to conserve are not in fact adequately protected at the present time.

The most extensive category of "protected lands" are those within Agricultural Security Areas", but this designation really affords no protection against their conversion to suburban uses. Farmers with land in Ag Security Areas are protected from nuisance suits, and this helps to insulate them to some extent from the adverse effects of encroaching development, but such designation does not guarantee that farmland in these areas will not later be developed.

Another geographically large area of "protected land" lies within the stream valleys of the Brandywine Creek and Broad Run, which have been designated as "Pennsylvania Scenic River Corridors". However, this designation does not afford much protection by itself, except for prohibiting discharges into stream waters from new sewage treatment facilities.

Similarly, the National Register Historic District in Marshallton does not restrict property owners from altering architecturally significant structures, pulling them down, or building new infill structures that are incompatible with their period surroundings. It does, however, provide official recognition of the importance of the village, and it restricts the expenditure of federal funds for projects what would negatively impact the district (provided that no reasonable alternative exists, in which case the proposed alteration, demolition or other change would be allowed to proceed in a manner doing the least harm to the historic resources.

In all three cases described above, the "protection" provided by the various designations is very limited at best. However, they do serve as a basis for more effective regulations enacted at the local level.

Another category of "protected land" that is not really protected in any enforceable manner includes "institutional, religious, and educational" properties. The assumption is that the organizations owning these lands are probably not under any economic pressure to develop their land, as they may be exempt from local property taxes, and have other means of supporting their activities. However, as suburban development encroaches and ultimately engulfs these properties, their real estate value increases dramatically, and churches, schools, and other institutions begin to examine the potential infusion of fresh cash that could be easily realized by selling those lands to developers. Although neither Camp Linden nor "Temenos" are currently the subject of discussion as development sites, their potential for such conversion should not be overlooked by Township officials. The recent example of a huge development proposal on property owned by Church Farm School in West Whiteland Township serves as a reminder of the vulnerability of institutional land (as well as the former YMCA Camp in the Township's northeast corner, which is now a subdivision).

A fifth category of land where long-term protection is not necessarily assured is land belonging to the county, the state, and public utilities. While development of officially designated parkland is only a remote possibility, lands owned by other levels of government for non-park uses (such as hospitals, schools, maintenance facilities, watersheds, etc.) can become sites for various types of new development. For example, part of the Embreeville Hospital property has already been mentioned as a possible site for a group residence housing troubled adolescents. And many cases exist around the country where water authorities have sold part of their holdings for new development, to help finance facility expansion or improvement, on the basis that they must treat their raw water supply in any event to meet federal clean water drinking standards.

Probably the most reliable protection strategy involves legally restricting new development through permanent conservation easements, typically held by land trusts and conservancies, which are officially-recognized charitable non-profit organizations. These instruments are more effective than deed restrictions (which must be enforced by prior owners, who sometimes do not care enough about later violations to take legal action). Other lands that are probably also very adequately protected are those linear rights-of-way and easements held by utility companies, which presumably have a permanent need for them.

Even if all the land shown on the "Protected Lands Map" were truly protected from development, the majority of the Township's open space network would still be vulnerable to change, simply because those "protected lands" do not cover more than a fraction of the existing open space network. As mentioned above, the only parts of this system which are off-limits to new construction are wetlands and floodplains. Development on steep slopes is restricted in terms of density (three acres per dwelling, rather than one) and regrading. Clearing of wooded habitats that are steep, flood-prone, or seasonally wet is currently not controlled. No restrictions exist to prevent or control the subdivision of prime farmland or scenic fields and pastures from conventional checkerboard development. And there are no provisions requiring -- or even strongly encouraging -- the use of cluster design concepts to designate significant open spaces in new development, that could ultimately connect with protected open space in other developments or elsewhere in the network. (A brief description of the approach taken by officials in West Manchester Township, near York, PA -- involving clustering requirements and a township-wide map showing subdividers which parts of their development parcels must be designated as open space -- is provided at the end of Section 4.4.3.)

Conclusion: As a result of this comparison, it can be seen that almost all of the component features of the Township's open space network are potentially vulnerable to future change, conversion, and development. Very little land that

is not severely constrained by natural impediments, or that is not restricted from development through permanent conservation easements, is in fact really protected in any meaningful manner. This realization makes it all the more important that the Township adopt practical, equitable, and defensible strategies to ensure that its present and largely informal open space network remains intact over the coming decades, as suburban development gradually encompasses the remaining buildable land. Various approaches to achieve these objectives are discussed in the next section.

4.4 RECOMMENDATIONS/IMPLEMENTATION

4.4.1 Overview

This section presents and discusses recommendations for preserving the highest priority areas of West Bradford's open space network. Detailed protection strategies are presented and discussed in the following four categories:

4.4.2 Township Comprehensive Plan

The Open Space, Recreation and Environmental Resources Plan contained in this document will become an integral element of the West Bradford Comprehensive Plan and, as such, will amplify the findings, recommendations and policies of that earlier piece of work. Specific protection strategies should be recommended with regard to the following six types of open space areas:

Critical Natural Features

- * Floodplains, Hydric Soils, and Wetlands (including corridors of streams with Exceptional Value Water Quality, and Scenic Rivers)
- * Steep Slopes Greater than 20%

Sensitive Natural Resources

- * Woodlands, Seasonal High Water Table Soils, Serpentine Outcrops, and PNDI Impact Areas
- * Agricultural Lands

Sensitive Cultural Resources

- * Significant Landscapes (Visible from Public Roads)
- * Historic Districts and Sites

4.4.2.1 Critical Natural Features

The critical natural features of floodplains, wetlands, hydric soils, and steep slopes form the backbone of the Township's open space network, coinciding as they do with major stream corridors and their tributaries. They comprise a natural greenway system, and offer some of the best opportunities in West Bradford to create an inter-connected system of trails, in addition to providing significant habitat and travel corridors for wildlife.

To a very considerable extent, these Critical Natural Resources are already protected under existing Township zoning and subdivision regulations, with two important exceptions. The first is that none of the current restrictions limit clearing of woodlands on steep slopes, wetlands or floodplains. Regulations based upon those adopted on a state-wide basis in Maine during the early 1970s (under the Mandatory Shoreland Zoning Act) could form a good model for the Township to examine, to reduce erosion and sedimentation, protect wildlife habitat, and conserve scenic values. In addition, significant woodlands can be partially protected through subdivision ordinances requiring developers to identify and locate large trees over a certain diameter, and to design their building envelopes and roads around them. (It is often a good practice to place side or rear lot lines near such trees, which can then form part of the buffer areas between adjoining lots.)

The second issue that should be addressed here involves the pattern of houselots created in future subdivisions, which should be regulated to ensure that greenway trails for use by neighbors and other Township residents will become an integral part of the design for each new development in these stream valleys and lowland areas.

4.4.2.2 Sensitive Natural Resources

These resources encompass several different types of land that are not typically restricted from development, including farmland, upland woodlands, aquifer areas, locations containing serpentine rock outcrops, and places identified in the Pennsylvania Natural Diversity Index. In addition, this mapping category includes one kind of area where unsewered development is normally prohibited: soils with a seasonal water table 12" to 18" below the surface, where on-site septic disposal fields cannot be located.

Of all the various components of this mapping category, farmland is by far the most extensive in area. (This resource is also closely associated with the

"Significant Visible Landscapes" in the "Sensitive Cultural Resource" category discussed below.) Preserving farmland is one of the more difficult challenges of any open space strategy because farms typically contain some of the better-drained soils that are also very suitable for unsewered development. The Comprehensive Plan should therefore identify a multi-faceted strategy blending private and public efforts, regulatory and non-regulatory, to preserve those areas that have been ranked according to their significance (prime farm soils for crop production, and scenic vistas for rural landscape protection). Strategies for protecting these farmlands would be similar to those discussed immediately below with respect to upland forests.

The second most extensive feature of the "Sensitive Natural Resources" category is comprised of upland forests. These woodlands are often, but not always, associated with the poorer agricultural soils (which is one reason why they are not open fields or pastures), and in many areas of the Township these forest remnants, copses and hedgerows constitute a very significant wildlife habitat (as well as serving an important visual function in the scenic landscape).

The most cost-effective protection strategy for these areas of Sensitive Natural Resources is achievable by revising Township zoning and subdivision regulations, but this should be done in a manner that is fair to the rural landowner, so that existing equity is not disturbed. Among the strategies that should be recommended in the Comprehensive Plan are the purchase of development rights (PDR), the transfer of development rights (TDR), "density exchange options" (for non-contiguous parcels), "landowner compacts" (for adjoining parcels), density-neutral cluster design, and "limited development" (to create small country estates). Some of these techniques should take the form of requirements, rather than simply options for developers to accept or reject, at their own discretion. In other words, although there should always be a "menu" of choices for landowners and developers to consider, the Township should also draw the line at some point and say (at least in certain overlay districts) that conventional checkerboard development of houselots and streets will not be an acceptable option.

These regulatory strategies should be combined with other approaches, including the purchase of development rights or fee-simple interest in specific properties critical to the success of the greenway (typically with state or county funding, but local bond issues should not be ruled out), and donations of easements or land titles.

As they become protected through one or more of the above approaches, all parcels should be routinely evaluated for their potential contribution to a neighborhood or township-wide network of trails and bikeways. Until such time

as a continuous network has been created, some links will probably have to be provided by segments of rural roads. To the extent that these roads also offer scenic views (as shown on the Resource Composite Map), it may be appropriate for the Township to construct permanent bikeways or footpaths within their rights-of-way (in a manner that does not detract from their appearance, such as aligning them in a sensitive, winding manner through adjacent woodlands).

4.4.2.3 Sensitive Cultural Resources

This category includes historic buildings and settlements as well as the cultural landscape of fields, hedgerows and water-meadows that illustrate the Township's rural/agrarian heritage. Also included are the scenic lanes and byways which give certain parts of West Bradford their special rural character.

In order to provide more effective protection of the historic resources in villages such as Marshallton and Romansville, efforts should be renewed to adopt some form of local regulatory historic district. As a first step in that direction, the Township could adopt an ordinance that requires individuals wishing to alter their historic buildings to meet informally with a special advisory board which would review their ideas at an early stage while their ideas were still conceptual. This board should provide constructive comment and supply information about the stylistic features of buildings dating from certain period's in the Township's history, so that property owners may become better informed about the aspects of their building that are special or very expressive of a certain era. Although such meetings would be required before a building permit could be issued, the consultation would be purely advisory. Although such an approach might not be as effective in the short-term as the adoption of a regulatory historic district, it probably represents a more feasible strategy capable of implementation, in a community that has already once rejected proposed regulatory measures.

Significant rural landscapes visible from public roads are another large part of West Bradford's "Sensitive Cultural Resources", and protection strategies for them have been discussed above under "Sensitive Natural Resources" (farmland).

A variety of scenic roads have been identified in this study, some running through open farmland, others winding their way through thickly wooded areas. Safeguarding them involves three steps. The first is to protect the long vistas across farm fields and pastures (a goal which largely coincides with farmland preservation). The second step involves requiring deep front-yard setbacks for new construction, with no-cut wooded buffers at least 100 feet deep along the road, (and possibly also lengthening minimum street frontages along those roads). In addition, the recommendations for stream valley protection,

contained elsewhere in this chapter, are especially appropriate where scenic roads parallel a watercourse.

The third step involves the adoption of standards to be followed by the Township's public works crews, as they make physical "improvements" (such as widening cartways, trimming or removing trees, straightening curves, lowering gradients, and substituting asphalt for gravel surfaces). The best source book on this subject is "The Vermont Back Road", available through the Vermont Local Roads Program at St. Michaels College, Winooski, Vt. Some townships require public hearings on "improvements" proposed to be undertaken along designated scenic roads by municipal crews.

Discussions should also be initiated with representatives of PennDOT, with respect to the issue of widening the public roadway to accommodate acceleration/deceleration lanes near intersections with new subdivision streets. Such widening literally destroys the scenic qualities of rural roads, and the presumed need for them is highly questionable, except perhaps on very high-speed arterial routes where sight distances are less than ideal due to curves and hillcrests. The fact that all rural intersections (including those involving two numbered state highways) built before the current policy have never had accel/decel lanes, and have not experienced significant accident rates, demonstrates that such engineering "improvements" are generally not needed.

4.4.3 Township Zoning Ordinance

In order to protect the existing open space network, Township officials should consider amending the zoning ordinance to include a "menu" of approaches involving special techniques for "creative development":

1) **"Limited Development"**: Under this option, overall building density would be reduced by voluntarily creating a smaller number of much larger lots (typically mini-estates of 15 to 30 acres). In scenic areas with long sweeping views, such lots normally command premium prices, so that the same or greater return can be realized on the developer's investment. In order to encourage this approach, the Township could simplify its subdivision submission requirements (for instance, by eliminating certain requirements related to impacts generated by more intensive development proposals), and reducing street construction standards so that gravel-surfaced "country lanes" could be provided instead of wider asphalt roads. Through the use of "building envelopes" building locations can be restricted to certain parts of each estate lot where construction would be the least intrusive. Permanent conservation easements should be required to ensure that no further subdivision activity will occur at a later date.

2) "Landowner Compacts": Although this approach is not currently prohibited, neither is it encouraged (or even mentioned in the zoning as an option for people to consider). A "landowner compact" is a voluntary agreement among two or more adjoining landowners to essentially dissolve their common, internal, lot lines, and to plan their several parcels in an integrated, comprehensive manner. Areas for development and conservation could be located so that they would produce the greatest benefit, allowing development to be distributed in ways that would preserve the best parts of the combined properties. Taking a very simplified example, all the development that would ordinarily occur on two adjoining parcels could be grouped on the one containing the best soils or slopes, or having the least significant woodland or habitat, leaving the other one entirely undeveloped. The two landowners would share net proceeds proportionally, based upon the number of house lots each could have developed independently.

3) "Density Exchange Option": This approach is similar to "transfer of development rights" except that it does not involve the designation of specific "sending" or "receiving" areas. Two sets of written criteria define the characteristics of lands from which development rights may be purchased for use elsewhere, and other lands on which such rights may be used. Characteristics of "sending" properties typically include the characteristics that the Township wishes to protect (such as prime farmland, scenic views, mature woodlands, significant habitats, etc.). Another characteristic might be proximity to existing conservation properties, to provide additional buffering and/or to enlarge a block of protected land. "Receiving" properties would have different attributes, such as the absence of special natural or cultural features worthy of protection, plus the presence of utilities (or good soils for septic systems), and contiguity or nearness to other developed parcels. The objective that this approach was designed to achieve is to encourage the relocation of proposed subdivisions from developable rural areas that should ideally be kept as open space, to other areas that are already partly or substantially developed, where new subdivisions would not create such a salient intrusion into the countryside.

4) Cluster Design: This approach could become more than simply an option for developers to select or reject, a decision they typically make without much consideration of Township objectives for open space protection, as reflected in both the Comprehensive Plan and the Open Space, Recreation and Environmental Resources Plan. Choices for the Township to consider include requiring developers to employ the principles of "open space subdivision design" (at least in certain overlay zones characterized by an abundance of important open space resources), or re-structuring residential density limits to create a strong economic incentive encouraging developers to create more

compact lot layouts (such as by requiring significantly lower densities for conventional layouts, while allowing existing gross densities to be achieved

when cluster design techniques are used). Certain minimum standards for the quantity, quality, and configuration of open space should be specified. For example, with a base zoning density of one unit per acre, a 50% open space designation would not be unreasonable, in addition to unbuildable areas such as wetlands. Provisions for calculating density should be fair and equitable, and might be based upon a conceptual "yield plan" illustrating the maximum number of units that could reasonably be built in a checkerboard fashion upon the subject property. The location of such designated open space could be required to conform with a Township-wide map of West Bradford's Open Space and Greenways Network, so that they will contribute to the interconnectedness of that emerging system. Such a map could be modelled on the one adopted by West Manchester Twp., near York, Pa., where the areas that developers are required to set aside as open space are shown as an interlinking system flowing between adjacent properties on the township's Tax Parcel Map. Intending subdividers must base their conceptual development plans on this township-wide map of open space, and design their streets and houselots within the areas shown on that map as the most appropriate locations for new development.

Clear provisions should be included specifying how the potential "houselot yield" of a development parcel should be calculated. Such provisions could be incorporated into a "Site Capacity Analysis" consisting of formulas for "netting out" inherently unbuildable or environmentally sensitive areas (e.g., floodplains, wetlands, slopes over 20%, surface water, etc.). Of the remaining developable land, it would be appropriate for developers to contribute an additional 5-10% of their land area for passive or active outdoor recreation. (The lower figure would apply to sites that have many environmental constraints -- and hence a considerable amount of protected open space. The higher figure would pertain to sites with few or no constraints.) After subtracting the constrained land and the recreation set aside, plus an additional 10-15% for roads, the net site area should be divided by the minimum lot size in the district to determine "lot yield".

Regulations could then require that the full number of permitted houselots be designed in such a way that they would not cover more than a certain percentage of the site. Parcels with a high proportion of buildable land could be required to keep 40-50% of it as open space (in addition to the environmentally sensitive areas). parcels possessing a high proportion of environmentally sensitive land could be required to set aside 30-40% of that buildable area as open space. From a legal viewpoint (one that landowners and developers would share), it will be important to emphasize that this approach is "density-neutral". In other words,

it produces the same number of houselots, but influences their size and distribution so that legitimate public objectives of open space protection may also be achieved. To the extent that Township officials have tested their formulas on actual development parcels, as a "reality check" to ensure fairness to landowners and developers, the new regulations should be very defensible.

Total required open space would then be the sum of the environmentally sensitive lands, plus that proportion of the remaining buildable land described above (30-40% or 40-50%, depending on the overall character of the parcel). In no case should the required open space be less than 50% of the gross site area (this figure would apply to totally unconstrained sites). Because it is possible that some potential development parcels could consist almost entirely of unbuildable land (e.g., floodplains and wetlands), it is not wise to try to specify an upper limit for the amount of open space that could be required under a revised cluster regulations.

The issue of appropriate fees for developers to pay, in lieu of providing open space in addition to the environmentally constrained parts of their sites, is discussed in Chapter 5.

4.4.4 Township Subdivision Regulations

Subdivision regulations should be amended to include the following items:

* A two-step process involving an "Initial Tentative Concept Plan" and a "Detailed Plan". The first plan would be a broad, conceptual sketch plan of the development proposal, based upon a thorough analysis of the site, locating all special features of environmental, historic, scenic, or cultural interest. In addition to standard components such as topography and wetland delineations, the site analysis should show soils suitable for septic systems (in unsewered areas), vegetative patterns (meadows, fields, ordinary woodlands, mature woodlands, etc.), large trees (over a certain diameter), scenic landscapes or roadside vistas (as mapped by the Township), aquifers, PNDI's, significant wildlife habitats, and existing trails, paths, walls, fences, and structures. The broad concept map would then be overlain on top of the site analysis.

The second step, called a "Detailed Plan", would essentially be what the Township currently considers as a "Preliminary Plan", with the full amount of detail relating to metes and bounds, soil percolation tests, road cross-sections and profiles, drainage plans and calculations, etc. After the review is complete, a revised and refined version of the Detailed Plan would be submitted for final review and administrative approval by Township staff, as a formality not

involving any further technical evaluation or decision-making. (Plans that do not contain the changes noted by the Planning Commission would be returned to the applicant for completion in the recommended manner.)

* A four-step process for designing "open space subdivisions" should be at least briefly described in the subdivision regulations. After completing his site analysis, the applicant should then identify the 50% open space (in addition to certain unbuildable areas, to be netted out of the land area before density is calculated). After identifying the open space to be preserved, the home sites should be spotted in, maximizing the number adjoining or near the open space reserve. The next step is to draw in a road system to access each homesite. The fourth and final step involves the delineation of lot lines. This process is in reverse order to the way that most "cookie-cutter" subdivisions are laid out. The Township could also require that such plans be prepared by a landscape architect or professional planner, leading a design team that would also include a land surveyor and a civil engineer.

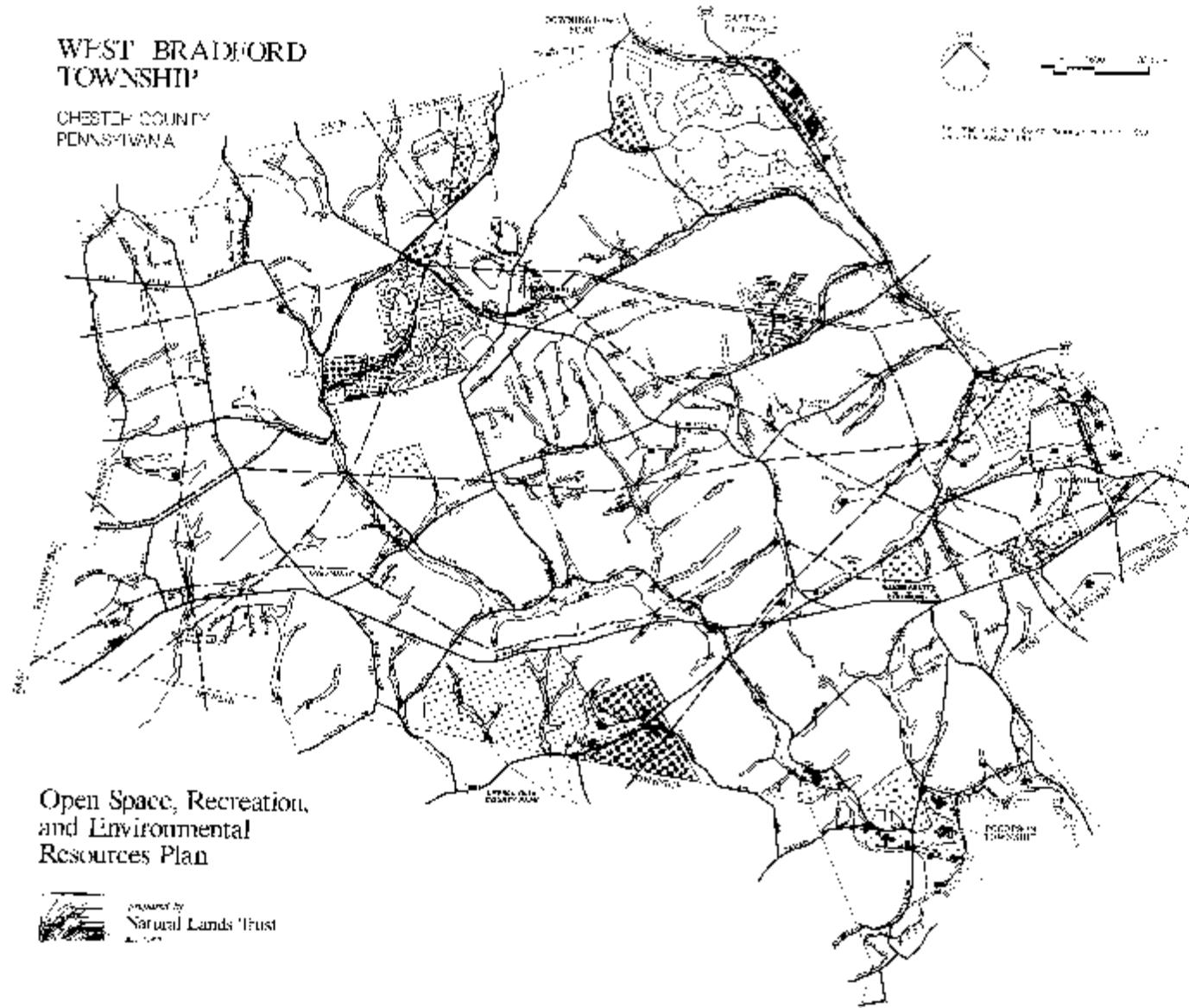
4.4.5 Other Activities

The trail network envisioned in this Open Space, Recreation, and Environmental Resources Plan will depend in large measure upon usage of utility line rights-of-way (for electric, gas and oil transmission lines). West Bradford's future trail system could be both more extensive and more interconnected than that of any other township in the County, due to the large number of utility lines and stream valleys that cross it in different directions. However, to become a reality, a concerted effort will be necessary to secure the approvals of the relevant utility companies, and to work with landowners and developers whose properties these lines traverse. Wherever possible and appropriate, new subdivisions along the township trail system should be required to be designed with open space adjacent to these paths. In order to ensure that necessary arrangements are agreed to with the utility companies that hold or own these lines and corridors, the township should consider appointing an ad hoc committee to meet with utility representatives, to discuss issues such as access, liability, and maintenance.

Acquisition of land by the Township should also be a part of the overall strategy for protecting open space, recreation and environmental resources in West Bradford. Because of limitations in available funding from the County, this part of the program will be relatively limited, probably involving one or two key parcels, whose acquisition will be necessary because other approaches would not work or would not be appropriate under the particular circumstances. One goal of this study is to identify areas in which such acquisition would be recommended, particularly with respect to the creation of an additional municipal park, and with respect to connecting trail segments.

WEST BRADFORD
TOWNSHIP

CHESTNUT COUNTY
PENNSYLVANIA

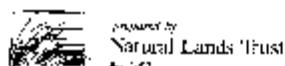


MAP 4-2

GREENWAY RECOMMENDATIONS

COKE GREENWAY LANDS

- Public Parks, Schools and Open Space
- Other Projects w/ Land Use
Public Railroads, Land, Valley
Caves, City Rooms
- Accomplice Zoning District
- Overhead License Rights of Way
- Underground Pipelines or
Cable Rights of Way



Chapter 5

PLAN FOR RECREATIONAL LANDS AND FACILITIES

5.1 OVERVIEW

Earlier sections of the West Bradford Township OSRER Plan reviewed the Township's natural resources and provided guidelines for preserving and protecting privately held open space and significant resources.

This section of the Plan will focus upon the varied components of West Bradford Township's public open space, to include park lands, facilities, and programs as well as park management, maintenance, and financing. Short- and long-term recommendations for the Township's public open space have evolved through a systematic process that has included: 1) an examination of public park standards and their application to West Bradford Township; 2) an inventory and review of West Bradford Township's existing park and recreation conditions; and 3) an analysis of West Bradford's existing public park and recreation conditions based upon standards that have been applied to the Township. Recommendations outlined in this section highlight specific Township responsibilities for parks and recreation.

5.2 STANDARDS

Standards represent a critical component of the planning process; they are not, however, precise paradigms and should, therefore, be considered in accordance with specific community needs and adapted to meet locally unique conditions. This section of the plan includes an examination of standards established by the National Recreation and Park Association, the Delaware Valley Regional Planning Commission, and the Chester County Planning Commission and presents specific standards for West Bradford Township related to public park acreage, facilities, programs, management, and financing.

5.2.1 Responsibility For Lands and Facilities

Responsibilities for public park lands, facilities, and programs are allocated to all levels of government; when appropriately administered, a hierarchy of public responsibility can help eliminate replication, conflict, and duplication.

Table 5.2.1.1 summarizes the types of public parks that serve West Bradford Township and outlines the levels of government that are responsible for providing facilities. State and county governments both provide natural areas for passive types of recreation along with programs for special events and environmental education; townships assume responsibility for meeting the more structured recreational needs of their residents. Pennsylvania townships typically maintain active recreation facilities (courts, fields, etc.) within a one-quarter to one-half mile access area for all residents and provide citizens with organized recreation programs.

TABLE 5.2.1.1
PUBLIC PARKS SERVING WEST BRADFORD TOWNSHIP

Regional Parks

Responsibility	State and/or Federal
Acreage Standard*	20 acres/1,000 population
Minimum Size	1,000 acres
Service Area	30 miles (60 min. drive)
Programs	Environmental Education
Facilities	Those related to natural resources and large expanses of land- marinas, ski areas, hunting, fishing, camping, trails, natural area
Length of Visit	Weekend to 1-2 weeks

Sub Regional Parks

Responsibility	County
Standard	8.5 acres/1,000 population
Minimum Size	100 acres
Service Area	7.5 miles (15 min. drive)
Programs	Special events - environmental education
Facilities	Pools, golf courses, trails, group camping, group and family picnicking,
Length of Visit	1/2 to full day

Community Parks

Responsibility	Local Government
Standard	4.5 acres/1,000 population
Minimum Size	20 acres
Service Radius	2.5 miles (5 min. drive)
Programs	Athletics, senior citizen, league games
Facilities	Tennis complex, community/senior center, swimming pool, regulation fields, group picnic
Length of Visit	Day use, 1 - 4 hrs.

(Table 5.2.1.1 Continued)

Neighborhood Parks

Responsibility	Local Government
Standard	3.5 acres per 1,000 population
Minimum Size	5 acres
Services Radius	1/4 - 1/2 mile (walking distance)
Programs	Summer playground, athletic instruction, pick-up games, informal family use
Facilities	Playground, multi-purpose field, courts
Length of Visit	Day use, 1-2 hours

Source: Chester County Recreation And Open Space Study, 1982

5.2.2 Park Acreage Standards

The 1982 Chester County Recreation and Open Space Study contains park acreage standards based upon criteria provided by the National Recreation and Park Association and the Delaware Valley Regional Planning Commission. Park acreage standards, as outlined in the County's Study, are illustrated in Table 5.2.2.1 ; West Bradford Township is identified as a Rural/Suburban Settlement.

TABLE 5.2.2.1
PARK ACREAGE STANDARDS

SETTLEMENT PATTERNS

<u>Park Type</u>	<u>Rural</u>	<u>Suburban and Rural Suburban</u>	<u>Urban</u>
Regional Parks	20 Acres/1000 Pop.	Applies to entire region	
Subregional Parks	8.5 Acres/1000 Pop.	Applies to entire county	
Community Parks	6.0 Acres/1000 Pop.	4.5 Acres/1000 Pop.	3.0 Acres/1000 Pop.
Neighborhood Parks	Not required	3.5 Acres/1000 Pop.	2.5 Acres/1000 Pop.

Source: Chester County Recreation and Open Space Study , 1982

Table 5.2.2.2 records West Bradford Township park acreage standards for both neighborhood and community parks; the two types of parks for which the Township is responsible. The minimum sizes identified in the Table represent the minimum acreages required to accommodate recreation facilities commonly attributed to each type of park.

TABLE 5.2.2.2
WEST BRADFORD TOWNSHIP PARK ACREAGE STANDARDS

<u>Park Type</u>	<u>Standard*</u>	<u>Minimum Size</u>
Neighborhood Park	3.5 Acres/1000 Pop.	5 Acres
Community Park	4.5 Acres/1000 Pop.	20 Acres

* Usable recreation acreage not impacted by wet soils or steep slopes

5.2.3 Recreation Facility Standards

Table 5.2.3.1 outlines the recreation facility standards identified in the Chester County Recreation and Open Space Study. Only the most common types of recreation facilities have been included in the Table. The standards are appropriate for use in West Bradford Township.

TABLE 5.2.3.1
RECREATION FACILITY STANDARDS*

<u>Facility</u>	<u>Standard</u>
Basketball	per 2,500 Population
Tennis	1 per 2,000 Population
Volleyball	1 per 3,300 Population
Baseball	1 per 2,000 Population
Soccer	1 per 2,000 Population
Softball	1 per 2,000 Population
Playground**	No standard

*Chester County Recreation and Open Space Study, 1982

** National Recreation and Park Association park design standards recommend one playground in each neighborhood park

5.2.4 Park and Recreation Systems Management

Ideally, park and recreation systems should be managed by a full-time director. In smaller municipalities, however, the management of park and recreation facilities is commonly assumed by either a secretary/manager, a park and recreation board, a community organization, or a group of volunteers. The Pennsylvania Department of Community Affairs' current standard states that communities with populations of 10,000 or more should retain a full-time park and recreation director.

5.2.5 Financial Standards

Unlike park acreage or facilities, there are no nationally or regionally accepted financial standards for township park systems. For comparative purposes, though, it is helpful to examine parks and recreation expenditures reported by other small Pennsylvania municipalities. Financial information secured by the Pennsylvania Department of Community Affairs indicates that, in 1990, all Chester County municipalities spent approximately \$7.00 per capita on parks and recreation programs. The same information indicates that, in 1990, second-class Chester County townships spent an average of \$5.00 per capita on parks and recreation programs.

Areawide park and recreation departments with average populations of 30,000, incorporating three or more municipalities (of which there are approximately twenty in Pennsylvania), spent \$11.00 per capita on park and recreation programs in 1990. It should also be noted that 81 of the first- and 799 of the second-class townships reporting to the Pennsylvania Department of Community Affairs spent an average of 4.1% of their total 1990 municipal budgets on park and recreation programs.

5.2.6 Recreation Program Standards

Nationally recognized prototypes and the 1982 Chester County Recreation and Open Space Study suggest that municipalities adhere to the following recreation program standards and provide:

- opportunities for organized games and sports, social activities, music, arts and crafts, drama, nature, and dance;
- comprehensive programs that include avenues for all neighborhoods, serve all ages and both sexes, and are family-oriented;
- programs that offer a wide range of recreational choices for both active and passive participants of varying skill levels;

- both indoor and outdoor recreation;
- programs that operate on a year-round basis, at various times of the day and on evenings, weekends, and holidays;
- programs that consider the needs of individuals as well as the needs of groups and special populations.

5.3 INVENTORY OF EXISTING PARK AND RECREATION CONDITIONS

This section of the plan summarizes existing conditions in the Township with respect to park acreage, facilities and programs as well as the methods used to manage and finance them.

5.3.1 Park And Recreation Lands

The recreational needs of West Bradford residents are served by public parks at all levels of government. Table 5.2.1.1 (on pages 5-2 and 5-3) outlines the respective responsibilities for each level of government. This theoretical system if applied avoids duplication by the various levels of government, and it will provide a complete spectrum of recreational opportunities for the people they serve.

5.3.1.1 Regional Parks: Six regional parks managed by state and federal agencies serve West Bradford Township:

<u>Name</u>	<u>Ownership</u>	<u>Acreage</u>	<u>Facilities</u>
Valley Forge Nat. Historical Park	Federal	2,500	Visitors Center, bike trails, historic facilities
Marsh Creek State Park	State	1,705	Pool, boating, picnic, fishing, trails, hunting, lake
French Creek State Park	State	7,339	Trails, camping, fishing, hunting, boating, pool, lake
Hopewell Village Nat. Historic Park	Federal	848	Historic, trails
Ridley Creek State Park	State	2,600	Trails, equestrian, picnic
White Clay Creek Preserve	State	1,251	Fishing, trails

5.3.1.2 County Parks: West Bradford is within the service area of two Chester County Parks

<u>Name</u>	<u>Acreage</u>	<u>Facilities</u>
Hibernia	800	Fishing, group camping, picnic pavilions, trails, open meadows
Embreeville	680	(Proposed only) - trails, canoe access, picnic pavilions, open meadows

Embreeville Park is currently undeveloped and an opening date has not been set. The County also plans to acquire another park in the eastern portion of the County. Depending upon location, this new park might also serve West Bradford residents.

5.3.1.3 Municipal Parks: West Bradford Township's park land may be classified as either developed or undeveloped.

5.3.1.3.1 Developed Sites:

1.) Beacon Hill Park Area - 12.6 acres

This site is adjacent to the West Bradford Elementary School. It slopes steeply in places from Beacon Hill Road to the small stream which is part of the headwaters of Broad Run Creek and which also separates the park from the West Bradford Elementary school property. Four ball fields which include a small instructional field have been cut into the hillside. The fields are served by a snack bar/storage building, a 75 car paved parking lot, and bleachers. Each field has a backstop and is fenced. The condition and maintenance of the grounds and facilities appears to be good. A portion of the site is wooded and it slopes steeply.

2.) Municipal Campus - 1.5 acres

Approximately 1.5 acres of this nine acre site are used for recreation. A ballfield and a small children's play area have been developed. Both are in excellent condition.

3.) Montvale Circle - 2.8 acres

A small pond and stream exist on this site. A lawn area is maintained along one edge of the pond. A portion of the site is wooded. Maintenance appears to be good.

5.3.1.3.2 Undeveloped Sites:

The Township also owns a number of undeveloped sites which have good to limited recreation potential.

- 1.) **Summit Ridge** (Price Lane) 8.2 acres.
This is a wooded site with large mature trees. Much of the site slopes steeply; although, there is one fairly level area.
- 2.) **Brandywine Meadows** - 48 acres
This site contains open meadows, woodlands, a small pond, and a storm water retention basin. The meadow along Rt. 322 has a 5-8% slope. Over 1/2 mile of the east branch of the Brandywine Creek forms the eastern boundary of this site while US Rt. 322 forms the western boundary.
- 3.) **Summit Ridge** (Broadview) 2.6 acres
Wooded site used as a retention basin.
- 4.) **Walnut Ridge** 1.4 acres
A retention basin.

5.3.1.3.3 Potential Future Township Land:

The Township also has under consideration five additional sites.

- 1.) **Deer Crossing** - 2.1 acres
Sloping, partially wooded with frontage on Romansville Road
- 2.) **Fox Fire** - 1.8 acres
A storm water retention basin in a deep ravine with steeply sloped banks.
- 3.) **Highlands** - 4.4 acres
A retention basin primarily open with scattered young tree growth.
- 4.) **Embreeville** - 52 acres
Surplus Embreeville Hospital Property. Chester County claims title. Wooded, rolling, some steeply sloped areas, open meadows.
- 5.) **Colonial Woods** - 19 acres
Located off Poor House Road, the site is entirely wooded with mature trees. Most of the site is on steeply sloping land.

5.3.1.4 School Recreational Lands

West Bradford is part of the Downingtown Area School District. West Bradford and Bradford Heights Elementary Schools are the only school facilities in the Township.

5.3.1.4.1 West Bradford Elementary School: This site is located off Broad Run Road adjacent to the Beacon Hill Park. It contains a variety of recreational facilities including two small (t-ball) ballfields, a 13 station Vita Fitness Course, an informal soccer field, a four-court basketball hard surface area ringed in the summer by temporary dasher boards for street hockey, two additional large paved areas for informal games, and scattered playground equipment. The site is well maintained.

5.3.1.4.2 Bradford Heights Elementary School: This site consists of 21 acres and is located off Romig Road in the northern portion of the Township. It was constructed in 1990; consequently, its turf and landscaping are not well established. An approximate four-acre sloping turf area wraps around the east and north sides of the building. No facilities have been developed on the turf area. A Hard surface area with two basketball courts and scattered play equipment including several man-made hills with built in slides have been constructed. The hill-slides already show signs of excessive wear.

5.3.1.5 Quasi-Public Sites

The West Bradford Youth Athletics Association currently leases a large area at Embreeville Center consisting of three soccer fields and an undeveloped area capable of supporting two little league fields. This is the only quasi-public site in the Township. The 20-year lease executed in 1989 has a five-year renewable option. The Association has spent approximately \$150,000 to improve the site which includes a large parking area. The Association plans to lease another parcel and construct a ball field, and it is considering leasing a third parcel large enough for four multipurpose fields. The Association is responsible for all maintenance of the leased area.

5.3.1.6 Private Lands

There are no private/commercial recreation facilities open to the public within the Township.

5.3.2 Master Site Development Plans

Sketch Plans were prepared as part of the 1987 Open Space and Recreation study for the Embreeville site, Beacon Hill Park, Municipal Campus, and Sunumit

Ridge. No professionally developed plans for the Township's parks have been prepared.

5.3.3 Recreation Programs

5.3.3.1 Public, Quasi-Public and Private Organizations

Currently the Township including its Recreation Commission does not offer recreation programs. Programs are provided, however, through arrangements with the West Bradford Youth Athletics Association (WBYA) and the Downingtown Area Recreation Consortium (DARC).

DARC is an evolution of the former Downingtown/Uwchlan Recreation Board (DURB) which was created by these two municipalities to provide recreation programs for their residents. Residents from other municipalities could participate in DURB programs but at a higher fee.

The Downingtown Area Recreation Consortium (DARC) was officially created in November, 1992; although, it was unofficially in effect for the 1992 summer program. DARC now provides recreational services to all eight communities within the Downingtown School District. Each municipality's financial participation in DARC is based on past resident program participation percentages in the DURB programs. In 1992, West Bradford's percentage was 16%.

The WBYA is the major recreation provider in the Township. Through some financial help from the Township, the WBYA offers a wide variety of athletic programs on a year-round basis as shown below:

Winter - volleyball, wrestling, basketball

Spring - softball, baseball and soccer

Summer - street hockey, women's and men's softball

Fall - soccer

The WBYA is managed entirely as a volunteer program. Program fees shown below support the program.

\$25	first child
\$40	two children
\$50	three children
\$5	for each additional child
Adults pay \$25 per program	

The WBYA has had good access to the public schools for their programs. They are required to pay an overtime janitorial fee for Saturday school usage.

Two other programs significantly serve West Bradford residents. The Downingtown Spirit, a traveling soccer program, serves boys ages 8 - 19. Also, the Downingtown Little League offers a much more competitive baseball program than the WBYA's Babe Ruth baseball program.

5.3.3.2 Recent Trends

There are numerous other clubs, organizations and programs such as the YMCA, equestrian clubs, and scout programs that West Bradford residents participate in on a limited basis.

Participation in WBYA programs has been steadily increasing. The Table 5.3.3.1 lists participation numbers in recent years in their various sports programs.

Table 5.3.3.1
WBYA PROGRAM

<u>Sport</u>	<u>Participants</u>				
	1986	1988	1990	1991	1992
Field Hockey	49	0	0	0	0
Fall Soccer	540	590	625	720	850
Spring Soccer	530	600	600	690	750
Boys Basketball	0	0	0	264	280
Girls Basketball	380	*	*	78	90
Boys Baseball	219	239	295	380	396
Wrestling	50	21	30	35	*
Street Hockey	0	380	285	234	170
Men's Basketball	62	*	*	104	*
Women's Volleyball	72	*	*	72	*
Coed Volleyball	68	*	*	33	*
Coed Volleyball (over 30)	0	0	0	22	*
Girls Softball	78	98	105	119	130
Women's Softball	104	*	*	74	*
Men's Softball	176	*	*	110	*

* Data not available

The DARC provides a summer playground program for ages 7 - 12 which was located at Bradford Heights Elementary School in 1992. It is a six-week program that saw 69 children registered. (70 is the maximum set by the DARC for any one site). Formerly, the program was located at West Bradford Elementary School.

but due to a reroofing project, it was moved to Bradford Heights Elementary for 1992. The Recreation Commission would like to see the program expanded to both school sites in 1993. The registration fee is \$40 for the six-week program.

The DARC also offers other recreational programs which West Bradford residents may participate in. In 1986, about 10% of the total DURB program participation was from West Bradford. Currently this figure is estimated to be 16%. Table 5.3.3.2 depicts West Bradford participation in the DURB program from 1989 through 1991.

Table 5.3.3.2
DURB RECREATION PROGRAM PARTICIPATION

<u>Year/Season</u>	<u>Total Participation</u>	<u>West Bradford Participation</u>	<u>West Bradford Percentage</u>
1989			
Winter/Spring	1720	269	16%
Fall	1620	188	12%
Summer	1843	212	11%
Total	5183	669	13%
1990			
Winter/Spring	1633	254	16%
Fall	1373	135	10%
Summer	1310	205	16%
Total	4316	594	14%
1991			
Winter/Spring			
Fall	1003	138	13
Summer	2373	298	13
Total			

5.3.3.3 Program Variety

While many of the DURB programs are not sports oriented, the programs weigh heavily toward competitive athletics. Program offerings, however, are for youth as well as adults. Teaching of skills is limited to that received as a team.

participant. No skill clinics are offered, nor are coach's training programs. The WBYA offers a fairly comprehensive sports program with perhaps the exception of tennis, gymnastics and lacrosse.

Creative and performing arts, special events, holiday programs, exercise, cultural, educational, and craft programs typically included in a well rounded municipal recreational program are not provided. No programming is provided for senior citizens or the handicapped. The high participation (16%) of West Bradford residents in the DURB program which includes more than just athletic activities indicates a need for other than sports programming for township residents. Had DURB type programs been offered in West Bradford so that travel time would have been minimized, participation undoubtedly would have been much higher.

5.3.4 Financing The Park And Recreation Program

Table 5.3.4.1 provides a five-year review of West Bradford's expenditures for parks and recreation. Over the five-year period, operating expenditures increased 78% while capital expenditures remained fairly constant averaging \$21,000 annually, with the exception of 1992 when funds for a major land acquisition were budgeted.

Table 5.3.4.2 shows by line item the Township's 1992 operating budget for parks and recreation as noted.

Table 5.3.4.1
WEST BRADFORD TOWNSHIP PARKS AND RECREATION BUDGET

Year	Operations	Capital	Total
1988	\$12,415	\$12,343	\$24,758
1989	15,416	22,142	37,558
1990	16,610	26,705	43,366
1991	20,690	23,122	43,812
1992	22,160	72,000	94,160

As noted above, the Township contracts with the WBYA to conduct athletic programs. In 1992, the Township budgeted \$16,400 for this service. In addition, the "capital expense" of \$600 in the 1992 budget is paid over to WBYA for field improvements. The WBYA does not differentiate between residents and non-residents in its fee policy. Formerly, the DURB, did charge an extra \$10.00 per person for non-residents. With the creation of DARC, this policy was discontinued.

The only revenue source for parks and recreation operations is the general fund budget, although the Township received a grant from Chester County to prepare this study. It has no formal policy on acceptance of gifts. The Township imposes fees and charges for other municipal services; however, since it does not operate the recreation program, a fee policy has not been set.

Table 5.3.4.1
1992 PARKS AND RECREATION OPERATING BUDGET

Acc. Number	Line Item	Amount
454.2000	Materials and Supplies	\$900
454.3600	Fuel, Light, and Waters	160
454.3700	Maintenance	4000
454.3900	Contributing	100
454.4500	Contracted Services	16,400
454.60	Capital	600
Total		\$22,160

5.3.5 Personnel

Currently the Township does not employ full-time or part-time personnel for its parks and recreation activities. The township manager handles all contractual and financial matters for capital projects as well as contracts with the WBYA and DARC. The Director of the Road Department is responsible for park maintenance.

5.3.6 Administration

Since the Township does not have a parks and recreation department, new projects are normally initiated by citizens or community organizations including the Recreation Commission. The initiating person or group typically submits a written proposal and presents it at a public Board of Supervisor's meeting. The Township Manager then reviews the request and submits his recommendation to the Board of Supervisors for their action. If the project is approved, the Township will either hire a consultant or undertake the planning and/or design in-house depending on the scope of the work. Once the planning and/or design is completed, the work will be bid for private contract or undertaken by volunteers depending again on the scope of work.

The Township Board of Supervisors created a seven member Recreation Commission in 1987 through Resolution 87-06. The Resolution charges the Commission with the following responsibilities:

- 1) Submit an annual report.
- 2) Advise the Board of Supervisors on maintenance, use and improvements to existing facilities, acquisition and development of new facilities, creation of new recreation programs, contracts for recreational services, and new land development proposals.
- 3.) Recommend and review related ordinances
- 4.) Monitor and update the 1987 Open Space and Recreation Study
- 5.) Act as a liaison between the Township and recreational contractors.

Currently, the Board does not administer any recreation programs, and its activity has been primarily limited to recommendations on land acquisition and facility development.

The Township entered into a contract with the WBYA, Inc., a non-profit corporation, in 1980 to provide recreational services to township residents. The one-year contract has been extended annually. Because the WBYA is considered an independent contractor, the Township realizes significant insurance savings. The WBYA is required to submit an annual report with an accounting of programs, expenses, revenue and participants. The Township makes an annual financial contribution to WBYA to support its program.

The Township has paid approximately \$2,500 annually to the DURB to provide a summer playground program at one school site. This program as well as other recreational services will be paid for through the Township's annual payment to DARC as discussed above.

The Township informs residents of current events through the West Bradford Township Newsletter which is produced quarterly and mailed to all township residents. The WBYA promotes its programs through its newsletter or via special announcements mailed to its membership. In addition, they advertise in the Daily Local News and send flyers through the schools. Advertising on a bulletin board at Beacon Hill Park and a sign board in the vicinity of the airport on the Marshallton-Thorndale Road has been effective in promoting their programs as well as occasional use of a "billboard" at the fire station in Marshallton.

The DARC primarily uses a brochure which they mail four times a year to 18,000 area residents.

5.3.7 Park Maintenance

Park maintenance is performed by several agencies. The Township Road Department periodically conducts maintenance such as weed control, major repairs and clean-ups. Some maintenance at Beacon Hill Park such as trash removal is done by WBYA. The Township recently contracted with the School District (\$1,200+- annually) for regular mowing of Beacon Hill Park. Mowing at Montvale Circle Park and the Municipal Campus is conducted by a private contractor for \$170 per weekly cutting or \$4,000+- annually. The Township does not specifically designate staff to park maintenance functions, and a park maintenance program has not been established.

Township equipment is stored in a new maintenance building which has ample space for storage and performing routine equipment maintenance tasks. The inventory consists of the following equipment which can be used for park maintenance:

Ford Dump Truck, F800, 33,200 GVW	1984
GMC Dump Truck, 33,200 GVW	1989
GMC Dump Truck, 32,200 GVW	1991
Chevy Dump Truck, 10,000 GVW	1987
Chevy Pick-Up Truck	1990
John Deere Tractor 1050	1982
John Deere Grooming Rotary Mower 272	1983
Case 580SK Backhoe	1992
Beaver-brush chipper (self powered)	1989
York Rake	1991
John Deere sickle bar bank mower	1990
Case rubber tire loader	1986
John Deere road grader	1986

One hand mower, one weed eater, and several chain saws complete the equipment inventory. None of the major equipment was purchased exclusively for park maintenance; however, all can be used for specific park applications. All equipment is in good to excellent condition, and the Township has developed a replacement schedule.

The Road Department has six full-time personnel including the Director. As stated above, none are devoted to park maintenance.

The Township parks are fairly well maintained. Routine maintenance tasks such as mowing and trash removal are performed adequately. Some major maintenance such as the correction of erosion problems or painting of the storage building at Beacon Hill Park require attention. Mowing has improved considerably since the Township contracted with the School District to mow

Beacon Hill Park. Some communication problems exist which are typical of a program that has a number of responsible parties.

The Township Manager makes a full inspection of each park one time per year. This inspection is then reviewed with the Township's insurance carrier.

5.4 EVALUATION OF NEEDS

The following section identifies the needs of West Bradford Township for park facilities and recreation programs, as well as the management and financing system required to support them. The Township's needs have been determined by comparing the inventory of existing conditions with the standards defined earlier in the chapter.

5.4.1 Park Acreage Analysis

Local governments traditionally and logically are responsible for meeting the day-to-day recreation needs of their residents through the provision of neighborhood and community parks. Park acreage sufficient to meet the needs of West Bradford Township residents (determined by the standards identified earlier in this chapter) is illustrated in Table 5.4.1. As depicted in the Table, the Township should have by the year 2010 approximately 62 acres of neighborhood parks and 80 acres of community parks.

TABLE 5.4.1
WEST BRADFORD TOWNSHIP PARK ACREAGE REQUIREMENTS

		RECOMMENDATION BASED ON STANDARDS		
POPULATION		10,406	13,140	17,665
	<u>STANDARD*</u>	<u>EXISTING</u>	<u>1990</u>	<u>2000</u>
Neighborhood Park	3.5 AC/1000	11.5 **	36 AC.	46 AC.
Community Park	4.5 AC/1000	31.5***	47 AC.	59 AC.

* Standards from the 1982 Chester County Recreation and Open Space Study. Usable recreation acreage not impacted by wet soils, steep slopes, or other conditions that would impede active recreation usage.

** Municipal Campus (1.5 Ac.), Colonial Woods (5 Ac.), Embreeville (5 Ac.)

*** Beacon Hill Park

An analysis of the Township's current open space for municipal park purposes is shown in Table 5.4.1.1. As noted in the standards section, acreage for neighborhood and community parks should principally be suitable for active recreation purposes. Much of the land owned by the Township does not meet this requirement; consequently, the only sites suitable for neighborhood park purposes are the Municipal Campus, (though it does not meet the minimum acreage requirements), the Beacon Hill/West Bradford Elementary School, and the Embreeville Site. Since some of the acreage of both the Colonial Woods and Embreeville sites is suitable for neighborhood park purposes, five acres of each site is designated for this purpose while the balance is listed as "Passive Recreation Lands". The only site approaching community park standards is the Beacon Hill site of 31.5 acres.

TABLE 5.4.1.1
ANALYSIS OF WEST BRADFORD TOWNSHIP OPEN SPACE
FOR MUNICIPAL PARK PURPOSES

Neighborhood Parks	Acres
1. Municipal Campus	1.5
2. Colonial Woods	5.0
3. Embreeville	5.0
Total Acres	11.5
Community Parks	
1. Beacon Hill	31.5
Total Acres	31.5
Passive Recreation Lands	
1. Montvale Circle	2.8
2. Summit Ridge (Price Lane)	8.2
3. Brandywine Meadows	48.0
4. Colonial Woods*	14.0
5. Embreeville*	47.0
Total Acres	120.0
Other Township Open Space	
1. Summit Ridge (Broadview)	2.6
2. Walnut Ridge	1.4

*The Township should take title to these sites in the near future

The Township currently owns or anticipates owning in the near future five sites which because they consist primarily of steeply sloping lands or wet areas are not appropriate for consideration as neighborhood or community parks. These five sites, however, are ideal for passive recreation purposes and should be considered for meeting the passive recreation requirements for a community park; thus negating the need to acquire a fifty-acre community park to meet community park standards. Both the Colonial Woods and Embreeville sites, currently not owned but expected to be obtained by the Township in the near future, should be considered primarily for passive recreation purposes.

Both the Summit Ridge (Broadview) and the Walnut Ridge sites are not suitable for recreation purposes; consequently, they are not factored into the calculations for community and neighborhood parks.

As shown in Table 5.4.1.1, total acreage of the three neighborhood parks is 11.5 acres which is well below the 36 acres required to meet current needs. The community park analysis, however, is more complicated due to the existence of 120 acres of passive recreation lands. Since the 120 acres of passive recreation lands can fulfill the passive recreation requirements for community parks, only 40-60 acres suitable for active recreation purposes are required to meet standards.

5.4.2 Recreation Facilities Analysis

Table 5.4.2 outlines both current and future needs for recreation facilities in West Bradford Township. As depicted in the Table, only the current needs for basketball and baseball have been satisfied.

Since playground facilities are recommended at each neighborhood park, a further analysis of playground requirements will be addressed in the Recommendations Section of this chapter. Also, although the 1982 Chester County Recreation and Open Space and Recreation Study did not set specific standards for trails, it did recommend that trails be included as part of the municipal park system. West Bradford Township does not currently have a trail system.

5.4.3 Recreation Programs Analysis

It appears that the WBYA program is adequately meeting the needs of youth as well as adults for athletic activities. Participation figures have been climbing steadily; consequently, some concern is expressed for the ability of this volunteer organization to continue to effectively manage the program. The extremely successful Lionville Youth Association is currently facing this problem. It may be necessary in the future for the Township and/or DARC to provide administrative assistance to WBYA.

The one township playground program was filled to capacity in 1992. Based on the Township's population, a minimum of one additional program is needed.

TABLE 5.4.2
WEST BRADFORD TOWNSHIP RECREATION FACILITIES ANALYSIS

FACILITY	STANDARD/POP	EXISTING	ADDITIONAL NEEDED BY YEAR		
			1993	2000	2010
Basketball	1 per 2,500	6*	0	0	1
Tennis	1 per 2,500	0	4	5	7
Volleyball	1 per 3,300	0	3	4	5
Baseball	1 per 2,000	5	0	2	4
Soccer	1 per 2,000	3**	2	4	6
Softball	1 per 2,000	0	5	7	9
Playground	No Standard	3***	--	--	--

* School District Owned

** Leased by WBYA

***Two owned by School District

With the exception of the athletic and playground programs, no other programs designed to specifically service West Bradford residents are offered. As indicated in the standards section, a municipality should offer a well rounded program consisting of music, arts and crafts, drama, nature, and dance in addition to athletics. Also, there is no programming for senior citizens or for the physically disabled. Since West Bradford residents have actively participated in DURB/DARC programs which primarily required them to travel outside the Township for their participation, undoubtedly similar type programs provided within the Township would be heavily supported.

5.4.4 Management Analysis

The Recreation Commission which is primarily comprised of individuals that are currently or were formerly active in the WBYA have not sponsored recreation programs and have assumed no administrative responsibilities for the

Township's overall park and recreation system. Their role to date has been primarily to advise the Board of Supervisors on the impact of planned subdivisions and to recommend actions for park acquisition and improvements.

The Township Manager works very closely with the School District, DARC, and WBYA and the Recreation Commission in coordinating the Township's park and recreation activities. This arrangement seems to be working adequately.

The Township has reached a population plateau when it should begin to consider the employment of a full-time parks and recreation director as recommended by the Department of Community Affairs. The Township's decision to join DARC which has a full-time recreation director will, for the immediate future, offset this need. The Township may, however, need to consider its own director if it aggressively moves forward with a park acquisition and development program to meet the needs of its citizens. It is possible, although complicated, for DARC to expand its role to provide park as well as programmatic services.

5.4.5 Financial Analysis

Using the average of the 1991 and 1992 operating budgets as a basis for comparison, West Bradford spent \$2.00 per capita for parks and recreation. This can be compared to an average of \$7.00 per capita spent in 1990 by all Chester County communities and during that same period the \$5.00 per capita spent by second-class Chester County townships. Also, second-class townships on a state-wide basis spent 4.1% of their total municipal budget in 1990 on parks and recreation. This compares to West Bradford Township's 1992 expenditure of 1.5% of its total budget.

National Park Service studies indicate that United States and Canadian communities judged to have good parks and recreation programs spent an average of 5% of their total municipal budgets for annual parks and recreation activities. This analysis reveals that West Bradford's per capita expenditure for parks and recreation is considerably less than both the Chester County and state wide averages. Also, similarly the percentage of its total operating budget dedicated to parks and recreation of 1.5% is well below state and national averages.

Since West Bradford has joined an area wide parks and recreation program (DARC), it is appropriate for purposes of this study that comparisons be made with state wide averages for similar intergovernmental arrangements. Pennsylvania's area-wide recreation and park organizations with an average population base of 30,000 spent \$11.00 per capita on parks and recreation in 1990.

DARC which has a population base of 48,212 spent \$3.00 per capita on parks and recreation in 1992. It should be noted that this figure reflects only DARC expenditures for programs, and it does not include what individual municipalities may have spent on park maintenance and/or recreation programs.

5.5 RECOMMENDATIONS FOR PARKS, TRAILS, PROGRAMS AND MANAGEMENT

This section of the West Bradford Township OSRER Plan provides recommendations for establishing a Township park and recreation system. In addition to providing a five-year capital improvement plan, both immediate and long-term recommendations are suggested for expanding the Township's parks and improving recreation facilities and programs for Township residents.

5.5.1 Understanding the Existing Public Open Space

Assuming Chester County does not change its policy with respect to the development and operation of its county parks, the Embreeville County Park should eventually contain a variety of passive recreation facilities including picnicking to serve the residents of the area. The Township must face the challenge of providing the active recreation facilities and programs necessary to meet the needs of its residents through neighborhood and community parks. Assuming that the Township takes title to both the Embreeville and Colonial Woods sites, it will have amassed approximately 170 acres in public open space. Reference is made to table 5.4.1.1 which provides a breakdown of this open space. Unfortunately, as noted earlier in the study, much of this open space is unsuitable for neighborhood and municipal park purposes. Portions of both the Embreeville and Colonial Woods sites have been designated for neighborhood park purposes while the balance of these sites has been designated as passive recreation lands. The Embreeville site is large enough to meet community park standards; however, because of its location as well as steeply sloping terrain, it is recommended that only a portion of it be used as a neighborhood park and the balance be used for passive recreation.

Similarly, five acres of the 19-acre Colonial Woods site has been designated as a neighborhood park, and the balance should be considered as part of the Township's passive recreation and open space system.

5.5.2 Recommendations for Existing Parks

5.5.2.1 Municipal Campus

The site should be maintained as it currently exists with the exception of the addition of trees to buffer the ball field and playground areas from the road, parking lot and neighboring residences and to provide shade for the playground.

5.5.2.2 Beacon Hill Park

Steps should be taken to control erosion problems on the site. Also discussions should be held with WBYA to reach a working accord on adequate maintenance of the concession building.

5.5.2.3 Montvale Circle

Over a period of time, much of the undesirable invasive plants and underbrush should be cleared. Other conditions should be maintained as they currently are.

5.5.2.4 Brandywine Meadows

This unimproved site should be designated for passive recreation. A master plan should be completed before any improvements are undertaken. For the immediate future, the Township should consider renting the open fields to a local farmer to maintain as hay. A trail system along the Brandywine as well as possibly a small picnic grove could be considered for this site. A parking lot should be provided.

5.5.2.5 All Other Sites

The balance of the Township sites should be maintained as passive open space. Where appropriate localized trails should be considered. These sites should be managed to minimize maintenance costs. Periodic trash removal, roadside mowing, and detention basin maintenance will be required. It is recommended that no recreation facilities be placed on these sites to avoid the long-term costs for operations and maintenance.

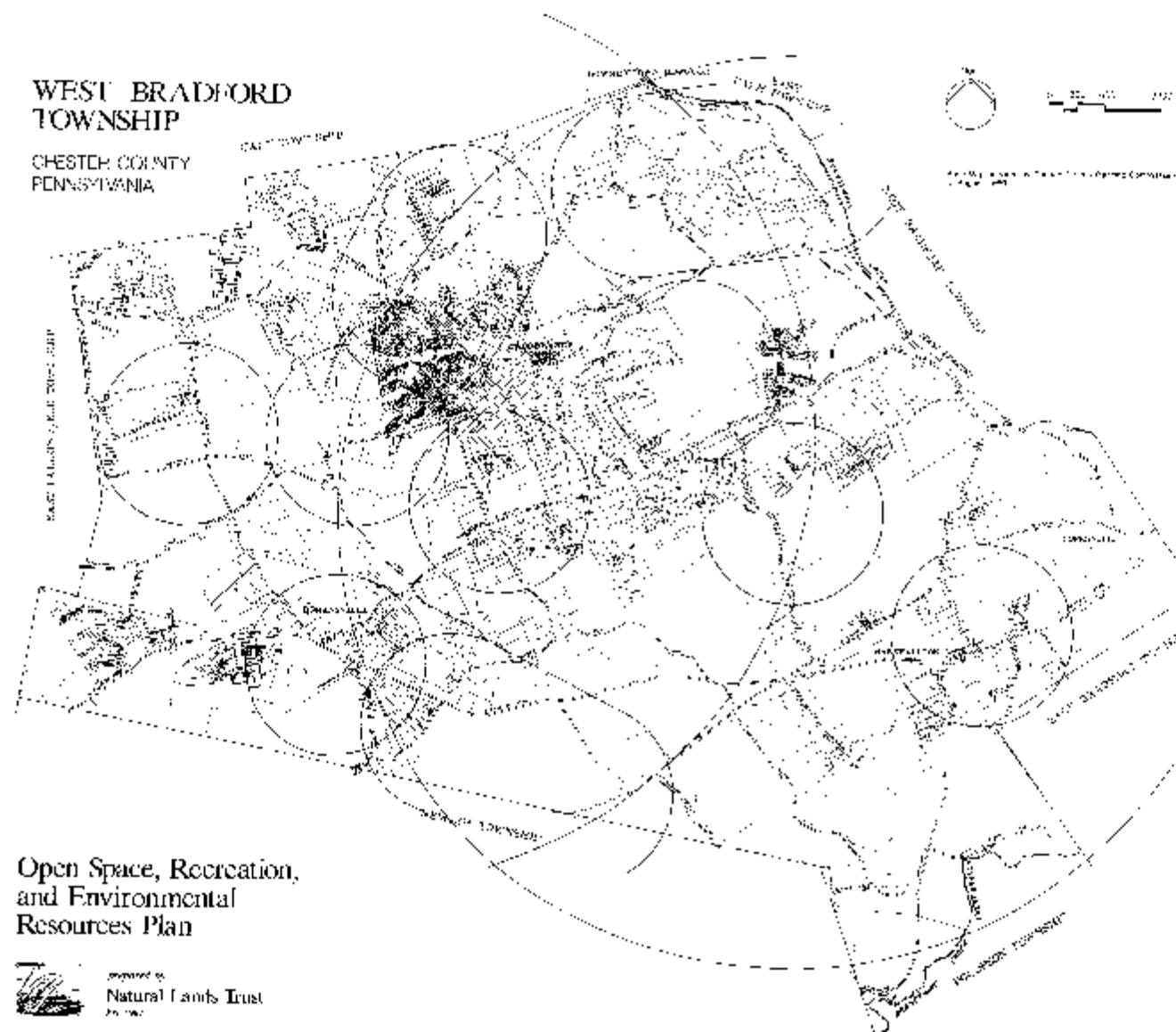
5.5.3 New Park Acquisitions

This study recommends the designation of eight neighborhood park sites and two community park sites. Community parks also serve as neighborhood parks; consequently, ten sites would serve their respective neighborhoods.

Of the ten neighborhood park sites assuming that Embreeville and Colonial Woods will soon be obtained by the Township and the WBYA will continue to

WEST BRADFORD TOWNSHIP

CHESTER COUNTY
PENNSYLVANIA



Open Space, Recreation, and Environmental Resources Plan



RECREATION RECOMMENDATIONS

- Proposed Naturalized Park
(100 acre lot)
- Proposed Community Park
(25 acre lot)
- Street Access Site

lease Embreeville Center lands, only five sites of ten acres each will need to be acquired which would realize a total of 62 acres +- necessary to meet Township park deficits by the year 2010. It is anticipated that a portion of the five new neighborhood park sites can be acquired through the subdivision process. Care must be taken, however, to assure that a minimum of five acres suitable for active recreation purposes are obtained for each site. The Township should be prepared to purchase such lands if they cannot be obtained through the subdivision process.

This study also recommends the designation of two sites for community park purposes. Since the Township already has a surplus of passive recreation lands, it is recommended that each of these sites contain a minimum of 20 acres suitable for active recreation purposes. Beacon Hill should be designated as one of the community park sites. The Township should attempt to acquire an additional 10 to 15 acres of land suitable for active recreation to compliment the existing Beacon Hill acreage. An additional site of 20 acres suitable for active recreation should be acquired by the Township. It is unlikely that a 25-acre parcel of relatively level land could be obtained through the subdivision process.

Map 5-1 depicts the service radii for the proposed neighborhood and community parks. Each neighborhood park has a service radius of one-half mile, while the two community parks have a service radius of 2.5 miles. The Embreeville site as well as the site currently leased by WBYA should be considered as a unit for development and programmatic purposes. The WBYA site standing alone should not be considered a neighborhood park due to its location near the Township boundary as well as the lack of future residential development envisioned for this area. This site is important, however, for meeting the athletic recreational needs of Township residents; therefore, should the Embreeville Center determine to sell the site, the Township should acquire it.

Similarly, the Municipal Campus and Colonial Woods as well as Bradford Heights Elementary School and Brandywine Meadows should be considered as single neighborhood park units for programmatic and improvement purposes. In both cases, the passive recreational lands will compliment the limited active recreation lands to adequately serve the respective neighborhoods.

The Beacon Hill/ West Bradford Elementary School site and the Bradford Heights Elementary School site have potential to become park/school facilities. The Township should attempt to establish a written agreement with the school district which would provide for Township recreation uses of the school facilities as well as cost sharing for maintenance and improvements to the grounds. Such

an arrangement would maximize the use of these facilities for community purposes and lessen the financial costs to both public agencies.

5.5.4 Proposed New Recreation Facilities

The five-year capital improvement plan on page 5-29 outlines the new facilities recommended to be constructed at the neighborhood and community parks to meet current recreational needs. Each neighborhood park should contain a parking area to accommodate ten to fifteen cars, a modest all-purpose field, and a playground facility. Remaining lands should be retained in their natural condition for passive recreational use.

Community parks should contain those facilities found in neighborhood parks as well as tennis courts and regulation athletics field. Community parks should contain a minimum 75 car parking lot, and sufficient natural areas should be left on the perimeter of the sites to provide a buffer for surrounding residences.

Park master plans should be completed for both neighborhood and community parks before construction begins.

Existing indoor facilities should be utilized for recreation programs. They would include the two schools, the Township municipal building and perhaps church facilities for senior citizen purposes.

The National Recreation and Park Association's standards call for one swimming pool for 20,000 population which will be reached by West Bradford Township in 2010. It is recommended that space be reserved in one of the Township's community parks to accommodate a pool. An intergovernmental pact to expand the population base as well as share in construction and operating costs is suggested. Properly managed, a pool's revenues should meet or exceed annual operating costs.

5.5.5 A Community Trail System

West Bradford Township should move aggressively to establish a two-part trail system consisting of: 1) a core system owned and maintained by the Township and 2) a spur system providing linkages to various subdivisions. The spur system could be owned and maintained by homeowners associations and/or easements could be obtained by the Township through the subdivision process. The core system should provide basic linkages to the Township's neighborhood and community park system and the County's Embreeville Park. The bulk of the core system should be suitable for hiking and equestrian use on natural surfaces. As the Township's population continues to grow, portions of the core system should be paved to accommodate bicycle usage.

While this study does not recommend a specific alignment for the Township core system nor those sections appropriate for biking, it is recommended that an immediate priority for the Township after the adoption of this plan would be the development of a detailed trail location plan and map. The plan and map should be used by Township officials to implement the trail concept outlined above and for reviewing future subdivisions so that full consideration can be given to dedicating trail sections through the subdivision process. It is anticipated that the Township may have to acquire critical linkages not obtained through the subdivision process. Full consideration should be given to the usage of appropriate utility rights-of-ways as well as several unimproved Township roads for trail purposes.

5.5.6 Recreation Program Recommendations

Currently, the Township's sports programming needs for both youth and adults appear to be adequately met through programs offered by the WBYA and other sports organizations. The sports programming could be rounded out by the addition of tennis, gymnastics, and lacrosse activities. Sport skill clinics designed for middle school age youth are recommended as a supplement to the sports competition programs.

The Township should devote future programmatic resources to expanding the program offerings to include activities such as the creative and performing arts, exercise, dance, nature, etc. Also, attention should be given to the recreational needs of senior citizens with the establishment of one senior center in the community.

A second summer playground program should be initiated so that programs are held at both elementary school sites. As new neighborhood park sites are acquired and constructed, consideration should be given to additional playground programs as need dictates.

To better ascertain resident interest in recreational programming, it is recommended that a future township newsletter contain a recreation program questionnaire. The basic recommendation for the Township's recreation program is that it should be greatly expanded as suggested in the standards section to provide a much more comprehensive offering than athletic competition. This recommendation can be met through greater DARC programming at Township facilities.

5.5.7 Managing the Parks and Recreation System

West Bradford should continue its membership in DARC to access the professional expertise of a full-time recreation director. It is critical, however, that the chairman of the Township Recreation Commission aggressively represent West Bradford Township's interests on the DARC board. Township residents will continue to benefit from the broad range of recreational programs that the Consortium provides to residents of the Downingtown area. To better serve Township residents, DARC sponsored programs should be conducted at locations throughout the Township principally at the schools and at public parks.

The Township Recreation Commission should be assigned the primary responsibility for implementing the OSRER Plan. Furthermore, as new appointments are made to the Commission, the Township should make every effort to realize a broader representation. Ideally, Commission members should represent all geographic areas of the community, as well as different interests such as environmental, planning, historical, arts, sports, etc.

To obtain a broader perspective on municipal park and recreation operations, the Commission should visit other Chester County park and recreation agencies, become a member of the Pennsylvania Recreation and Park Society, and attend local workshops and conferences on this subject.

The Township should also develop a written agreement with the School District to realize a cooperative arrangement between the two public bodies for not only the provision of the park and recreation services but also improvements to and maintenance of outdoor school recreation facilities. This type of park/school plan conceptually would provide for recreational use of school buildings and grounds after school hours, on weekends, and holidays. The agreement could also realize cost sharing with the construction of outdoor recreation facilities and their maintenance. Such an arrangement could avoid duplication of facilities and the respective maintenance costs.

The Township manager should continue to direct the park planning, acquisition, and improvement program, and the Recreation Commission should continue to serve the Board of Supervisors in an advisory capacity regarding these matters.

While the current park maintenance program is adequate, with the acquisition and development of additional neighborhood and community park facilities, a more structured maintenance program will be required. A separate park maintenance budget will have to be developed, and it is recommended that initially a park maintenance function be established within the Road Department. Part-time summer personnel should be employed to assist with park maintenance responsibilities such as mowing, trash removal, and minor

repair work. As the park system expands, however, full-time personnel will be required.

Also, as the Township park and recreation system grows, its day-to-day administration will require more than the part-time attention currently given it by the Township Manager. Initially, the Township should attempt to expand the role of DARC to provide the additional administrative assistance required. Should such an arrangement be found inadequate, it is recommended that the Township retain a full-time park and recreation director who would be responsible for park planning, acquisition, development, maintenance and programmatic functions. At this time, a Parks and Recreation Department should be created and the park maintenance functions transferred to it from the Road Department.

5.5.8 Financing of the Park and Recreation System

5.5.8.1 Five Year Capital Improvement Program

Table 5.5.8.1 presents a five-year capital improvement program to implement the priority land acquisition and park improvement projects recommended above. Land acquisition costs have been based on a value of \$15,000 per acre and park improvement estimates are based upon figures obtained from the Pennsylvania Department of Community Affairs.

With respect to land acquisition, the Township should give highest priority to the acquisition of an additional 15 +- acres at Beacon Hill Park. Three new neighborhood parks each consisting of ten acres are recommended to be acquired during the next five-year period. While their full acquisition costs have been shown, it is anticipated that a portion if not all of the land may be obtained through the subdivision process.

Also, a \$10,000 lump sum figure for three consecutive years has been shown for trail acquisition. These funds should be considered as the initial costs to begin the process of implementing a trail system. While major portions of the system will follow roadways, existing power lines, and/or be obtained through the subdivision process, the Township, nevertheless, will still be required to acquire key linkages not obtained through other means.

Improvements consisting of parking facilities, trails, and miscellaneous improvements to both Colonial Woods and Brandywine Meadows are recommended in 1994. With the completion of these facilities to compliment the Municipal Campus and Bradford Heights Elementary School sites, these units will effectively meet the neighborhood park requirements for their respective areas.

The new recreation facilities recommended for Beacon Hill Park would be constructed on the new land to be acquired. These improvements would satisfy the current deficit in recreation facilities identified in the standards section of this study. It is important to note that a master plan for the Beacon Hill site as well as plans for the new neighborhood park sites should be completed prior to construction of any new facilities.

One new neighborhood park should be completed during the next five-year period. New facilities called for include a playground, parking facilities, and a multi-purpose field.

TABLE 5.5.8.1
WEST BRADFORD TOWNSHIP
PARKS & RECREATION FIVE YEAR CAPITAL PROGRAM

	<u>1993</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>Total</u>
<u>Land Acquisition</u>						
Community Park		225,000				225,000
Neighborhood Park			150,000	150,000	150,000	450,000
Trails		10,000	10,000	10,000	10,000	30,000
Total Land Acquisition	225,000	160,000	160,000	160,000	160,000	705,000
<u>Park Improvements</u>						
Colonial Woods		20,000				20,000
Brandywine Meadows		25,000				25,000
Beacon Hill Park						
Master Plan		15,000				15,000
Tennis Courts (4)		90,000				90,000
Volleyball (3)			6,000			6,000
Soccer (2)			32,000			32,000
Softball (2)			44,000			44,000
Misc. Improvements			50,000			50,000
New Neighborhood Park						
Master Plan		10,000				10,000
Playground			20,000			20,000
Parking			2,000			2,000
Multi-purpose Field			16,000			16,000
Misc. Improvements			15,000			15,000
Trail Improvements						
Plan	10,000					10,000
Misc. Improvements			10,000	10,000		20,000
Total Park Improvements	160,000	142,000	63,000	10,000	10,000	375,000
Program Totals	385,000	302,000	223,000	170,000	1080,000	

A detailed township-wide trail plan should be prepared early in the five-year improvement program in order to provide immediate guidelines to Township officials for their review of upcoming subdivisions. A lump sum amount has been placed in the budget to make surfacing, water drainage, and gating improvements to the initial sections of the trail to be opened to the public.

The day-to-day operations of the park and recreation system should be financed through the taxes paid into the Township's general fund. A fee program for participation in recreation programs should be implemented, for recreation programs have the potential to be self-supporting.

5.5.8.2 Financing the Capital Program

With respect to financing the capital improvement plan, there are a number of techniques available to the Township which are outlined below.

5.5.8.2.1 Chester County Heritage Park and Municipal Grant Program

The Chester County Board of Commissioners have established a grant program to assist municipalities with the planning, acquisition, and improvements for their municipal park systems. Currently the County's program can assist West Bradford in three ways:

1. Acquisition Program - The County will reimburse up to 50% of the approved costs to a maximum of \$250,000 for each fee simple property acquisition.
2. Park Improvements - The County will reimburse up to 50% of the cost to develop a park site up to a maximum grant of \$200,000.
3. Small Park Improvements - The County will award municipalities a \$15,000 non-matching grant for minor park improvements.

5.5.8.2.2 Recreational Improvements and Rehabilitation Act Program (RIRA)

The Pennsylvania Department of Community Affairs administers grants to local government for park planning, acquisition, and development. Currently the program provides matching grants to a maximum of \$150,000 for these purposes.

5.5.8.2.3 National Recreation and Trails Act (SYMMMS)

This is a new program initiated in late 1992 that will provide grants up to 80% of the cost for trail improvements, restoration, and maintenance. The program is

administered by the Department of Environmental Resources, Bureau of State Parks.

5.5.8.2.4 Township Bond Issue

A township bond issue which would spread the payments for park acquisition or improvements over a long period of time consistent with their life span is a recommended option for the Township. The bond issue would give the Township the immediate cash required to move aggressively forward with high priority projects recommended in the plan.

5.5.8.2.5 Mandatory Dedication or Fee In Lieu

The mandatory dedication and fee in lieu program is provided for in the Municipal Planning Code and is currently used successfully by many municipalities throughout Pennsylvania. The concept behind the program is that land developers through their subdivisions create demands for new community services such as parks which they should be expected to help financially subsidize. Where park acreage has already been set aside to serve a new subdivision, the Board of Supervisors could require the subdivider to pay a fee in lieu of dedicating park acreage. Such fees should be placed in a special fund designated for the improvement and/or maintenance of the neighborhood park designed to serve that subdivision. Before enacting such provisions, the Township must have an approved Recreation and Open Space Plan to guide its actions.

Chapter 6

RECOMMENDATIONS SUMMARY

6.1 PURPOSE

The purpose of this final chapter is to outline the recommendations contained in Chapters 4 and 5 ("Plan for Open Space" and "Plan for Recreational Lands and Facilities"), and in the process to define a cohesive bottom-line strategy (and timetable, where applicable) to assist the Township in implementing this report's recommendations. This chapter does not summarize the basis for, or the rationale behind, the recommendations, or for the details of the recommendations themselves, for that information is readily accessible within the text of the previous two chapters. First priority recommendations should be implemented within two to three years following plan adoption. Second-level recommendations shall be implemented within five to six years after plan adoption.

6.2 RECOMMENDATIONS FOR OPEN SPACE PROTECTION

6.2.1 Possible Refinements to the Zoning Ordinance: First Priority

- * Consider amendments that would provide more explicitly for a "menu" of options for landowners, including incentives for "*limited development*" (less than full density, typically on large "country estate lots") and a variety of full-density alternatives such as clustered "*open space design*", "*landowner compacts*" involving adjacent parcels (in which density can be shifted around among the parcels to conserve the most significant parts of the entire acreage), and the "*density exchange option*" (density exchanges within a rural residential district between nearby non-contiguous parcels).

- * Consider amendments that would successfully encourage new residential subdivisions to be designed to include significant areas of permanently protected open space, in a "full-density" manner enabling landowners to maintain their equity and value when they sell their property to developers. This could be accomplished by allowing developers to build clustered subdivisions at full density, while allowing new "checkerboard" layouts (with no open space) only at lower overall densities.
- * Consider adding a "Site Capacity Analysis" procedure to clarify the acreage upon which full development density for clustered subdivisions may be calculated, to ensure that truly unbuildable land is not included, while also ensuring that landowners and developers will be able to build this type of land-conserving subdivision with the same number of dwellings that they would have been able to construct under existing rules governing conventional "checkerboard" layouts.
- * Consider amendments that would provide greater protection for streambanks and steep slopes, though design standards affecting the overall pattern and location of development within a parcel, while not reducing the total number of units that could be built. Such amendments should address the issue of clear-cutting and woodland removal in sensitive environmental areas.
- * Consider creating zoning overlay districts prohibiting the storage of materials that could easily pollute surface waters or groundwater, and establishing minimum setbacks from watercourses and waterbodies within which construction, vegetative clearing and regrading would be prohibited.

6.2.2 Possible Refinements to the Subdivision Ordinance: First Priority

- * Consider amendments to modify the current two-step Preliminary and Final Plan submissions so that the first plan submitted (called a "Concept Plan") will include a site analysis and schematic layout showing how natural areas and other open space features will be protected, with the second plan (called a "Detailed Plan") providing the technical detail normally associated with current "Preliminary Plans". Under this approach, the minor adjustments usually following the "Detailed Plan" review could be handled administratively by Township staff.
- * Consider amendments to require that subdivisions be designed around existing natural features worthy of preservation, such as serpentine outcrops, mature woodlands, hedgerows, historic structures, steep slopes, wetlands, and hydric soils, while providing development designers with greater flexibility to facilitate sensitive layouts of houselots and streets that avoid impacting such

areas to the maximum extent feasible. Such areas could be designated on approved subdivision plans as special features that may not be disturbed (by being located inside "preservation envelopes" within individual houselots, being located within commonly held open space subject to conservation easements, or being deeded to the Township or a local land trust). In order to facilitate this, a four-step approach to subdivision design could be described in the regulations, as follows: 1) identification of open space to be protected; 2) location of house sites; 3) alignment of roads; and 4) location of lot lines.

* When reasonable alternative layouts cannot be identified and when a new development must encroach upon a valued natural habitat area (such as a woodland), consider adopting design standards requiring that the houselots be minimized in area and frontage so that tree clearing, site disturbance, street construction, and habitat fragmentation will be minimized.

* Consider relating the maps contained in this report to the development design process, so that the open space that is designated within new subdivisions bears a reasonable relationship to the natural features and other open space elements identified as worthy of protection in this Plan. In this way, it is possible that these protected lands may ultimately form an inter-connected system of permanent open space for wildlife habitat, water quality protection, passive recreation, etc. In order to facilitate this process the Township should consider preparing a Township-wide "Map of Open Space and Greenways Network", which should be drawn with respect to tax parcel lines to ensure that no property would be unduly affected (i.e., that every property would still be able to achieve full density development, if that is the owner's wish).

6.2.3 Open Space Protection: Non-Regulatory Approaches

* Work with individual rural landowners and groups of landowners in rural neighborhoods to inform them of options for conservation, including participation in Agricultural Security Areas (protecting farmers from nuisance suits), participation in the Act 515 program for current-use property taxation, and the estate tax benefits of donating conservation easements on all or part of their holdings to the township or a recognized land conservation organization.

* Work with individual rural landowners to help them qualify for the "purchase of development rights" program in Chester County.

* Consider acquiring, at fair market value, key parcels of land necessary for the implementation of this Plan, where other approaches are either not appropriate or not feasible.

6.3 PARK AND RECREATION RECOMMENDATIONS

6.3.1 Park and Recreation Recommendations: First Priority

- * Acquire a 10 to 15 acre addition to the Beacon Hill site, prepare a master site development plan for Beacon Hill Park, and construct improvements at the Beacon Hill site.
- * Complete master site development plans for Colonial Woods and Brandywine Meadows.
- * Acquire land for one new neighborhood park.
- * Acquire the Embreeville site from Chester County.
- * Undertake a planting plan for the Municipal Campus site.
- * Revise subdivision language to include new mandatory dedication and fee-in-lieu provisions.
- * Conduct a township-wide survey to determine recreation programming interests of residents.
- * Apply for county and state funds to assist the Township with acquisition and park improvement projects.
- * Initiate acquisition of key parcels for the trail system.
- * Develop agreements with appropriate utilities for trail usage.

6.3.2 Park and Recreation Recommendations: Second Priority

- * Acquire two new neighborhood park sites.
- * Complete master site development plans for each new neighborhood park site.
- * Complete improvements as recommended in the plan for each neighborhood park site.
- * Establish a new playground program at Bradford Heights Elementary School.
- * Continue to implement the trail plan.

- * Broaden representation on the Recreation Commission by adding new members with interest in trails, arts, the environment, etc.
- * Acquire a new community park of 20-plus acres.

APPENDIX A

WEST BRADFORD TOWNSHIP OPEN SPACE, RECREATION, ENVIRONMENTAL RESOURCES PLAN

MAP LEGENDS

Existing Land Use

Single Family Residential
Two Family, Multi-Family Residential
Mobile Home Park
Retail Service/Office Commercial
Airport
Industrial
Public Institutional
Private Institutional, Educational, Religious
Public Open Space, Recreation
Quasi-Public Open Space, Recreation
Utilities, Railroad
Overhead electric line
Pipeline
Underground cable
Agricultural
Woodlands
Vacant
Approved, unbuilt subdivision

Sources:

1. West Bradford Township Comprehensive Plan, Existing Land Use Map, 1988.
2. Aerial photography, March, 1990.
3. West Bradford Township Open Space Task Force, July, 1992.

Water Resources

100 Year Floodplain and Alluvial Soils
Additional Seasonal High Water Table Soils 0 to 1 Ft. from Surface (Hydric Soils)
Additional Seasonal High Water Table Soils 1 to 1.5 Ft. from Surface
Wetlands
Major Watershed Boundaries
Headwaters: Drainage Area of First Order Streams
Stream Order Classification
Aquifer Areas, Underlain by Carbonate Bedrock

Sources:

1. USGS 7.5' quadrangle of Coatesville, Pa., 1953, revised 1973, and Unionville, Pa., 1953, revised 1973.
2. Geologic Survey of Pa., compiled by A. A. Socolow, 1978.
3. Groundwater Resources of Chester County, Pa., U.S.G.S., Water Resources Investigations, 77-67, L. J. McGreevy and R.A. Sloto, 1975.
4. National Wetlands Inventory, Coatesville and Unionville

quadangles, U. S. Department of the Interior, Fish and Wildlife Service, 1982.
5. Soil Survey of Chester County, Soil Conservation Service.
6. Zoning Map of West Bradford Township.

Geology and Groundwater Yield

1 to 5 Wells to Produce 1 Million Gallons per Day
Franklin Marble
5 to 20 Wells to Produce 1 Million Gallons per Day
Felsic Gneiss, Hornblende Bearing
Felsic Gneiss, Pyroxene Bearing
Wissahickon Formation, Oligoclase-Mica Schist and Albite-Chlorite Schist
5 to 45 Wells to Produce 1 Million Gallons per Day
Peters Creek Schist
15 to 40 Well to Produce 1 Million Gallons per Day
Serpentine
Greater than 30 Wells to Produce 1 Million Gallons per Day
Diabase
Fault

Sources:

1. Pennsylvania Geological Survey, compiled by A. A. Socolow, 1978.
2. Groundwater Resources of Chester County, Pa., U. S. Geological Survey, Water Resources Investigations 77-76, L. J. McGreevy and R. A. Sloto, 1975.

Land Resources

Steep Slope Greater than 20%
Prime Agricultural Soils (Class I and II)
Additional Farmland of Statewide Importance (Class III)

Sources:

1. USGS quadrangles of Coatesville and Unionville, Pa., 1953, revised 1973.
2. Soil Survey of Chester County, Pa., Soil Conservation Service.
3. Chester County Soil Conservation Service.

Biotic Resources

Impact Zone of Pa. Natural Diversity Inventory Site
Exceptional Value Waters (All other streams warm water fisheries)
Woodlands
Underlain by Serpentine Bedrock
Individual Large Trees
Grove of Large Trees
Concentrations of Birds

Sources:

1. Planning Buletin No. 37, Chester County Planning Commission, January, 1990.
2. Aerial Photography, March, 1990.
3. Geologic Survey of Pa., compiled by A. A. Socolow 1978.
4. West Bradford Township Open Space Task Force, July, 1992.
5. Pa. Natural Diversity Inventory, Pa. Department of Environmental Resources, 1991.
6. West Chester Bird Club, Spring and Christmnas bird count records, 1967 through 1992.

Scenic, Historic, and Cultural Resources

Scenic Resources

Road Functional Classification

Arterial
Collector
Local, Paved
Local, Unpaved

Non Scenic Roads

Cul de Sac Roads and Developed Road Frontage
(minimum length 1500 ft.)

Scenic Roads

Historic Building Cluster or Village
Rural

Significant Visible Landscapes

Vista Points

Rock Outcrops

Brandywine Scenic River Corridor

Historic Resources

Sites on the National Register of Historic Places

Sites Eligible for Listing on the National Register

Sites on the Chester County Historic Sites Survey

District on the National Register of Historic Places

Ruins, Sites of Structures

Sites of Quarries

Sources:

1. West Bradford Township Comprehensive Plan, Historic Resources Map, 1989.
2. Brandywine Scenic River Nomination, Scenic Landscapes Maps, Turtle Creek Associates, November, 1987.
3. Field Survey by Natural Lands Trust, November, 1992.
4. West Bradford Township Open Space Task Force, November, 1992.

Protected Lands

Public Parks and Open Space
 County Owned
 Township Owned
Other Public Lands
 State Owned
 Township Administrative Campus, Stormwater Facilities
 Schools
Quasi-Public Lands with Open Space or Recreation
 Homeowners Associations
 Recreation Associations
 Institutional, Religious or Educational
Lands under Conservation Easement
Agriculture Security Areas
Historic Districts on the National Register
Pa. Scenic River Corridor
Utility Company Rights of Way
 Overhead Electric Lines
 Underground Pipelines
 Underground Cable
Deed Restricted Lands (Greater than 5 Acres)

Sources:

1. Chester County tax assessment records, 1991.
2. Chester County Agricultural Development Office, 1992.
3. Brandywine Conservancy, Environmental Management Center
May, 1992.
4. West Bradford Township Open Space Task Force, July, 1992.

Resource Composite

Critical Natural Resources

 Floodplains, Alluvial and Hydric Soils, Wetlands
 Steep Slope Greater than 20%

Sensitive Natural Resources

 Seasonal High Water Table 1-1.5 Ft. from Surface,
 Aquifer Areas, PNDI Impact Areas, Serpentine Bedrock,
 Woodlands

Agricultural Lands Identified in:

 Township Comprehensive Plan, Land Use Management
 Plan
 County Open Space and Recreation Study,
 Recommendations Summary
 Both Comprehensive Plan and Open Space Study

Sensitive Cultural Resources (Overlay)

 Historic Sites, National Register Historic Districts
 Significant Visible Landscapes

Sources:

1. Same as inventory maps.

APPENDIX B

West Bradford Township Large Tree Inventory

Map number, approximate diameter in inches at breast height, species
November, 1992

- 1 36" oak
- 2 36" oak
- 3 42" sycamore
- 4 60" oak
- 5 42" sycamore
- 6 36" oak
- 7 36" sycamore
- 8 60" to 36" sycamores, five around quarry edge
- 9 30" unidentified species
- 10 30" unidentified species
- 11 30" oak
- 12 diameter not measured, oak
- 13 36" Kentucky coffee bean
- 14 48" oaks, three
- 15 42" linden
- 16 60" sycamore
- 17 48" sycamore, on south bank of creek in Pocopson Twp.
- 18 36" tuliptrees, two
- 19 42" sycamore
- 20 48" silver maple
- 21 42" oak
- 22 36" oak
- 23 36" white oak
- 24 48" unidentified species
- 25 42" oak
- 26 36" sycamore
- 27 36" oak
- 28 36" oak

